

# How to Increase Election Voting Rate

## To maintain strict democracy

5101 Ino Haru

### 1. Abstract

These days, the voting rate in elections is rapidly decreasing in Japan. It is about under 50% and the number is the worst in G20 countries. However it is not only in Japan but also in other countries such as the United States of America. What they have in common is that voting rate of the younger generation is fewer than the older generation.

In such a situation, the policy will be for elderly so it will not be comfortable to live in for young people. Therefore, the problem is connected with other problems such as declining birthrate. For this reasons, we must tackle the problem.

First, I thought that the problem is happening in developed countries so I researched the rate of G20 countries which are generally called developed countries. The result was different from my forecast. The rate of some countries such as Australia is higher that 80%. Other countries which score high but not in G20 countries are Laos, Vietnam and so on. These countries scored over 90%. And also, nordic countries are high rate countries too. There are two main factors why these countries score high. The first one is the duty to vote. In some of these countries, they will be punished if they do not go to vote. Second one is that young people are interested in politics. In nordic countries, a 34 years old female primeminister was born. In addition to this, youth's opinions sometimes change the government so they know well that their voices have power to change the countries.

In my conclusion, I want to suggest some ideas. The first one is education about election or politics in school. Second one is change the voting place.

### 2. Introduction

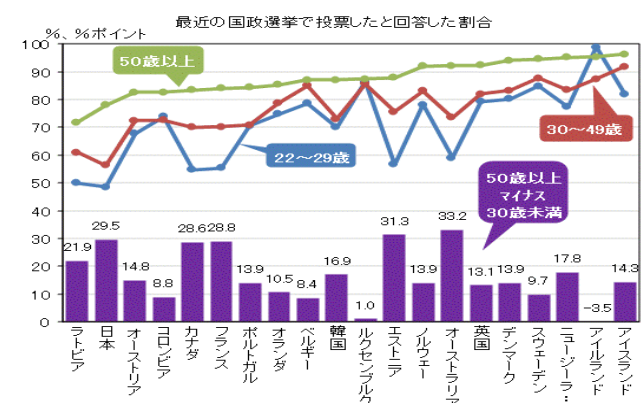
In Japan, the voting rate in elections is decreasing rapidly. The Japanese voting rate is about 48% and to solve this problem, the government gave the right to vote to teenagers.

However, we cannot recognize noticeable effect and the rate is still low. The problem happens not only in Japan but also in other countries like the United States of America. The country's rate is also about 50%.

Therefore, the problem is a global one.

In addition to this, elections are an important part of democracy, so decreasing voting rate would affect strict democracy. To maintain the world's situation and not to outbreak wars, it is effective to prevent decreasing voting rate.

年齢別投票率格差の国際比較(2021年)



(注)2000人前後のサンプルによるOECD Trust Survey (<http://oe.cd/trust>) が原資料。国の並びは50歳以上の投票率昇順。  
(資料) OECD (2022) Building Trust to Reinforce Democracy

### 3. Purpose and meaning of this research

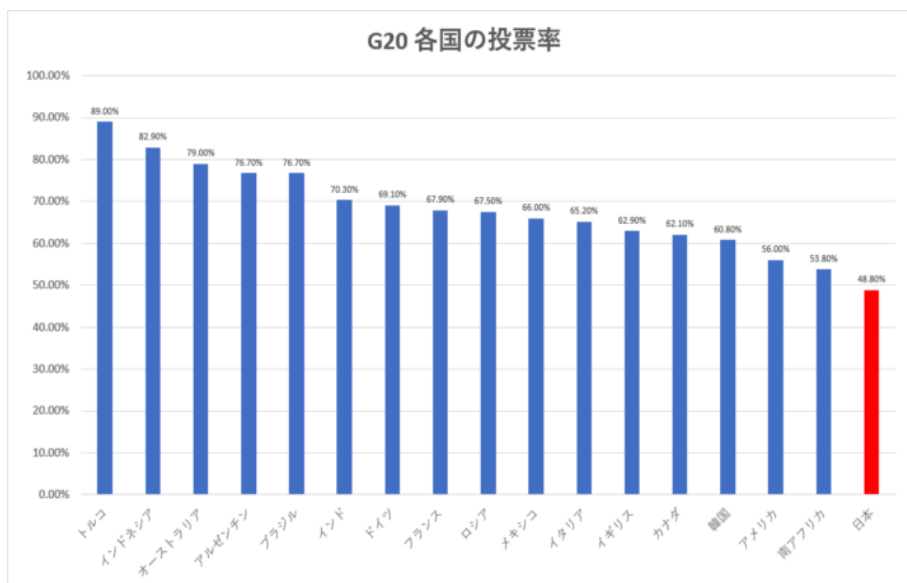
If election voting rate decrease, it means that the government don't reflect the people's opinion sufficiently in the politics. We can say that the voting rate show how much democracy spread in the country. In this respect, it is necessarily for us to emphasize tha rate. This graph (Green: over age 50 Blue: age 22-29 Red: age 30- 49) shows that the rate of older generation's rate surpasses the rate of younger generation in most of the countries. The wider the gap between the elderly and the young become, the harder it would become for politicians to conduct policies for young people because they need to gather votes in election. It is reasonable to focus on the policies for elderly. Therefore, we must think how we can increase the rate of young people.

### 4. Research methods

Using the internet and collecting the data which shows the rates of each countries and the policies other countries are conducting to increase the rate. In addition, I will search for the point in common among high rate countries or different point between high countries and low countries.

### 5. Discussion and Implication

First, I researched the rate of foreign countries.



This graph shows the rate of G20 countries. This graph shows only a 1 year rate but the voting rate does not change drastically in only few years so I will analyze this data.

In these countries, the lowest country is Japan, the rate is under 50% followed by USA, South Africa, Korea, The UK and Canada. Contrary to this, the highest country is Turkey, the rate is over 85% followed by Indonesia, and Australia.

According to this data, countries in G7 indicate low rates so I made an assumption that the decreasing of voting rate is happening in developed countries.

Second, I researched the countries which are outstanding but not in G20. The high rate countries are Laos, Vietnam, and Singapore. The low rate countries are Iran, Iraq, and Egypt.



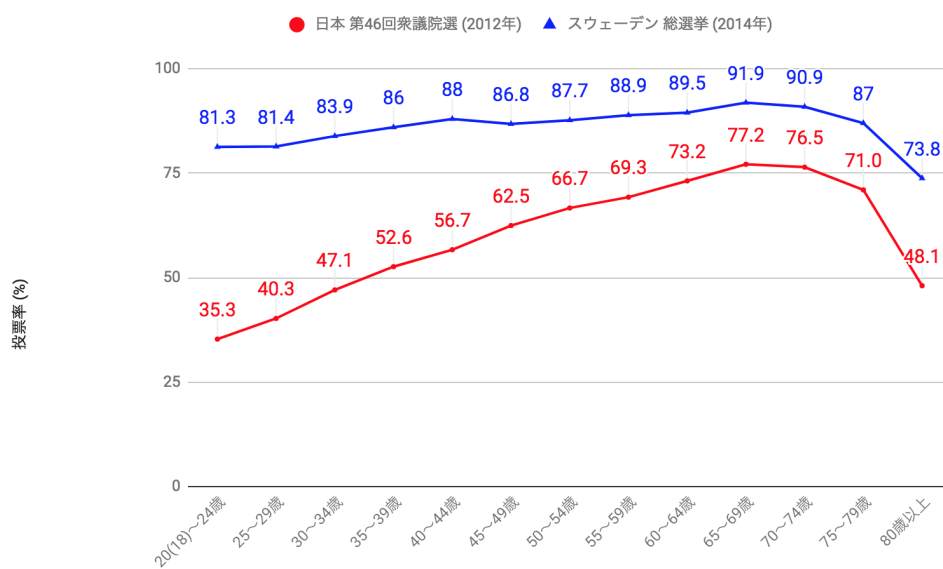
We then investigated why the rate was so high in the countries with high voter turnout. The first thing that comes to mind is duty to vote, which is conducted in countries such as Australia, Turkey, and Argentina, which had the highest levels among the G20 countries. This means that they can be punished for not voting. Singapore, whose name was mentioned earlier, also makes voting compulsory, and penalties for not voting are strictly enforced, including "striking a name from the electoral roll." In Australia, the voting rate, which was in the 50% range, has risen to nearly 90% since the introduction of mandatory voting. I thought that mandatory voting would increase turnout.

However, there are several problems if we conduct mandatory voting. First, if voting were to be made mandatory, strict penalties would need to be established. Australia and Singapore have strict penalties for violations, including fines and disenfranchisement. However, turnout can be low in countries where voting is mandatory but the application of penalties is not strict or unclear. In fact, this is the case in Egypt, where voting is formally mandatory but turnout is among the lowest.

And another issue is that mandatory voting could invade the right to liberty. Mandatory voting could invade rights in today's world where people advocate the right to make decisions based on one's own will. I thought I have to consider whether it is effective or dangerous.

We then investigated the differences between Japan and the Nordic countries. The reason for this is that there were many comparative data and studies on Japan, a country with a low voter turnout, and the Nordic countries, which are ahead of Japan in welfare systems and elections, so these data makes it easier to conduct the research. One thing that was pointed out there was that there is a big difference in the attitude of young people. In some Scandinavian countries, the voting rate of young people exceeds that of the elderly, which is the exactly opposite of Japan. In Finland, the prime minister is a 34-year-old woman, and it can be said that Finland has achieved active participation in politics by young people. In the Nordic countries, there are many events that have been realized through the voices of young people, such as gender equality and LGBT acceptance, and people understand the importance of elections and the importance of their votes.

日本とスウェーデンの年齢別投票率の比較



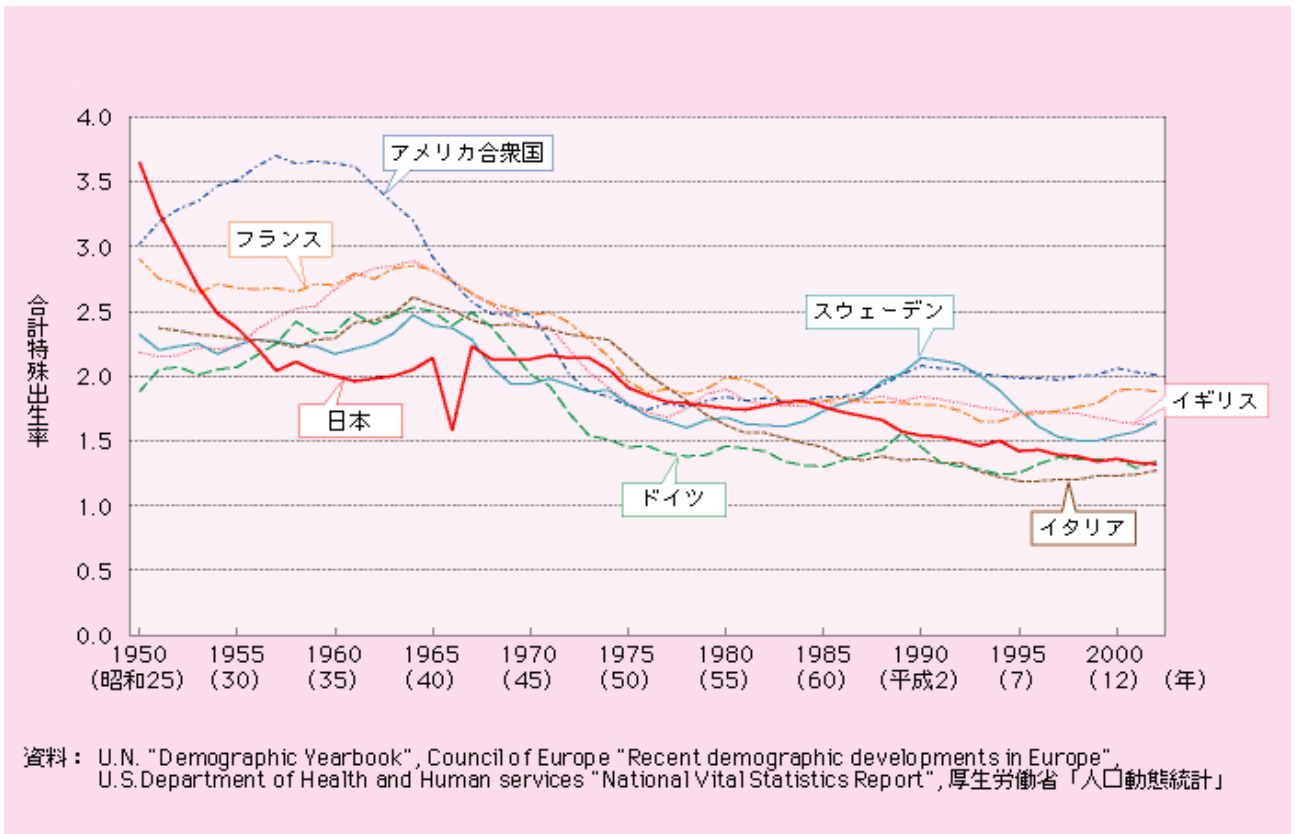
↑ Two countries with a noticeable gap in youth voter turnout (Source: 明るい選挙推進委員会)

Comparisons between Japan and the Scandinavian countries show that there is a clear difference in public awareness between countries with low and high voter turnout. In addition to the awareness of national politics, some countries, such as Australia, seem to regard elections as an event, with barbecue stands set up near polling places and a festival-like atmosphere. It seems that there are differences in attitudes toward elections themselves. We conducted a survey of the United States, which is another country with a low voter turnout rate. The U.S., like Japan, has a problem of low voter turnout among young people, and the voter turnout among 18- to 29-year-olds was a low 28% in the 2006 midterm elections.

However, in the 2008 presidential election, the turnout was 50%, which is more than in the midterm elections, but not high enough to be considered high. There are several possible reasons for the low voter turnout among young Americans. The first is the complexity of the voting process. Someone becomes of voting age does not mean that they can immediately vote. There are many questions such as which polling place to go to or how to cast an absentee ballot, and as a result, some people do not vote. The second reason is that young people have the mindset that their vote will not make a difference. Some young people have a feeling of resignation that they are at a disadvantage from the beginning and that the mainstream will win anyway. I thought that this could be said of Japan too, and it seemed to me that this is a problem that is unique to developed countries with stable politics in various aspects. Young people in countries like Japan and the U.S., where the voting rate of young people is lower than that of other generations, know that they cannot win over the mainstream, which is supported by a larger number of people, even if they unite and vote for the candidates they want to promote. This would lead to a vicious cycle of lower and lower youth voter turnout, as they would not see the value of their vote.

A third reason is the lack of information among high school students. Politicians may come to universities to make speeches, but not to high schools. This is not surprising, since most voters are in college, but this means that those who do not go on to college are not exposed to politics. And those who live in the suburbs and do not go to college will have even fewer opportunities to do so.

So far, we have looked at the current situation and efforts in the G20 countries, countries with extremely high voter turnout, Nordic countries, and the United States, a country with similar circumstances to Japan. From the above surveys, it seems that the main reason for the large difference between countries with high and low voter turnout is the voter turnout rate and awareness among young people.



In addition, as the above graph (source: Cabinet Office) shows, the number of countries with declining birthrates in the developed world is increasing considerably. If the voting rate in such countries declines and the youth turnout is low, it may be difficult to develop the kind of politics that young people want. We have decided to examine the importance of efforts to increase youth voter turnout in countries where voter turnout has declined.

First, we considered the promotion of electoral education for students in the compulsory education process in each country. As the previous example in the U.S. shows, there are certainly young people who lack knowledge about elections and national politics, or who intend to vote but do not know how exactly to vote. In terms of specific educational content, we felt that in addition to the mechanism and necessity of elections, more detailed education is needed on how exactly to vote, how to vote, and how to vote in the areas where these educational institutions are located. We also felt that it would be effective to provide explanations of candidates' manifestos at schools during relatively large elections. By incorporating these activities into school education, we can expect that interest in politics will be generated in our daily lives.

## 6. Conclusion

From these studies I would like to make some suggestions. The first is about education. As I mentioned before, in countries with low turnout, some people do not have enough knowledge about elections and politics and it is apply especially to young people. This is why I thought it would be effective to implement detailed electoral education in the compulsory education

curriculum. Specifically, they are to identify local polling places and explain the pledges of each political party. However, this type of education can be difficult in developing countries. Then, from the perspective of separation of church and state, teachers need to be careful as well.

The second is the polling place. The first effective way to increase youth voter turnout would be to allow them to vote in schools. In addition, it would be important to place the ballots near train stations and other locations that are in line with the flow of people.

Third, encourage young people to vote. In Japan, the My Number Card has spread to many people, including young people, due to the score of points awarded. This principle could be used to encourage voting by offering some kind of benefit. Needless to say, however, there are many problems with this.

Future tasks are to flesh out and examine proposals, as well as to consider more effective proposals.

## 7. References

<https://www.cao.go.jp/> (内閣府)

<https://go2senkyo.com/articles/2019/07/22/43035.html> (選挙ドットコム)

<https://camp-fire.jp/projects/view/250619> (スウェーデンの主権者教育の教材「政治について話そう」和訳版を冊子化して届けたい！)

<https://www.yomiuri.co.jp/world/20221110-OYT1T50024/> (読売新聞)

<https://www.asahi.com/articles/ASQC50RKMQC3UHBI01D.html> (朝日新聞)

<https://forbesjapan.com/articles/detail/38033> (米国の投票率、他の先進国と比べると実は低い？)

[https://www.mext.go.jp/content/20200828-mxt\\_kyoiku02-000009659\\_2.pdf](https://www.mext.go.jp/content/20200828-mxt_kyoiku02-000009659_2.pdf)

(文科省)

# Improvement in Global unemployment rate

## Cooperation between developed and developing countries

5102 Imaizumi Daichi

### Abstract

In this research, I examine the improvement in global unemployment rate by cooperating with developed and developing countries. These days, due to COVID-19 pandemic, the unemployment rate is increasing in the world and I thought this is a serious problem. I think this rise means the expansion of the gap between rich and poor. So, improvement in unemployment rate can lead to world peace indirectly.

The way to research is mainly information gathering on the internet and analyzing the current situation based on those materials. Then, I reached a conclusion.

I found two things in this study. The unemployment problem is serious in African countries and they improve the rate with their original policy in developed countries. First is about the rate in Africa. I was aware that the unemployment problem in developing countries (mainly in Africa) was serious before, so I realized that this is the problem which we should solve quickly again by researching. Second is about the policy in developed countries. I researched the policy of Sweden, America and Germany. In Sweden, they make an effort to improve the unemployment rate together with the country and the support such as unemployment insurance is fulfilling. In America, they didn't do some special policy, but the companies improved the problem with corporate effort. In Germany, the country uses the policy called "Bürger arbeiten". In this policy, the country gives some public jobs to unemployed people and they make those people get a job for sure.

As a conclusion of this study, I came up with the idea that developing countries should introduce the German policy. With this project, we give a job such as child care and raise those children as future human resources. As a result, we can fulfill the double improvement of the unemployment rate today and in the future.

\* In this study, I defined "developed countries" as the Western countries and "developing countries" as African countries.

\* In this study, I used a different meaning of "Improvement".

-> "Improvement" in developed countries means "to lower the rate to single figures",  
and in developing countries means "to lower the rate to the level as developed countries".

### 1. Introduction

The purpose of this study is to improve the global unemployment rate. My focus is on developing countries in Africa, where unemployment has always been a serious problem. I believe that the global unemployment rate will also improve by improving the unemployment rate in African countries. Also, by improving this problem, the gap between the rich and the poor can be narrowed, which may indirectly lead to world peace.

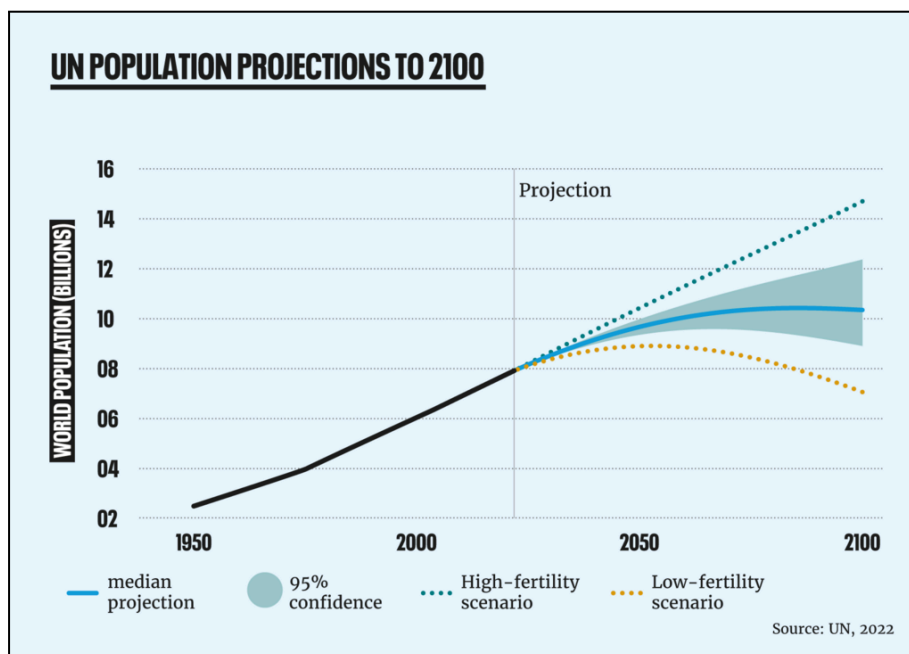
I believe that this research will lead to the achievement of SDG No. 8, "Decent Work and Economic Growth".

The sub-theme of this study, “cooperation,” refers to financial and technical support between developed and developing countries. I thought that developing countries have little money and may not be able to realize their ideas for improving the unemployment rate, even if they have them. So, I thought that it could be realized by having developed countries provide support. In my opinion, cooperation between developed and developing countries should be done among trading countries. Since trading countries have already established diplomatic relations with each other and have a certain degree of cooperation, it would be easy for them to “cooperate” in this study.

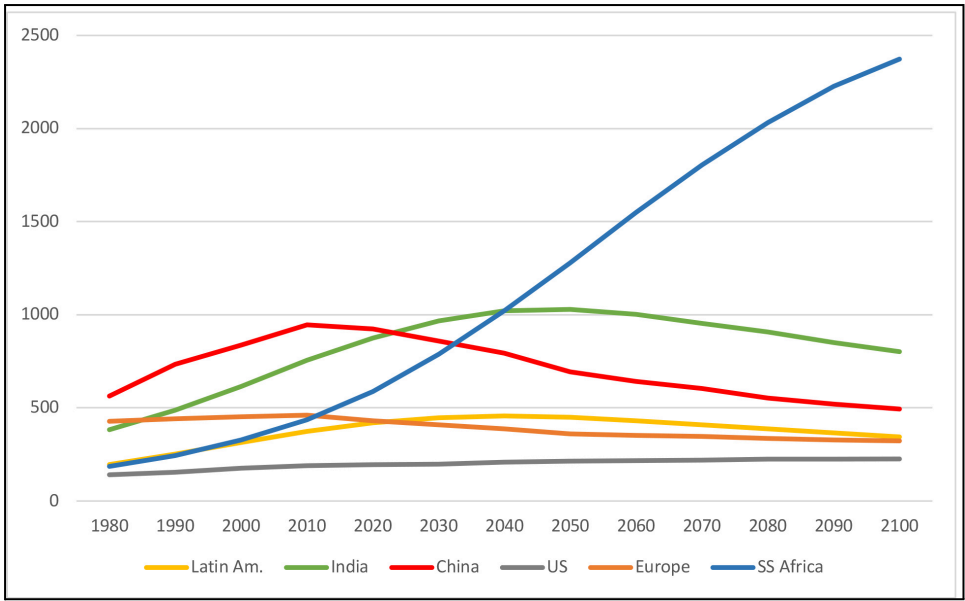
## 2. Discussion and implications

There are three main findings of this study.

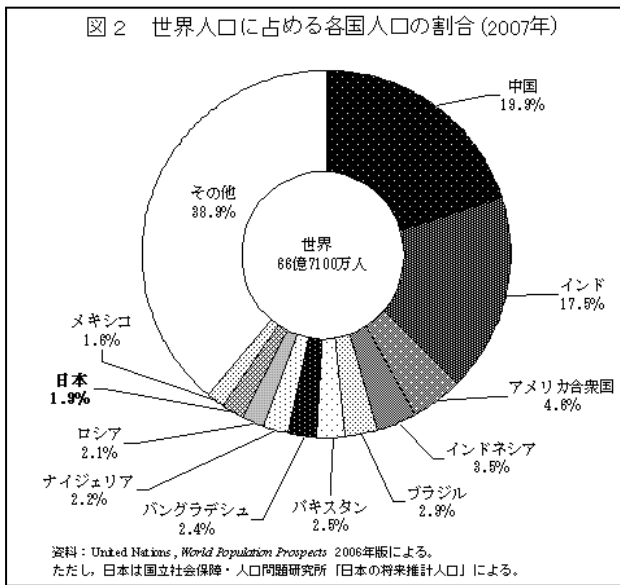
First, Africa's population and young population are growing rapidly. In recent years, the world's population has been increasing, and is expected to reach about 10 billion by 2050 (Figure 1). Especially in Africa, the population is expected to overtake that of China and India, which have the largest populations in the world today, by 2032, and to reach about 2.1 billion by 2050 (Figure 2). These data show that Africa will account for about 22% of the world's population in 2050. This is more than China's share of the world's population in 2007, which was about 20% (Figure 3). The young population in African countries has also been increasing year by year (Figure 4). These data show that population growth is increasing worldwide, especially in Africa, and that the young population is also increasing.



[Figure 1] UN Population Projections to 2100 (from POPULATION MATTERS)

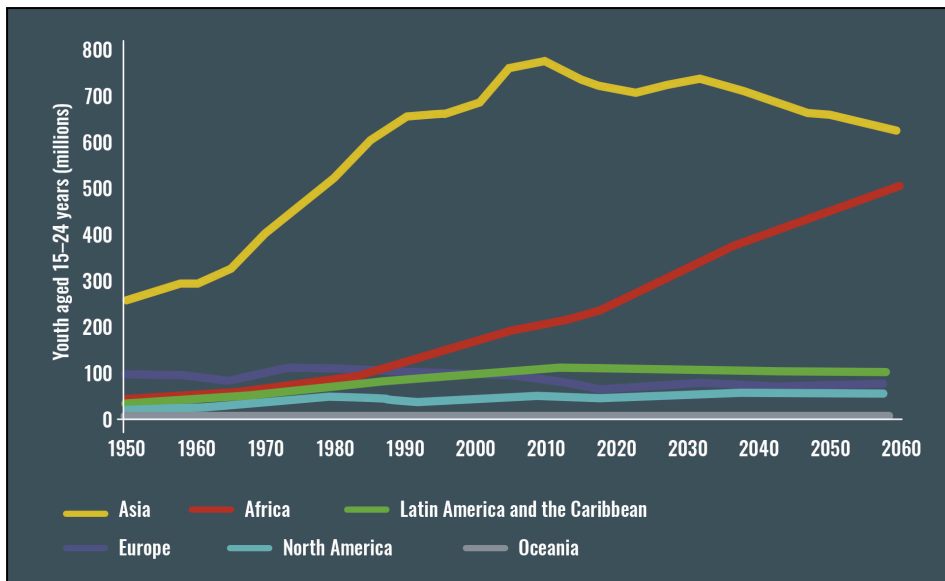


[Figure 2] Growth of Labor Force (Population age 15-59) in millions, 1980–2100 (from HOOVER INSTITUTION)



[Figure 3] World Population and Japan's Population in honor of "World Population Day" (from Statistics Bureau of Japan)





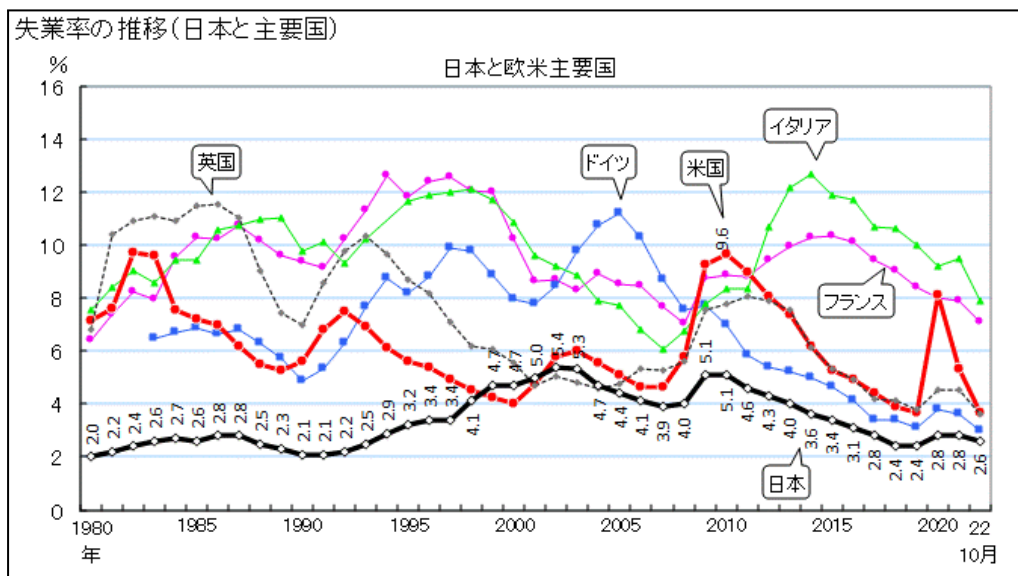
[Figure 4] The steady rise of Africa's youth population against world continents (from World Economic Forum)

Second, I looked at the policies of each developed country to improve their unemployment rates. In this study, I researched Sweden, the United States, and Germany. The reason why I chose these three countries is that Germany and the U.S. have been steadily reducing their high unemployment rates (Figure 5). Figure 5 shows that Germany succeeded in reducing its unemployment rate by 8% from 2005 to 2022, and the U.S. succeeded in reducing its unemployment rate by 4% in a short period of only two years from 2020 to 2022. The reason why I chose Sweden is because it is said that Scandinavian countries are advanced in many aspects, such as education. And when I researched approaches in Scandinavia, I found out about Sweden.

To begin with the unemployment policy in Sweden. I found out that Sweden has a policy called an “active labor market policy”. Specifically, a non-profit organization called TRR provides coaching services to job seekers and supports them in acquiring skills and knowledge that are promising. Also, Sweden has a good unemployment insurance system, and the Unemployment Insurance Fund guarantees basic insurance even to those who are not insured or do not meet the conditions for benefits. There is also a system that provides 80% of the previous wage for 200 days if income-proportional insurance is utilized. In other words, Sweden provides substantial support for the unemployed to find new jobs and financial support for the unemployed. This has helped to keep the unemployment rate at a low level. In the second place, it is about the unemployment policy in the US. In the United States, the unemployment rate rose sharply from 2019 to 2020 due to the impact of the global spread of COVID-19. This is believed to be due to the layoffs (hiring practices) of many companies in COVID-19 disaster and people leaving their jobs because they feared their own infection. An investigation into why the unemployment rate in the U.S. fell so sharply showed that it was due to the resumption of economic activity by businesses, not government policy. 2022 has seen the global spread of the COVID-19 settle down, and economic activity has resumed in many countries and regions. In response, companies resumed hiring to make up for the staff they had cut back due to COVID-19 spreading disaster. Short-staffed companies increased wages to compete for job seekers, and average hourly wages rose at a pace of 4.7% per year, up from about 3% per year before COVID-19 disaster. In other words, the unemployment rate in the U.S. was not improved by the government, but by the companies, and the

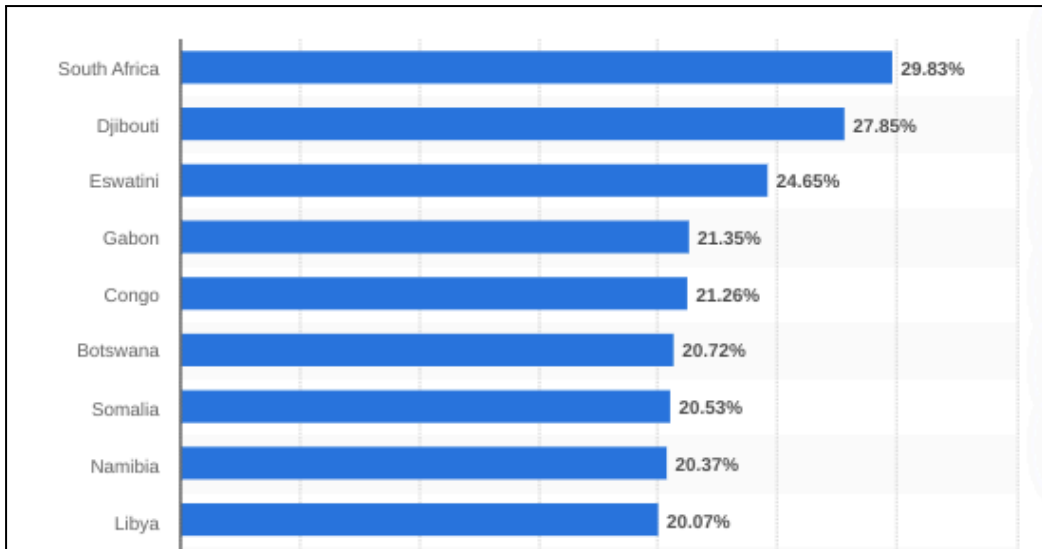
unemployment rate fell as each company increased wages and otherwise retained its workforce.

Then, it is about the unemployment policy in Germany. In Germany, it was found that the production of “Bürger Part-Time Work” is being implemented. This project targets people who have no possibility of finding regular employment at this time, who have considered participating in training for a vocational qualification, training measures within a company, or “additional work opportunities in the public interest,” called “1 Euro Jobs,” and still have no prospects for such possibilities. In order to get them out of unemployment as quickly as possible, public benefit jobs are provided for them, such as fire prevention, homes for the elderly, church work, and child care. In other words, it was found that Germany has improved its unemployment rate by “giving” jobs to the unemployed rather than forcing them to look for work.



[Figure 5] Unemployment Rates in Japan and Major Western Countries (from 社会実情データ図録)

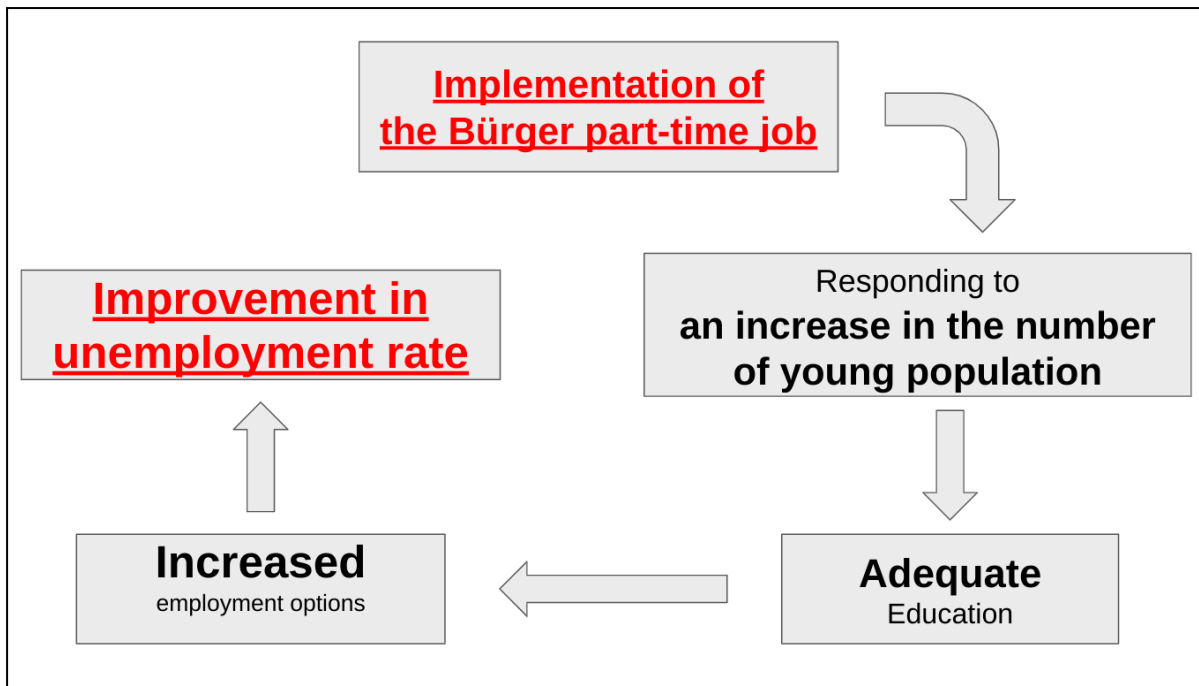
The third fact in the study is about unemployment rates in Africa. Research shows that the main African countries have by far the highest unemployment rates compared to Japan (Figure 6). Looking at South Africa, I found that the unemployment rate is about 14 times higher than that of Japan. From this data, I got the idea that the unemployment problem in Africa is a very serious problem.



[Figure 6] Unemployment rate in Africa as of 2024, by country (excerpts) (from Statista)

### 3. Conclusion

The conclusion of this study is that the policy of “Bürger Part-time” in Germany could be used as a model to improve the unemployment rate in developing countries. As mentioned above, a “Bürger part-time job” is a public benefit job prepared for the unemployed. I mentioned that examples of this work include fire prevention activities, activities in homes and associations for the elderly, and child care, but I focused on the “child care” job content here. The reason for this is that, as can be seen from Figure 4, the number of young people in African countries is increasing year by year. So, I thought that the increase in the young population would lead to a shortage of people in charge of child care (childcare). In order to cope with this increase, I thought that if we implemented a “Bürger part-time job” and created a “child care” job, we could give jobs to the unemployed and also cope with the increase in the number of children in the country. However, since "care" would mean something like “babysitting,” I thought it would be better to make this a “children's education”. It doesn't have to be a solid education like in schools, but it could be as simple as teaching general education, and it doesn't have to be done without special qualifications. I also believe that the implementation of the Bürger part-time program will lead to an expansion of the children's future employment options. Children cared by Bürger part-time can receive care (education), which leads to an “adequate education”. Children who receive an “adequate education” will have more options for work. This means that children who have received “adequate education” will have more job options, which will lead to an improvement in the unemployment rate (Figure. 7).



[Figure 7] Solution by Bürger part-time job (Created by Google Slides)

#### 4. Future issues and prospects

There are three major issues to be considered for the future. The first is to research and consider whether developing countries have the economic strength to secure financial resources and salary sources after employment. The second is to expand employment options by attracting foreign companies through infrastructure development;. The third is to consider skills for “children's education”. Also, more consideration of “cooperation” is an issue to be considered in the future. I want to research more on these issues and conclude.

#### 5. References

<View 2022/5/19>

Investing Wisely

-What will an improvement in the U.S. unemployment rate do to the economy?-

<https://wm.openhouse-group.com/column/%E3%82%A2%E3%83%A1%E3%83%AA%E3%82%AB%E3%81%AE%E5%A4%B1%E6%A5%AD%E7%8E%87%E6%94%B9%E5%96%84%E3%81%AF%E7%B5%8C%E6%B8%88%E3%81%AB%E4%BD%95%E3%82%92%E3%82%82%E3%81%9F%E3%82%89%E3%81%99%E3%81%8B-100006-93>

The Japan Institute for Labour Policy and Training

-Germany: What to do about long-term unemployment? -

<https://www.jil.go.jp/column/bn/colum082.html>

<View 2022/6/3>

The Adecco Group

-Learning from Scandinavia “Measures for the Unemployed and Public Education to Nurture Human Resources”-

[https://www.adeccogroup.jp/power-of-work/vistas/adeccos\\_eye/34/03](https://www.adeccogroup.jp/power-of-work/vistas/adeccos_eye/34/03)

The Japan Institute for Labour Policy and Training

-Africa Economic Report Released-

[https://www.jil.go.jp/foreign/jihou/2012\\_7/oeed\\_01.html](https://www.jil.go.jp/foreign/jihou/2012_7/oeed_01.html)

<View 2022/9/17>

社会実情図録

-Unemployment Rate Trends-

<https://honkawa2.sakura.ne.jp/3080.html>

アフリカ経済しらべ

-Employment Situation in South Africa: Check Employment Rate, Unemployment Rate, Occupational Composition, and Labor Productivity-

[https://africa-keizai.com/employment\\_productivity\\_southafrica/](https://africa-keizai.com/employment_productivity_southafrica/)

GraphToChat

-The graph shows the juvenile population of the Central African Republic-

<https://graphtochart.com/population/central-african-republic-age00to14.php>

UNFPA Tokyo

-Materials & Statistics-

<https://tokyo.unfpa.org/ja/resources/%E8%B3%87%E6%96%99%E3%83%BB%E7%B5%B1%E8%A8%88>

Statistics Bureau of Japan

-World Population and Japan's Population ~On the Occasion of World Population Day~ -

<https://www.stat.go.jp/data/kokusei/topics/topics23.html>

MONEX, Inc

-Population Growth and Urbanization in Sub-Saharan Africa-

<https://media.monex.co.jp/articles/-/7872>

<View 2023/10/23>

Population Matters

-THE WORLD OF POPULATION PROJECTIONS-

<https://populationmatters.org/news/2023/01/the-world-of-population-projections/>

Hoover Institution

-Africa 2050: Demographic Truth and Consequences-

<https://www.hoover.org/research/africa-2050-demographic-truth-and-consequences>

World Economic Forum

-The children's continent: keeping up with Africa's growth-

<https://www.weforum.org/agenda/2020/01/the-children-s-continent/>

Statista

-Unemployment rate in Africa as of 2024, by country-

<https://www.statista.com/statistics/1286939/unemployment-rate-in-africa-by-country/>

# Consumer Psychology and our Life

- Protecting the earth by leveraging consumer psychology -

5103 Yu Iwai

## < Abstract >

In recent years, the negative influence of global warming has come to the surface. Therefore, we should understand more about environmental issues and their current progress. Environmental aggravation such as global warming is the result of development that we have done in order to develop our daily lives. I think we need to think about our life with global warming.

Then, I thought that we could take some actions for global warming by using consumer psychology. Using consumer psychology means that selling more eco-friendly products and SDGs contribute products.

Specifically, using consumer Psychology, and I would like to know about many people that have eco-friendly products and SDGs goods. Marketing that uses "consumer psychology" means devising sales techniques when selling a product. Consumer psychology means "psychological factors that affect the selection and consumption of goods and services, either directly or indirectly." Using consumer Psychology, I would like to make people buy environmentally friendly products so that they can take environmentally friendly actions unconsciously and without any burden on themselves.

## 1. Introduction

We have been worried about the environmental aggravation of the Earth for many years. However, environmental aggravation such as global warming is the result of development that we have done in order to develop our daily lives. I think we need to take eco-activities and environmentally friendly actions in our daily lives.

Therefore, I think that environmentally friendly actions could be done by using "consumer psychology". Consumer psychology means "psychological factors that affect the selection and consumption of goods and services, either directly or indirectly." Values, religion, lifestyle, fashion sense, fashion trends, etc. have relationships for our buying action. If we use consumer psychology, I think that the company can sell environmentally friendly products and help improve the environment without unconsciously changing.

Marketing that uses "consumer psychology" means devising sales techniques when selling a product. For example, using the Diderot effect, the psychology of action that makes people want to buy "unity" and "consistency" in products. The idea is that making a series of products and communicating the brand's global view and philosophy will encourage more people to buy environmentally friendly products.



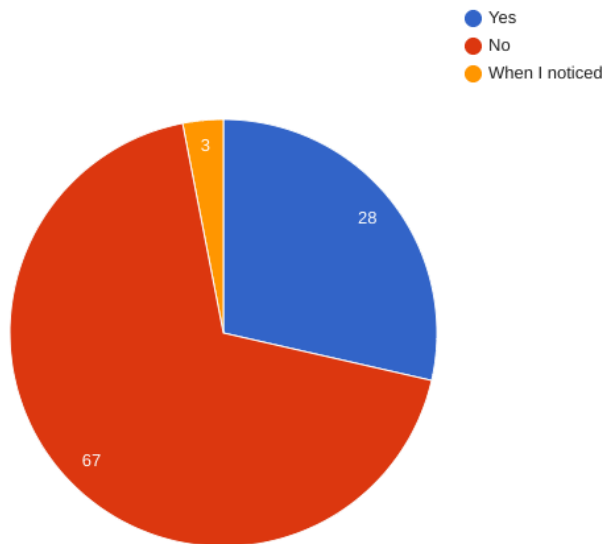
## 2. Discussion and implications

From my research, I have found a number of effects related to consumer psychology. Consumer psychology has been shown to have a few effects as written below. I have selected some of these to use in my research.

Principle of retro-return / Diderot effect / Zion effect / Bandwagon effect / Anchoring effect / Cocktail party effect / The Caligula effect / The halo effect / Placebo effect / The Pine, Bamboo, and Plum Law / The Windsor Effect / Tension Reduction Effect / Bandwagon effect

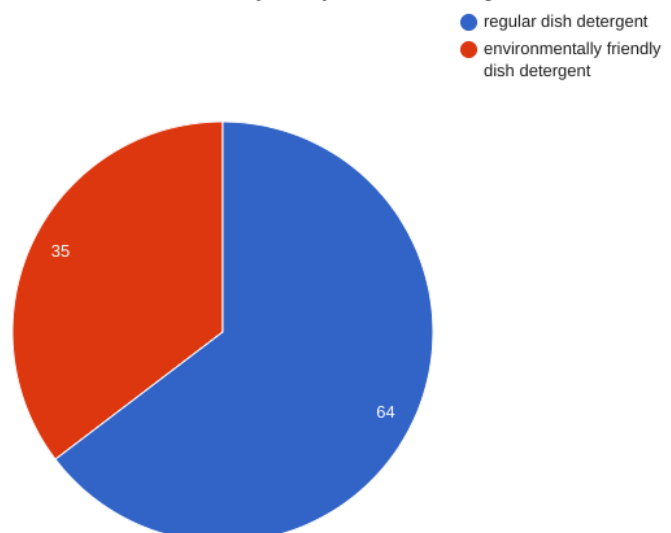
I took a survey of my classmates asking them “Do you try to buy eco-friendly products in your daily life?” The results showed that about 70% of the people were not always able to buy eco-friendly products.

Do you try to buy eco-friendly products in your daily life?



I also asked, “If you were buying, which would you buy: regular dish detergent or dish detergent that is made of environmentally friendly materials and it is gentle to our skin?” (This time, I use dish washing for example.) The results showed that about 64% of the people buy regular dish detergent, and about 36% people buy dish detergent that is made of environmentally friendly materials and it is gentle to sensitive skin.

If you were buying, which would you buy: regular dish detergent or dish detergent that is made of environmentally friendly materials and it is gentle to our skin?



Finally, I asked, “In answer to the above question, why did you choose the answer?” Those who chose cheap dish detergent gave the reasons “That’s because it’s cheap” and “That’s because I think If I act for the environment alone, I don’t think I can change the environment” these reasons were given.

In contrast, those who chose the less expensive but more environmentally friendly and gentle dish detergent gave the reasons “That’s because I wanted something that was environmentally friendly even if it costs a little more.” Also, “That’s because I have sensitive skin” and “That’s because it is a large amount” were the reasons given.

From these things, I found that something like an additional action would increase the purchase rate.

### 3. Conclusion

From the research results, I thought that additional effects, series of products, and products with a sense of unity in color and pattern would be good to make it easier for consumers to buy environmentally friendly or eco-friendly products. In addition, I thought it could be used for product marketing of environmentally friendly and eco-friendly products. This is because consumer psychology has various effects other than those introduced in this report. I searched for past research and found that there are actually efforts to use similar consumer psychology. I felt that I needed to read more past research and take surveys from more people in the class. I would like to continue my research so that I can make better use of consumer psychology in the time I have left.

### 4. References

- <https://news.1242.com/article/128846> (4/25)  
渋滞にも科学！人間の心理を巧みに利用した渋滞対策の数々！
- <https://gazoo.com/column/daily/19/10/16/> (4/25)  
渋滞を楽にする10の知識 渋滞対策を予報士に聞いてみた！
- <https://marketing-rc.com/article/20151201.html> (4/25)  
消費者心理を上手く利用したWEBライティングの10のテクニック | マーケティングリサーチキャンプ | 市場の旬を調査で切る！
- <https://ad-journal.com/knowledge/psychology-technique.html> (5/9)  
【そういうことか】消費者理解が深まる行動心理学のテクニック10選
- <https://www.tryeting.jp/column/3223/#i-2> (06/20)  
消費者行動の例をご紹介！時代による変化の状況や影響を与える要素とは？ | TRYETING Inc. (トライエッティング)
- [https://liskul.com/wm\\_consumer-8475](https://liskul.com/wm_consumer-8475) (06/20)  
WEBマーケティングに消費者心理を～購買意欲をそそる15の秘訣～ | LISKUL
- [https://www.egmkt.co.jp/column/consumer/20220105\\_EG\\_242.html](https://www.egmkt.co.jp/column/consumer/20220105_EG_242.html) (8/30)  
環境問題のために個人でできることは？現状や対策まで紹介
- [https://www.shop-stationery.com/user\\_data/free/ecogoods.php](https://www.shop-stationery.com/user_data/free/ecogoods.php) (9/20)  
環境にやさしいノベルティ エコグッズ・SDGs貢献グッズ大特集
- [https://noveblo.com/eco-friendly\\_goods/](https://noveblo.com/eco-friendly_goods/) (9/20)  
【2022年最新版】SDGs関連グッズ総まとめ | ノベブロ / NOVBLO

- <https://prtimes.jp/main/html/rd/p/000000045.000039029.html> (9/20)  
お弁当用カップで環境負荷低減。日々使うものだから環境に配慮した商品を使ってもらえるように。FSC®認証紙採用のおべんとうカップeチェック柄シリーズを発売！
- [https://mba.globis.ac.jp/about\\_mba/glossary/detail-12514.html](https://mba.globis.ac.jp/about_mba/glossary/detail-12514.html) (9/20)  
AIDMA(アイドマ) | グロービス経営大学院 創造と変革のMBA
- <https://webma.xscore.co.jp/study/aidma/> (9/20)  
AIDMAは古い？ 基本的な考えを活用事例・メリットと併せて解説
- <https://marketing.saisoncard.co.jp/article/2021/07/21/106> (9/5)  
マーケティングに活かせる行動心理学。実務で応用可能なテクニック11選【マーケティングコラム】
- <https://markezine.jp/article/detail/39156> (2/1)  
日本の消費者の約8割がサステナブル製品への購買意欲が高いただし実購買へは至らず【ベイン調査】:MarkeZine(マーケジン)
- <https://gallery.intage.co.jp/ethical-consumption/> (2/1)  
「サステナブル」な商品、高くても買う？ 日本人のサステナビリティ意識と行動

# Nursing Need in Healthcare

## Genderless in Nursing

5104 Mihiro Iwasa

### Abstract

Male nurses are necessary to fulfill the role of the nurse which is to assist in medical treatment, to view the patient from various aspects. Finally, I suggest that the ratio of men to women in videos and illustrations about nurses be 1:1 and that male nursing students take on medical tasks during the draft. I couldn't judge how effective that would be, but the University of Nottingham has created videos and images featuring male nursing students in the United Kingdom. In Taiwan, modifying media coverage to eliminate gender discrimination and stereotyping is one effective way to increase the number of male nurses. The draft after graduation from nursing school is a problem for men. This is because there is a gap between school graduation and clinical practice.

### 1. Introduction

I am interested in nurses because I had previously studied community health care and learned that nurses have many different ways of working. When I heard the word "nurse", I associated it with women. In fact, in 2020, the gender composition of nurses in Japan was 91.9% female, while 8.1% were male. In the world, women account for 9 out of 10 nursing positions, but this varies by region. In the African region, the gender ratio is 3:1, with male nursing positions outnumbering female nursing positions in 13 countries.

### 2. Discussion and implications

First, I focused my attention on male nurses. I wonder if the situation means that we do not need male nurses. I considered the research question, "Are male nurses needed?" The role of a nurse is "to assist in medical treatment, to view the patient from various aspects such as physical, mental, social, and cultural aspects, and to accurately determine the nursing care needed". I think that having male nurses will enable us to provide better nursing care by considering not only women's but also men's perspectives. For this reason, I assume that male nurses are necessary.

I have been trying to figure out how to ensure that we have the right number of male nurses. Nurses, both male and female, have a high turnover rate. The number of nurses worldwide who are thinking of leaving their jobs in 2021 was between 20% and 30% of all nurses. I thought it was important to create a good working environment to keep the male nurses we have now from quitting.

I researched about the countries which have high gender gap index, and have tackled the problem related to male nurses aggressively.

First, I researched about the countries which have acted against the problem related to male nurses to know what is an effective way to solve this problem.

#### •United Kingdom

One way to address gender issues is for universities to increase the number of male nursing students. For example, the University of Nottingham has created videos and images featuring

male nursing students. Coventry University has advocated “gender-neutral re-branding of nursing” and created role models for male nursing students. The number of male nurses in the United Kingdom had increased slightly since 2002, but the number of applications for nursing programs at the University of 2023 decreased by 18.6% compared to January 2022. It is said that this is due to the 2022 nurses striking for the first time over low wages. Thus, it was not possible to determine whether the British approach to solving the problem was effective.

•Taiwan

The “衛福部性別平等推 動計畫(男女共同参画推進事業)108-111 年” was started in 2019. The policy includes modifying media coverage to eliminate gender discrimination and stereotyping. In Taiwan, the number of male nurses increased significantly from 1735 in 2012 to 6822 in 2021. This led me to believe that the policy may be effective. In Taiwan, the draft after graduation from nursing school is a problem for men. This is because there is a gap between school graduation and clinical practice.

I focused on two points in Taiwan policy, “modifying media coverage to eliminate gender discrimination and stereotyping” and “a problem for male nursing students : the draft”.

About “modifying media coverage to eliminate gender discrimination and stereotyping”, there is an effect of the way in the policy. The number of male nurses increased 1735 in 2012 to 6822 in 2021. So I think the policy is effective.

The data item	The percentage
I’ve refrained from doing something because I’m a man.	76.4%
Sometimes the changing rooms were substitutes. (e.g., goods shortage)	71.7%
I have been given roles such as class president and moderator, because I’m a man.	71.7%
I have been treated as a man.	70.1%

Here are the results of a 2005 survey conducted in the Japanese psychiatry department. I summarized the items that received 70% or more responses. Many of them caused bias.

About the draft, I found that it is practiced in 64 countries and that it prevents male students from studying.

### 3.Conclusion

I suggest that the ratio of men to women in videos and illustrations about nurses be 1:1 and that male nursing students take on medical tasks during the draft. By doing so, we might be able to remove the bias that nursing is a job for women, and male nurses can work comfortably.

### 4.Referesnces

[https://www.ishikawa-nu.ac.jp/pdf/kenkyu/03\\_13.pdf](https://www.ishikawa-nu.ac.jp/pdf/kenkyu/03_13.pdf) 2023.8.9

<https://mhlw-grants.niph.go.jp/project/155964> 2023.11.11

[http://www.isgsjapan.org/journal/files/8\\_miyazaki\\_seiko.pdf](http://www.isgsjapan.org/journal/files/8_miyazaki_seiko.pdf)

2024.1.20

[https://mhlw-grants.niph.go.jp/system/files/download\\_pdf/2021/202106024A.pdf](https://mhlw-grants.niph.go.jp/system/files/download_pdf/2021/202106024A.pdf) 2024.1.15

[https://rucforsk.ruc.dk/ws/portalfiles/portal/85237654/Men\\_in\\_nursing\\_education.pdf](https://rucforsk.ruc.dk/ws/portalfiles/portal/85237654/Men_in_nursing_education.pdf) 2024.1.15

[https://kyokuhp.ncgm.go.jp/library/other\\_doc/2020/SekainoKango2020\\_.pdf](https://kyokuhp.ncgm.go.jp/library/other_doc/2020/SekainoKango2020_.pdf) 2024.1.15

[https://www.jstage.jst.go.jp/article/jjsnr/32/4/32\\_20090130005/\\_pdf](https://www.jstage.jst.go.jp/article/jjsnr/32/4/32_20090130005/_pdf) 2024.1.22

<https://www.mhlw.go.jp/toukei/saikin/hw/eisei/20/dl/kekka1.pdf> 2024.1.22

<https://www.nurse.or.jp/aim/nursing.html> 2023.12.15

<https://www.nurse.or.jp/home/publication/pdf/research/98.pdf> 2023.12.15

# Spread of Animal-Assisted Therapy

~What we can do for children with autism spectrum disorder~

5105 Ohno Shuto

## Abstract

Now, people with autism spectrum disorder (ASD) are one in a hundred in the world. These health problems do not have an established solution, so they cannot recover completely. However, Europe and America have good resolution ways. One of these is animal-assisted therapy(AAT), which is using the power of animals to care for their mental feelings. The world has already got scientific grounds to become good for the health of our heart by coming into contact with animals. However, this is not developing in Japan and we cannot understand it now. So, this study's goal is that many people know about the symptoms of autism and the advantages of AAT. Finally, I want to make a process which connects autistics and animals.

## 1.Introduction

Now, autistics are one in a hundred in the world. They can be roughly classified into three kinds. For example society and personal relationships, communication and delay of intellect and, having some unbalanced activity and interest. Such children are unconcerned with communication, speech delay, expression peculiar to words and hypersensitivity or unconcerned to the sensation.

Nevertheless, a lot of people do not have knowledge about autism so, the people around them look at them coldly as the days continue in public. A countermeasure permeated through Europe and America. It is AAT. Interacting with animals that are known to have high emotional levels, such as dolphins and horses, has been shown to help people trust others. I believe using this way, autistic children will be able to live comfortably. Also, my last year's research was about AAT so I think this theme is useful for me to research something.

## 2.Discussion and implications

The goal of this study is to make a process which connects autistics and animals and supports them reverting to community. If this can be achieved, I will ask some engineers to develop matching applications.

First of all, In 2018, an estimated 480,000 people in Japan were diagnosed with developmental disabilities among these are autism. According to Nomura Research Institute, Ltd's research, economic losses associated with social difficulties for people with developmental disorders amount to 2.3 trillion yen in Japan. Furthermore, Japan is an aging society with a declining birthrate, and according to the same study, the working-age population is expected to decline by about 35% by 2060, resulting in a shortage of up to approximately 790,000 of IT workers. However, the subjects of this study are adults. At first glance, this may seem irrelevant to this study, but it is not. It is difficult for adults to recognize developmental disabilities in themselves and others. Conversely, they thought that if they were aware of their developmental disabilities while they were children, they would not have to worry about them as adults.



Second, AAT has many benefits. For example, promoting secretion of chemicals that make us feel happy, healing our mental health, and improving social skills. Social skills in particular are essential in our lives. Because if this is lacking, there are cases where students do not know how to relate to others and are bullied in school. However, with the recent shift to nuclear families, there are fewer opportunities for children to develop them. In addition, many parents are becoming over-involved, not knowing how to relate to their children due to their intense workloads and other factors. Therefore, recent years are not developed for children. Also, children with such symptoms were bullied by their classmates in school, and they refused to go to school. AAT is an effective way to develop such skills. However, Japan has a lot of problems adopting it.

First, Japan has not been so proactive in adopting this, and even if it has, only small-scale events have been held. On the other hand, in Europe and America the values held toward animals are different from those in Japan, so some hospitals and organizations are actively adopting AAT. In addition, the fact that the use of animals for treatment is not officially recognized in Japan, whereas it is in other countries, has contributed to the lack of profit for hospitals, which has also contributed to the low performance of AAT in Japan.

Second, Because AAT is a drug-free treatment, it is difficult to scientifically prove its effectiveness, and few organizations are willing to adopt it, so experiments have not progressed. This is true of all non-drug treatments, but they may not work for everyone and of course may come with risks that are not yet recognized. Considering these factors, it will not be easy to incorporate them into the medical field.

Finally, It means that hygiene issues must be paid close attention to, and it is a big burden for both the AAT provider and the AAT recipient. If the receiving hospital were to have problems with infectious diseases, AAT activities could also be a factor. Because of such risks, many hospitals do not even think of using them.

Despite these advantages, the disadvantages are the only ones that attract attention, so it is still not very familiar in Japan. I believe that we will not be able to approach the goal of our research unless we first solve these problems.

The solution we came up with was to promote animal therapist training and create a place to learn about zoology. Currently in Japan, to qualify as an animal therapist, it is necessary to take individual courses offered by each organization, and the cost is not something that is easily affordable. In addition, there are still few places in Japan where one can study zoology, while in developed countries such as America, zoology is so widespread that there are even specialized departments in universities. Since neither of these problems can be solved immediately, we would like to continue our research through repeated trial and error.

### 3. Conclusion

ASD is a common problem not only in Japan but also in the world today, and it will be very important to solve this problem with the help of animals. Of course, this is not a disease that can be completely cured, and it is difficult to solve it completely, but there is still a possibility of improving the condition in the early years of childhood. Also, for families with such children who are reluctant to have them take the AAT, I urge them to adopt a dog or cat. You

will see the children's thoughts and behavior change as they interact with them. In this way, I believe that the Japanese government should recommend using AAT for curing ASD. We must understand their symptoms for that.

#### 4.References

THE WEEK. (2018). *Pet dogs can help reduce ADHD symptoms in kids*. Retrieved from <https://www.theweek.in/leisure/lifestyle/2018/07/19/pet-dogs-can-help-reduce-adhd-symptoms-in-kids.html>

週間エコノミスト Online (2021) 発達障害人材の活用が企業競争力を左右する 「2.3兆円の経済損失」を生み出す無理解・無関心の正体  
<https://weekly-economist.mainichi.jp/articles/20211012/se1/00m/020/065000d>

ASD(自閉スペクトラム症、アスペルガー症候群)について | e-ヘルスネット(厚生労働省)  
<https://www.e-healthnet.mhlw.go.jp/information/heart/k-03-005.html>

障がいをもつ子どもがいる家庭でペットは飼える？ | 障害者支援施設の検索  
<https://www.minnanasyougai.com/article1/%E9%9A%9C%E3%81%8C%E3%81%84%E3%82%92%E3%82%82%E3%81%A4%E5%AD%90%E3%81%A9%E3%82%82%E3%81%8C%E3%81%84%E3%82%8B%E5%AE%B6%E5%BA%AD%E3%81%A7%E3%83%9A%E3%83%83%E3%83%88%E3%81%AF%E9%A3%BC%E3%81%88%E3%82%8B/>

■イルカ療法 Dolphin Therapy - カナダ発！自閉症療育支援の〜と「たんぽぽ」  
<https://tampoppo.jimdofree.com/home/%E6%B2%BB%E7%99%82%E2%91%A5-%E3%82%A2%E3%83%8B%E3%83%9E%E3%83%AB%E7%99%82%E6%B3%95/>

自閉症とは？症状・特徴や子供との接し方・行動リスト | LITALICOジュニア | 発達障害・学習障害の子供向け発達支援・幼児教室 | 療育ご検討の方にも  
<https://junior.litalico.jp/about/hattatsu/autism/>

子どもの発達障害「自閉スペクトラム症(ASD)」とは？アスペルガー症候群などとの違い | NHK健康チャンネル(文中図)  
[https://www.nhk.or.jp/kenko/atc\\_346.html](https://www.nhk.or.jp/kenko/atc_346.html)

# Utilization of New Materials for Environmental Issues

## Effects of the spread of new materials

5106 Oba Tomoka

### Abstract

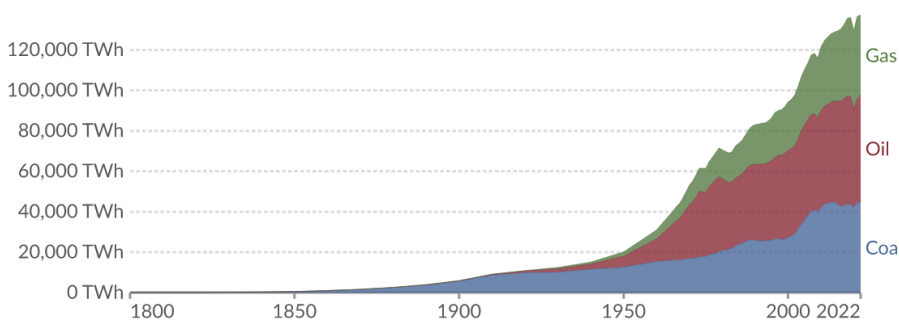
‘New materials’ are an advantaged version of existing materials such as oil and coal. I wanted to make new materials spread around the world to solve environmental issues such as global warming. To do so, I suggest three ideas. The first is the fusion of new materials and existing materials. New materials have some better points than existing materials. For example, new materials can reduce the amount of emission of carbon dioxide and they can not be used up. However, they have some disadvantages such as high cost and low publicity, so if we fuse them together, we can make products which are good for the environment. The second is making products which are close to us, such as stationeries and selling them at stores. The third is cooperation between countries. Some countries have many raw materials, while others have few of them, so if there were a system of import and export, and utilization of products with new materials, it would lead to the spread of new materials in the world. By doing so, it will solve the environmental issues in the world.

### 1 Introduction

This paper focuses on new materials which have a good effect on the environment. The purpose of this study is to spread new materials around the world and solve environmental problems. These days, there are a lot of environmental problems such as global warming. The main causes of global warming are fossil fuel consumption and carbon dioxide emissions. According to figure1 and figure2, both global fossil fuel consumption and carbon dioxide are increasing year by year. By using new materials instead of existing materials such as oil and coal, it will lead to stopping global warming.

### Global fossil fuel consumption

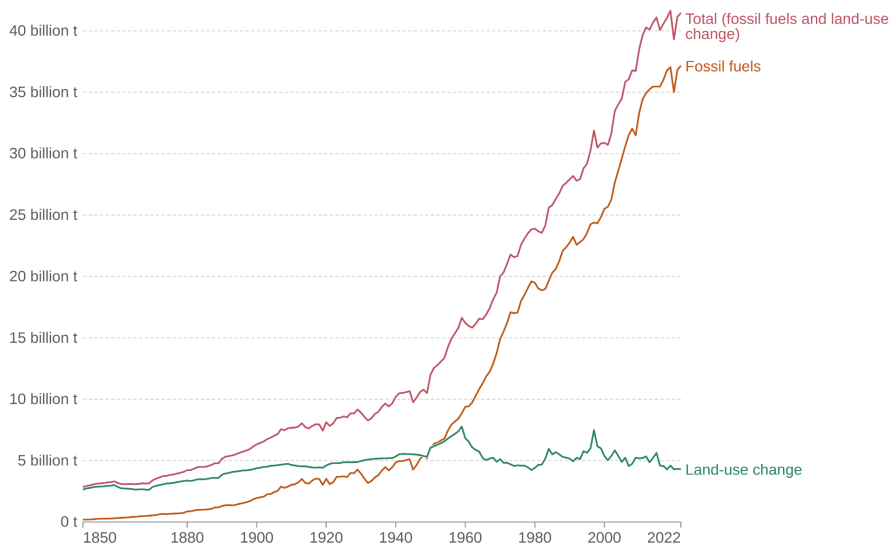
Measured in terawatt-hours of primary energy consumption.



Data source: Energy Institute - Statistical Review of World Energy (2023); Smil (2017)  
OurWorldInData.org/fossil-fuels | CC BY

< Figure 1 - Our World in Data >

## CO<sub>2</sub> emissions from fossil fuels and land-use change, World



Data source: Global Carbon Budget (2023)

[OurWorldInData.org/co2-and-greenhouse-gas-emissions](https://OurWorldInData.org/co2-and-greenhouse-gas-emissions) | CC BY

〈Figure 2 - Our World in Data〉

A lot of companies are working on inventing new materials these days. However, we should point out that sales of products using new materials are not growing much. Recent investigations about new materials demonstrated the advantages of new materials, and the way to join some new materials. These experiments are of great value to consider the possibility of new materials in the future. However, few investigations consider the way to spread new materials, so this paper focuses on these points.

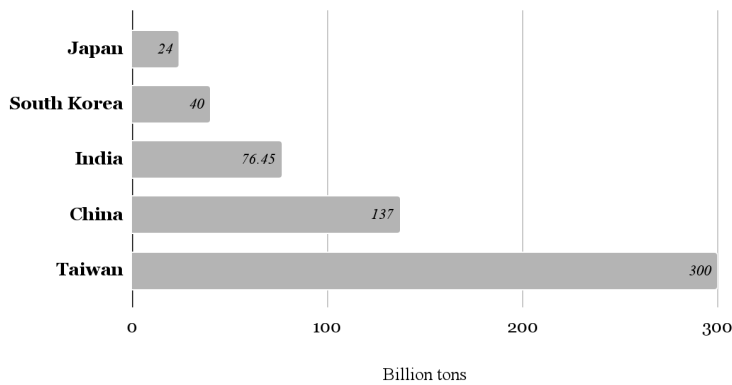
The research question of this study is “What can we do to spread products using new materials around the world?”. In this paper, I tested the hypothesis that new materials affect the environment well, but there are some problems such as high cost and lack of popularity. I have investigated this research question by using the Internet.

## 2 Discussion and implications

As an example of new materials, this study has focused on LIMEX and NUNOUS. First is LIMEX. LIMEX is considered as a new material to replace paper and plastics, and it was developed by TBM company. They are made of limestone, and it has two merits.

The first is sufficient reserves of limestone. According to the Ministry of Economy, Trade and Industry, there are about 24 billion tons of limestone in Japan in spite of the fact that Japan has less limestone than other countries. So, the self-sufficient rate of limestone in Japan is about 100%. In addition, Taiwan, which has much limestone, has about 300 billion tons of them. This result shows that limestone will not run out in the future.

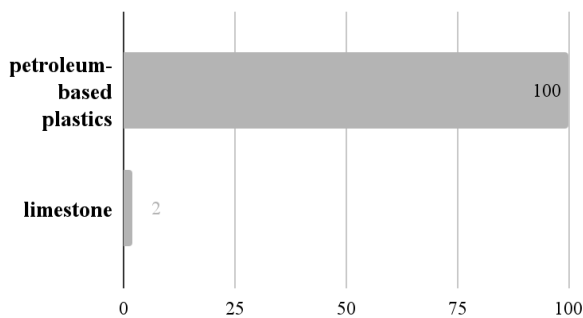
### Reserves of limestone



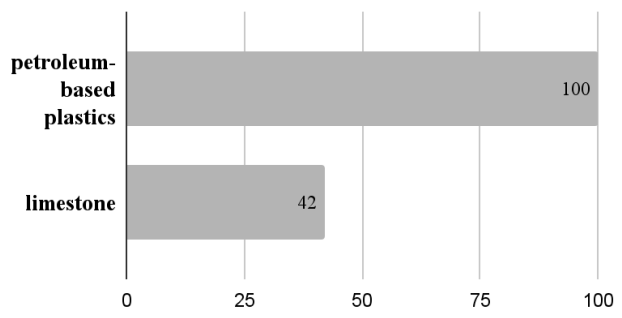
〈Figure 3 - Ministry of Economy, Trade and Industry〉

The second is the reduction of carbon dioxide emissions. According to an investigation comparing the carbon footprint of petroleum-based plastics and limestone, limestone has significantly lower emissions than petroleum-based plastics. When people collect raw materials, we can reduce carbon dioxide emissions by 98%, and also when burning the materials, we can reduce it by 58%. This result shows that limestone is eco-friendly. Moreover, the paper which is made of LIMEX can reduce water usage by 97% than ordinarily paper.

### When collecting raw materials



### When burning materials



〈Figure 4 - Japan Plastic Recycling and Reuse Association〉

Second is NUNOUS. NUNOUS is considered as a new material to replace paper and cloth. The first merit is upcycle. Upcycling is different from recycling. Upcycling is the process of making new materials and products from materials that are no longer needed. The second is that it can also be used for a variety of purposes. For example, it is used for wallets, belts and so on.

There are a lot of good points, but there are some problems. They are expensive and lack popularity. For example, NUNOUS is used for a wall at public buildings such as museums, so it costs about 5000 yen per cloth. Also, both companies of LIMEX and that of NUNOUS have only online shops and provision to companies or local governments, so there

are few products which use LIMEX or NUNOUS at stores. This current situation indicates that LIMEX and NUNOUS are not well known.

### 3 Conclusion

To elucidate the effects of spreading new materials, this study reveals the merits and demerits of new materials. Consequently, I would like to suggest three ideas to solve these problems.

The first is material fusion. As this study mentioned before, new materials have a lot of better environmental benefits than existing materials. For example, they are abundant resources, use less carbon dioxide and water, so they are good for the environment, but they cost highly. On the other hand, the price of existing materials is lower than new materials, but there is a risk of running out. For these investigations, if we fuse new materials and existing materials, it will be eco-friendly products.

The second is making products around us and selling them at stores. For example, ballpoint pens using LIMEX were made and sold. However, these products may be sold only on the Internet, so this study suggests to sell products using new materials not only on the Internet, but also at stores. As examples of products using new materials, I think stationeries, clear files, and plastic bags are good.

The third is cooperation between countries. I suggest a country cooperates with other countries by importing and exporting new materials between countries, and experiments of new materials products. For example, there is a country which has a lot of new materials exports them to a country which has few new materials. In addition, by sharing and experimenting with products using new materials with each other, they would spread products in both countries.

From now on, I want to consider how to cooperate with countries for spreading products using new materials. Furthermore, I would like to think about three problems. First is how we can increase the use of products using new materials. Second is how we can sell a lot of new materials products at stores. Finally is what kind of products fuse conventional materials with new materials.

### 4 References

Adding new value to waste cloth. New upcycled cloth material “NUNOUS” - SDGs SCRUM  
<https://sdgs-scrum.jp/actions/1594/> (2022/05/16)

TBM official website  
<https://tb-m.com/> (2022/05/16)

What are Advanced Materials and Their Joining by Ryohei Tanaka  
[https://www.jstage.jst.go.jp/article/qjjws1943/55/8/55\\_8\\_466/\\_pdf](https://www.jstage.jst.go.jp/article/qjjws1943/55/8/55_8_466/_pdf) (2022/05/31)

New material meaning - ICHANA.NET WEB DICTIONARY  
<https://ja.ichacha.net/japanese/%E6%96%B0%E7%B4%A0%E6%9D%90.html> (2022/05/31)

What is LIMEX? We will explain the advantages, disadvantages, and usage examples! -  
Communication supplement

<https://www.kenbunsysa.jp/commusapu/sdgs/263/> (2022/09/05)

Emergency series: Is limestone paper really eco-friendly? - alterna

<https://www.alterna.co.jp/28503/3/> (2022/09/05)

KANAGAWA Upcycle Consortium

[https://www.pref.kanagawa.jp/documents/53835/190920\\_siryoku.pdf](https://www.pref.kanagawa.jp/documents/53835/190920_siryoku.pdf) (2022/09/27)

What is upcycling? A new approach to SDGs that is different from recycling and remake -  
KODANSHA

<https://sdgs.kodansha.co.jp/news/knowledge/40580/> (2022/09/27)

Our World in Data

<https://ourworldindata.org/fossil-fuels> (2024/02/05)



# Creating New Living Spaces - New Worlds in the Metaverse-

ID 5107 Ryo Ono

## 1. Summary

Continued from last year.

## 2. Backgrounds

The background of this research is that the market has begun to expand rapidly following META's (formerly Facebook) large investment and focus on the development of the Metaverse (another living space in virtual reality), in addition to the increasing demand for remote work and other lifestyles that avoid direct contact with people. I would like to discuss the VR industry and the current challenges it faces.

This theme was chosen because I wanted to think about what the combination of the VR industry and existing issues could do.

## 3. purpose and significance of the study

First, let us discuss the research question for this study.

The eternal research question in this study is "What can we do with VR?"

However, since the research cannot proceed as it is, we have focused on the situations of "work and school" and have proceeded with the research. As soon as the research is completed, we would like to apply it to other fields. We will touch on the specifics in section 4.

Now, in terms of work and school situations, in what kinds of situations can we actually use the system?

Remote work, as mentioned in section 2, is the most exemplified by video conferencing using zoom and the like. For example, there are remote classes at schools, as we have done.

Let me explain some of the problems with videoconferencing.

It is difficult to convey facial expressions.

There is no sense of "being there" as in reality.

Gestures and reactions are limited.

I think you can find these problems even if you look for them roughly. In an experiment that demonstrated "Melavian's Law," a well-known psychological law, the breakdown of information conveyed to the other person was 7% verbal, 38% auditory, and 55% visual.

Have we conveyed the importance of body language and facial expressions?

If so, why not project yourself onto an avatar in a virtual world instead of a video?

I decided to research "VR conferencing.

#### 4. Research Methods

machinery and tools

- PC  
(スペックは以下)
- CPU Ryzen 5 3500
- GPU GTX1660 SUPER
- RAM DDR4 16GB
- ROM SSD512GB

- VR goggles ( made by HTC)

Other peripherals (keyboard, etc.)

- (1) 3D modeling to build a world that can be used in VRSNS
- (2) Work using Virtual Desktop
- (3) Sell (1) at BOOTH, etc.

In (1), as mentioned above, we created the VR world primarily through 3D modeling.

The reason why we created the world in this way is that a place in VR is essential for the VR conference mentioned above.

It would have been nice to use the worlds posted by many volunteers on VRSNS, but I decided to create my own world because I wanted to use it for my research and because of the rights involved.

It is not that I had no knowledge of modeling at all, but I struggled with it to a certain extent. I created a simple space that could be used for meetings or desk work, and when I published it on Twitter, etc., it was used by a small number of people.

The process of publishing the space was to create it in Unity and then post it on VRchat (I won't go into the details). (I won't go into the details of the process.)

In this paper, I am working on this paper in VR using Virtual Desktop software. In fact, I am still working on this paper in VR. <https://youtu.be/mVftWPMsxs0>

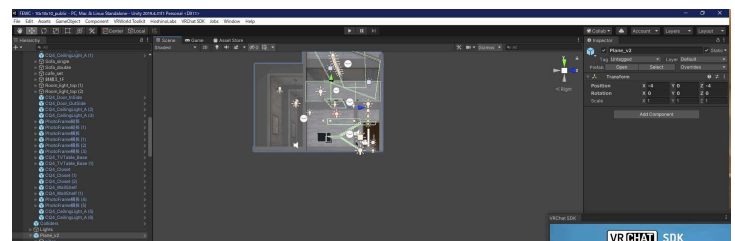
Easy to use, even in bed, as long as you have a keyboard and a mouse.

The screen is large and easy to read (distance, angle, and size of the screen are adjustable).

Large screen, easy to read (adjustable screen distance, angle, and size) • Immersive and easy to concentrate on

In (3), it is like a continuation of (1). The data created in (1) was sold on BOOTH. The data created in (1) was sold on BOOTH for free, since it was not something that could be sold for money. However, it was quite popular and 1,20 people downloaded the data. I would like to publish the data and show how the rooms were actually created.

We are still in the process of developing a system that will allow sharing and viewing slides and PDFs loaded on VR, although we have not



yet introduced this system.[https://youtu.be/gV8zjOVi\\_e0](https://youtu.be/gV8zjOVi_e0)

```
using UnityEngine;
using UnityEngine.UI;
using System.Collections;
using VRChatAPI;

public class PowerPointController : MonoBehaviour
{
    public GameObject powerPointPrefab;
    private GameObject powerPointInstance;
    private VRChatAPI.VRCUiManager vrcUiManager;

    void Start()
    {
        VRCSDK2.VRC_SceneDescriptor descriptor = FindObjectOfType<VRCSDK2.VRC_SceneDescriptor>();

        if (descriptor != null)
        {
            descriptor.TriggerEvent("OnPlayerJoined", null);
        }

        vrcUiManager = FindObjectOfType<VRChatAPI.VRCUiManager>();
    }

    public void ShowPowerPoint()
    {
        if (powerPointInstance == null)
        {
            powerPointInstance = Instantiate(powerPointPrefab, transform.position, transform.rotation);
        }

        vrcUiManager.ShowScreen("Screen", powerPointInstance);
    }

    public void HidePowerPoint()
    {
        vrcUiManager.HideScreen("Screen");
    }
}
```

もう1通りあります (Loadコマンド利用)

```
using UnityEngine;
using UnityEngine.UI;
using System.Collections;
using System.IO;
using System.Diagnostics;

public class PowerPointController : MonoBehaviour
{
    public Text statusText;

    void Start()
    {
        statusText.text = "Ready";
    }

    public void LoadPowerPoint(string filePath)
```

```

    {
    if (!File.Exists(filePath))
    {
        statusText.text = "File not found";
        return;
    }

    statusText.text = "Loading...";

    string powerPointPath = Path.GetFullPath(filePath);
    Process.Start("POWERPNT.EXE", powerPointPath);

    statusText.text = "Ready";
    }
}

```

もう一つ、動作確認のついでにより実践的なものも作成しました。

```

using UnityEngine;
using UnityEngine.UI;
using System.Collections;
using System.IO;
using System.Diagnostics;
using VRChatAPI;

public class PowerPointController : MonoBehaviour
{
    public Text statusText;
    public GameObject powerPointPrefab;
    private GameObject powerPointInstance;
    private VRChatAPI.VRCUiManager vrcUiManager;

    void Start()
    {
        statusText.text = "Ready";
        vrcUiManager = FindObjectOfType<VRChatAPI.VRCUiManager>();
    }

    public void LoadPowerPoint(string filePath)
    {
        if (!File.Exists(filePath))
        {
            statusText.text = "File not found";
            return;
        }

        statusText.text = "Loading...";

        if (powerPointInstance != null)
        {
            Destroy(powerPointInstance);
        }

        string powerPointPath = Path.GetFullPath(filePath);
        Process.Start("POWERPNT.EXE", powerPointPath);

        StartCoroutine(WaitForPowerPointToLoad());
    }

    IEnumerator WaitForPowerPointToLoad()
    {
        yield return new WaitForSeconds(5);

        powerPointInstance = Instantiate(powerPointPrefab, transform.position, transform.rotation);
        vrcUiManager.ShowScreen("Screen", powerPointInstance);

        statusText.text = "Ready";
    }
}

```

```
}  
  
public void ClosePowerPoint()  
{  
    vrcUiManager.HideScreen("Screen");  
}  
}
```

## 6. conclusions and future tasks

I have been able to connect with many people through SNS and interact with many people through VRchat and other means.

I was able to literally feel the possibilities of VR through the skin of my avatar or with the skin of my avatar.

Perhaps a future where we no longer need to gather in reality for meetings or classes may be just around the corner.

Toward such a future, I would like to experience a lot of VR technology and apply it to my research as an issue for the future.

I would like to involve other people more in my research.

## 7. 引用文献・参考文献

特に参考にした文献などはない(先行研究がほぼなかった)ので利用したサービスのダウンロードURLなどを置いておきます

VRchat公式HP <https://hello.vrchat.com/>

DLページ <https://store.steampowered.com/app/438100/VRChat/>

BOOTH <https://booth.pm/ja>

virtual desktop [https://store.steampowered.com/app/382110/Virtual\\_Desktop/](https://store.steampowered.com/app/382110/Virtual_Desktop/)

Blender 3D <https://blender.jp/>

# Wood shock X Vacant house

Transforming Japan from an Excessive Lumber Importer to an Exporter

5108 Obuchi Kosei

## Abstract

I conducted a study related to wood shock. I suggest a system which can resolve the problem. The system that I invented is called “Wood x Vacant house wood reuse system”. This system is that first the government buys vacant houses all over Japan and has some companies demolish houses. Second the government spends money to processing company, and the company recycles wood from vacant houses. Finally those woods are cheaper than foreign woods. Consequently, consumers in Japan buy the reused woods on the condition that foreign woods are expensive. This system will play a role in solving a problem in which Japan greatly depends on foreign woods despite Japan having a number of fine trees. But, processing wood costs a lot, such as money, time, and labor costs. So I suggest that the Government should subsidize the company to make the product of wood at a lower price than foreign wood. Research methods are the internet and books.

## Research goal

- 1 Sustainable Wood Use in Japan
- 2 Transforming Japan from an Excessive Lumber Importer to an Exporter

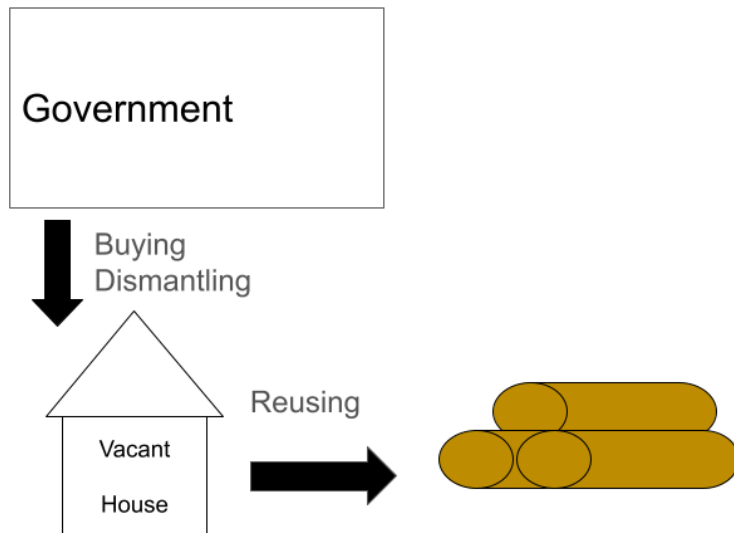
## Introduction

Today's world wood prices are increasing. Because of COVID-19, a number of people all over the world had been forced to “Stay Home”. In America and China, which have a large population, people decided to buy their new houses on this occasion. In these countries that export a large amount of these woods, domestic consumption has exceeded exports. As a consequence, prices for foreign lumber have soared. The most serious problem Japan has is that good materials such as logs and wood boards are used for biomass power generation. Apparently, the fact looks like a great use of the system, but the best material for biomass generation is wood chips with no other option but to throw it away. These good materials have many uses, including building houses and making crafts. Using materials that have no use such as wood chips for renewable energy generation is effective, but using materials that have other uses such as logs and wood boards for biomass power generation is wasteful and not suitable. The reason why this is happening is that Japan imports too much timber and cannot sell domestically produced, higher-priced timber. So, in these days of wood shock and soaring overseas timber prices, we thought it would be a good time to take a fresh look at Japanese timber. I then devised a solution to promote Japanese timber as much as possible and reduce our dependence on timber.

## Suggestion

My suggestion is to install a system which is called “Wood Shock X Vacant House Reusing System”. This system is very simply,

- 1 The government buys up and demolishes vacant houses all over Japan.
- 2 The woods which was produced by dismantling are reused and reprocessed for new use



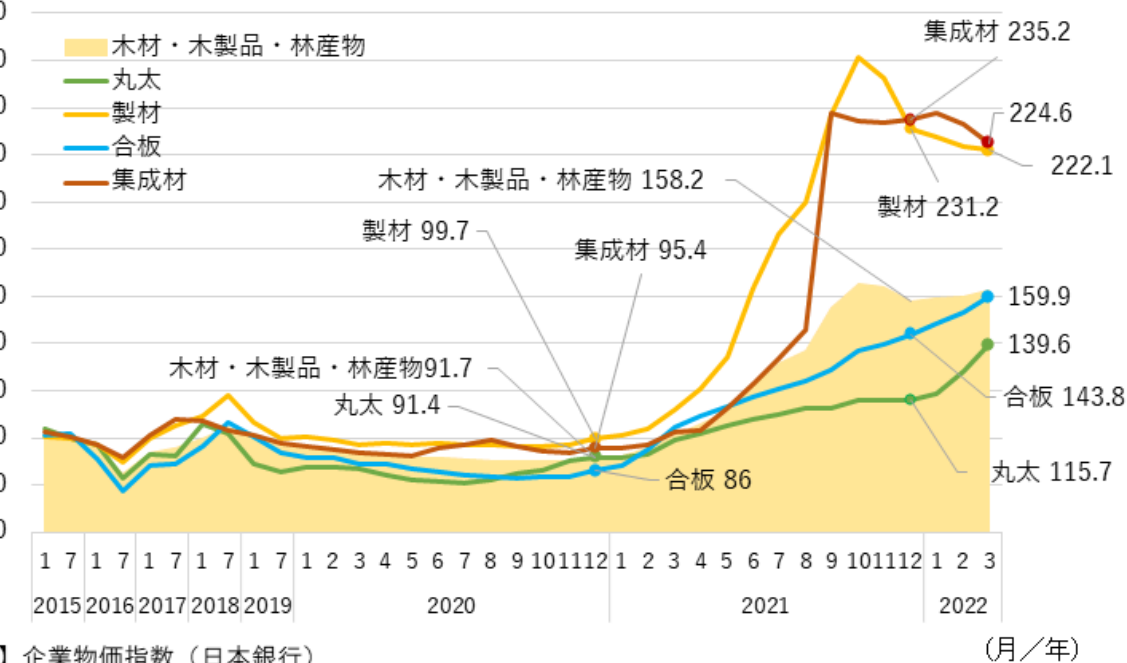
I think this system is vital because it reduces the amount of high-priced imported lumber and can carry some of the burden of domestic lumber consumption.

At this point, some may ask whether the government can demolish a vacant house in the first place. The answer to the question is yes. The law that the government can demolish vacant houses was enacted. By using the system, we can buy domestic timber more cheaper than imported

timber. Although this system cannot play a major role of reducing the foreign lumber, however this install can make a big difference to promote domestic lumber consumption. Although I have made many good points so far, this system has a very big challenge.

## 木材・木製品・林産物の輸入物価指数

(2015年=100)





# **Music Therapy and Depression**

## **Well-being management with music therapy**

5109 Kanzawa Yuzuki

### **Abstract**

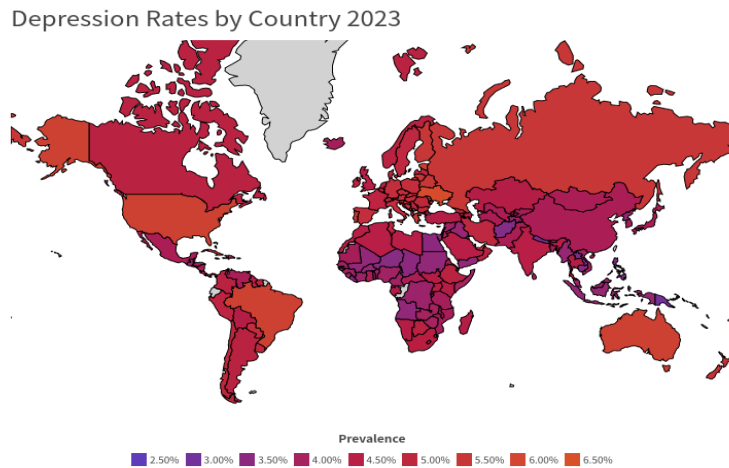
These days, the rate of depressed people is increasing in developed countries. One in six people will suffer from depression at some point in their lives. Depression affects our mental and physical condition. In addition, it leads mood swings, negative thinking, insomnia, and loss of appetite. WHO said “we need speedy solutions and medical treatment because depression is the world problem”. I think there is great significance in improving depression to reduce the number of suicides, and reduce the number of people who do not go to work or school. The conclusion is to implement Well-being management with music therapy. Globally, 15% of working-age adults live with a mental disorder, so I suggest wellbeing management by using music therapy in the workplace to improve depression in the working generation. Specifically, I suggest listening to classical music.

### **Introduction**

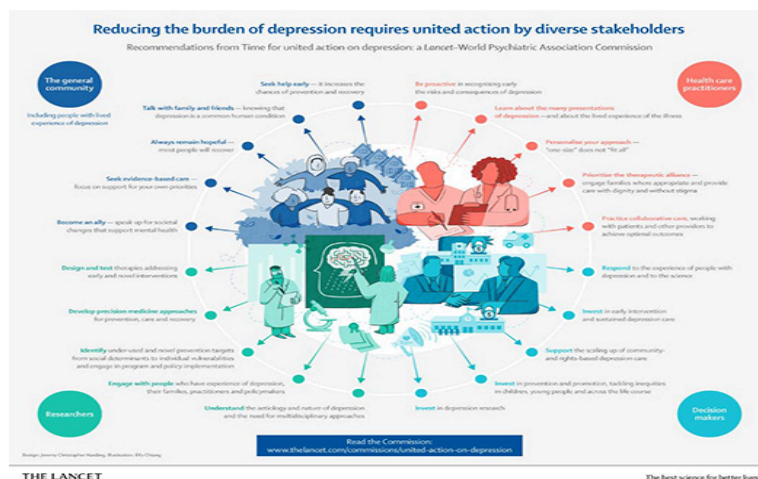
Currently, the number of depressed people is increasing in the world. Depression is the health condition in which our brain doesn't function because of mental and health stress and pressure. It is called modern disease and 6 out of 100 people suffer from its effects. The main symptom is feeling depressed. If you are depressed, you are not interested in everything and feel strong pressure. Also, it causes insomnia, loss of appetite, losing energy and strong feelings. These body conditions range from mild to severe. The cause is not found yet. Difficult foster care experiences, recent life events (stressful events such as divorce, bereavement, and other losses), and traumatic events (abuse, violence, etc.) are at risk for depression. It is easy to recur and almost all people suffer from depression for a long time. Social support has been reported as a protective factor for depression. Although the cause and treatment methods are not specifically known, psychological treatment and drug therapy are said to be effective. In addition, the WHO selected depression as the theme for World Health Day in 2017. According to a WHO report, as of 2015, 302 million people suffered from depression, and it's about 4% of the world's population. This has increased by 18% compared to 2005, with Asia the largest share of the population, at over 50 million. It is also cited as the second reason for the number of suicides. WHO points out that although it is a global problem, many of them are not receiving correct judgment and treatment, so WHO is calling to take action. Therefore, I want to reduce the number of patients with depression by using music therapy more widely around the world. Then, what is music therapy? It is using music's physiological, and social functions. Music is used intentionally and systematically to recover from physical and mental disorders, maintain and improve functions, improve quality of life, and change behavior. The main effect of music therapy is mental stability. Using this effect, I did my research in relation to depression, which is a unique disease in modern society.

## Discussion and implications

The significant of this research is reducing the number of depressed people, suicide due to depression, truant students and absence. According to the graph of WHO below, as of 2023, the rate of depressed people around the world is increasing in developing countries.



The number of deaths caused by unipolar depression and bipolar disorder is approximately 10,000 out of 100,000 in each country. According to “mental health at work”, 15% of working-age adults worldwide have a mental disorder. If effective structures and support are not in the working place, despite the desire to work, it can affect confidence, enjoyment of work, work performance, absences and the ability to find employment. More than half of the world's workforce works in informal companies with no legal guarantees for health and safety. These workers may face additional threats to their mental and physical health due to a lack of company's support. In particular, non-regular workers often work in dangerous working conditions, work long hours, and are likely to be paid less than the average person. For everyone, the workplace can be a place that enhances or undermines mental health. A safe and healthy working environment is not only a basic right for all workers, it is also likely to improve work performance and productivity, and minimize tension and interpersonal conflicts. On the other hand, a poor working environment can cause stress, become a risk factor for employment and economic problem after retirement, and for suicide risk factors due to unemployment. Additionally, only 35% of countries reported having programs to promote and prevent work-related mental health, according to the WHO.



This shows that this plan is effective and that there are important issues that need to be improved. This research also emphasizes the importance of social changes that support mental health in the general community. It promotes early intervention and sustained depression prevention, especially for those people who have social responsibility at work and school. As a solution to this problem, I propose that companies around the world actively incorporate music therapy as part of depression treatment and prevention. Well-being management should use music therapy. In particular, classical music is said to have a lot of effect. For example, it decreases blood pressure, fights depression, boosts memory, sparks creativity, reduces stress levels, makes you happy, supercharges brain power and improves productivity. Scientists say the tempo of classical music is similar to the tempo of the human heart and can reduce anxiety and depression. In addition, the secretion of dopamine activates the central nervous system in the brain, increasing brain wave activity that is directly related to memory. Also, music makes repetitive tasks more enjoyable and increases employee productivity. By playing classical music in the office, it is possible to prevent depression for workers and create a comfortable working environment. In addition, companies can enjoy the following benefits by using wellbeing management methods such as four classical music therapy. Firstly, it reduces medical costs. Employee well-being refers to the physical and mental health of employees at the office and at home, so if you manage this effectively, you can have a healthy, stress-free and happy team without having to use company health insurance. Therefore, healthcare costs for the organization are reduced. Secondly, improving employee productivity. This is part of the general health of the employee regarding their physical, mental and emotional state. This is because employees can focus better, work more, and achieve the highest productivity and success with the lowest error levels and workplace absences. Thirdly, improve employee morale and loyalty. Employees will identify with a workplace with the highest moral and loyalty levels. People in their happy, healthy group will feel appreciated, feel like this is their company, and will go the extra mile to meet company's expectations. Finally, making good employer branding, improving brand image and brand price leads to increasing customer trust. As a result, it leads to a lot of sales. Having no intention of changing the company means that it is a sign that the company, its culture, and its culture are in jeopardy to society, customers, potential customers, and even the strong talent you are looking for. It is great evidence for public image. In the future, you may even be able to recruit people from competing companies to join your team. Therefore, health management helps build desirable brand awareness and exposure at the employer and corporate level.

## **Conclusion**

The goal of this research is proposing well being management by using classical music to companies in the world. I believe that music can improve people's health and reduce the labor force and suicide rates. However, it is difficult for workers who do precision work and important work to use because music sometimes may distrube conscentration. Also, I couldn't find some effective experiments to be persuasive. The effects of music therapy are difficult to find because it works on human psychology. It is an easy method to carry out, so I want everyone to know music is one of the effective and easy ways to prevent depression in our daily lives.

## References

Depression and Other Common Mental Disorders(WHO) 2023/6/24

<https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf;jsessionid=B208D0B7B4F645C5310E4367E3D599DD?sequence=1>

Taking concerted action to reduce the global burden of depression 2023/11/24

<https://www.kyoto-u.ac.jp/sites/default/files/2022-02/20220216-furukawa-dc36c32bd8e5a9c76cd6411a9c091167.pdf>

Definition of depression Ministry of Health, Labor and Welfare 2023/8/28

<https://www.mhlw.go.jp/shingi/2004/01/s0126-5b2.html#:~:text=%EF%BC%91%EF%BC%89%E3%81%86%E3%81%A4%E7%97%85%E3%81%AE%E4%B8%80%E8%88%AC,%E3%81%AF%E3%81%A3%E3%81%8D%E3%82%8A%E3%81%A8%E3%82%8F%E3%81%8B%E3%81%A3%E3%81%A6%E3%81%84%E3%81%AA%E3%81%84%E3%80%82>

The 5 Hidden Benefits of Employee Wellbeing 2023/12/8

<https://www.lpcentre.com/articles/the-5-hidden-benefits-of-employee-wellbeing>

10 Shocking Benefits of Listening to Classical Music 2023/12/8

<https://takelessons.com/blog/10-shocking-benefits-listening-classical-music-infographic>

Time for united action on depression: a Lancet–World Psychiatric Association Commission 2023/12/8

<https://www.thelancet.com/commissions/united-action-on-depression>

Mental Health at work WHO 2023/11/9

[https://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---safework/documents/publication/wcms\\_856976.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_856976.pdf)

WHO mortality database Noncommunicable diseases 2023/12/8

<https://worldpopulationreview.com/country-rankings/depression-rates-by-country>

# Ocean pollution spreading around the world

## Reduce plastic waste

5110 Kimotsuki Konatsu

### Abstract

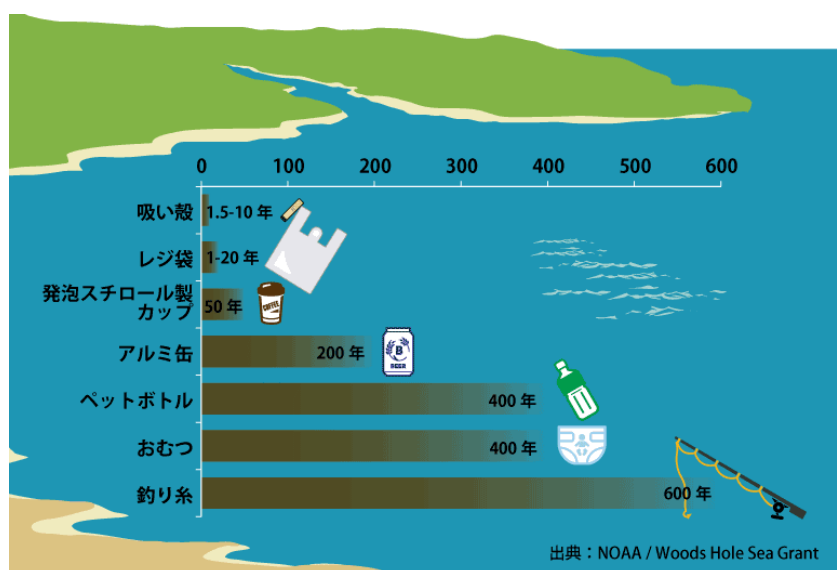
I am researching the theme of marine pollution. In order to be able to conduct deeper research on the broad topic of marine pollution, I set a goal to find a problem close to home that is related to my topic and propose a solution to it. I mainly focused on the current state of garbage and wastewater, and then turned my attention to materials that can be substituted for plastic as a way to reduce them. Since these are still in the developmental stage and have not yet been commercialized, I am trying to think of other ways to do this.

### 1 Introduction

The purpose of my research is to learn about marine pollution and achieve the goal of reducing plastic litter, which is a global problem. I also want to research and spread the word about what we should be doing to get closer to that goal.

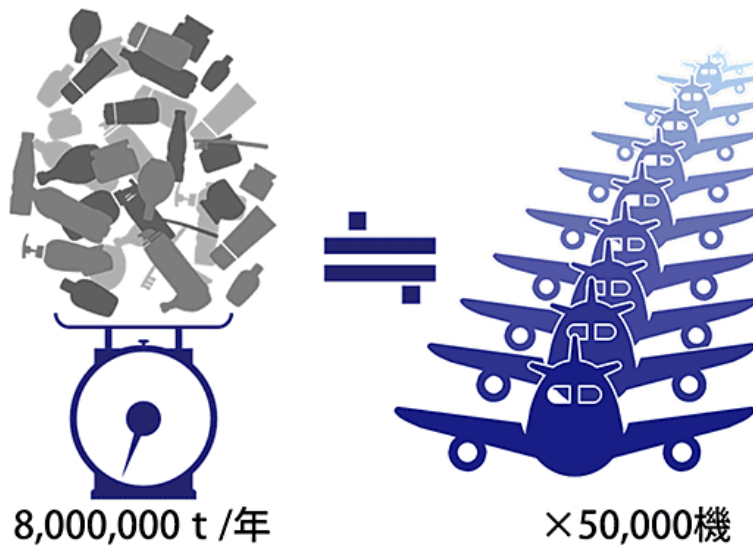
### 2 Discussion and implication

First, I researched the status of the art regarding ocean pollution. Marine pollution is mainly caused by garbage and wastewater produced by humans. This causes a loss of habitat for living creatures and affects marine products. This is a big problem for us.

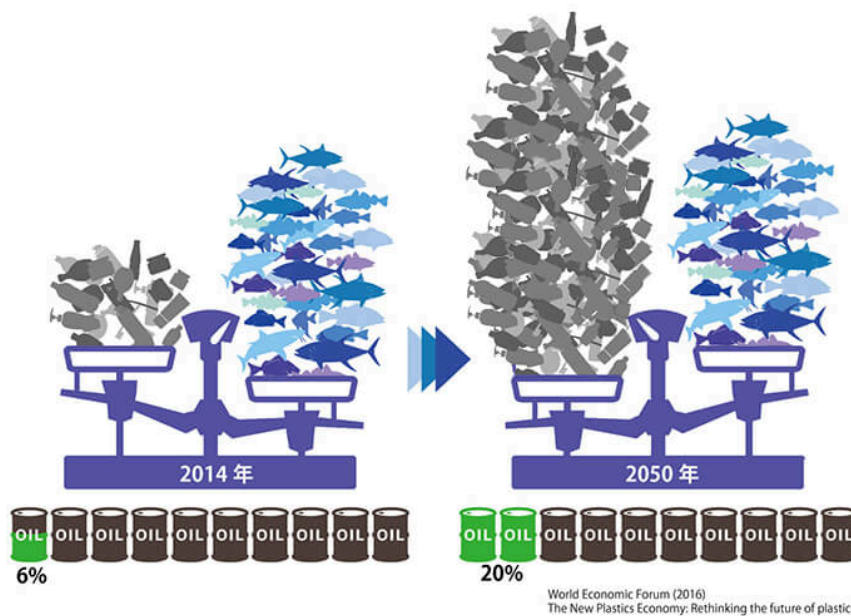


From this graph, the most common plastic litter in the ocean is fishing lines, plastic bottles, and aluminum cans. It is clear that humans are directly involved.

There are 150 million tons of plastic waste in the world's oceans today. I was surprised to learn that more than 8 million tons are newly accumulated in the oceans every year. 8 million tons is the same weight as 5000 jet airplanes. This is very heavy.



If plastic waste continues to increase at this rate, it will exceed the amount of fish by 2050.



The problem here is that it is impossible to extract. This is because the ocean is very deep. In addition, as time goes by, plastics break down into smaller and smaller pieces and become microplastics, which are very small. Therefore, it is extremely difficult to remove anything but trash floating in the ocean.

so I decided to come up with measures to prevent more plastic waste from accumulating in the ocean.

The material I will address is called LIMEX. It is an alternative to plastic. LIMEX is made of limestone. So it is very stable. The big merit is that limestone can be dissolved by rainwater. As another solution, I thought of a plastic waste collector. I researched it, but it is still in the development stage, so I could not get much information about it.

### **3 Conclusion**

To get more information and find better solutions. We also want to be able to clearly present how the solutions we derive will affect us.

### **4 References**

[ uni LIMEX | mpuni.co.jp ]

<https://www.mpuni.co.jp/company/press/20210317-52200.html>

[ LIMEX detail | kenbunsha ]

<https://www.kenbunsha.jp/commusapu/sdgs/263/#>

[ TBM | prtmes.jp ]

<https://prtmes.jp/main/html/rd/p/000000056.000016815.html>

[ MOLp® ONLINE STORE | molpec.com ]

<https://molpec.com/>

[ Seabin group for cleaner oceans | seabin.co.jp ]

<https://seabin.co.jp/>

[ global environment | showa sangyo ]

<https://www.showa-sangyo.co.jp/csr/global-environment/global-environment01.html>

[ ocean pollution problem | WWF japan ]

<https://www.wwf.or.jp/activities/basicinfo/3776.html>

# Music and insomnia

## Music therapy enliven economy

5111 Saito Miuna

### Abstract

The lack of sleep affects the economy. Insomnia, one of the sleeping disorders, decreases concentration and motivation. About 10% of the world's population experience insomnia that qualifies as a medical condition. Also the treatment to solve insomnia is difficult because sleeping pills have side effects, so some countries prohibit using sleeping pills. Doctors say that using sleeping pills is a major treatment but using it for a long time is bad for health. Also improving lifestyle and sleeping habits without using pills is difficult because the patients must manage themselves. I think music therapy is the best way to treat insomnia. Also to avoid feeling sleepy during the day, I think using office music is a good solution. Through using office music, it can solve the cause of insomnia. Also office music affects not only insomnia's patients but also another person, so it connects improving economy.

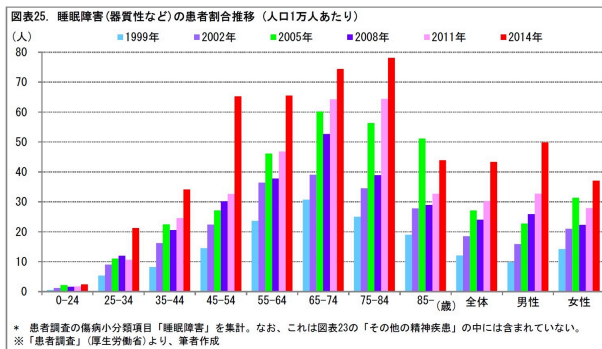
### 1 Introduction

Insomnia is a health-related illness. Insomnia causes sleepiness during the day due to inability to get enough sleep at night, loss of concentration, and decreased motivation. The number of insomnia patients in Japan has more than quadrupled over the past 15 years. Comparing the number of patients with insomnia per 10,000 population, in 1999 there were about 10 patients, but in 2014 there were more than 40. However, the main treatment for insomnia is medication, which cannot be taken for a long time. That's why I suggest music therapy instead of drug therapy. In this way, insomnia can be treated more safely.

### 2 Discussion and implication

Insomnia is a common sleep disorder. With insomnia, you may have trouble falling asleep, staying asleep, or getting good quality sleep. This happens even if you have enough time and the good environment to sleep well. Insomnia can get in the way of your daily activities and may make you feel sleepy during the day. About 10% of the world's population experience insomnia that qualifies as a medical condition. The graph below shows change of sleep disorder patients. According to this graph, the number of sleeping disorder patients are increasing.





Sleeping disorder affects not only daily life but also the economy. Lack of sleep affects daily life sleepiness, decreases concentration, weakens the immune system, and becomes a lifestyle-related disease. Also there are merits about sleeping, for example relief from fatigue, stress relief and memory retention and so on.

Insomnia is the time when you experience disruptions in how you feel or function because you aren't sleeping well. About 10% of the world's population experience insomnia that qualifies as a medical condition.

The causes of insomnia can be grouped into four main categories. Specifically, psychological like feeling stress, physical like disease, mental like anxiety and depression, pharmacological like medicine, alcohol and caffeine. And insomnia has two types treatments. One is drug therapy and the other is non-drug therapy. Drug therapy is treatment using sleeping pills. Non-drug therapy is treatment improving lifestyle and sleeping habits, but sleeping pills have some problems. First, sleeping pills have a carry-over effect. For example, sleeping pill's effects continue the next morning, so they feel sleepy and putter. Also it has muscle relaxation, so patients may fall down when they stand up. Second, memory problems that cause blurred memory or forgetting of what was experienced after taking the drug. Third is dependency that cannot be calmed down without medication. From this, I think improving insomnia with music therapy, which has no side effects, rather than drug therapy.

Music therapy draws on the power of music in a therapeutic relationship to manage a range of conditions and improve your quality of life. A music therapist tailors sessions to your needs. You may sing or play instruments, listen to music or discuss the meaning of lyrics. Therefore you don't need musical skills, and people of all ages can benefit. Prior studies have found that music therapy can improve sleep quality. Music that improves sleep quality is characterized by nature sounds such as murmuring rivers and chirping birds, but listening to music during sleep may cause more insomnia, so I think office music is the best therapy to improve insomnia. Therefore, I thought I could devise a way to listen to music during the day. In order to feel sleepy at the right time at night, I figured that using office music during the day would be a good idea.

Music played in the office is songs that come in naturally and are not intended to be heard. Office music can create an environment where you don't feel sleepy during the day by playing music that wakes you up. There are three effects of playing music in the office.

First is the relaxation effect. Music has been shown to reduce feelings of discomfort. Previous studies have also noted that listening to music has been shown to decrease psychological stress and mildly decreased physiological stress. In an experiment to see how

office workers would change after listening to 30 minutes of background music from the office music channel "Concentration: Increasing Workers' Concentration" during work hours, an increase in body temperature was observed for all employees, and an increase in saliva production was observed for 86% of them. In addition, the physical changes shown in the figure below are evidence of stimulation of the parasympathetic nervous system, indicating a shift from a state of tension to one of relaxation.

【仕事の合間に30分音楽を聞くことで起こった現象】

体温の上昇	100%
唾液分泌量の増加	86%
唾液IgA値の増加	71%
唾液コルチゾール値の減少（ストレスで増加）	71%

Second is the masking effect. The masking effect is "the overlapping of two sounds so that one of them is harder to hear." When there is no music in the office, one's ears are subject to the voices of neighbors talking, answering the phone, and sometimes even being scolded. According to the workplace environment survey, a surprisingly large number of people are dissatisfied with noise in the workplace, with some stressful comments such as "I can hear the chatter" and "I can't concentrate because I can hear the phone ringing. Office music reduces the stress that causes insomnia by making it difficult to hear ambient noise and creating an environment in which each person can easily concentrate on the work at hand.

Third is to increase concentration. Originally, background music began to be marketed as environmental music to improve concentration and productivity, when the Muzak Company in the U.S. in the 1930s noticed that productivity in offices and factories was increased by background music rather than silence.

Office music is good for working and solving the cause of insomnia and if we used music during work, we would not feel sleepy and that would help enliven the economy. But office music is something to keep in mind. When playing music, it is important to carefully implement volume control. It is also recommended to adjust the volume according to genre. For example, classical music, which stimulates the brain and improves concentration, tends to play familiar tunes. If music with a tune you know without lyrics is played, you will not be able to listen to it. Therefore, if you play classical music, it is recommended to set the volume a little lower. Also, a workplace is not only a space where work is done. For spaces such as company cafeterias, break rooms, and restrooms, it is advisable to change the volume and music selection for each location. For example, some companies play mid-tempo instrumental music at a slightly higher volume in the company cafeteria to create a cheerful

atmosphere. On the other hand, it is not uncommon for companies to play nature sounds such as the murmuring of a river, the sound of waves, or the chirping of birds at a lower volume in break rooms. In other words, by adjusting the music selection and volume according to the effect or purpose you want to achieve through music, you can bring out the best effect. In addition, having separate music for the work area and other spaces can be helpful in switching moods. Furthermore, in some cases, music selection and volume are set for each time of day. For example, in the morning hours before work, some companies play up-tempo songs that everyone knows at a louder volume to improve mood, or play a certain song before lunch. Adjusting the song and volume at different times of the day can have a time management effect.

From this, if we used office music correctly, we could solve the cause of insomnia and it connects an enlivened economy.

### 3 Conclusion

The use of music to improve insomnia was found to be effective. I think that office music can be used as music therapy to help people avoid feeling sleepy during the day. Office music can also improve the psychological and psychiatric causes of insomnia, and can promote work efficiency in non-insomniacs. This will allow insomniacs to perform at their best during the day without being adversely affected. This will also enliven the economy. Office music should be chosen to suit the occasion in terms of time and volume.

### 4 References

Insomnia Economic effects

<https://financial-field.com/living/entry-144589#i-3> (2023.6.16)

what is insomnia

<https://my.clevelandclinic.org/health/diseases/12119-insomnia> (2023.11.7)

what is music therapy

<https://my.clevelandclinic.org/health/treatments/8817-music-therapy> (2023.11.22)

office music volume

<https://officebgm-hikaku.info/column/adjustment/#:~:text=%E4%B8%80%E8%88%AC%E7%9A%84%E3%81%AB%E8%81%B7%E5%A0%B4%E3%81%AB,%E5%A4%A7%E3%81%8D%E3%81%95%E3%81%AF%E5%A4%89%E3%82%8F%E3%82%8A%E3%81%BE%E3%81%99%E3%80%82> (2023.11.22)

# The Prevention and Remedy of Depression

## Spread the recognition all over the world

ID5112 Sakai Yuta

### Abstract

The research question for this study is “what are the effective and practical prevention against depression, and how can I spread the way to do it?” In the whole world, the number of patients with depression is increasing now, and the only thing I can suggest is to broaden the recognition and how to prevent depression. The way of prevention is by resting,relaxing, doing what they like, for example,hobbies,and so on. Another effective way of prevention will be considered. And now I search for the remedy for it because my research with only prevention seems low quality.

### 1.Introduction

Now there are a lot of patients of depression, and the pandemic of COVID-19 may contribute to increasing the number of them. Actually, I had researched the problem of the students who refuse to go to school,and found that mental diseases are something to do with refusing to go to school. However I did not have enough time to verify that, so I started this research.

And in this research, I mainly focused on the prevention of depression in advanced countries because in developing countries, there are too many things that I cannot change(ex.the shortage of doctors, bad financial situation, and so on).

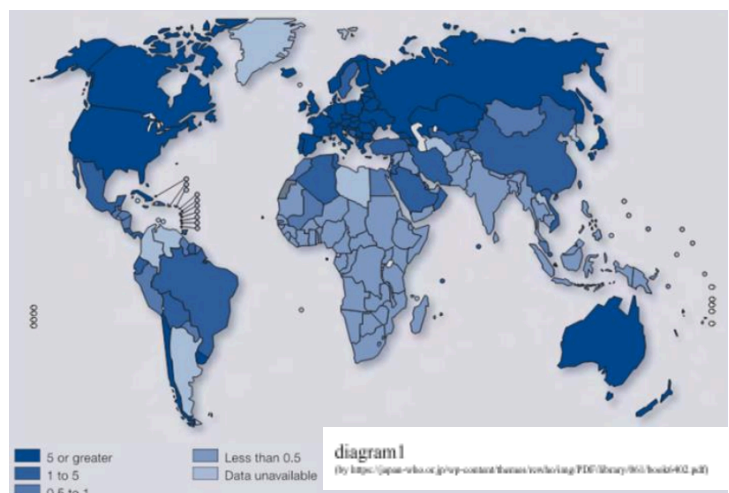
In this research, I set the research question, “what are the effective and practical prevention against depression, and how can I spread the way to do it”. In my opinion, mental stress may be relevant to developing depression, so getting rid of it may reduce the risk of developing this disease.

In this research, I only use the Internet to search for information. This can cause a lack of trust for it, so I had to rely on the specialists who are worth being trusted, but that is too late now...

### 2.Discussion and Implication

i .The present circumstance of the world

In the whole world, the number of patients with depression is increasing every year, and now there are nearly 300 million of them on the earth.



Surprisingly, the rate of the patients who are cared for is only one-third of all in developing countries, and one-second in even advanced countries, so a lot of patients cannot take any treatments. And what is worse, there are few doctors who have the correct information of depression in developing countries, as shown by diagram 1.

But though it is a big problem, I judged I could not resolve this situation as I had no idea how to increase the number of doctors in developing countries at the beginning of this research, so I focus on countries that are similar to Japan in terms of economy.

#### ii .What is depression

The factor of this disease is not clarified very much, but it is said that keeping feeling stressed may increase the risk of onset. So every person regardless of region, raccoon, and profession may cause it. Additionally, women are more likely to get depression than men, and the number of patients of women is 1.6 times larger than that of men. When pregnant women get this disease, they are called postpartum depression style.

The existence of patients has impacts on not only themselves and their family but also the whole society. That's because the onset often occurs in school days and those who are in the prime of their career, and the treatment, and the loss that would not happen if the patients worked cost so much. Reuters announced that we will lose 16 trillion dollars from 2010 to 2030 unless there are no countermeasures.

#### iii .How to care depression

This disease appears differently among individuals, so patients need many kinds of treatment. However, the main factor is mental stress, so patients have to get rid of the cause of it. In addition, the prevention of depression is the same,too. To do so, taking rest and being absorbed in hobbies are cruel.And especially, medication is almost vital to treatment.

Also, for depression, it is very important that others, such as patient's families, colleagues,even doctors, and so on, understand about this disease, and cooperate with patients. To complete this, correct knowledge about depression is essential. Depression is a disease, so the patients cannot treat only themselves. However, this fact is likely not recognized in developing countries because of the lack of the number of doctors, as diagram 1 shows you. For example, in Guinea, only 5 doctors are there though there are 13.5 billion people in the country.

What is worse, developing countries have less enough money to hire doctors, so the only way to solve this problem is financial help, I think.

### 3.Conclusion

Now, I can only suggest spreading awareness about depression, such as the symptoms,treatment,remedy, and etc. In advanced countries, there are more opportunities to know about this disease than before, but they may not learn the details. Needless to say, people in developing countries don't recognize a lot. So my assignment from now is what is the effective way to make people be aware of deep understanding about depression. This seems like a very difficult task to achieve.

#### 4.References

[国際的な精神保健の開発](#) 2022/05/09

[2017年世界保健デーのテーマは「うつ病」です。](#)2022/05/11

[世界の約10億人が精神疾患、新型コロナでうつ病患者が激増](#)

[世界で精神疾患が増加、2030年までに16兆ドルの損失も＝研究](#) | [ロイター](#) (2022/09/05)

[うつ病の治療費はどのくらい？～うつ病は薬物療法だけではない！？](#) (2022/10/05)

[世界・人口10万人あたりの総合病院の精神病床数ランキング](#) (2022/10/17)

[開発途上国の分類](#) (2022/10/17)

[「世界と日本と自分のうつ病」](#) 2022/11/16

[Depression and Other Common Mental Disorders](#) 2022/11/16

[世界的に注目されている新しい認知行動療法の有効性を確認](#) | [国立研究開発法人 国立精神・神経医療研究センター National Center of Neurology and Psychiatry](#) 2023/02/01

[うつ病とは - 原因、症状、治療方法などの解説](#) | [すまいるナビゲーター](#) | [大塚製薬](#)

2023/02/01

[精神医学における AI 活用の現状, 課題, そして可能性](#) 2023/05/02

[3分で理解できる！SVM\(サポートベクターマシン\)とは](#) | [AIZINE \(エーアイジン\)](#)

2023/05/02

[ランダムフォレストとは？基本の仕組みから活用事例までまとめて解説](#) | [DXを推進するAIポータルメディア「Aismiley」](#) 2023/05/02

[世界で精神疾患が増加、2030年までに16兆ドルの損失も＝研究](#) | [ロイター](#) 2023/11/07

# Avoiding unemployment by digitalization

## Make a world which people don't have trouble working

ID 5113 氏名 Shuma Sato

### Abstract

The motivation for this research is that I was concerned about our future when I learned about the decrease in employment due to digitalization in the news.

The purpose of this research is to develop a solution to avoid the problem of unemployment due to digitalization, and to ensure that Japan's economy and public safety will continue to develop in a secure order even if technology related to AI is developed in the future.

As a result of this research, I got various information such as the fact that Japan had created jobs by revitalizing tertiary industries in response to changes in the unemployment rate caused by the collapse of the bubble economy and the Lehman Shock. And the problem of young people giving up their jobs early, which is called "753 leaving work," has not been resolved yet. In addition, information on the issue of unemployment shown by IT indicates that the human resources required by companies have changed over the past few years. It means that some jobs will disappear and others will be created as a result of the shift to IT. Based on the above, the temporary solutions considered were to train young people to adapt to IT, to create jobs by taking advantage of created jobs, and to enhance support so that even if a person loses their job, they can immediately find a new one.

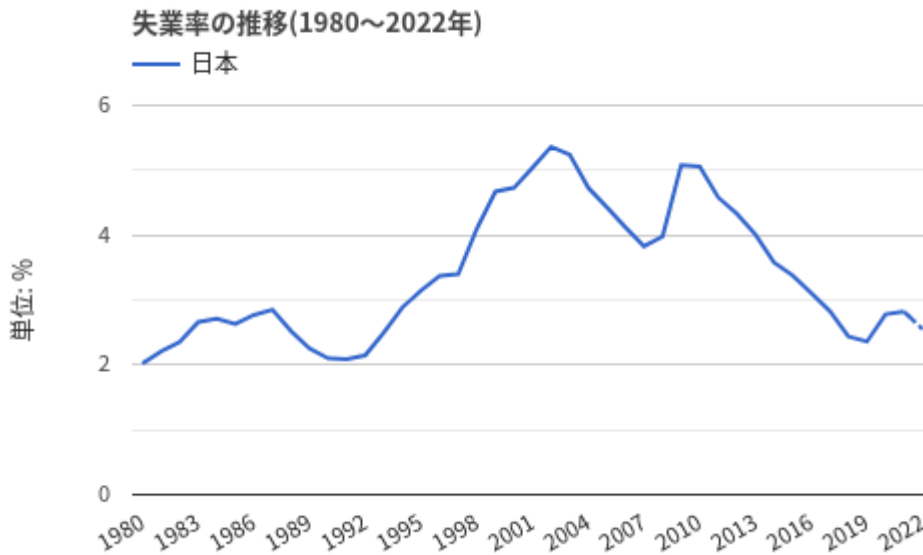
### Back ground

I became interested in unemployment when I saw a news report of the unemployment problem caused by the COVID-19. The news showed that people who own restaurants and other businesses were forced to close their stores due to poor business performance. Unemployment is a problem not only in Japan, but also in most countries around the world. I felt that it would be a waste to lose a job that one has taken the trouble to get, so I did some research on this topic. and I learned that the issue of unemployment due to digitalization has become a main topic recently. I felt that the social problems that are feared in the future society are worth solving, so I decided to conduct research with the aim of preventing the occurrence of unemployment problems due to the use of information technology.

### Purpose

The research question is what measures should be taken to avoid the unemployment problem caused by IT. If we can come up with a solution to this problem, we will be able to prevent

the deterioration of public safety and economic decline caused by the increase in unemployment in Japanese society in the future.



The graph above shows the unemployment rate in Japan: after the bursting of the bubble economy in the 1990s, the unemployment rate exceeded 5%, then settled down and declined, but then the Lehman Shock of 2008 coincided, and the unemployment rate rose again to 5%. The generation of the unemployed at that time was mainly young people in their 20s, and a mismatch between companies and job seekers was cited. Furthermore, a high percentage of the unemployed were voluntarily quitting their jobs, and the term "753 job leavers" was coined out of concern that among newly hired graduates, 70% were middle school graduates, 50% were high school graduates, and 30% were university graduates.

Measures were taken to solve these problems, such as increasing employment mainly in the tertiary sector, and when the unemployment rate gradually dropped and stabilized at around 2%, a pandemic of a new type of coronavirus infection occurred, and the unemployment rate has risen to nearly 3% in the past few years. This is the present.

The unemployment problem also affects the macroeconomy (the economy of the country as a whole). As the number of people not working increases, social productivity declines, and consumption levels, tax revenues, and social insurance income also decline, creating a vicious cycle. In addition, the income gap between the rich and the poor will widen, and the rich will end up monopolizing profits. If this happens, it would be hard to say that it will not lead to the wealthy gaining power. Therefore, solving the unemployment problem will help protect the world economy in the future.

As I mentioned in my previous discussion of the reasons for unemployment, I investigated whether the causes of the unemployment problem have changed in recent years.



What caught my attention was the issue of the continued recognition of the term seven five-three turnover, the problem of new hires leaving the workforce too soon, which remains a problem. This is a serious problem related to the future employment of the younger generation. Among the seven-five-three job turnover, the number of cases of new hires who immediately leave their jobs after graduating from junior high and high school has decreased by approximately 20%, but the turnover rate of college graduates has not changed compared to the 1990s and 2000s, when the term was first coined. When examining the reasons for leaving their respective jobs, there was always a reason that the job was not a good fit for all groups, and while the junior and senior high school graduates had other reasons for not being able to work due to unavoidable circumstances, such as family reasons or higher education, the university graduates had other reasons that came from conflicts with their own wishes, such as human relations and the work environment.

To avoid mismatches in the workplace, the respondents were advised to familiarize themselves with the work environment by having a mentor or by providing adequate training, and to explain their wishes in detail.

Next, the causes of the unemployment problems due to IT are summarized again.

First, the number of general clerical workers has decreased as IT has made operations more efficient. According to data from the Ministry of Health, Labor and Welfare, 34.1% of the companies surveyed said that the number of employees had decreased. Furthermore, companies now require personnel with basic IT literacy and IT skills as part of their human resource needs.

In addition, some restaurants and other establishments are beginning to employ AI robots to replace store clerks, raising concerns about further job losses.

## AI時代に生まれる可能性がある仕事15

番号	仕事名
1	データ探偵
2	ゲノム・ポートフォリオ・ディレクター
3	散歩・会話の相手
4	倫理的な調達 (ES) 責任者
5	最高信用責任者 (CTO)
6	サイバー都市アナリスト
7	人間と機械の協働責任者
8	人工知能 (AI) 事業開発責任者
9	BYO (個人所有機器活用) ITファシリテーター
10	エッジコンピューティング専門家
11	フィットネス・コミットメント・カウンセラー
12	デジタル仕立屋
13	AI支援医療技師
14	財務健全性コーチ
15	量子機械学習アナリスト

※出典：What to do when machines do everything

On the other hand, however, if we are creative, we can create many new jobs, such as drone pilots, virtual creators, data investigators, and, for something a little different, walking and talking companions, as new occupations that are likely to increase in demand when the use of IT advances.

In addition, jobs that require sophisticated skills, such as salespeople, customer service, hairdressers, childcare workers, and other occupations that require communication with people, as well as craftspeople and builders who create traditional crafts, will not be affected as much, since they require humans to do the work.

Thus, we have learned that IT has an aspect of job creation as well as job loss, but it would be unreasonable to say that you should become a drone pilot because there are no more clerical jobs.

Therefore, I think we should turn our attention to the development of young people who will enter society in the future. In Finland, which ranks at the top in international comparative studies of academic achievement, students' academic ability is improved from elementary school through small class sizes, high-level teachers, emphasis on experiential learning, and early education. Although not to the same extent, I felt that in Japan, IT skills and IT literacy should be taught more in the upper grades of elementary school so that young people can keep up with the IT trend, which should be a top priority.

In addition, I also think that career path education should be enhanced to prevent job mismatches, and employment insurance should be optimized to facilitate reemployment in the event that a person loses his/her job.

In addition, through my visit to companies in Singapore, Pasona, I learned that, with regard to the development of young human resources, it is important to educate them to be interested in future changes in the world and to have an eagerness to learn, and to nurture human resources with flexible thinking.

## Conclusion

The study concluded that one of the first things to be done is to develop young human resources adapted to IT, to create jobs in foreign countries by using newly created jobs, and to improve support so that if they should lose their jobs, they can immediately find new ones. To be a world citizen, we have to grasp the situation in the world and discuss solutions constantly.

## References

- alumnavi

<https://alumnavi.com/753phenomenon/>

- homepage of Ministry of Health, Labour and Welfare

<https://www.mhlw.go.jp/index.html>

- book of world economy

[https://ecodb.net/exec/trans\\_image.php?type=WEO&d=LUR&c1=JP&s=&e=](https://ecodb.net/exec/trans_image.php?type=WEO&d=LUR&c1=JP&s=&e=)

- The Adecco group

[https://www.adeccogroup.jp/power-of-work/vistas/adeccos\\_eye/34/03](https://www.adeccogroup.jp/power-of-work/vistas/adeccos_eye/34/03)

# Review Japanese medical insurance system

~More accessible system to Japanese~

5114 Sawada Hina

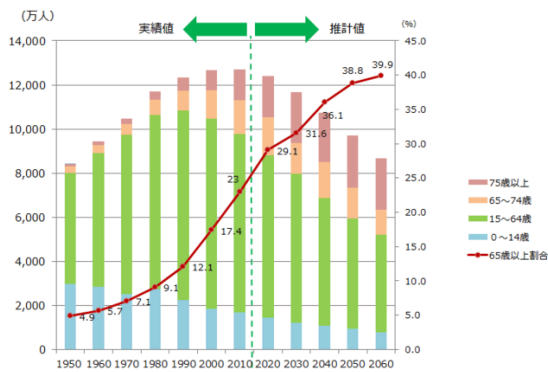
## Abstract

The purpose of this study is to reduce the burden of medical costs. I am interested in nursing and public health so I started learning about the Japanese insurance system. Japan has a “universal health insurance system”. This reduces the burden of expensive medical expenses in case of illness or accident. Everyone is able to receive appropriate medical care. Nowadays Japan has a ‘Low birthrate and aging society’, the burden of medical expenses for the elderly, which are supported by the working-age population, is increasing. So how do we keep costs down? I think medical expenses should be free for children under the age of 18. It is a good effective ‘low birthrate and aging society’. we can increase the Japanese birth rate and support the next generation. I also suggest a "registration system" like in most countries. It can reduce waiting time and costs. I believe that the cost can be reduced by improving the efficiency of medical care. As for current medical costs, we would like to improve the efficiency of medical care through ICT and robotics. How to make medical care more efficient is a future issue.

## 1 Introduction

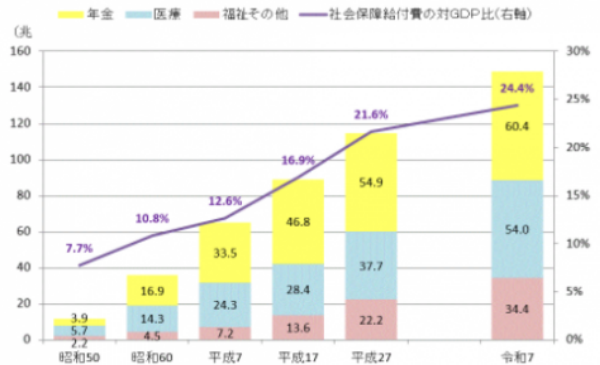
I am interested in nursing and public health nursing so I started learning about the Japanese insurance system. This reduces the burden of expensive medical expenses in case of illness or accident. Everyone is able to receive appropriate medical care so the Japanese Insurance medical level and average life keeps one of the best levels in the world. Nowadays Japan has a ‘Low birthrate and aging society’ (graph 1), medical costs for the elderly will increase (graph 2). I found that the disadvantage of the system's youth bearing the cost of medical care is outstanding; I thought that the current system will be difficult to support in the future because of the high cost of medical care for the elderly, which is supported by the working-age population up to the age of 65. I also think this is a serious problem because Japan has the world's oldest population (graph 3). Therefore, I would like to propose that we investigate insurance systems in other countries and improve them by adopting a system that fits the Japanese current situation.

graph 1

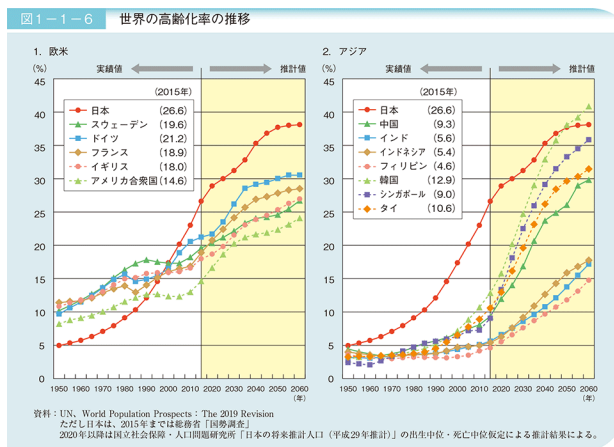


資料：2010年までは総務省「国勢調査」、2015年は総務省「人口推計（平成27年国勢調査人口速報集計による人口を基準とした平成27年10月1日現在推定値）」、2020年以降は国立社会保障・人口問題研究所「日本の将来推計人口（平成24年1月推計）」の出生率・死亡中位仮定による推計結果  
 (注) 1950年～2010年の総数は年齢不詳を含む、高齢化率の算出には分母から年齢不詳を除いている。

graph 2



graph 3

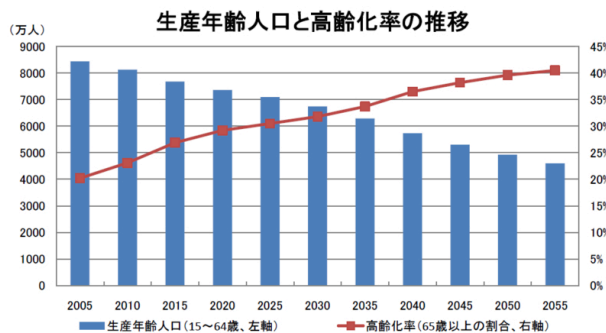


## 2 Discussion and implications

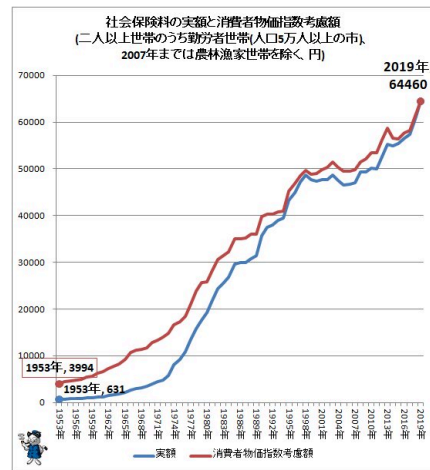
The National Health Insurance Law was enacted in 1958, and the universal health insurance system began in 1961. Before this system began, Japan had the social disadvantage that people such as those who were self-employed or engaged in agriculture needed large sums of money for medical expenses. It meant that they could not receive medical care with peace of mind. At that time, only 1/3 of the population was enrolled in the system, so a universal health insurance system was made. As a result, most people joined. Now almost 100% of the Japanese population is enrolled. The advantage of this system is that we do not need to pay a full amount of medical bills. For example, the elderly over 70 years old pay 20% of their medical expenses, those over 75 years old pay 10%, those under 70 years old pay 30% and 60%, those under 70 years old pay 30%. The remaining is paid to medical institutions from contributions collected from the public, companies, and local governments.

On the other hand, the disadvantage is the collapse of the system by the low birthrate and aging population (graph 4). It rose by 180,000 yen in 30 years (graph 5).

graph 4



graph 5



The burden on the working generation is heavy so the government has been trying to improve the efficiency of medical care. For example, online consultations, electronic medical records, and vaccinations. However, these measures do not seem to have made a significant improvement so I want to think that appropriate medical care for us. I found a system that suits Japan.

Country: Japan

System: Public universal health insurance, free access system

Medical expenses: Public universal health insurance. The Japanese social security system aims to provide relief to people who have become vulnerable.

Country: United Kingdom

System: Registration system. When a patient becomes ill, they first consult their family doctor who has been decided upon in advance.

Medical expenses: free

Country: U.S.A.

System: Only "Medicare" and "Medicaid" care system.

Medicare...For all people aged 65 and over.

Medicaid...For the people who need money to live.

Medical expenses: Depends on insurance

Country: France

System: Reimbursement system. Patients pay all medical expenses, of which about 75-85% is later reimbursed by insurance. They have to pay for their own medical expenses once.

Medical expenses: Public universal health insurance 75-85% of medical expenses are paid by insurance.

Country: Germany

System: Universal health insurance

Medical expenses: Public 90% , National Health Insurance 10%

Country : Sweden

System: Social security system

Medical expenses: Through a tax system. Almost all systems are directed toward the working age population, including childcare, education, and parental leave benefits.

The term "free access" refers to the fact that patients themselves are free to choose the hospital or clinic they wish to visit. While it is commonplace in Japan, there are few countries with well-developed medical systems that have adopted a free-access system. It is said that it is quite rare to see a doctor like in Japan. On the other hand, in other countries, it is a "registration system. After seeing a family doctor, a patient can ask for a letter of introduction and then go to a larger hospital for consultation. The national government and the Japan Medical Association define a family doctor as follows. The national government and the Japan Medical Association define a family doctor as "a doctor who can be consulted about anything, is well versed in the latest medical information, can refer patients to specialists and specialized medical institutions when necessary, and has the overall ability to take charge of community medicine, health, and welfare in a familiar and dependable manner. Which of the two is more acceptable to the Japanese people and reduces the cost of medical care? Considering the roles and costs of clinics such as medical examinations and university hospitals like treatment of serious illnesses and hospitalization, I think it would be a good idea for Japan to register family doctors. This will reduce the waiting time for patients to visit large hospitals, since they cannot go to a large hospital without a doctor's referral. This would reduce the burden of visits to hospitals.

Then, how to reduce costs ? Based on the previous [summary of healthcare systems in various countries], I think we should adopt Sweden's tax-based public health and medical services. The system is aimed at the "working-age" population and is free of charge for those under the age of 18. At first glance, this may seem more burdensome than the current system, as it requires more taxes to be collected, but I think it is a good countermeasure for the declining birthrate in Japan. We believe that costs can be made less burdensome by focusing on improving the efficiency of medical care. Improving the efficiency of medical care involves changing the medical and long-term care delivery system and program, and utilizing ICT and robotics.

### 3 Conclusion

A registration system that eliminates the need for anyone to see a doctor at a large hospital multiple times would be more efficient because it would allow patients to be seen by their family doctor at the appropriate medical facility. This would prevent congestion, make medical examinations smoother and less time-consuming, and reduce costs. In addition, by making medical care free for children under the age of 18, as in Sweden, the goal is to raise Japan's birth rate and support the next generation. As for current medical costs, we would like to improve the efficiency of medical care through ICT and robotics. How to make medical care more efficient is a future issue.

### 4 References

<https://hoken-all.co.jp/hoken/kokuminkaihokenseido/>

国民皆保険制度をわかりやすく解説 | 今後の課題や海外との違い 9/5

<https://www.med.or.jp/people/info/kaifo/compare/>

日本と諸外国の医療水準と医療費 9/5

<http://www.ntvkenpo.jp/member/outline/system04.html>

「医療費助成制度」とは？ 10/5

<https://www.hws-kyokai.or.jp/images/book/chiikiiryo-2.pdf>

地域の医療と介護を知るためにーわかりやすい医療と介護の制度・政策ー 第2回 日本の医療制度はイギリスやアメリカと違う？ 11/2

<https://www.mhlw.go.jp/bunya/shakaihoshho/iryouseido01/dl/info02d-37.pdf>

医療費の一部負担(自己負担)割合について 11/7

<https://www.mhlw.go.jp/wp/hakusyo/kaigai/08/dl/22.pdf>

[各国にみる社会保障施策の概要と最近の動向(アメリカ・イギリス)] 11/19

<https://www.nta.go.jp/taxes/kids/hatten/page13.htm>

税の国際比較 11/19

<https://mirasus.jp/sdgs/health-wellbeing/5671>

スウェーデンの社会保障の特徴と日本とアメリカとの違い 12/5

<https://job.minnanokaigo.com/news/kaigogaku/no1201/>

「日本医師会vs政府」かかりつけ医の制度化をめぐる対立関係を読む 12/18

<https://financial-field.com/tax/entry-131379>

日本の税金は高いの？世界の税金と比較 12/18

<https://www.icer.or.jp/blog/tanakahideaki20181114.html>

病院の混雑解消、フリーアクセスを見直して質とコストを改善しよう 12/18

<http://www.gaihoren.jp/gaihoren/public/medicalcost/html/index.html#:~:text=%E3%82%8F%E3%81%8C%E5%9B%BD%E3%81%AE%E5%8C%BB%E7%99%82%E8%B2%BB%E3%81%AF%E5%9B%BD%E9%9A%9B%E7%9A%84%E3%81%AB%E8%A6%8B%E3%82%8B%E3%81%A8,%E3%81%AE1%E3%81%AB%E3%81%99%E3%81%8E%E3%81%BE%E3%81%9B%E3%82%93%E3%80%82>

日本の医療費について 12/18

<https://medical.nikkeibp.co.jp/leaf/all/blog/nhc/202001/563853.html#:~:text=%E7%8F%BE%E5%9C%A8%E3%80%81%E5%9B%BD%E3%81%8C%E9%80%B2%E3%82%81%E3%82%8B%E5%8C%BB%E7%99%82,%E5%8A%B9%E7%8E%87%E5%8C%96%E2%94%80%E2%94%80%E3%81%A7%E3%81%99%E3%80%82>

医療現場の「業務効率革命」はこんなにスゴイ！ 12/22



# The system to save the poor

~Steady income by the food value chain~

5115 Shimoda Kodai

## **Abstract**

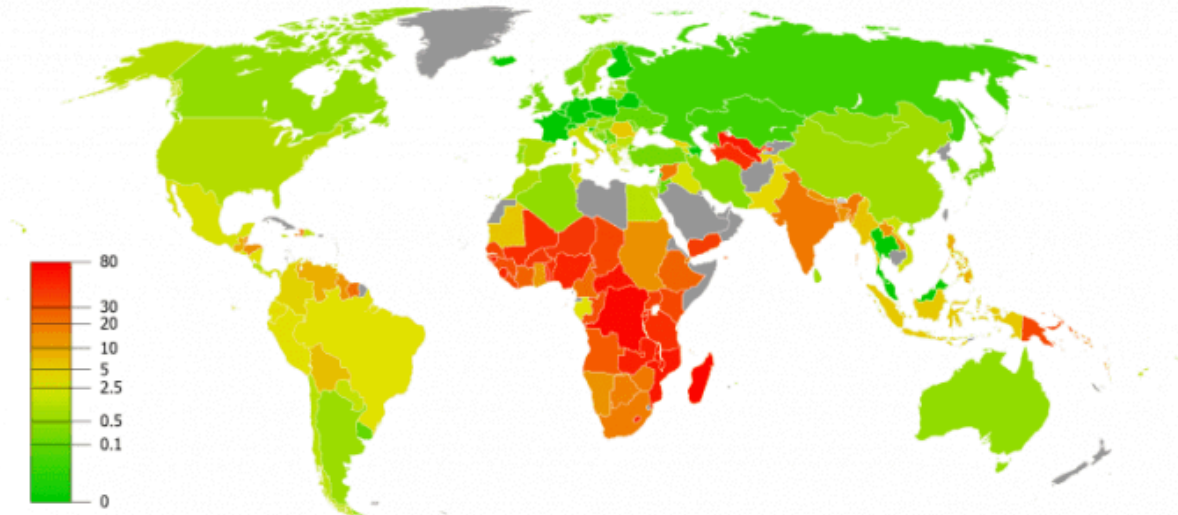
The reason why I started this study is that most of the poor live in farming villages. I thought I could save the poor if they improved the lifestyle of farming. In order to promote my study, I utilized the library and the internet and I examined the lifestyle of farming suited to specific areas in detail. In my study, I focused on the area of South Asia and Africa because the areas have more people who are poor than any other countries in the world. When the poor do farming and ship their crops, they have been traded cheaper than usual price on the market. The poor can't get money which is worth the cost because of this fact. Therefore I think improving the route of distribution is most important to make their life better. I regard agricultural recognition as the best way for this purpose. I suggest a organization to sell agricultural products in bulk to reliable companies. I also focused on added value which is one of the elements of the food value chain. In rural areas, using a large amount of agricultural chemicals and trying difficult farming methods are not suited to people because they don't have much money. So I think breeding chickens and growing crops by using fertilizer made from the chicken's droppings are good. The organic vegetables which people made by the farming method I suggested have added value. In addition, chickens cost them a few to raise and it takes a few times to get the effect of improving sand by the droppings.

## **1.Introduction**

The reason why I started this study is that most of the poor are living in agricultural areas, and I think I can save them by improving agricultural methods. For example, Japan has some land which nobody uses, but they can be useful places if we try to do farming there. I think the poor can improve their lives if they devise a way to do agriculture more efficiently as well as the Japanese example. In dry areas, people grow specific crops which don't need a lot of water because of lack of it. However, there are other ways to grow crops effectively without using a lot of water such as water saving agriculture. On other hands, most of such methods cost a lot of money, and it is hard for the poor. Therefore I want to look for an agricultural method without costing much which doesn't require high technology. In addition, I would try to look for a route where the poor can sell their crops. I set the goal of study that I find the system or the way in which the poor can earn enough money to live their lives and find the route to sell their crops to reliable companies. I think this study will enable the poor to get a job if I can find the ways in which those who have little land and few implements to do agriculture can grow their crops.

## 2. Discussion and implications

There are a lot of poor in the world. The world bank defined the people who live on the national poverty line as the poor, and the number of this gets seven billion now. Most of the poor live in rural areas and they can't live decent lives because of various problems.



【The area where there are some of the poor】

※The darker the color, the higher the poverty rate.

The areas which have a lot of poor people are in Africa and South India mainly. For the instance, in South Africa, the people who can be useful as social workers can't be produced because of the lack of education. Second, economic disparity due to government corruption. Third, difficulty in obtaining foreign currency due to lack of exports to compete with other countries. In addition, there are other problems such as health infrastructure with slow diffusion, civil war, terrorism. Similarly, there are some problems in South Asia. First, Coffee beans, a major agricultural crop, are bought at a low price and producers do not receive adequate income. Second, The government is not working well due to the demonstration, so it is unable to improve infrastructure, and they can't make some policies to improve the lives of poor people. Third, because of lack of irrigation, their yields vary with the weather and their income is unstable. Of course, several organizations are working to solve these problems, including NPOs and NGOs in Africa and JAFS in Asia, but they have yet to solve the underlying problems.

I thought if we could work to support and improve the agriculture of the rural population, we could reduce the number of poor people because of the fact that most of the poor live in rural areas. I think there are some reasons why the poor people can't earn enough money to live. First, it is difficult for them to get land, seedlings and kits to do agriculture. Second, they can't get proper revenue because of lack of distribution channel. I thought we should first be aware of the 'food value chain', which includes both distribution channels and the added value that is created through them.



I show the problem that coffee beans, a major agricultural crop, are bought at a low price and producers do not receive adequate income. This is because there is not enough demand and popularity for coffee beans produced in South Asia in order to compete internationally. Added value greatly relates with demand of the international community and popularity of it. Crops could have added value by organic and new varieties of vegetables, high quality and so on. Poor people can only farm a limited amount of land. I think it is important to grow crops which have added value in order to get more income from limited land. Concretely, I suppose that it is good to grow organic vegetables which are raised with chicken droppings. I have three reasons why I think so. First, they produce nutritious eggs which are good for the health of poor people. Second, chickens don't cost people to raise such as cheap cages and cheap disease prevention. Third, chicken droppings have the immediate effect as a fertilizer. I will suggest the concrete way. First, keeping chickens and using their droppings to plow the field. Second, grow and harvest organic vegetables in the fields. Finally, you use some harvested vegetables as chicken feed. It is a good way in terms of the organic cycle. Increasing the number of farmers who grow organic crops causes the improvement of the added value of them. However, in recent years, even if a farmer calls himself an organic farmer, the animals that emit the droppings used to fertilize in his fields often eat feed containing large amounts of pesticides.

The crops prevailed as organic ones even if they contain some pesticides. So their added value will be greater by growing organic crops in the true sense of the word.

Next, I will suggest the appropriate distribution channels. Since selling to commercial buyers can be a risky business, because the crops the poor people grew often are sold at cheaper prices than the appropriate ones. I think it would be a good idea to form an agricultural group that brings together the poor of the area and sell the group's harvest to a reputable company. If an agricultural organization is established, even the poor who have difficulty learning agricultural techniques can learn them. What is more, if there are a few educators in the organization, they can also lend and borrow machinery, tools, land, and so on. However, there are some problems with the idea of creating an agricultural organization, and we would like to make corrections in the future as we confront these problems.

### 3. Conclusion

At the present stage, the issues are land for farming, marketing channels for crops, educators of agricultural technology, and the creation of agricultural organizations. The first thing to consider is the issue of agricultural organizations. There are three problems. The first is about how to collect the crops harvested by the poor in one place. If the poor are gathered in one place, we can collect them by car and so on. But if not, we have to think about how to collect the crops. The second issue is about the money that is needed to rent things to the group to get those things. Third, the

problem of how and where to hire staff. We need to figure out whether to recruit from the outside of the poor or from the poor.

#### **4. References**

food value chain [https://www.jica.go.jp/publication/mundi/1808/201808\\_02\\_02.html](https://www.jica.go.jp/publication/mundi/1808/201808_02_02.html)

Areas of high poverty [https://gooddo.jp/magazine/poverty/africa\\_poverty/2171/](https://gooddo.jp/magazine/poverty/africa_poverty/2171/)

Poverty in South Asia and Africa

[https://gooddo.jp/magazine/poverty/asia\\_poverty/5060/#:~:text=%E5%8D%97%E3%82%A](https://gooddo.jp/magazine/poverty/asia_poverty/5060/#:~:text=%E5%8D%97%E3%82%A)

Activities aimed at solving poverty [https://gooddo.jp/magazine/poverty/africa\\_poverty/66/](https://gooddo.jp/magazine/poverty/africa_poverty/66/)  
[https://gooddo.jp/magazine/poverty/africa\\_poverty/2171/](https://gooddo.jp/magazine/poverty/africa_poverty/2171/)

# Child care reform

## ~For women's progress~

ID 5116 Sugibayashi Hasumi

### Abstract

I have been doing this research since last year. It is difficult for women to both work and child care in Japan now. This time, I wanted to consider a system that would reduce the burden on mothers. I researched the Chinese system. I found that the Chinese system is not sufficient, but the burden on mothers is low because they can rely on a lot of support from grandparents. I thought that it would be possible to reduce the burden on mothers by providing such a system of support for grandparents. Therefore, I propose the idea of establishing a compact city that specializes in child care. It builds necessary facilities in a compact city such as nursery schools and supermarkets. As a result, the place where living and growing becomes very close, so they can receive good support in the local area and the burden is decreased. It also saves time so they can gain relaxation time. As a problem, I should think about some rules in the complex to prevent trouble between the residents.

### 1 Introduction

I wanted to consider a system that reduces the burden on mothers. Since last year, I have been researching how to improve the Japanese childcare systems. As a result, I focused on a local cooperative system called Family Support Center. The conclusion was creating an app to make the system easier for everyone to use. However, this system did not ease their anxiety of leaving their children with a stranger even if they are local people.

I set a research question: What is needed for women to balance work and child care? The employment rate of women in Japan is increasing. They are making good progress in society. However it is difficult to take childcare leave for men and some people have prejudice for working women. Because of these factors, about half of women quit their jobs when they give birth. To solve this problem, it is necessary to consider what is needed by mothers to balance their work and childcare with their sense of security. I thought that if I could create a system that values connections among mothers and helps each other, it would help reduce the burden on them.

### 2 Discussion and implications

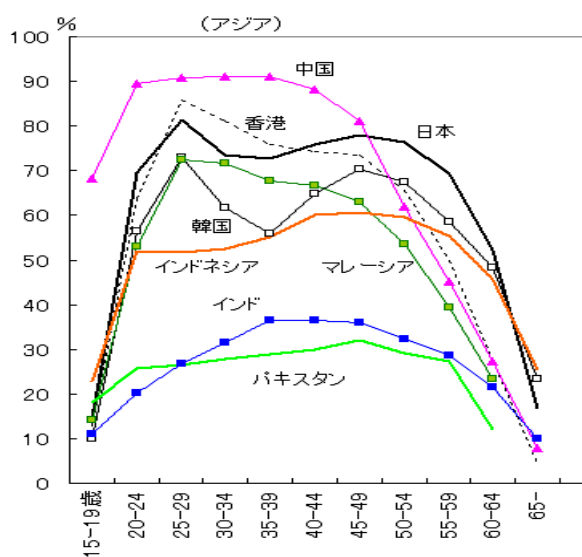
I believe that the current system is not enough for mothers to balance work and child care in Japan. In Finland, a country known for its advanced child care system, such as education and school lunch fees are exempted, and child care support is available. There is a local government organization called "Neuvola" that provides facilities and services for child care. When a woman realizes that she is pregnant, she first informs Neuvola. Neuvola provides services from the time the pregnancy to the child turns six years old.

There is a good system of childcare leave in Finland. It is common for men to take childcare leave. It would be nice if Japan could adopt a system like Finland's, but Finland's system is

supported by high taxes. Therefore, I thought it would be difficult to set up a support system like the Finnish in Japan.

Next, I examined efforts in China. Since China's period of rapid economic growth, women's employment has increased. As a result, it is common for married couples to both work. As in Japan, balancing work and child care has become an issue. However, in China, grandparents often help their mothers. If both parents are busy with work, grandparents take care of their grandchildren. It is common for grandparents to provide support. Mothers do not have to give up work. This graph1 shows that in Japan, the employment of women aged 25 to 44 is declining, because they must quit their job to take care of their children. While in China it is not declining and has remained constant. This means that with close support, mothers do not need to quit their jobs.

女性の年齢別労働力率(2015年)



graph1

I consider the Chinese way of child care to be ideal. However, in Japan, the number of families whose grandparents live near or together is decreasing. Therefore, I decided to create an environment that mothers can receive support from people close to them, which is not limited to grandparents.

Therefore, I researched compact cities. This focuses on the reduction of the burden to time savings. The advantage of this is that transportation and use of facilities become more efficient. Building a compact city will provide easy access to public, commercial, and medical facilities. You will be able to use inexpensive public transportation. This will increase convenience by reducing costs. Also, the limited areas of the city will allow for good services to be provided. It is expected to improve services and make their lives easier. In recent years, the number of nuclear families is increasing. It is difficult to connect with each other. However, compact cities can promote community building by allowing people in similar situations to live around them.

### 3 Conclusion

I propose the formation of a super-compact city dedicated to child care. This is a smaller version of the normal compact city. This is an apartment complex where nursery schools, supermarkets, etc. are built. In this complex, people who are raising children will be given priority to live there. In addition, the nursery schools should be limited to residents of the complex. Another advantage is that it will make it easier for the community to cooperate with each other. Many mothers suffer from feelings of isolation during child care. Residents of the same housing complex can easily pick up and drop off children at the daycare center or do the shopping on their behalf. Since the location is limited, it is also easier to utilize shuttle buses and mobile sales. People thought they could save more time. If a system like a family support center limited to the apartment complex could also be created there, it would allow for more cooperation.

The problem with family support centers is that the person who takes care of the children changes every time. Mothers feel anxious because they do not know if they can be trusted to take care of their children. However, if a community could be formed, I thought it would be safe to use the center.

The cost of building this compact city will be paid for by the company that will build it in the apartment complex. Most residents of the complex will use the stores located in the complex. The clientele is also limited to child care consumers, making it easy to research consumption. The company will definitely make a profit. Therefore, I thought it would be worth investing in the company.

There are some problems. It is essential to investigate how much demand is for this super-compact city among working mothers. It is also necessary to come up with rules within the complex, because there is a possibility of trouble between residents. I will now consider what methods to use for research and what rules will be most effective.

#### 4 References

Child Care in Finland

<https://finlandabroad.fi/web/jpn/ja-finnish-childcare-system> (5/5)

Institutional Analysis in 10 Major Countries

[https://www.gender.go.jp/kaigi/senmon/syosika/siryo/pdf/sy05-1\\_1.pdf](https://www.gender.go.jp/kaigi/senmon/syosika/siryo/pdf/sy05-1_1.pdf) (5/10)

Effects of Grandparental Childcare Participation on Child Development: Japan and China

<https://www.ritsumei-human.com/essay/essay-2471/> (8/30)

Efficiency through aggregation

<https://www.mlit.go.jp/hakusyo/mlit/h25/hakusho/h26/html/n1213000.html> (9/26)

Creating a living environment conducive to the birth and upbringing of children

[https://www8.cao.go.jp/shoushi/shoushika/meeting/outline/k\\_1/s2\\_3mlit.html](https://www8.cao.go.jp/shoushi/shoushika/meeting/outline/k_1/s2_3mlit.html) (11/4)

Results of the 2020 National Survey on Family Support Center Activities

[https://www.jaaww.or.jp/securewp/wp-content/uploads/2022/07/report\\_family\\_support\\_reiwa\\_2.pdf](https://www.jaaww.or.jp/securewp/wp-content/uploads/2022/07/report_family_support_reiwa_2.pdf) (12/1)

Social Factual Data Catalog

<http://honkawa2.sakura.ne.jp/1500.htm> (12/5)

What is Needed for a Bright Child Care Environment - Current Issues and Expected Policies

Naoki Yokota, Senior Researcher, Design for Living Research Department  
Kyohei Sasaki, Researcher, Design for Living Research Department

[https://www.myri.co.jp/publication/myilw/pdf/myilw\\_no88\\_feature\\_3.pdf](https://www.myri.co.jp/publication/myilw/pdf/myilw_no88_feature_3.pdf) (12/16)





# Food Waste Problem in the World

We can solve global warming by decreasing food waste

5117 Suzuki Toshiya

## Abstract

Many people have heard about “food loss”, but we could not understand this meaning. In Japan, it is generally called “food loss”, but we call it “food waste” too. Food loss is throwing food away that we can still eat. It has two bad influences. First, we used a lot of money when we dispose of food. If we dispose of the food, we use 3 million yen. Second, when we dispose of food, we discharge a lot of CO<sub>2</sub>. It discharges 8% CO<sub>2</sub> of all CO<sub>2</sub> emissions.

These days, there are many problems in the world, but I think the environmental problem is the most important. The most famous problem is global warming. We can solve this problem by CO<sub>2</sub> emission, so I think if we decrease food loss, we can solve global warming.

My research corresponds to the SDGs goal 12, “Responsible Production and Consumption”. The most important thing is we stopped food loss and global warming, so we are necessary to solve this problem. We change the consciousness of world problems explicitly and we must put a plan into action. If we attain this goal, not only we will solve food loss and global warming, but also we will solve various problems. In conclusion, we will be able to solve food loss, and we will save the world.

Coupled with food loss, developing countries hold postharvest problems. Meaning of the postharvest loss, we couldn't eat when they make food or carry a stand. There are problems in production and distribution. Looking to the world, postharvest loss is more serious than food loss.

## 1 Introduction

Food loss has many disadvantages, so we need to solve this problem. We dispose of food, which has a bad effect on the environment. Until now, they said food loss has a bad effect, but it doesn't matter to others. This research focuses on food and environment, and solves problems with each other. Some professors research food loss, but their conclusions are not used now. That said, this research gives a concrete conclusion. Another key thing to remember is that not only suggestions, I want to act on this conclusion.

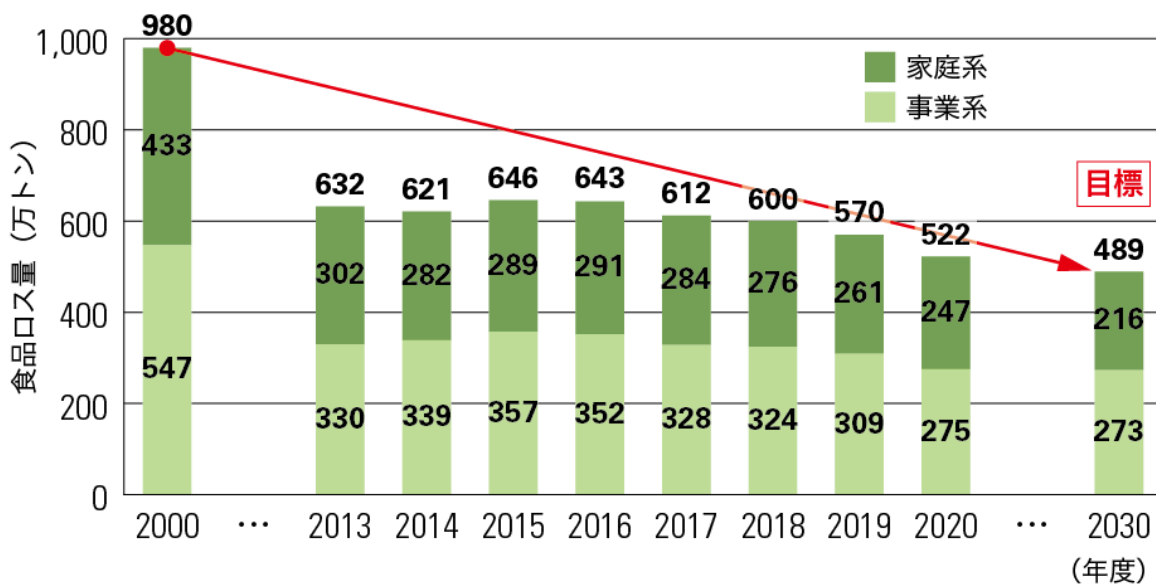
One of the goals is to decrease food loss. The project is still at the stage. First I knew Food loss. The word's meaning and state now. Second, I think about what we want to do. This research often uses the Internet for information.

## 2 Discussion and Implications

First, I searched to make food for a year. As a result, about 4 billion foods are made in one year. But we lost 1.3 billion foods. We lost one-third of the food in the world. If we think of the 8 billion population in the world now, we have enough food for the whole population. That said if we solve food loss, we achieve one of the SDGs goals. Another key thing to remember is we solve poverty. SDGs 12 goal is “Responsible Production and Consumption”. Above all, the most important problem is 12.3 “Halve per capita food waste”. The target

specific plan is “Halve global per capita food waste at the retail and consumption level by 2030 and reduce food losses in the production and supply chain, including post-harvest losses”. We must attain this plan by 2030. Therefore, we change consciousness. In Japan, about 40% of food waste is leftovers. The leftover food is a major food loss problem. Other food waste is cooking scraps such as possible. Eliminating cooking scraps requires the development of science and technology, which is difficult. However, if we lose food loss to change consciousness, we can decrease this. Food loss is especially high in places where large numbers of people gather. For example, banquets, weddings, and hotels. Because these meetings are often beret style meals, so many meals are prepared, resulting in food waste. Therefore, it is necessary not to make too many such occasions. I think it would be better to stop the buffet system and adopt a system of ordering individual items.

We would like to introduce one example of the current situation of food loss in Japan. As of 2000, Japan had just under 10 million ton grams, from there it has continued to decline year after year. The amount of food loss has been reduced to 5.22 million tons in 2020, which is about 300,000 ton-grams away from the 2030 goal. There are many reasons for this result, and I believe one of them is that the Japanese government made the law. Specifically, the Law for Promotion of Food Loss Reduction and Food Recycling promulgated in 2019. This law may have raised public awareness in no small measure. However, this law is likely not well known to the public. There are numerous people, including myself, who do not even know the law was created unless they research it or are interested in it. Therefore, I think it is necessary to make the public more aware of the negative effects of food loss.



Public Relations Office - Government of Japan

### 3 Conclusion

Food loss is not only a "waste" of food, but also has many negative effects on the environment. Solving the food loss problem is indirectly related to solving the environmental problem. Food loss means that each person needs to take action to avoid producing garbage. Here is one thing I wish FAO (Food and Agriculture Organization of the United Nations) and

UNEP (United Nations Environment Programme) would do right now to reduce food loss in the world. It is the latest reference to food loss published by WRAP, a non-profit organization launched by the British government in 2000, that estimates food loss in the United Kingdom for the 2018 fiscal year at about 9.5 million tons. It is worth noting that the last sentence of this reference states that this amount of food loss is worth about 190 pounds (28 trillion Japanese yen) or more per year. It also states that this amount is responsible for 36 million tons of greenhouse gas emissions. Thus, I think it is necessary for global organizations to not only point to the amount of food loss, but also to show the negative impact of this figure on the economy and the environment.

As I have mentioned, reducing food loss is of course something that should be done, but this should be actively addressed in developed countries, while developing countries should separately address the issue of "post-harvest loss. It is more important for the future that developing countries become able to produce their own food and live on it, rather than sending foodstuffs from developed countries to save developing countries from starvation. Solving the two problems of "food loss" in developed countries and "post-harvest loss" in developing countries would be the first step toward creating a prosperous country where the entire world can live comfortably.

#### 4 References

<https://sdgs.media/blog/6753/>

Current Situation and Problems of Food Loss | Explaining Measures for Reduction and New Businesses 5/24

[https://gooddo.jp/magazine/sustainable-consumption-production/food\\_loss/](https://gooddo.jp/magazine/sustainable-consumption-production/food_loss/)

What is the problem of food loss? What is the current situation in the world and Japan, and what are the efforts being made? 4/16

[https://www.maff.go.jp/j/shokusan/recycle/syoku\\_loss/161227\\_4.html](https://www.maff.go.jp/j/shokusan/recycle/syoku_loss/161227_4.html)

What is Food Loss: Ministry of Agriculture, Forestry and Fisheries 4/16

<https://www.gov-online.go.jp/useful/article/201303/4.html>

You can start today! Food Loss Prevention at Home 4/24

<https://news.yahoo.co.jp/byline/iderumi/20211201-00270634>

Latest Food Loss Volume, Smallest on Record - Is the Food Loss Reduction Promotion Law a Contributing Factor? What We Want from the Japanese Government 5/10

<https://www.jacom.or.jp/nousei/news/2022/06/220610-59482.php>

Food loss: 5.22 million tons, the smallest since estimates began, still 1 million tons more than global aid, MAFF 6/5

# Reforming to a New Food Culture

## Our health and eating without walls

ID 5118 Name Suda Asahina

### 1. Introduction

I started this research for two main reasons. First, I want to find a way to lose weight healthily and easily control our bodies. Second, I want to avoid situations that people cannot eat what they want to eat due to allergies or religion. Recently, because of the popularity of Kpop, more and more people have been attracted to a thin body shape. As the result, more and more people are dieting by skipping meals, leading to an increase in the number of thin people. Furthermore, the number of obese people is increasing due to the stress of those diets and the changing rhythm of eating in the Corona Disaster. So I want to figure out how I could control weight loss or gain based on eating well three times a day.

### 2. Discussion and implications

This research is to solve three problems. First, it means reducing the number of thin and obese people. Second, to build a healthy body and shape control, lose weight healthily and as easily as possible. Third, to eliminate food barriers for people with allergies or who have the reason of religious. Of these three, I decided to focus on the third issue, the food barrier.

First of all, let us discuss the current status of these problems. Every year, the number of both thin and obese people is increasing. In addition, many diets are considered to be about skipping meals and excessive exercise. As a result, more and more people suffer from nutritional deficiencies and diseases such as eating disorders. Furthermore, there are many people who are unable to eat food containing such ingredients because they are allergic to them, or who are unable to taste the cuisine of a country when they go abroad because some foods are not allowed to be eaten according to their religion.

I have gathered information from various Internet sources to research those issues and have recommended research .

My research question is “Can we create a new food culture by incorporating PBF?” PBF stands for plant-based food and refers to vegetable-derived raw materials. PBF has many good points. For example, low calorie, good for the body and so on.

### 3 Conclusion

I have three ideas to solve problems. First problem is that it means reducing the number of thin and obese people. As a solution to this problem, I would suggest replacing meals with PBF. We are supposed to eat three meals a day: breakfast, lunch, and dinner. The idea is to make one of those meals PBF. By doing so, the number of meals and nutritional intake will not extend to nutrition, but the caloric intake will be reduced. And I would like to get input from diet supporters, doctors who treat obesity, and researchers who are studying PBF in order to implement this proposal.

Second, to make weight and shape control and dieting as healthy and easy as possible. The solution to this problem is similar to the method described above. First, we suggest replacing

the basic diet with PBF in order to reduce the number of thin thinners. However, if all meals are replaced with PBF, the nutritional content may be uneven, leading to nutritional deficiencies. Therefore, it is necessary to incorporate PBF while supplementing nutrition with therapeutic drugs and supplements. Next, let's look at the use of PBF in diet. We suggest using PBF as a snack or a meal item. For example, some sweet and calorie-dense sweets such as cakes and cookies are produced on PBF. Other ways to reduce calorie intake is to try changing some of the ingredients around you, such as the ingredients in a bowl of rice or the sauce in a hamburger.

Third, to eliminate food barriers for people with allergies or who are religious. I suggest that I provide dishes using PBF. The person entering a person and the religion to have an allergy by changing a thing becoming the allergens such as an egg or the milk and the food which religion limits such as beef or the chicken suffer from into PBF can taste delicious. And I want to perform this approach at the international restaurant or airport which the person of various countries visits. I think that an opportunity for other countries to learn other countries and opportunities to touch it increases and can build international relations by doing this approach.

I think that two are greatly demanded from us to carry out these suggestions. The first gives the popularity of PBF. I do not attract attention even in Japan let alone the world as far as it is not very well known. Furthermore, there will not be the person who is going to order it even if PBF appeared on the menu. Then I do not make sense. Therefore I think that it is important to have you know the existence of the food called PBF. And the second is to clarify an effect of PBF. It cannot have a hand taking PBF to pull the interest of people if it is not revealed whether it actually does an effect even if I hear from PBF that there is a great effect. Therefore, I want to clarify the effect of more PBF and want to spread it to more people.

I want to perform the future study from the viewpoint of three. The first is about dishes using PBF. As it advances, much food may reproduce more techniques in the raw materials of the vegetable origin from now on more than now. Therefore I want to study what kind of cooking can reappear by PBF. The second about PBF and an allergic relationship. The person asks whether patients with allergy can eat the food which replaced an allergen with PBF and the allergy durability to think that I thereby want to eat dishes of PBF wants to think from the aspect of supply and demand how much they are. The third is about the live birth rate and the price of PBF. Because PBF still has low popularity, much production is not done so much. More production is necessary if it becomes possible as I spread the existence of PBF to more people. Therefore I want to check whether you can produce it more efficiently in large quantities. If there are few consumptions, the price rises like it necessarily, too. The people to take as a way if a price rises decrease; of the minus number become spiral. Therefore I want to study price and production in detail.

#### 4.References

PLANT BASED FOOD 植物由来のものを積極的に生活に取り入れよう！

<https://www.profoods.co.jp/plantbased>

プラントベースフードとは？ベジタリアン・ヴィーガンとの違い

[https://www.otsukafoods.co.jp/soymeatlabo/article/what\\_is\\_plant\\_based\\_food.php](https://www.otsukafoods.co.jp/soymeatlabo/article/what_is_plant_based_food.php)

カゴメは「プラントベースフード」に取り組みます

[https://www.kagome.co.jp/foodservice/thema\\_contents/plantbase/](https://www.kagome.co.jp/foodservice/thema_contents/plantbase/)

はじめよう！植物性の生活♪野菜と豆でできたカレーとパスタソース

<https://www.kagome.co.jp/products/brand/plantbased/>

体と地球に優しいプラントベースフードとは？ヴィーガンとの違いも解説

<https://smartagri-jp.com/food/3246>

プラントベースフードとは何か。おいしさと健康を両立する「食」の考え方

<https://zoomlife.tokyo/food/233>

プラントベースとは？ヴィーガンやベジタリアンとの違いやおすすめ商品・実践のヒントを簡単に解説

[https://spaceshipearth.jp/plant\\_based/](https://spaceshipearth.jp/plant_based/)

プラントベースフード

<https://www.kewpie.co.jp/products/product/hobotama/>

# Exterminate Introduced Species with Cycle Method

With the aim of the diversity of inland water

ID 5119 氏名 Yuki Suto

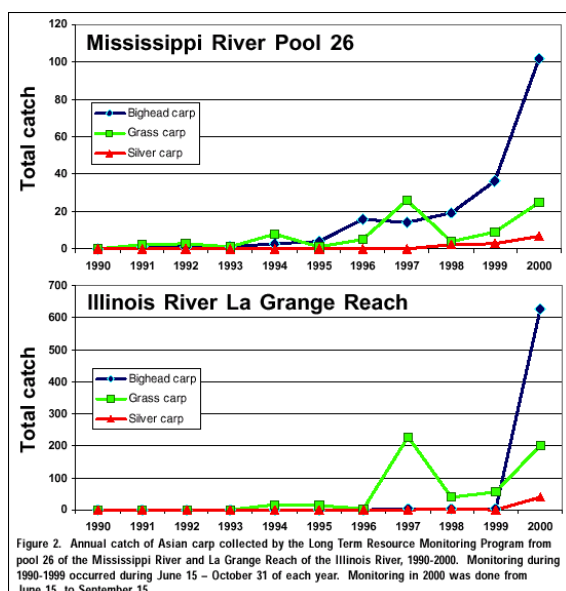
## Abstract

I focused on the diversity of the environment of inland water, which is hardly damaged by human activities. I found a terrible fact that carps, which destroy the ecosystem completely, are increasing rapidly. Therefore, I was determined to eliminate them. I came up with two solutions. First, "Fish powder circulation." The method of this is gathering carps, cooperating with fishery cooperative associations and processing them into fish powder. After that, put them on the Internet market as fertilizers to preserve the environment. With the revenue, we can continue working. Second, in order to remove carp worldwide, I thought the cooperative extermination system was effective. We need some administration to deal with all of the offers of carp toll. However, there are some issues to carry out the plan. If I surpassed such obstacles, the world environment would be diverse.

## 1. Introduction

The purpose of this research is to protect the environment of inland water, which is damaged by human beings. These days, the number of invasive alien species are rapidly increasing not only in Japan but also around the world. I thought that I must solve this problem as fast as possible to protect the native environment. There are many previous studies, but those are worked on individually or in just a small scale. Through my research, I am looking forward to carrying out this method worldwide. The way of my research is to search for the preceding studies and the present condition on the Internet. After that put those effective solutions and my original idea together. Finally, repeat considering and revising the solution to make more conclusions effectively.

## 2. Discussion and Implications



The purpose of this research is to decrease the number of invasive alien species and implement diversity of inland water. Look at this graph, it shows that the number of carp are multiplying sharply. They are omnivorous, eating anything from aquatic insects to aquatic plants, and the phenomenon of desertification of the water bottom has become a serious problem. When they grow to large sizes, they have no natural enemies and become the top of the ecosystem hierarchy in the waters where they are released.

The International Union for Conservation of Nature (IUCN) has listed carp as one of the world's 100 most invasive alien species because of the pressure they are exerting on ecosystems around the world. For these facts, I decided to focus on carps. I found that many local governments of Japan and TV programs tackle this problem. One of their solutions was to make "Fish Powder". First, catch a vast amount of fish or turtles. After that, gather and dry them for approximately eight hours. In consequence, it became easy to smash. Processed fish powder can be used for seasoning and fertilizer. I focused on their use in fertilizers. Fish powder made from alien species is not suited for seasoning as they have a distinct flavor and I can not guarantee that it is safe. Also, I found that there are remarkable effects for plants. Even more telling, plants which nourished fish powder grew more than ones which nourished

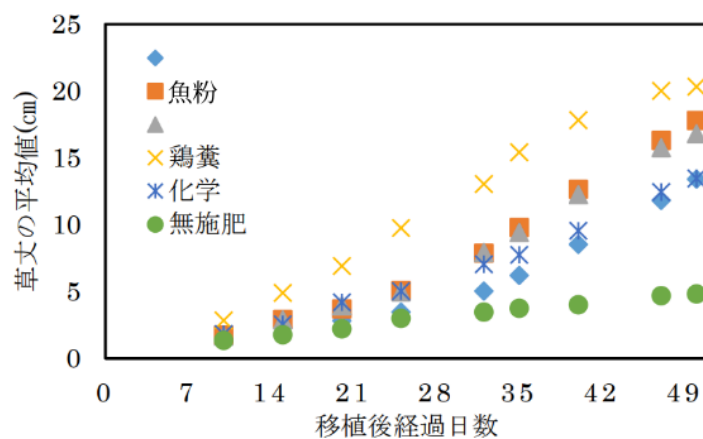


図1 ワグネルポット移植後のコマツナ草丈の推移  
Changes in Komatsuna's height after tansplanting on Wagner pot

chemical fertilizer. I realized that I can solve another problem that is mentioned recently: the danger of chemical fertilizers to soil and our health. Through this research, I came up with two solutions. First "Fish powder circulation". Gather invasive alien species, cooperation with Fishermen's Associations. They have specialized knowledge of invasive alien species, so I chose them. After collecting such fish, process to fish powder and put on the market as fertilizer for countermeasures against invasive species with advertising those

advantages. I am going to use the profit of marketing as the next activity's capital. I anticipate that this method can be semi-permanent. Another solution is for the process of gathering alien fish. In order to eradicate invasive alien species, which destroy the original environment, I have to expand the scope of our activity. When I receive requests from the government, company, commoner's house and so forth, I rely on helpers and volunteers who affirm our activities, for instance, university students and boy scouts. With these relationships, extermination of invasive alien species can be implemented more effectively and on a world scale.

### 3. Conclusion

As indicated earlier, my proposals are "Fish powder circulation" and a cooperative extermination system. However, there are some problems. These systems demand a large number of bases to work worldwide. Additionally, we have to go hand-in-hand with overseas organizations. Last but not least, observe and understand foreign ecosystems and deal with them in a way that is appropriate for each region.



#### 4 References

- <http://www.env.go.jp/nature/biodic/inochi/pdf/full.pdf>  
(Life Is Connected)
- <http://www.env.go.jp/water/mizukankyo/hyokahomanual.pdf>  
(Manual for Assessment of Water Quality by Aquatic Organisms)
- <https://www.env.go.jp/nature/biodic/rikusuiiki/leaflet/full.pdf>  
(For The Conservation of Biodiversity in Terrestrial and Aquatic Areas)
- <https://www.env.go.jp/policy/hakusyo/kodomo/h25/files/11-14.pdf>  
(Issues That Threaten Biodiversity)
- <http://www.ans.kobe-u.ac.jp/pdf/89.pdf>  
(Fertilization of Invasive Alien Species After Control)
- [http://soil.en.a.u-tokyo.ac.jp/jsidre/search/PDFs/16cd/manuscript\\_pdf/\[8-6\].pdf](http://soil.en.a.u-tokyo.ac.jp/jsidre/search/PDFs/16cd/manuscript_pdf/[8-6].pdf)  
(On The Effectiveness of Non-native Fishmeal as a Fertilizer)

## Absurb

How many people suffer from hunger? I wonder what we can do. What actions are connected to help them? I thought reducing substandard vegetables would lead to solving this problem. Substandard vegetables are produced for some reasons. One major reason is that consumers want food that looks good. I thought we should change their appearance. When I researched about this I found one company. This company sells frozen food which uses the remaining fruits in farm. I decided to do like this. My idea is that substandard vegetables are changed. I wanted to change it to anything we can use. I decided to make smoothies. I think this change makes it possible to reduce waste of substandard vegetables.

## Introduction

First I will explain my research's background. Now it is said that a tenth of the world's population suffer from starvation. There is food loss that causes this problem. 820 million people are starving in the world. One third of food production is wasted worldwide. That means about 1.3 billion tonnes of food goes to waste every year (not including substandard vegetables). I know this present condition, and I think reducing food loss will cause hunger of the number of people suffering from hunger. (The meaning of food loss is throwing away food that normally can be eaten because of shape, color etc.) I learned about substandard vegetables during research. Substandard vegetables account for 30% of all vegetables produced. I thought about what we can do to help hungry people and to reduce food loss, so I started this research.

## Discussion and impression

Among research for food loss I pay attention to substandard vegetables. Substandard vegetables mean vegetables which have problem. For example, shape and color. Between 30-40% of the vegetables currently shipped in Japan are substandard. They are thrown away. I wondered why such a large amount had to be thrown away. I thought that if the vegetables were in bad shape, we could devise ways to sell them at a lower price, etc. As a result of my research, I learned these things. It is important that many people can trade vegetables in an easy way. Our research has revealed three reasons. First reason  
To facilitate the distribution of goods.

### 2. 品位基準

A	B	C
①品種固有の形状を有し色沢良好なもの。	①Aに次ぐもの。	①Bに次ぐもの。
②肩おち、尻太り、尻細りがないもの。	②肩おち、尻太り、尻細りが目立たないもの。	②肩おち、尻太り、尻細りの程度が軽微なもの。
③病虫害、傷害がないもの。	③病虫害、傷害が目立たないもの。	③病虫害、傷害の程度が軽微なもの。
④腐敗、変質していないもの。	④同左。	④同左。
⑤曲がりの程度が2L・L・Mで1.5cm以内、Sで1cm以内であるもの。	⑤曲がりの程度が2L・L・Mで3cm以内、Sで2cm以内であるもの。	⑤曲がりの程度が2L・L・Mで4cm以内、Sで3cm以内であるもの。
⑥清浄で新鮮なもの。	⑥同左。	⑥同左。

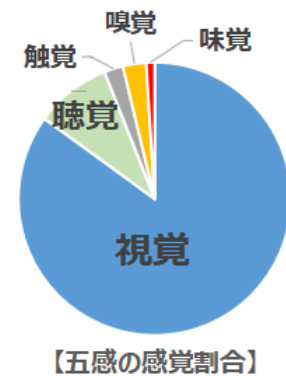
(Opinions from people in different positions)

- Supermarkets : If the product does not meet the standard, it cannot be sold at a fixed price. Also, in bulk sales, badly shaped products remain unsold. Therefore, no profit can be made.
- Processing : manufacturing, food service, etc. Many machine-cooked products are used, and it is difficult to use uneven products. Product appearance is also important.
- School lunch factories : Many machine-cooked products are difficult to use if they are uneven.
- Producers : Thorough cultivation management is increasing the percentage of A products. (If you don't take care of it, out-of-specification will increase.)

Second reason

"I only buy beautiful, well-shaped products." This is due to the widespread consumer ego that "I only buy what is beautiful and of good shape".

The chart on the right shows the proportion of the five senses. It is shown that the visual sense accounts for the majority, at 87%. This graph shows how much appearance influences people.



Third reason

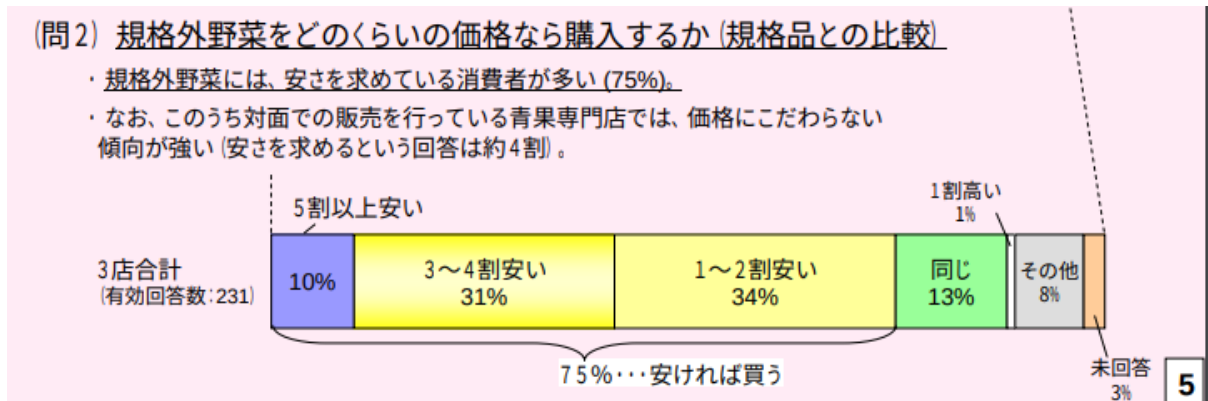
Maintaining the value of the vegetables themselves by selling uniform products. If substandard vegetables are distributed despite sufficient supply, there is a possibility of oversupply and a decay in vegetable prices. Therefore, the reality is that some producers do not feel comfortable with the distribution of sub-standard products. In addition, the sale of substandard products at lower prices is expected to reduce demand for regular products.

As these standards are set for good reasons, we find it difficult to eliminate or loosen them. I thought that we should consider how we can use substandard vegetables in light of these disadvantages. First of all, we thought about selling substandard vegetables at a lower price. Several websites sold vegetables at low prices or for free. There are examples in (web) sites such as 'unica', 'TABE CHOKU', and 'TADAYASU'. In these websites, I looked into unica, a web service that allows producers and consumers to trade. Unica specializes in trading vegetables and fruit that are considered 'bad looking', but these vegetables and fruits are unique in that they are just different in appearance from the norm. The service is based on a direct-to-production system that allows producers and consumers to trade directly with each other.

By trading discarded fruit and vegetables,

- (1) Producers can improve sales of the waste.
- (2) Providing consumers with opportunities to purchase products that are rarely seen in supermarkets.
- (iii) Reducing food loss that occurs at production sites as a social issue.

The company contributes to the reduction of food loss at production sites as a social issue.



This is a really good initiative. The diagram also shows that many people are looking for cheap prices in relation to sub-standard products. (From the Ministry of Agriculture, Forestry and Fisheries) Therefore, I felt that it would be a good idea. On the other hand demand may turn towards substandard vegetables, which may reduce the value of the vegetables themselves. If this happens, farmers' income may also decrease. Therefore, substandard vegetables are not sold as they are. They are reshaped and sold at the same price as the official product. I thought that farmers could earn sufficient profit and sell substandard vegetables. So I suggest using substandard vegetables to make smoothies.

The reasons are as follows.

- 1, You can utilize vegetables (as opposed to just fruit)
- 2, No need to worry about details such as shape and color (the original shape and color doesn't matter if you make a smoothie)
- 3, Phyto-chemicals, which can be consumed in high amounts in smoothies, have recently attracted a lot of attention.
- 4, It is possible to sell vegetables without reducing their value
- 5, A wide variety of vegetables can be used. The following are some of the main reasons for this. (Phytochemicals are said to have a variety of functions depending on the type, such as antioxidant action, metabolism promotion, immunity improvement and brain function enhancement, as there are more than several thousand types of phytochemicals, many of which have antioxidant properties.) As a form of smoothie, we want to combine vegetables and fruit and focus on the non-standard vegetables that are common at the time. When I was thinking about how to market this, I found a smoothie subs company.

GREEN SPOON, 840-900 yen per serving (over 140 different vegetables from a wide variety, carefully selected by a nutritionist and an original recipe with nutrition in mind. Rare and expensive vegetables can be enjoyed. Can be stored for a long time by quick freezing. Can be freely combined with smoothies, salads, soups, etc.)

CLEAN FOOD, Dr Smoothies, etc. After researching these options, we decided to proceed with our research with a view to having a physical shop, as the costs could be too high.

The problem at the moment is that, as mentioned above, we do not yet know how to market these products and the details of the costs involved. Therefore, we would like to deepen our research in the future.

## Conclusion

This study considered the use of sub-standard vegetables. It was proposed to make smoothies from the substandard vegetables. There are problems in terms of cost and freshness of the vegetables. I felt it necessary to continue our research. In addition, although it was not possible to investigate in detail this time, it would be good to make vegetable chips from non-standard vegetables. I felt that this would have many advantages, such as long-term storage. There are still many shortcomings in my research. I would like to continue my research in the future.

## Reference

[https://shizen-hatch.net/2021/07/15/agricultural\\_product\\_standard/#:~:text=%E4%B8%80%E9%83%A8%E3%81%AF%E3%80%81%E3%82%B8%E3%83%A5%E3%83%BC%E3%82%B9%E3%82%84,%E5%87%A6%E5%88%86%E3%81%AB%E3%81%95%E3%82%8C%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82](https://shizen-hatch.net/2021/07/15/agricultural_product_standard/#:~:text=%E4%B8%80%E9%83%A8%E3%81%AF%E3%80%81%E3%82%B8%E3%83%A5%E3%83%BC%E3%82%B9%E3%82%84,%E5%87%A6%E5%88%86%E3%81%AB%E3%81%95%E3%82%8C%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82)

Eliminating waste of substandard vegetables [WATCH].

<https://www.zennoh.or.jp/hr/syukkakikaku/img/kikaku01.pdf>

Vegetable grade standa

\*Refer to the research proposal by referring to the issue research method p96~.

<https://naruhodosdgs.jp/imperfectvegetables/#:~:text=%E3%81%93%E3%82%8C%E3%82%89%E3%81%AE%E8%A6%8F%E6%A0%BC%E5%A4%96%E9%87%8E%E8%8F%9C,%E9%87%8E%E8%8F%9C%E3%81%8C%E3%81%BB%E3%81%A8%E3%82%93%E3%81%A9%E3%81%A0%E3%81%AA%E3%82%93%E3%81%A6%E2%80%A6>

Eliminate substandard vegetables

[https://shokuzenlab.com/colum\\_senses\\_delicious-senses/](https://shokuzenlab.com/colum_senses_delicious-senses/)

Percentage graph of the five senses

[https://style-free.co.jp/news/news\\_detail.php?id=6#:~:text=%E8%B2%A9%E8%B7%AF%E3%81%AE%E3%81%AA%E3%81%84%E9%87%8E%E8%8F%9C%E3%82%84,%E6%97%A5%E3%81%AB%E3%83%AA%E3%83%AA%E3%83%BC%E3%82%B9%E3%81%97%E3%81%BE%E3%81%97%E3%81%9F%E3%80%82&text=%E3%81%9D%E3%81%AE%E5%8F%96%E5%BC%95%E3%81%AB%E7%89%B9%E5%8C%96%E3%81%97,%E7%89%B9%E5%BE%B4%E3%81%AE%E4%B8%80%E3%81%A4%E3%81%A7%E3%81%99%E3%80%82&text](https://style-free.co.jp/news/news_detail.php?id=6#:~:text=%E8%B2%A9%E8%B7%AF%E3%81%AE%E3%81%AA%E3%81%84%E9%87%8E%E8%8F%9C%E3%82%84,%E6%97%A5%E3%81%AB%E3%83%AA%E3%83%AA%E3%83%BC%E3%82%B9%E3%81%97%E3%81%BE%E3%81%97%E3%81%9F%E3%80%82&text=%E3%81%9D%E3%81%AE%E5%8F%96%E5%BC%95%E3%81%AB%E7%89%B9%E5%8C%96%E3%81%97,%E7%89%B9%E5%BE%B4%E3%81%AE%E4%B8%80%E3%81%A4%E3%81%A7%E3%81%99%E3%80%82&text)

About unica



# To Balance Childcare and Work

## Support for working women

5121 Takahashi Hikari

### **Abstract**

In today's Japan, working women are touted as having the greatest potential, increasing the number of working women may contribute to maintaining social security. According to the Labor Force Survey by the Statistics Bureau of the Ministry of Internal Affairs and Communications, the graph of the labor force shows an M-shaped curve due to the large number of women in their prime working years leaving the workforce upon marriage. What measures can be taken to increase the number of women who continue to work after marriage?

I have been thinking about initiatives that will allow people to combine work and childcare while staying close to their children. I would like to propose the introduction of teleworking and company nurseries. There are two suggestions in my mind. First, telework. It is a form of work that uses information and communication technology, such as the Internet, and the work is not bound by time or place. The second suggestion is the introduction of company nurseries, which would be set up in or near the company to look after the children of employees who work for the company. The main benefit is a sense of security. The children are looked after in close proximity, where you can go and check on them quickly, so you can react quickly if your child gets sick.

In conclusion, I suggest telework and company nurseries should be the best way to increase the number of women who continue to work. As a future issue, I will consider how to improve the disadvantage of not being available for women who commute from rural to urban areas.

### **1 Introduction**

I questioned the fact that in today's society, which upholds gender equality, inequality has not yet disappeared and the concept of women doing housework and men working outside the home still remains. In this study, I propose an initiative to support women who want to work but are unable to do so because of difficulties in balancing work with childcare. The goal is to increase the number of working women, thereby bringing us a little closer to achieving gender equality and maintaining the social security system. Prior studies have improved specific women's support systems. My research will focus on the improvement and implementation of facilities rather than institutions. The hypothesis of this study is that by encouraging companies to install the equipment and to increase the number of working women, they will contribute to society. Consider the best idea for Japan through comparisons with other countries using the Internet and fieldwork.

## **2 Discussion and implications**

According to my survey, Sweden has the most extensive parental leave system in the world, with a total of 480 days to be shared between parents (80% of salary is paid) until the child turns 8 years old. In addition, fathers are guaranteed to use 90 of those days. On the other hand, Japan's childcare leave system allows parents to take childcare leave until the child reaches one year of age, or until the child is one year and two months old if both parents take the leave. About 80% of the salary is also paid. As can be seen by comparing Japan and Sweden, the period during which childcare leave can be taken in Japan seems to be shorter than in Sweden. However, we thought that imposing long-term leave due to labor shortages and other problems would cause problems for the company and create an environment in which employees would not be able to take leave even if they wanted to. In Sweden, when returning to work, employees do not need to think about childcare, since their children are 8 years old, which means they can stay at home by themselves or attend elementary school. In Japan, however, when children reach the age of one and they want to continue working, they have to choose limited options, such as leaving their children at preschool or with a baby-sitter. Therefore, I came up with an initiative that would allow me to balance work and child rearing while still being in close distance from my child.

## **3 Conclusion**

I would like to make two suggestions: company preschools and the introduction of telework. Telework is a form of work that utilizes information and communications technology (ICT), such as the Internet, and is not restricted by time and place. The benefits of telework include improving the work-life balance of workers, securing work opportunities for those with time and geographical constraints due to childcare or nursing care (i.e., securing the labor force), reducing commuting allowances and other corporate costs, and making it easier to balance work and childcare. Telework also has advantages for both the company and the employee. Employees can continue their work careers and knowledge while giving birth, increase their income during childcare leave, smoothly return to work after childcare leave, and continue working from home after childcare leave depending on their childcare situation, among other various advantages. For the company, there are advantages for both parties: female employees can continue their work careers after giving birth, they can continue working during childcare leave, they can smoothly return to work after childcare leave, and they can work from home instead of taking a break while raising their children. In Japan, the need for telework is growing as reforms in work styles require diverse work options and flexible work styles. However, it has not spread as widely as expected due to bottlenecks such as the need for information security, the need for a certain level of capital investment, and the difficulty of managing and controlling working hours. Therefore, large corporations and other companies that have created and introduced telework facilities are asked to provide their technology to small and medium-sized companies. In this way, large companies can use their equipment and small and medium-sized companies can gain access to telework technology. In this way, problems such as information security can be solved and the use of teleworking



can be further promoted. In terms of time management and administration, I think it would be a good idea to use online tools such as GoogleMeet on a regular basis to share information about each other's work progress and actively communicate with each other. We thought that the introduction of telework would enable men who could not take advantage of the childcare leave system because their jobs and responsibilities were unique to them or because they were short-staffed to do so, to take advantage of childcare leave at the same time. However, the number of occupations where teleworking could be introduced would still be limited. Therefore, we propose the use of company preschools. They are facilities to take care of the children of employees of established companies, and are established inside or near the company. The first merit cited is a sense of security. Because the children are taken care of in a close area where you can go to check on them immediately, you can respond quickly if your child gets sick. In addition, it is not uncommon for the hours of care to be longer than those of ordinary preschools and daycare centers, so even if you have to work late, you allow devote yourself to your work without worrying about the time you have to pick up your child. Currently, compensation is available for setting up an in-company nursery, so although there are conditions, it can be set up without spending too much money.

However, there is a disadvantage in that women who commute from rural areas to urban areas cannot use this service. Therefore, I will now consider how to solve this problem.

#### **4 References**

<Internet>

80% of income with a living guarantee even after childcare leave! Learning from Sweden, creating an environment conducive to childcare leave.

<https://gozal.cc/basics/living-expenses-at-childcare-leave-compared-with-sweden>

(2022/5/20)

Current Situation and Issues for Working Women

[https://www.sangiin.go.jp/japanese/annai/chousa/keizai\\_prism/backnumber/h31pdf/20191810\\_2.pdf](https://www.sangiin.go.jp/japanese/annai/chousa/keizai_prism/backnumber/h31pdf/20191810_2.pdf)

(2022/6/1)

Labor force participation rates for women by age group

[https://www.gender.go.jp/about\\_danjo/whitepaper/r01/zentai/html/zuhyo/zuhyo01-02-03.html](https://www.gender.go.jp/about_danjo/whitepaper/r01/zentai/html/zuhyo/zuhyo01-02-03.html)

(2022/6/1)

Survey on balancing work with childcare and nursing care

<https://www.jil.go.jp/kokunai/statistics/doko/h1507/>

(2022/7/8)

Thinking about Women's Advancement in Society

[http://www.f.waseda.jp/k\\_okabe/semi-theses/2105Mao.KURODA.pdf](http://www.f.waseda.jp/k_okabe/semi-theses/2105Mao.KURODA.pdf)

(2022/7/17)

Subsidy for Establishment and Operation of On-site Childcare Facilities

<https://www.mhlw.go.jp/bunya/koyoukintou/ryouritsu01/dl/hoikupanhu.pdf>

(2023/6/4)

A strong ally of working mothers! What kind of place is the in-house childcare center?

<https://smart-parking.jp/lab/in-housenursery>

(2023/7/9)

## Young carer with people around ~Fusion with other country's policy~

5122 Tanaka Nonoha

### Abstract

I researched about 'young carer'. Have you ever heard this word? It is generally said that children under 18 years of age routinely care or perform household chores for their family. In Japan, it is estimated that about 5 percent are young carers, which means there are 2 or 3 children in class. However Japan has no policy to solve this problem and many Japanese don't know about young carer.

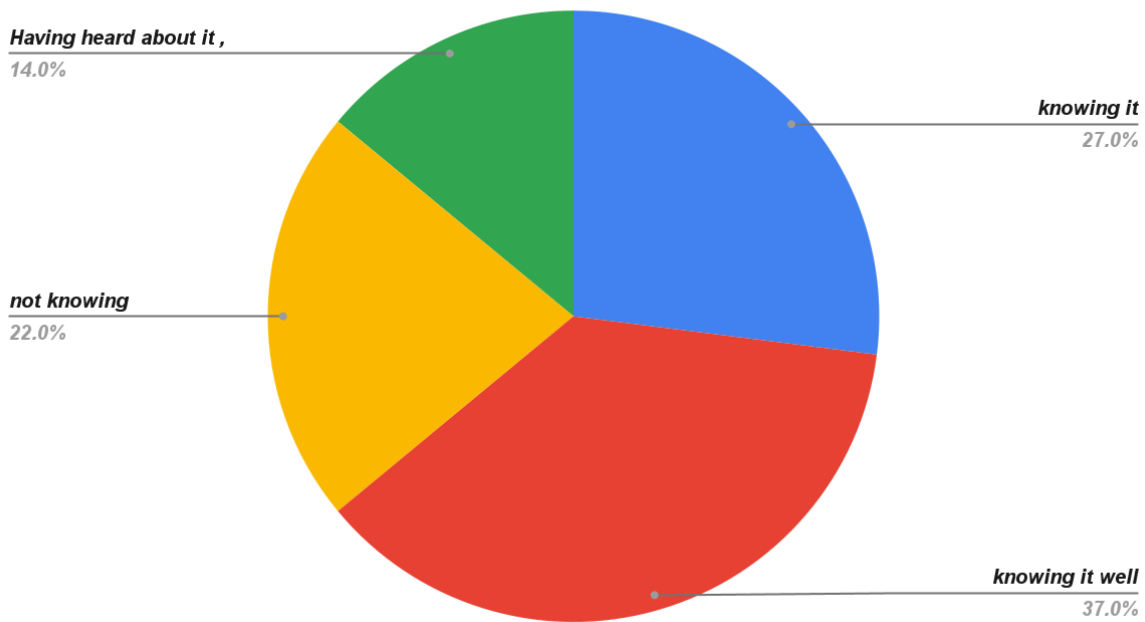
So what if we look abroad? In the UK, the government finds that it has been attracting attention for about 40 years. The UK is proactive towards young carers, and has many policies. European countries developed policies for young carers, they carry out events in which children can relax and communicate with other young carers. The time is important for young carers to relate with social people. I would like to make a suggestion that the government could provide places for young carers to stay with other children, using these foreign examples as a guide. However there is also the question of how to help young carer children. In fact, the number of young carers currently in Japan is not even accurately known. I think we should first investigate the actual number of Young Carers in classes and schools as a first step toward making proposals. Then, I will think carefully about what I can propose among them in the future.

### Discussion and implications

I researched about child abuse last year. In this research, I often saw the word 'young carer'. I am interested in welfare, so I decided that I would research young carers next year. However, researching about this subject has many problems.

Young carers are not famous in Japan now. Therefore, not all people doesn't know about this existence.

## Do you know Young carer?



(source:shinitori.net)

※Green...Having heard about it,but not knowing it well

As previously stated, young carers are generally said to be the children under 18 years old who routinely perform household chores and take care of family members.

However, in Japan we cannot quite grasp the actual conditions of young carers.

“Young carers are a rare existence” I think that the soul of this belief lies in the Japanese people's understanding of young carers and also in the Japanese government. Few policies are currently being implemented by the Japanese government. However, in recent years, the term "young carer" has become more widespread little by little, and the government has put together four support measures.

### 1. "early identification”

Support measures for early identification will include training for educators, medicine, nursing, and welfare personnel and children's committee members. For example, if a class has a student who tends to be absent from school, the teacher searches for the student's life. If a student takes care of their family, school and social workers work together and connect welfare services by the municipality.

### 2. "consultation support”

In a fact-finding survey, more than 60% of young caregivers said they had never consulted anyone. For this reason, the government has decided to promote initiatives in which people caring for family members can provide consultation not only in person. However also online through social networking services and other means.

### 3. "housework and childcare support"

The survey found that many students are taking care of their "siblings." To this end, the government is creating a new service to assist with household chores and childcare at home.

### 4. "provision of nursing care services."

If children are at home, they may not be able to access care services because people think children should take care of themselves. For this reason, municipalities and other organizations have made caregiving services available to children without assuming that they will be the caregivers.

These support measures are still only suggestions, and many municipalities have yet to implement them.

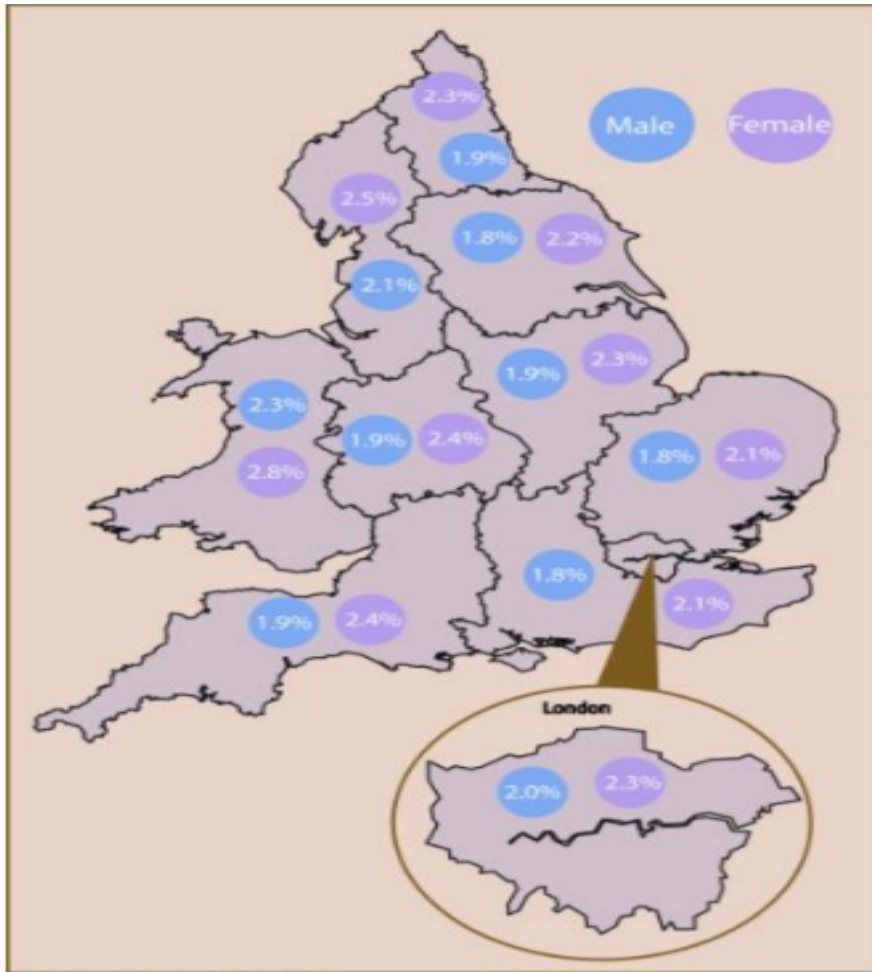
So what if we look abroad?

In the UK, they find that it has been attracting attention for about 40 years. The UK is proactive towards Young Carers, and many policies. (EU made a policy that was said "Law on children and family") And the EU took a National census of young carer in 2003.

Figure1



Figure2



( source :census-office for National statistic)

※Figure1:Provision of unpaid care per week for 5 to 17 years-olds in England and Wales,2011

※Figure2:Percentage of unpaid care provided by 5 to 17 years-olds:by sex on regions and Wales.

According to this census,the government was able to know actual conditions and worked out new measures about young carer.

Every year in the UK, there is a "Young Carers Festival".This is a time for young carers to relax, go to amusement parks and watch movies that they would not normally go to. This not only gives the children fun memories, but also allows them to communicate with other Young Carer children.

### Conclusion

We would like to make a suggestion that the government could provide a place for young carers to stay with their children, using these foreign examples as a guide.However there is also the question of how to recruit young carer children.

In fact, the number of young carers currently in Japan is not even accurately known.So I think Japan has more young carer children than now. Those children are hiding.I think we should first investigate the actual number of young carers in classes and schools as a first step

toward making proposals. Then, I will think carefully about what I can propose among them in the future.

## References

Young Carers What are the four support measures outlined by the government?  
(2023.11.22)

[https://www.nhk.or.jp/shutoken/wr/20210601yc\\_a01.html](https://www.nhk.or.jp/shutoken/wr/20210601yc_a01.html)

Young carers who want to know (2023.11.8)

<https://www.nhk.or.jp/shutoken/yc/>

Perceptions of Elementary and Junior High School Teachers and Staff Regarding Young Carers (Ministry of Health, Labour and Welfare 2023.11.15)

<https://www.mhlw.go.jp/content/11907000/000753054.pdf>

Office for National Statistics, 2013, "Providing unpaid care may have an adverse affect on young carers' general health" (2023.11.15)

<https://webarchive.nationalarchives.gov.uk/ukgwa/20160107224205/http://www.ons.gov.uk/ons/rel/census/2011-census-analysis/provision-of-unpaid-care-in-england-and-wales--2011/sty-unpaid-care.html>

The Unexpected Reality of "Young Caregivers" - Too Many Misconceptions  
The First Step in Support is to Be Close to Diverse Voices. (2023.11.22)

<https://toyokeizai.net/articles/-/634750>

What is a Young carer? (2023.11.22)

<https://www.mhlw.go.jp/young-carer/>

About young carer. (2023.11.30)

<https://shinitori.net/research/2064>

The Carer Support System in the United Kingdom and the Actual State of Services Provided by Private Nonprofit Organizations (2023.12.15)

[https://catalog.lib.kyushu-u.ac.jp/opac\\_download\\_md/4772272/009\\_p095.pdf](https://catalog.lib.kyushu-u.ac.jp/opac_download_md/4772272/009_p095.pdf)

Young Carer's Prefestival in Yokohama (2023.12.15)

[https://omoshirosan.or.jp/news/20221124\\_001/](https://omoshirosan.or.jp/news/20221124_001/)

NHK special | YouTube (2023.12.15)

<https://youtu.be/MjrOUatx67Q?feature=shared>

[https://youtu.be/s73iT53Cd\\_M?feature=shared](https://youtu.be/s73iT53Cd_M?feature=shared)

# Anger management

~peace to the world~

5123 Tomiya Komei

## Abstract

Anger management is a useful skill when we communicate with people. It is a method to alleviate anger that we use when emotions of anger arise. I hope to bring peace to the world through this method, but anger management is unknown in the world. It is being actively adopted by foreign companies in Japan. We thought that learning anger management would bring many benefits. For example, it allows us to have good communication when interacting with others. So how can we learn about anger management? I think the best way is to incorporate it in our school class, because teachers are compelled to teach their students about anger management. However, this method can only communicate to students. I need to think about how to propose this to the adults.

## 1 Introduction

Have you ever heard of “anger management”? I think many people have not heard this word. There is a skill in the world called anger management. I think that I can enrich my life by learning this skill. It is used in various places around the world. In Japan, it is often used in discussion among foreign-affiliated companies and Japanese affiliated companies. So what is anger management? Anger management is a psychological education and training program for dealing with anger. By the way, have you ever heard of the six-second rule? The six-second rule states that if you wait six seconds after an emotion called "anger" appears, the peak of the anger will pass and it will subside. Some of you may wonder if it really works, or if the world would be at peace if it worked this way. I actually wondered about this myself, so I decided to research anger management to learn more about the six-second rule.

The purpose and significance of my research was that I thought that if this rule was disseminated, the feeling of anger would diminish. I thought that if the feeling of anger diminished from the world, the problem of war would be solved. I believe that all reasons for bad relationships stem from the emotion of anger. Therefore, I thought that if we spread this rule, we can build a good relationship between each country. However, I thought that anger management is still not well known in the world and it is important how to let people know about it.

## 2 Discussion and implications

The research results can be divided into two main categories. The first research finding is that anger management originated in the United States. It originated as a skill required for internationally active human resources. In fact, many foreign-affiliated companies in Japan require anger management skills, and it was written that acquiring anger management skills improves human relations. Some websites also said that acquiring anger management skills would enrich one's life. To acquire anger management skills, you can try various methods and learn them. Anger management does not aim for a "no anger" state. We



should train ourselves to be good at getting angry in situations where we need to be angry, and not to get angry in situations where we do not need to be angry. It is about learning anger management as a kind of skill so that you can distinguish between anger and choose your emotions independently. Here are two ways to learn anger management

The first is the six-second rule. The six-second rule is to wait for six seconds after the onset of one's feelings of anger. This does not mean that the anger will stop, but it is a way to let the peak of the anger pass. When you count to six seconds, count "1...2...3...". If this doesn't work, it was noted that you can repeat in your mind words to calm yourself down, such as "It's okay not to be angry". As you can see in the graph below, "anger" is a feeling that fades away after its peak.



I have actually tried this myself among family members. At that time, I found that it did not work very well with people with whom I usually have feelings of "anger" because my own anger did not fade much. However, I thought it might be effective to try the six-second rule when I feel anger in business interactions or when interacting with people I am meeting for the first time.

Next, I will introduce another method of scoring anger. Score your anger on a 10-point scale, with 0 being peaceful and 10 being the greatest anger of your life. While scoring, you can be objective about your anger, which helps it subside. You can also say, "Today's anger is a 3. I got a 5 the other day, so maybe this is something I don't need to be angry about this time." By evaluating your current anger relative to your past anger, you can be selective about your emotions. I thought I could suppress my emotions more than usual because I could evaluate my anger relatively in this way.

0 point	A state of no anger at all.
1-3 point	Mild anger that subsides quickly.
4-6 point	Anger that doesn't subside over time.
7-9 point	Intense, blood-curdling anger.
10 point	Absolutely unforgivable anger.

The graph above is just an example, but you can score (quantify) your anger like this.

I thought of my own way of controlling my anger based on these two methods. I thought that combining the two methods would be more effective. This method is a combination of the two methods introduced, and all you have to do is try to score your anger while counting the six seconds after the emotion of "anger" occurs to yourself. While doing this, I naturally thought that the six seconds had passed and the feeling of "anger" had diminished. However, I think it is important to note that "anger" cannot be eliminated.

I thought it would be good to incorporate anger management into school education as a way to spread anger management. By incorporating it into school classes, we can teach it to students in a compulsory manner.

### 3 Conclusion

The conclusion of the study is that it is important to spread anger management throughout the world. It is said that in this world, friendship relationships collapse just because of the deterioration of human relations. I thought that if we could control the cause of this problem, anger, we could delay a good life. For this purpose, I thought I could lead a good life by adopting the method of "scoring anger while doing the six-second rule," which I introduced. I thought of my own way to spread this kind of method. There are actually two ways I thought of in my own way: First, I asked a famous person to introduce me. For instance, Atsuhiko Nakata has a video about anger management on his YouTube channel, which has been viewed more than a million times. The second is to incorporate it into school classes. For example, we thought that by actually learning anger management during moral education classes at elementary and junior high schools, students would gain a better understanding of anger management.

### 4 References

LikeU Anger management

[https://www.smbc-card.com/like\\_u/life/anger\\_management.jsp](https://www.smbc-card.com/like_u/life/anger_management.jsp)

Jibunmigaki Anger management

<https://cinq.style/articles/3100/>

Japan Anger Management Association

<https://www.angermanagement.co.jp/about>

Mainabi Agent

<https://mynavi-agent.jp/dainishinsotsu/canvas/2021/01/post-38.html>

American Physiological Association

<https://www.apa.org/topics/anger/control>

Tokyo mental health

<https://www.tokyomentalhealth.com/anger/>

Verywell Mind

<https://www.verywellmind.com/anger-management-strategies-4178870>

Japanese comics  
< Spreading comics to the world >

5124 Todokoro Riria

### 1. Research Abstracts

I researched manga. Japanese comics are one of the most popular aspects of Japanese culture in the world. My goal is to get more people overseas to buy Japanese comics and to help Japan's economy. I mainly used the internet to do my research. The results showed that 58,4% of the world's total population used social networking services. Therefore, I concluded that I should ask influencers in each country to introduce Japanese comics to increase awareness and lead to sales.

This time I focused on the US, so in the future I would like to investigate other countries as well.

### 2. Research background.

I think comics are one of the most famous cultures in Japan. Japanese comics are one of the most famous cultures in the world. I often read comics. I chose this theme because I wanted to let people overseas know more about the fun of Japanese comics. In addition, sales of Japanese comics have been increasing overseas in recent years, tripling from 2012 to 2019. When people find comics they like, they often want to go on pilgrimages to sacred places and buy comics goods, so they can increase their spending in Japan by coming to Japan and buying comics goods. Based on this, I decided to use Japanese comics to revitalize the Japanese economy and set a sub-theme for my research as a way to revitalize the Japanese economy.

### 3 Research objectives.

The research question is "What should be done to promote Japanese comics overseas?"

When Japanese comics are sold well, Japanese publishers can make a profit.

Then, when people get hooked on a work, they want to buy merchandise from that work.

Lastly, they come to Japan to visit the places and events that are the motifs of the comics, purchase limited-edition products, and go sightseeing in Japan, and they spend money. They will then become addicted to new works, and so on, creating a virtuous cycle. If this happens, the Japanese economy can be revitalized.

### 4 Research methods

- ① Gather information on Japanese comics.
- ② Find out which comics are popular in each country.
- ③ Research the most popular SNS in each country.

- ④ Based on the information, think of ways to increase awareness overseas.
- ⑤ Research the situation in each country and think about the best way to spread comics.

### 5. Research results

First, we looked into the current state of Japanese comics. Comics Beat, an American website specializing in comic information, reported on February 4, 2022, "Report: Graphic Novel Sales in 2021 Increased 65% YoY" (Figure 1). Graphic novels are foreign manga-style books and visual books with frame-by-frame layouts, and their sales have tripled from 2012 to 2019. This suggests that the Japanese comics format is more readily accepted overseas.

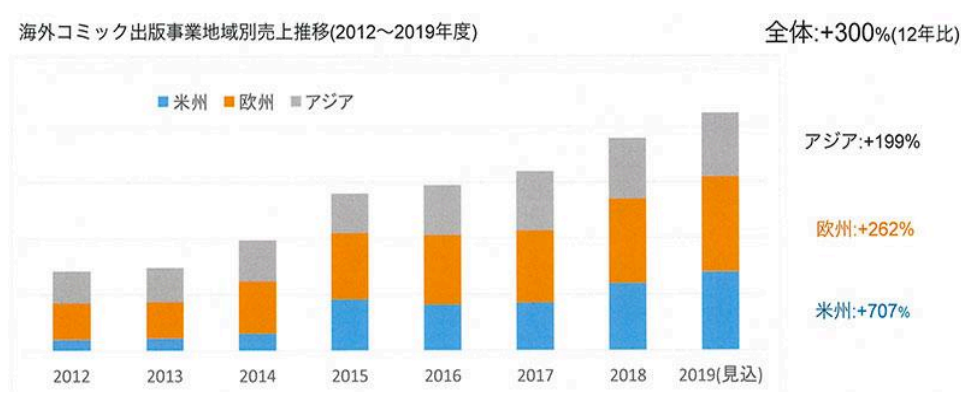
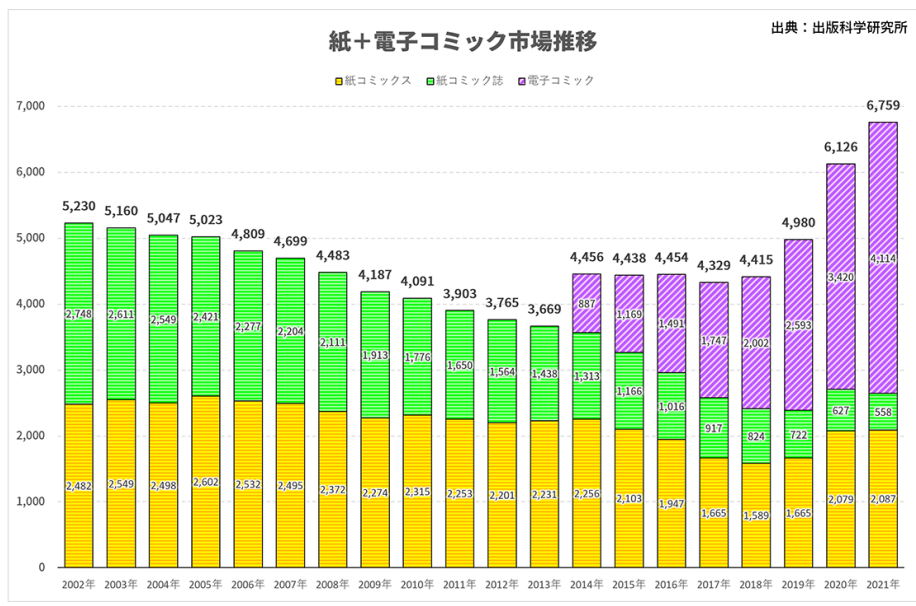


figure1 ⇕

figure2 ⇓



Also in Japan, according to an article in the Asahi Shimbun newspaper in December 2021, e-comics reversed paper comics sales in Japan in 2019. (Figure 2)

In 2020, paper-bound comics will be 270.6 billion yen and e-comics will be 342 billion yen, showing a big difference between paper-bound and e-comics. Sales of e-comics will continue to rise and are expected to reach approximately 3,533 billion yen in the global market around 2028. Overall sales are also rising.

An e-book is a book that is converted into electronic data, such as a comic book or paperback book, which can then be read on the display of an electronic device. Books that can play not only text but also video and audio are also e-books.

The growth rate of the global e-book market shows that emerging economies such as Thailand and Turkey, in addition to the BRIC countries, are at the top of the list. It is thought that the number of users of 'suddenly e-books', which do not use paper books, is increasing because of the spread of mobile devices and the development of communication networks. Also, in some countries, even if paper is not widely available, smartphones are available, so the usage rate is high. From those I thought that e-books could be used to promote more comics in the world.

Korean comics have been gaining popularity in recent years. Unlike Japanese comics, it is full color and features a vertical scrolling style that allows you to read from top to bottom using your smartphone. Vertical scrolling, which originated in South Korea, is also called "webtoon" after the name of the worldwide service. While Japanese comics depict multiple scenes on two-page spreads, vertical scrolling has almost no panels and is read by scrolling one scene at a time. It has become popular because it is easy to read and can be enjoyed in your free time. Korean comics often rank high on the popular Japanese comics apps Piccoma and Line Manga, so I thought it would be a good idea to try incorporating those methods.

Next, I looked into popular comics in each country. The ranking of popular comics in each country is as follows.

America: 1st place: Attack on Titan, 2nd place: Our Hero Academia, 3rd place: Demon Slayer: Kimetsu no Yaiba

South Korea: 1st place One Piece, 2nd place Golgo 13, 3rd place Dragon Ball

France: 1st place: Demon Slayer: Kimetsu no Yaiba, 2nd place: Tokyo Revengers, 3rd place: One Piece

Brazil: 1st place Jujutsu Kaisen, 2nd place Demon Slayer: Kimetsu no Yaiba, 3rd place One Piece

The above results were obtained. From this result, I found that the comics that are most popular overseas are fantasy, otherworld, and battle, so when introducing comics, I think it's a good idea to introduce battle and fantasy comics first.

I thought about how to spread comics. According to DataReportal's "Digital 2022 Global Overview Report," there are 4.62 billion SNS users in the world (as of January 2022), which is 58.4% of the world's total population. In 2021, 424 million new users started using SNS. I

decided to use SNS, which is used by many people around the world, as a way to increase awareness.

While there are many countries around the world, in this time, I looked into ways to increase awareness in the United States. I chose America because it was financially comfortable, could spend money on entertainment, had a good internet connection, and had a large population. From We Are Social/DIGITAL 2020, THE UNITED STATES OF AMERICA, the most popular SNS in the United States is Facebook, followed by Instagram. In a survey of Internet users, 80% said they used Facebook, so this time I thought I'd use Facebook to introduce it. The top Facebook followers have 90 million followers. Ask influencers to share their favorite comics. That alone is enough to get a good advertising effect. People who did not know that comics existed would buy them if the influencers introduced them. In this way, more people will become aware of the appeal of comics. I think it would be possible to get people to buy comics on a sustained basis.

## 6. Conclusion

The demand for e-books is now growing in the comics industry. The idea was to use these comics to turn the Japanese economy around. It is necessary to make Japanese comics known. There are many countries, but this time we thought about how to promote comics in the US. As a result, I found that there are many Facebook users in the USA. In order to spread comics, I thought of a way to ask foreign influencers with a large number of followers to introduce manga they recommend. In this way, many people can become aware of the existence of Japanese comics.

The challenge for the future is to think of ways to spread comics in countries other than the US.

## 7. citation

<https://vdata.nikkei.com/datadiscovery/21book/> 「data discovery」

[https://www.digima-japan.com/knowhow/united\\_states/16314.php](https://www.digima-japan.com/knowhow/united_states/16314.php) 「Degima」

<https://signal.diamond.jp/articles/-/1119> 「SIGNAL」

<https://www.mottainaihonpo.com/kaitori/contents/cat07/015-denshishoseki-toha.html> 「Mottainai Honpo News」

<https://worldsegg.com/manga-world/> 「dreamer」

<https://note.com/sudotadashi/n/n63ad08f1437b> 「note」

<https://japan-forward.com/japanese/86800/> 「JapanForward」

<https://tomoruba.eiicon.net/articles/3893> 「TOMORUBA」

[https://style.ehonnaivi.net/ehon/2021/10/21\\_622.html](https://style.ehonnaivi.net/ehon/2021/10/21_622.html) 「EhonNaviStyle」

# **Lower The Mortality with Caffeine**

Saving the coffee beans crisis

5125 Sayuri Nakazato

## **Abstract**

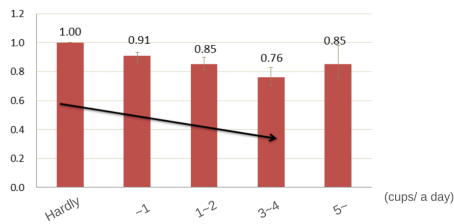
The purpose of my research is to save the production of coffee bean crisis and reduce mortality of varied diseases with caffeine. The reason why I chose this topic is because I tackled the problem of the recent increase of patients suffering from bronchial asthma and solutions until last year and I focused on childhood asthma. Then, I wanted to try to solve worldwide problems other than childhood asthma so I decided on this topic. The production of coffee beans may become impossible as a result of global warming in the future. Also, bronchial asthma and diabetes are included in the top ten causes of death. According to the research, I found that people who drink the correct amount of coffee can lower the mortality rate of bronchial asthma. However, people who drink a large quantity of coffee may get osteoporosis. Caffeine is often included in drinks such as coffee, tea, and energy drinks and high cacao chocolates. Generally, caffeine seems to be a bad substance. It may be because caffeine is often included in coffee or energy drinks which are always drunk by people so as not to fall asleep so most people may consider it unhealthy. However if we observe the consumption of caffeine correctly, it gives us the effect such as recovery from fatigue. And it has a positive effect that expands the width of bronchi. I want to secure the production of coffee beans to help patients who have bronchial asthma and those who suffer from bronchial asthma and diabetes. So I decided on this theme. I suppose that we can obtain the amount of the production of coffee if we can secure the place to grow Robusta, the type of coffee beans. Robusta is one of the types of coffee beans raised all over the world and it is the strongest even if it is grown in a hot place. Then, I am going to consider how to grow Robusta in hot conditions as a result of global warming.

## **Introduction**

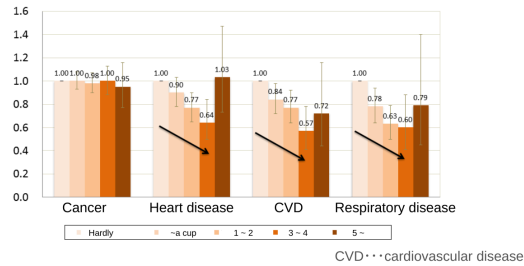
I try to secure the production of coffee that might be impossible to produce in 2050 as a result of global warming because I want to help the patients who have bronchial asthma and supporters who like drinking coffee. According to the research in the National Cancer Center, drinking the correct amount of coffee can lower the mortality rate of bronchial asthma and diabetes. The research team divides the elderly patients into five groups based on the amount of drinking coffee a day. As a result, we found that people who drink five or more coffee a day have the highest mortality. Besides, we found that people who drink three to four cups of coffee a day have the lowest mortality from different diseases. Specifically, the caffeine in the coffee worked immediately in the disease such as heart disease, CVD, and respiratory disease.



The intake of coffee and the mortality



Intake of caffeine and the risk of death



So I decided to recommend the correct amount of coffee for people who like coffee. I am also going to recommend the containing caffeine drinks such as green tea for those who don't like coffee regardless of their ages. According to a survey by AGF, Japanese corporations, I found that tea includes a lot of caffeine. In Particular *gyokuro*, the finest grade of green tea in Japan, includes about two and a half times as much caffeine as coffee drunk commonly in the world. I think it is easier to drink tea for children than to drink coffee. Besides, childhood asthma is recently increasing so it is effective for children too. Nevertheless, the production of coffee beans is speculated to diminish after a few years.

According to the thesis, coffee beans are predicted to be damaged most of the agricultural products in the world by climate change as a result of global warming. Even if the carbon dioxide is discharged, 45% to 75% of the land to grow coffee beans is anticipated to decrease in the future. It is incredible that the land growing coffee beans in Brazil will decrease by about 90%. Therefore, it requires land or some ways to grow coffee beans in the hot conditions as a result of global warming. And there are three main types of coffee beans, Arabica, Robusta, and Liberica. First, Arabica is grown in nearly 60% of the entire consumption and it is the most produced coffee bean in the world. Second, Robusta is the strongest one of the three as its name means "sturdy" and "tough". The conditions to grow Robusta are easy because we can cultivate Robusta in hot places, rainy places, and lowland places. So I decided on Robusta. Then, I plan to find some lands that apply the conditions to cultivate coffee beans or find other ways to cultivate them although it is anticipated that the temperatures would rise.

### Discussion and implication

People around the world prefer to drink coffee so making sure the production of coffee beans is effective to prevent the development of bronchial asthma. According to the research in MYEL, a website that shows various surveys, I got the information about people drinking coffee in Japan. The website shows us the results of a survey by more than 11 thousand people. 70 percent of the people drink coffee every day. In addition, nearly forty percent of the people drink two to three cups of coffee a day. Seeing the research these years, the number of people drinking coffee is increasing gradually compared to the previous result. Also, people often drink coffee during break time, lunchtime, and while they are studying or working. Some people drink coffee to relax, while others drink to concentrate on work. These are great effects of caffeine. I found the problem of decreasing the production of coffee beans is so serious for people because the number of people drinking coffee is increasing little by little. Besides, looking at the graph showing age groups, the fifties is the largest number of

people drinking coffee. The sixties is the second largest and the forties is the third largest. The older people tend to drink coffee more than the younger. It is a good tendency because older people are apt to suffer from diseases such as bronchial asthma and diabetes. In addition, the mortality from these diseases is higher than the younger. Because it is easy for elderly people to get worse. Moreover, looking at the graph that shows gendered differences, men drink more coffee than women. According to research, most men in Japan tend to get diabetes more than women because many older men have the habit of drinking or smoking. These actions cause diseases. The habit of smoking makes it easy for people to get bronchial asthma. Young people have a high immunity to various diseases. In Particular, it is said that people in their twenties have the highest immunity in their lives. On the other hand, the immunity of the people in their forties to fifties will be halved. So older people tend to get bronchial asthma and get worse conditions. Also, the habit of drinking has a bad influence on diabetes. According to the Ministry of Health in Japan, there is a possibility that the correct intake of alcohol may prevent their body from diabetes but the excessive intake will cause hyperglycemia. Excessive drinking and eating food can be the cause of getting diabetes. We need to be careful of such problems. The problem of reducing coffee beans is called “The Coffee 2050 Problem”. It is that coffee beans will decrease due to the decrease in growing area. This is because of global warming. Then, the world's demand for coffee beans will increase and people all over the world will not be able to drink coffee. The coffee growing areas will be reduced by half due to a significant rise in temperature and the cultivation areas in Brazil ,the largest production of coffee, will be reduced by about 60 percent in 2050. It seems to be a serious situation for me because the number of people drinking coffee in their daily life is increasing recently so the demand for coffee in the world will accelerate the lack of the production of coffee beans.

## **Conclusion**

In conclusion, I am going to recommend that coffee or other caffeinated drinks for people to lower the mortality because of bronchial asthma and diabetes regardless of whether they are children or adults. So it needs to find lands fitting the conditions to cultivate coffee beans in the world and some opportunity or system to recommend drinking coffee to keep healthy. The purpose of these is to lower the mortality due to suffering from bronchial asthma and diabetes. I will mainly focus on older people (from the forties to the sixties) since they are likely to prefer drinking and smoking than younger people. The habit of excessive smoking and drinking will lead them to various lifestyle-related diseases and older people tend to have this habit. I will compare cultures and the tendency of the amount of coffee in the world by area and find solutions to the problem of patients who are suffering from bronchial asthma and saving to the coffee beans crisis.

## **References**

MEMORVA, The average of the span of the life in the world

[https://memorva.jp/ranking/unfpa/who\\_whs\\_life\\_expectancy.php#:~:text=%E5%B9%B3%E5%9D%87%E5%AF%BF%E5%91%BD%E3%83%BBUNFPA%E7%89%88&text=%E5%B9%B4%E9%BD%A2%E3%81%AF%E5%89%8D%E5%B9%B4%E3%81%8B%E3%82%8](https://memorva.jp/ranking/unfpa/who_whs_life_expectancy.php#:~:text=%E5%B9%B3%E5%9D%87%E5%AF%BF%E5%91%BD%E3%83%BBUNFPA%E7%89%88&text=%E5%B9%B4%E9%BD%A2%E3%81%AF%E5%89%8D%E5%B9%B4%E3%81%8B%E3%82%8)

[9%E5%A4%89%E5%8C%96.88%E6%AD%B3%E3%81%A71%E4%BD%8D%E3%80%82](#) (2023/05/13)

Illustrating the consumption of coffee in the world, what is the difference between the largest consumption of coffee in the world and Japan?

<https://gigazine.net/news/20120726-coffee-consumption/> (2023/07/06)

The project relating to prevent cancer in National Cancer Center

<https://epi.ncc.go.jp/jphc/outcome/3527.html> (2023/07/06)

Ministry of Agriculture about the excessive consumption caffeine

[https://www.maff.go.jp/j/syouan/seisaku/risk\\_analysis/priority/hazard\\_chem/caffeine.html#:~:text=%E3%82%B3%E3%83%BC%E3%83%92%E3%83%BC%E3%81%AF%E3%80%81%E9%81%A9%E5%88%87%E3%81%AB%E6%91%82%E5%8F%96.%E5%98%94%E5%90%90%E3%81%99%E3%82%8B%E3%81%93%E3%81%A8%E3%82%82%E3%81%82%E3%82%8A%E3%81%BE%E3%81%99%E3%80%82](https://www.maff.go.jp/j/syouan/seisaku/risk_analysis/priority/hazard_chem/caffeine.html#:~:text=%E3%82%B3%E3%83%BC%E3%83%92%E3%83%BC%E3%81%AF%E3%80%81%E9%81%A9%E5%88%87%E3%81%AB%E6%91%82%E5%8F%96.%E5%98%94%E5%90%90%E3%81%99%E3%82%8B%E3%81%93%E3%81%A8%E3%82%82%E3%81%82%E3%82%8A%E3%81%BE%E3%81%99%E3%80%82) (2023/07/06)

What is the chlorogenic acid included in coffee?

[https://beans-express.com/article/detail.php?article\\_id=10040](https://beans-express.com/article/detail.php?article_id=10040) (2023/08/31)

WHO announced that the top ten of causes of death all over the world in 2019

Decreasing the death because of CVD

<https://sndj-web.jp/news/001149.php> (2023/08/31)

How much caffeine is included in a cup of coffee?

Merit and demerit of intake of caffeine and other drink

<https://macaro-ni.jp/32967> (2023/08/31)

About The Coffee 2050 Problem

<https://www.keycoffee.co.jp/sustainable/2050.html> (2023/09/01)

Expected global suitability of coffee, cashew and avocado due to climate change

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0261976> (2023/09/05)

Ajinomoto AGF corporation

[https://faq-agf.dga.jp/faq\\_detail.html?id=62](https://faq-agf.dga.jp/faq_detail.html?id=62) (2023/11/15)

# Impact on the Roadkill to the Wildlife ~Coexisting with the wild~

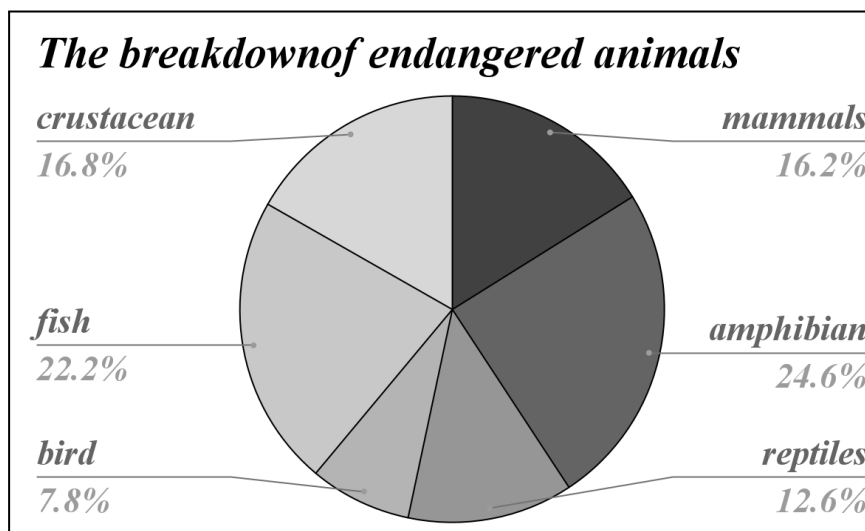
5126 Manaka Nakamura

## Abstract

There are many animals in the world and there are many endangered animals, too. It is because of global warming, destruction of the environment, and so on. Then, I focused on roadkill. It is the easiest problem to solve with other problems and it is a near thing for us. I doing this study and I can protect the wild animal's ecosystem because if endangered animals became extinct, the number of herbivorous animals is increasing so it is not good for the balance of ecosystem. Now, more than thirty hundred thousand of them were killed by it in Japan. Not only Japan but also other countries can say same thing. Road kill is common serious problem in the world. To avoid this problem, I found some solutions to it. First, No fence system. It is like a stick and when the car's flashlight hits it, it is responsible for the buzzer and turn signal to warn the wild animals car is coming here. Second, the animal bridge. It is used in many countries. The place where roadkill accidents are large is mountainous area. So I think we built the animal bridge above the expressway. If we carry out this solution, we cannot ultimately have an accident so we have to think how to coexist with human and wild animals is important.

## 1. Introduction

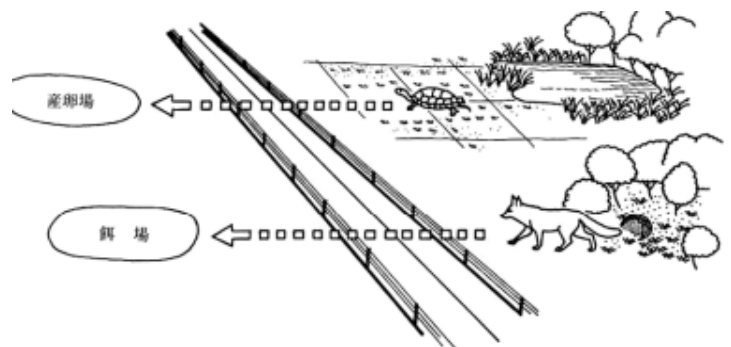
First, the significance of doing this study is that I want to eliminate roadkill completely. By the way, have you ever seen the scene of roadkill? Cats or birds are often dead on the road. They are a very tragic scene. To avoid this, we should solve it immediately. There are more than 40000 species of endangered animals in the world. (It is shown in the red list.) The figure accounts for about 27% of the whole world's animals. This is the table shown about the ratio of endangered species. showing



I especially contract with mammals,amphibians,reptiles,birds,fish,and crustaceans.We can know more than half of endangered animals live on land and they are living near us.So we have a risk of roadkill with endangered species.The reason why I think roadkill is problem is if these endangered animals happen roadkill,the balance of the ecosystem break.I think it is serious problem.Not limited endangered animals happen roadkill,in case of carnivore happened it,many number of it are killed and the number of herbivores will increase.

## 2.Discussion and implications

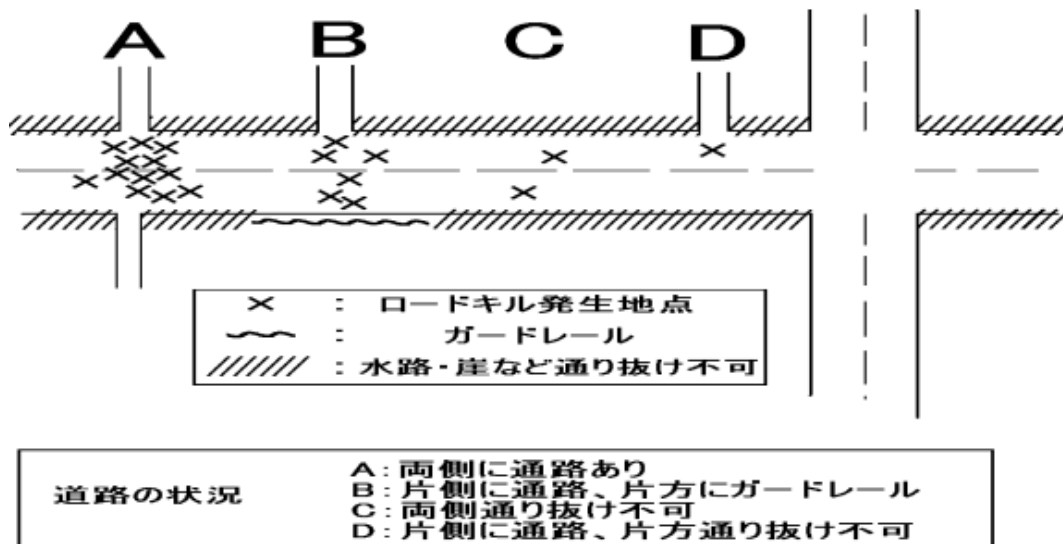
By the way do you know how many animals have roadkill in a year?In Japan,more than three hundred thousand of them occurred.The big reason for this happening is development of infrastructure.There are animals living space in the forest but human cut down the tree to make road.Therefore animal have habit living same place if their residence extinct.so when they want to go river they have to across the road.



出典) 日本道路公団、(社)道路緑化保全協会：高速道路と野生生物

図 I-4 移動ルートを変えない動物の例

When they cross the road,they have some pattern.Wild animals can judge whether there are roads in the opposite lane.Look at this figure.↓



This figure expresses the difference between the road's situation.As you can see from this,Point A is the highest point of accident rate.We can understand that wild animals can judge whether they can go this street after crossing the road.From this we have to careful when we are driving especially such as point A.Also if measure can be taken in such places ,I think it is effective to reduce roadkill.

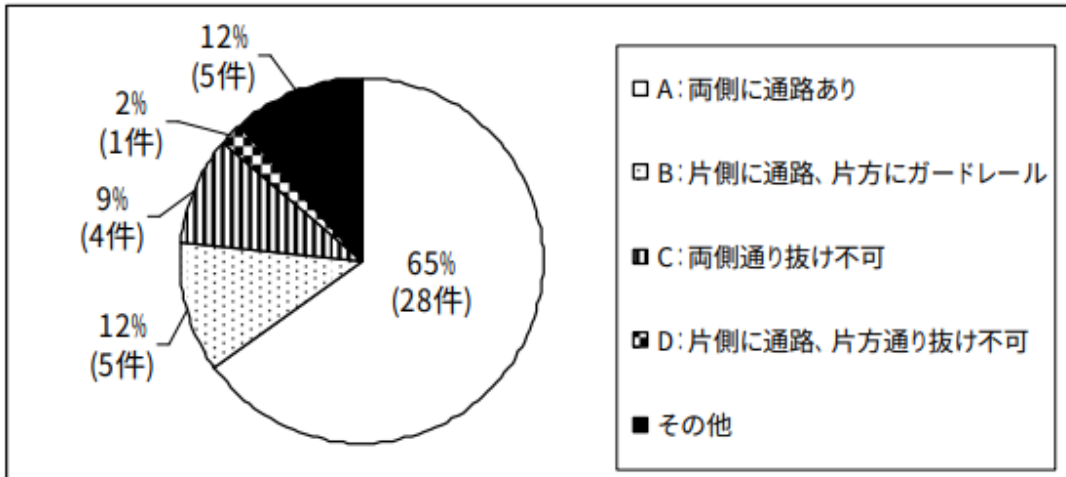
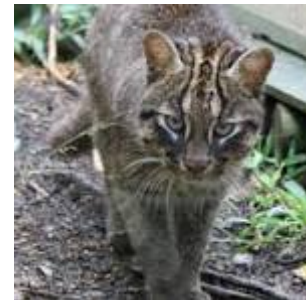


図2 対象道路に接する通路パターンとロードキル発生件数

To do this study, we can be conscious about roadkill and reduce the number of it. Why is roadkill a serious problem? I will give an example. This is a picture of Iriomoteyamaneko. It is a Japanese endangered animal. It is inhabiting only in Iriomote island. Most deaths are caused by roadkill. This is a very rare animal. Protecting them from roadkill, people who live in Iriomote Island made Iriomote Island's map which is showed the point roadkill occurred or sighting information. We don't know these effort lead to solving this problem, but I think to visualize current situation and share it with the world is good thing.



For this problem, I have some suggestions.

( i ) Animal bridge

The left one is a Japanese bridge and the right is a German bridge.



Germany is an environmentally advanced country so there are many animal bridges in the country. There are animal bridges in Japan, too. However we can see that the scale is small compared to foreign countries. The most different thing is building animal bridges is public works in the abroad but it is local efforts in Japan. So to make these big bridge in Japan is difficult with differences in thinking between countries. Even if the scale is small, we should increase it is important.



( ii ) No fence system

This item is my ordinary thing. It is like a stick and when the car's flashlight hits it, it is responsible for the buzzer and turn signal to warn the wild animals. It is put on the side of the road instead of the fence. Also I'm thinking how about install mosquito sounds like cat repellent, too. I think it's quite practical but to put it all the road is difficult so achieving this requires considerable time and cost we need.

### 3. Conclusion

We can't do anything directly to the wild animals so we can't ultimately do roadkill but it is necessary to think why these problems occur and know the current situation. Although, this is not a convincing conclusion but to suggest my proposal to the environmental organization, I think it would be great if it could help solve the roadkill, even if only a little. I hope roadkill will disappear someday.

### 4. References

The IUCN Red List of Threatened Species

<https://www.iucnredlist.org/ja>(11/14/2023)

国土技術政策総合研究所 研究資料

<https://www.nilim.go.jp/lab/bcg/siryou/tnn/tnn0721pdf/ks072104.pdf>(10/20/2023)

Mirainoshiten

<https://www.mirainoshitenclassic.com/2020/04/blog-post.html>(10/20/2023)

Iriomote Wildlife Conservation Center

<https://iwcc.jp/iriomotecat/cat/>(9/8/2023)

study on discrimination of animal roadkill points

<http://soil.en.a.u-tokyo.ac.jp/jsidre/search/PDFs/06/06004-17.pdf>(8/10/2023)

Ministry of the Environment good life award

[https://www.env.go.jp/policy/kihon\\_keikaku/goodlifeaward/report/2015\\_01/](https://www.env.go.jp/policy/kihon_keikaku/goodlifeaward/report/2015_01/)(12/15/2023)

# Improving The Foster Care System in Social Care

~Implementation of permanency planning~

5127 Nisihara Sae

## Abstract

There are two types of social care for Aid-requiring Children which use the foster care system or stay at Children's home. The rate of trust foster care system in Japan is low, about 20 percent. The purpose of this study is to improve the foster care system with permanency planning and to reform the foster care system in America.

There are advantages and disadvantages in the Foster care system. The children can be raised up in detail. However, there is a danger that Aid-required Children are raised inappropriately for the sound raising of children and there is a high probability that the relationship between children and birth parents come to an end.

In America, the view which is called Permanency Planning regards foster-parent system as a short-term measure for foster-children. Also, the way of thinking indicates Aid-required Children should be brought up under a permanent relationship with adoptive parents who are conducted a strict examination. From a perspective that Aid-required Children should be grown up healthy not only good but also permanent home, it is essential to realize permanency planning in Japan so as to care for children, and support their birth parents whose home is dysfunctional.

## 1 Introduction

The purpose of this study is to encourage permanency planning to make become more popular. The Foster-parent system provides Aid-required Children with a home which gives affection and grows them up with good understanding. According to the article which was written by National Foster Parent Association of Japan, the system helps Aid-required Children form attachments to specific people under the foster parents' raising. So, it is said that it realizes the sound raising of Aid-required Children.

The Foster-parent system should be regarded as a short-term care measure from the perspective of permanency planning. There is a premise that Aid-required Children's lives with their birth parents who had enough support and then recovered mentally and physically to raise them should be preceded by any types of homes.

However, it stops supplying foster-children with support when they turn 18 years old. After that, foster-children will be placed in society without any backing, and many foster-children are likely to face these difficulties in their lives.

It doesn't apply to permanency planning. In Japan, people can become foster-parents without qualification as a Child Welfare Officer easily and the requirements for foster-parents are easier to meet than them for adoption. There is a moderate probability that inappropriate foster-parents raise Aid-required children.

## 2 Discussion and implications



First, I researched Aid-required Children. By definition, the word refers to children without guardians or a child for whom the custody of their guardians is found inappropriate. In Japan, almost all Aid-required Children are left to children's homes. Also, it is entrusted foster-parent with raising of Aid-required Children.

Also, there is a large difference in the percentage of children who were trusted to foster-parent system between Japan and other countries.

“Percentages of children who were trusted to foster-parent system as a percentage of Aid-required children in each country (around 2018)”

the United Kingdom: 73.2 (2019)

the Federal Republic of Germany: 48.3 (2017)

the French Republic: 44.2 (2018)

the Italian Republic: 52.4 (2017)

the United States of America: 81.6 (2018)

Canada: 85.9 (2018)

the Commonwealth of Australia: 92.3 (2019)

Hong Kong: 57.0 (2018)

the Republic of Korea: 29.6 (2019)

Japan: 21.5 (2020)

(“Toward the Promotion of social foster care”—the Ministry of Health, Labour and Welfare, Child and Family Policy Bureau, the home welfare department)

In Western countries, there are seemingly more children who are trusted to foster-parent systems than in Japan. On the other hand, there are less children who are trusted to Children's homes in the area than in Japan. Also, it is the part for close relative to get on with the role of foster-parent.

Permanency Planning in Western countries prepares various programs accordingly such as comprehensive support for Aid-required families, helping people who seek adopted children to find them. The purpose of it is Aid-required children to return to the home of biological parents, and to be adopted children.

Also, There are three conditions to raise children: normal and healthy. First, continuous affectional bond. Second, constant environment. Third, stable relationship with the outside.

There is a view that sudden changes in the environment of the process of children growing up cause stagnation of children's growth because they involve children's considerable stress. It is said that the best way for children is to bring up under the home consists of their birth parents.

Even though they are under functional disorder homes, if the family can recover its function through support for those parents and rehabilitation programs, it is believed that the children should be returned to their original homes rather than trust to foster-parents' home or children's homes. There are not enough supports for those families in Japan.

### **3 Conclusion**

Realization of Permanency planning is important to improve Children's welfare in Japan. Also, Japanese society has to support the birth-parents of Aid-required children whose home has become a functional disorder. For example, the support should be provided actively for their birth-parents who have difficulties about childcare due to financial problems, mental or physical factors.

## 4 Reference

“Child Welfare Act (Act No. 164 of 1947)”—Japanese Law Translation Database System  
[https://www.japaneselawtranslation.go.jp/ja/laws/view/11#je\\_ch1sc4](https://www.japaneselawtranslation.go.jp/ja/laws/view/11#je_ch1sc4)(2023/12/15)

“About the foster-parent system, etc.” — the Ministry of Health, Labour and Welfare  
[https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/kodomo/kodomo\\_kosodate/syakaiteki\\_yougo/02.html](https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/kodomo/kodomo_kosodate/syakaiteki_yougo/02.html) (2023/12/15)

“About the foster-parent system in America” — Ikeya Kazuko  
<http://id.nii.ac.jp/1060/00006470/>(2023/12/15)

“Toward the Promotion of social foster care”— the Ministry of Health,Labour and welfare  
<https://www.mhlw.go.jp/content/000833294.pdf>(2023/12/15)

“Toward the Realization of Permanency Planning in Japan: planning a System to Position Adoption in Social Care”  
<http://fosterfamily.web.fc2.com/monthly/permanency.html#:~:text=Malucci%E3%81%AE%E5%AE%9A%E7%BE%A97%E3%81%AB,%E6%8F%90%E4%BE%9B%E3%81%99%E3%82%8B%E3%82%82%E3%81%AE%E3%81%A7%E3%81%82%E3%82%8B%E3%80%82%E3%80%8D>(2023/12/15)

“The briefing session of foster-parent system by central child consultation center in Oita prefecture”— the Ministry of Health,Labour and welfare  
<https://www.mhlw.go.jp/file/06-Seisakujouhou-11900000-Koyoukintoujidoukateikyoku/0000074719.pdf>(2023/12/15)

“The requirements of foster parent”— the Ministry of Health,Labour and welfare  
[https://www.mhlw.go.jp/shingi/2009/01/dl/s0108-4b\\_0084.pdf](https://www.mhlw.go.jp/shingi/2009/01/dl/s0108-4b_0084.pdf)(2023/12/15)

# Earth's Final Frontier Project

## Solution of the hunger in Africa

ID5128 氏名八木伸乃輔

### 1 Abstract

First my conclusion is to solve the hunger in Africa by Regenerative Agriculture: RA and Sustainable Agricultural Intensification: SAI. These projects are kind of biotechnology. There is a strong synergy between them. However, there is no way to do them, so I want to connect them by Artificial satellite. Some Japanese farmers use satellite-based agriculture. Therefore, I chose Japan as my research target, and I would like to spread this technology on the Internet. These days, the Digital Revolution happened in Africa. So I think this revolution should be taken advantage of.

Next I'll introduce why I choose Africa. Africa may be the most important place in the world. This is because the number of population in Africa is going to increase. Africa is called "Earth's Final Frontier". This means that one in four people is going to be African in the world. Africa is this important so we should solve some problems in Africa. I'm sure that this project is good for the world.

### 2 Discussion and implications

Africa has the best potential in the world.

Africa has .....

Petroleum Coal Iron ore Natural gas  
Uranium Cesium Diamond gold Silver  
Copper Tin Zinc Lead Tungsten Tantalum  
Nickel Titanium Cobalt Platinum Selenium  
Bauxite Chromium Lithium manganese  
vanadium rare earths



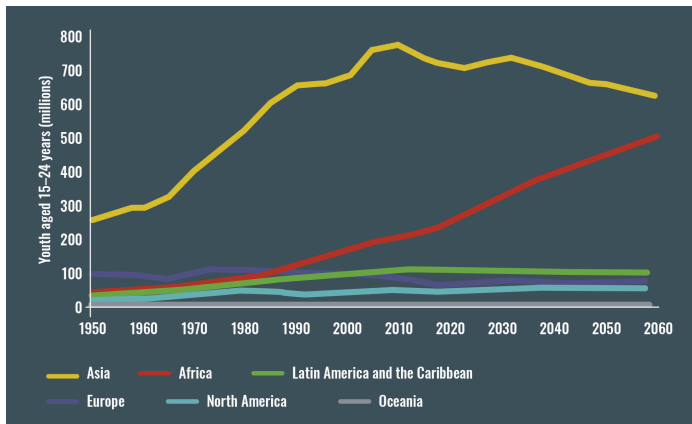
And Africa is going to have a large population.

The percentage of the African people who live there in 2022 is 17,7%.

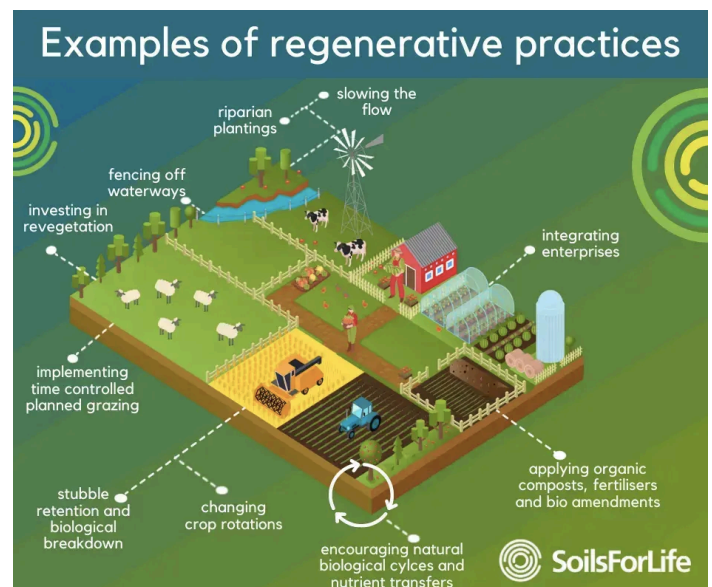
The percentage of the African people who live there in 2030 is over 20%.

The percentage of the African people who live there in 2050 is 25,4%.

The percentage of the African people who live there in 2100 is 37,8%.

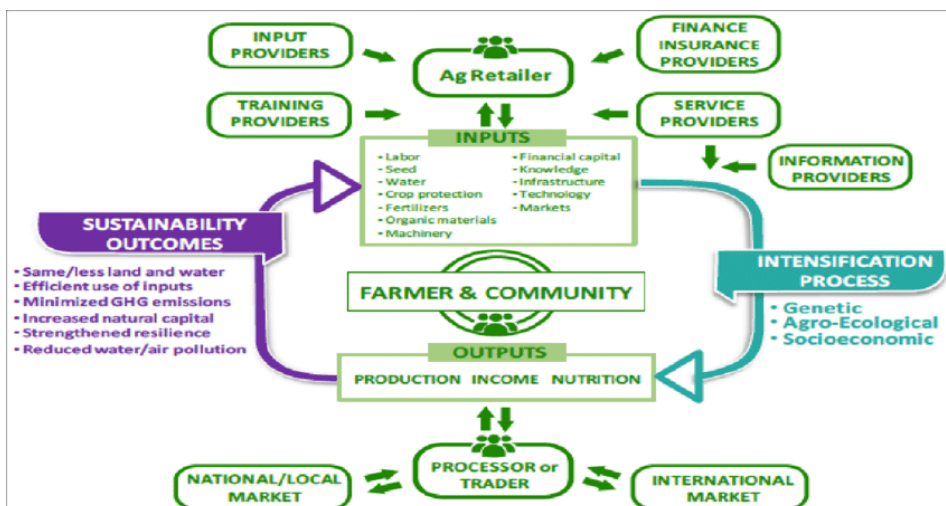


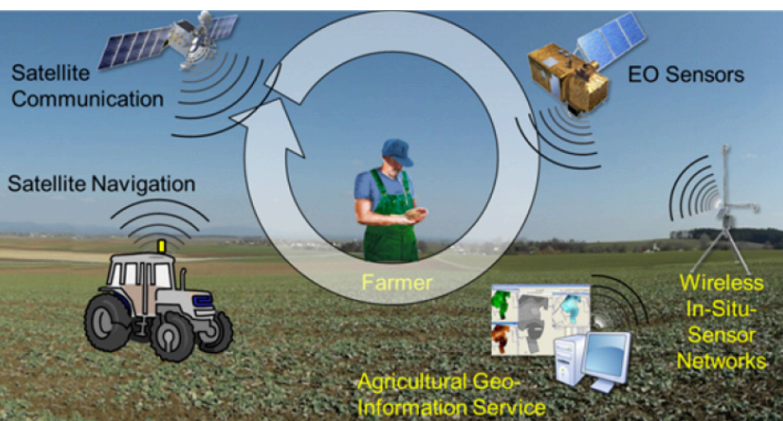
For these reasons, Africa has big potential but Africa has a lot of issues. For example, there are Medical issues, Labor issues, Educational issues and so on. However, these issues have the same cause. It is hunger, so I am tackling this problem. From now on, I will introduce two solutions. One is RA and the other is SAI. RA is the system about agriculture. It is the agriculture that not only keeps the soil healthy, but also aims to repair and improve the soil while recovering it to its natural environment. And Sustainable agricultural intensification (SAI) are practices to produce more from given land, water or other natural resources, while protecting the environment and increasing economic and social gains. These solutions are tried to use both because there are good combination of solving hunger in Africa. But there are no ways to connect them. And that's all they're going to study today.



From here, I'll say my suggestion. I suggest using Artificial satellite. In Japan, a venture company provides data such as the temperature of the earth's surface observed by an artificial satellite. Based on this data, agriculture will be carried out automatically, and satellite agriculture provides specific management of water sources and soil analysis. Soil analysis is done by artificial intelligence, which

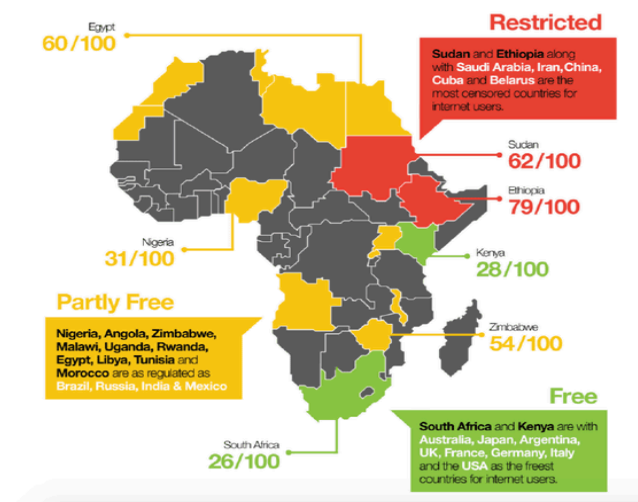
visualizes the farm and tells the farmer where to spread fertilizer. This allows Africans to farm with a minimum of work and spend the additional time studying and other activities. Yet here you





might have thought, "How can there be such a satellite in Africa?" But it is not a problem. The African countries that have launched population perpetuity are Egypt, South Africa, Nigeria, Algeria, Morocco, Angola, Ghana, Ethiopia, Kenya, Rwanda, Sudan, and Mauritius. Zimbabwe and Uganda are also planning space projects, and more and more African countries are expected to enter the space industry. However, the design and manufacture of satellites is mostly

led by foreign countries. Specifically, China, Russia, Japan, and other space agencies provide support. In recent years, Rwanda and Ghana have started to develop small satellites in collaboration with the University of Tokyo and other institutions, as well as the Kyushu Institute of Technology and JAXA. This project is not only beneficial to African countries. Developed countries that provide the technology will also be able to experiment with new technologies. I hope to be able to share this innovation throughout Africa using the Internet. There is a digital revolution happening in Africa right now. This is due to the fact that governments have begun to develop Internet infrastructure as they expect Africa's population to grow and its markets to develop, and also due to the increase in cell phone penetration. Although there are still only a few countries where the Internet can be used, the number of countries where it can be used will increase in the future. I would like to see the system developed to share this innovation by making maximum use of the Internet, and to further develop the system based on the records that can be collected in various countries.



### 3 Conclusion

Previous studies have shown that the collaboration between RA and SAI can produce excellent results. I recommend satellite-based soil management to link the two. Satellite-based agriculture is a Japanese agricultural practice that automatically manages farms. This will ensure that people of Africa will not have to be consumed solely by agriculture. They will have more time to spend on their studies. I also hope to use Africa's digital revolution to promote innovation and build a large-scale Internet system. However, there are some problems. For example, the benefits to the countries that provide technology and funding are too small. The challenge for the future will be how much merit we can show to the developed countries.

#### 4 References

Population of Africa

<https://graphic-data.com/page/geography/026>

Soils of Africa

<https://ajf.gr.jp/book/bk-food-security/5-2/>

[http://www.iiid.or.jp/ardec/ardec53/ard53\\_key\\_note2.html](http://www.iiid.or.jp/ardec/ardec53/ard53_key_note2.html)

Source of Africa

<https://theexchange.africa/countries/african-countries-are-rich-in-resources/>

Africa High Resolution

[https://www.jircas.go.jp/ja/program/program\\_d/blog/20210330](https://www.jircas.go.jp/ja/program/program_d/blog/20210330)

<https://www.weforum.org/agenda/2020/01/the-children-s-continent/>

Hunger in Africa

[https://gooddo.jp/magazine/hunger/africa\\_hunger/](https://gooddo.jp/magazine/hunger/africa_hunger/)

World hunger rates

<https://volunteer-platform.org/syokuryou/>

[https://gooddo.jp/magazine/hunger/africa\\_hunger/471/](https://gooddo.jp/magazine/hunger/africa_hunger/471/)

World Children's White Paper 2019 - Food and Nutrition for Children

<https://www.masahiro-ishida.com/post-10774/>

Soil level

[https://www.jircas.go.jp/ja/program/program\\_d/blog/20210330](https://www.jircas.go.jp/ja/program/program_d/blog/20210330)

-Potential for environmentally regenerative agriculture-

<https://www.jircas.go.jp/ja/program/proc/blog/20220715>

<https://www.jircas.go.jp/ja/release/2022/press202205>

Internet situation in Africa

<https://africabusiness.beforward.jp/%E4%B8%96%E7%95%8C%E3%81%8C%E6%B3%A8%E7%9B%AE%E3%81%99%E3%82%8B%E3%80%8C%E3%82%A>

[2%E3%83%95%E3%83%AA%E3%82%AB%E3%81%AE%E3%83%87%E3%82%B8%E3%82%BF%E3%83%AB%E9%9D%A9%E5%91%BD%E3%80%8D%E3%81%A8%E6%96%B0/](https://africabusiness.beforward.jp/%E3%83%95%E3%83%AA%E3%82%AB%E3%81%AE%E3%83%87%E3%82%B8%E3%82%BF%E3%83%AB%E9%9D%A9%E5%91%BD%E3%80%8D%E3%81%A8%E6%96%B0/)

<https://gigazine.net/news/20160527-africa-internet-situation/>

Agriculture by Satellite

[https://www3.nhk.or.jp/news/contents/ohabiz/articles/2023\\_0417.html](https://www3.nhk.or.jp/news/contents/ohabiz/articles/2023_0417.html)

<https://agrinfobank.com.pk/prospectus-and-constraints-of-satellite-farming/>

SAI

<https://saipatform.org/>

[https://www.researchgate.net/figure/a-Sustainable-Agricultural-Intensification-and-its-enabling-environment\\_fig5\\_346032895](https://www.researchgate.net/figure/a-Sustainable-Agricultural-Intensification-and-its-enabling-environment_fig5_346032895)

RA

<https://upfood.earth/regenerative-agriculture/>

[https://www.google.com/url?sa=i&url=https%3A%2F%2Fsustainablereview.com%2Fregenerative-agriculture-explained%2F&psig=AOvVaw27GIP59pHYilt3TrRs98K7&ust=1702690615769000&source=images&cd=vfe&opi=89978449&ved=0CAUQjB1qFwoTCMjog\\_2mkIMDFQAAAAAdAAAAABAD](https://www.google.com/url?sa=i&url=https%3A%2F%2Fsustainablereview.com%2Fregenerative-agriculture-explained%2F&psig=AOvVaw27GIP59pHYilt3TrRs98K7&ust=1702690615769000&source=images&cd=vfe&opi=89978449&ved=0CAUQjB1qFwoTCMjog_2mkIMDFQAAAAAdAAAAABAD)

Agricultural measures in Africa

<https://www.jetro.go.jp/biz/areareports/2020/ccc5e3ac0ecefbc7.html>

[https://www.maff.go.jp/j/kokusai/kokusei/kaigai\\_nogyo/k\\_syokuryo/h20/pdf/h20\\_africa\\_01.pdf](https://www.maff.go.jp/j/kokusai/kokusei/kaigai_nogyo/k_syokuryo/h20/pdf/h20_africa_01.pdf)



# Japanese Pro-wrestling to the World

## Meaningful alternating current with foreign groups

5129 Yuoka Masahiro

### Abstract

From 2020 to 2023, there was a big effect by COVID-19 in Japan. The Japanese pro-wrestling industry also suffered great damage. Let companies limit the number of athletes and support from fans. The biggest pro-wrestling company in Japan, New-Japan Pro-Wrestling, should have kept their profit but they couldn't do it. These days, many people think the impact of COVID-19 will converge but the company still has a little damage. I started to think about if the pandemic happens again, what actions the company should do. The most important thing is keeping the popularity and being active. It is difficult to come and go again and again between Japan and other countries. Generally speaking, the companies are said that they don't want to communicate with each other because it means showing their own audience to the enemy. However, it is important to make new stimuli to keep profit when famous athletes abroad can't come to this country. So communicating with each other a lot of times is good. Also making new relationships between companies abroad is a good way to show the stimuli. As I said it is not easy to come and go so I want to suggest the rental trade, exchanging wrestlers into organizations. The theory can make novelty matches. Of course they are rivals. Therefore the companies don't usually use this system.

### 1 Introduction

These years, Japanese Pro-wrestling, including New Japan Pro-wrestling, which is the biggest in Japan, has grown. In the Showa period, it is normal that the TV programs connecting Pro-wrestling's viewership ratings were always over 20%. The beginning of the Heisei period, the popularity of the sport was decreasing because of the influence of MMA but when star athletes like Hiroshi Tanahashi and Kazuchika Okada appeared, the industry could reclaim its popularity. In 2019, the yearly revenue became about 5 billion yen. The number was the best in the history of this company. However, the impact by COVID-19 caused great damage to this company after 2020. It made the profit decrease and made the government restrict a lot of things in watching sports thereby audiences can't enjoy the real Pro-Wrestling. Many of the audience told like "Matches came to be boring." Nowadays, New Japan reclaimed the popularity but it took about 3 years to take the benefit as of 2019. I wonder how to recover the damage quickly if the pandemic happen again, so I started to think about that.

### 2 Discussion and implication

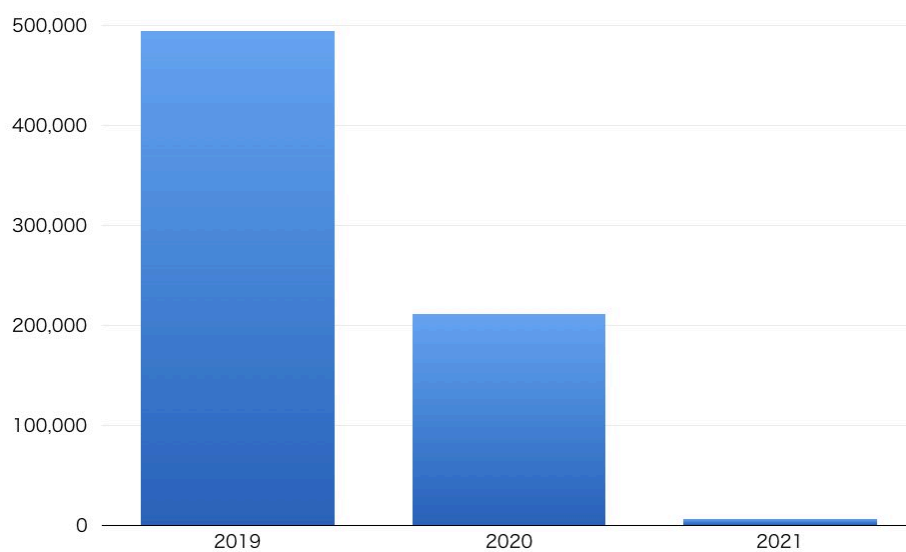
New Japan is said to be the third biggest group in the world. (The most is WWE and the second is AEW.) Connection between New Japan and WWE is very thin and there is no merit for WWE to cooperate with others because the gain is by far the best in the world.



AEW was established by famous wrestlers in 2019. One of the athletes and the vice president of AEW is Kenny Omega. He is known as a great champion of New Japan in this country. It is said that if he couldn't have played an active part in New Japan, he couldn't have made the company. Therefore we can see a little involvement between 2 groups after AEW rose to prominence in the United States. In 2022, the joint event named Forbidden Door was held. The tickets were sold out only 40 minutes after beginning selling them and the revenue of PPV, which is the system that paying money for paid content, was recorded to be about 650 million yen. The number was the best for both groups in that year. We can conclude that Japanese fans like to watch the rise of foreign wrestlers who were active in Japan and American fans and other country's fans want to watch unknown wrestling stars in Japan. What I want to suggest is the lending transfer. It was often seen in the soccer world. This system was used in the Pro-wrestling world long ago. Athletes can work in other groups set time while keeping the contract with a company which they belong to now in this system style. Audiences can watch athletes who have another style than their favorite group's wrestlers, so they don't have to get bored and they can notice a lot of the charm of this sport. Furthermore, New Japan Pro-Wrestling has a new American organization, NJPW STRONG, which was created to discover new star athletes for those who currently have difficulty coming to Japan, and it would be possible to replace the athletes with those from Japan. NJPW STRONG has a strong relationship with Japan, so it would be easier to input and output players, and we thought this would be an effective way to increase the popularity of Japanese wrestling in both Japan and the U.S.

### 3 Conclusion

Most New-Japan pro-wrestling fans believe that a limited-time mutual rental transfer with AEW would allow both Japan and the U.S. to discover the appeal of professional wrestling in new ways. We also thought that a similar rental transfer or one-way transfer with NJPW STRONG (since NJPW STRONG is a sibling company of New Japan Pro-Wrestling, it is difficult to imagine that a one-way transfer would cause much damage) could improve the popularity of Japanese wrestling in both Japan and the United States. This research was motivated by any serious disasters, but we would like to make a plan that can be utilized even after some debacles are resolved.



■ 当期純利益 / Net income

#### 4 References

New Japan Pro-wrestling...<https://sp.njpw.jp/>

AEW...<https://www.allelitewrestling.com/>

WWE...<https://www.wwe.com/>

Local Performance

[https://repository.lsu.edu/cgi/viewcontent.cgi?article=3328&context=gradschool\\_dissertations](https://repository.lsu.edu/cgi/viewcontent.cgi?article=3328&context=gradschool_dissertations)

# Treatment of Mental Illness with Music

## Music therapy for all mentally ill patients in Japan

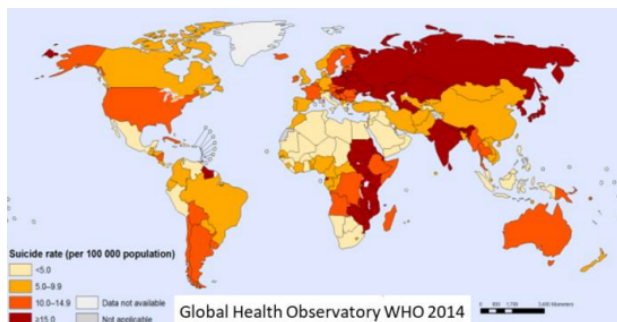
5201 Igahama Tamaki

### Abstract

This study examined how we can solve various problems in the treatment of mental illness in Japan. I focused on music therapy, which uses music to treat illness and disability. The goal of the study is to improve mental health care and increase treatment options for patients. Music therapy has many therapeutic benefits. For example, it has relaxing effects and creates opportunities for communication with others. However, music therapists are an occupation and they are not well recognized in the country. There are big differences between Japan and the West in the year it was established, and it can be said that Japanese psychiatry is behind the times. There are limited treatment options compared to other countries. This is the major reason why the number of patients in Japan increases year by year and requires a longer period of treatment than in other countries. I propose four actions to catch up in the development and improvement of health care. Presentation of a unified educational process for training music therapists by the Ministry of Education, Culture, Sports, Science and Technology. Nationalization of the music therapist certification examination. Income stability protection for music therapists by the government. In addition, insurance coverage for music therapy. These will increase the visibility of music therapy in society. And the employment of music therapists will increase, and the number of people who are involved in this therapy will grow. This will make music therapy more accessible.

### 1 Introduction

I started this research because I was interested in why this was happening when I learned that the number of suicides in Japan was increasing. After that, I learned that this was due to the increasing number of mentally ill patients in the background. The table and graph below show the increase in the number of mentally ill people in Japan and the increase in suicides as a percentage of the population. Is Japanese medical care giving quality treatment to the increasing number of patients year after year? Therefore, I decided to research ways to increase treatment options and improve health care. Although there is no one-size-fits-all treatment for all patients by individual differences in psychotherapy. However, I would like to promote the use of music therapy, which is not widely practiced in Japan. Music therapy can be relaxing because it affects the autonomic nervous system and changes heart rate and blood pressure. It can also affect the state of mind, activating emotions, perception and cognition. This effect may improve depression. Some memories and emotions are recalled by listening to music, and it is effective in the treatment of memory disorders and lack of emotion. Enjoying music with others can create a sense of connection, intimacy and camaraderie, which has the effect of alleviating symptoms of autism and communication disorders. I believe that by making music therapy an option for all patients in Japan, this research will improve health care.



## 2 Discussion and implications

First, I studied the prevalence of music therapy. The main reason for the lack of development of music therapy in Japan was investigated. In Japan, we rarely hear about music therapists in our daily lives, and I know nothing about them. There are several reasons why music therapy and music therapists are not widely known to the public. First, being a music therapist is a profession. For people to become one, they have to be qualified. In order to qualify, they need to study at a university. However, there are only about 10 universities in Japan where music therapy can be studied. Certification as a music therapist is not easy to obtain and requires a high level of skill and knowledge. In addition, this certification is not a national examination and is administered by the Japanese Society of Music Therapy. Therefore, it is not clear whether a qualified person will be employed by a medical institution, special education school, or children's home. The number of people who want to become music therapists is small, and employment is low compared to the rest of the world. The small number of music therapists forces medical institutions to choose psychotherapy, which is not music therapy, when providing treatment.

To begin with, music therapy was established in the West in the early 20th century, a pioneer in psychiatry. Music therapy was already established as a form of treatment during World War I and World War II. However, the first music therapy in Japan was in the 1980s. This means that Japanese patients have been without access to music therapy for almost half a century. Japan is completely behind other developed countries in music therapy and psychiatry. This limited availability of treatment options compared to other countries is a major reason why the number of patients in Japan is increasing each year and why they require longer treatment periods than in other countries.

I have come up with four measures we can take to help Japan catch up on mental health care and make healthcare more accessible. First, the Ministry of Education, Culture, Sports, Science and Technology should present a unified educational process for training music therapists. In today's Japan, there is no clear curriculum for music therapist training, unlike the general educational content of universities. Therefore, I believe that unifying and clearly stating the curriculum will ensure equality in music therapist training education, as lectures with the same general content for the music therapist certification examination will be given throughout Japan. In addition, a well-known institution like the Ministry of Education should make this information public. This would be one way to make the existence of music therapy more widely known throughout the country.

Second, it's a nationalized music therapist certification exam. It is believed that this would increase the level of trust in music therapy, as patients would be reassured that music

therapy is a nationally recognized treatment method. In addition, if the certification exam becomes a national exam, medical institutions and other employers of music therapists will be able to hire them with peace of mind, and employment will increase.

The third is the government's income stability protection for music therapists. In Japan, most music therapists are employed on a part-time basis due to the low demand for music therapists. As a result, income for music therapists is often low and unstable. The lack of a high income, even after passing the difficult certification exam, also contributes to the low number of people who want to become music therapists. If the government provides financial support and otherwise stabilizes income, the number of people studying music therapy can be expected to increase.

Finally, there is insurance coverage for music therapy. In the United States, music therapy is covered by insurance. In Japan, there is an insurance system called "Medical Care for Services and Supports for Persons with Disabilities," which the Ministry of Health, Labor and Welfare defines as "for patients receiving treatment for psychiatric illnesses," but music therapy is not actually included. Insurance coverage is expected to reduce or eliminate the amount of money patients have to pay out of pocket for medical treatment, thereby increasing the number of people who try music therapy and expanding the range of treatment options for patients' mental illnesses. By increasing the number of treatment options available through music therapy, it is expected that the number of patients who can be cured will increase.

### 3 Conclusion

Japan as a country needs to establish music therapy as a form of treatment and music therapists as a profession. I propose four things to ensure that people suffering from mental illness in Japan can receive effective treatment. These are: a unified educational process for the training of music therapists by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), nationalization of the certification examination for music therapists, income stability protection for music therapists by the government, and insurance coverage for music therapy. These four activities will improve medical care for patients with mental illness and make music therapy available to all people with mental illness.

There are several challenges to doing these things. Even if music therapy can be offered in medical institutions, I need to increase the number of patients who want to receive it. I need to think about how to provide information and outreach to those affected by mental illness.

In addition to that, I should think about how to manage the large amount of money that will surely be required in the process of actually implementing insurance coverage and a subsidy system to stabilize the income of music therapists.

I would like to think about how music therapy can be integrated into daily life, not only from a medical perspective, but also for the mental care and improvement of mental conditions of people with developmental and physical disabilities.

### 4 References

<https://japan-who.or.jp/wp-content/themes/rewho/img/PDF/library/061/book6402.pdf>  
Depression in the World, Japan, and Myself (June,15,2023)

<https://chikyumura.org/2014/11/post-743.html>

Why does Japan have the most psychotic beds in the world? (June,15,2023)

<https://cellbank.nibiohn.go.jp/legacy/information/ethics/refhoshino/hoshino0122.pdf>

On Music Therapy (July.5.2023)

<https://medical.nikkeibp.co.jp/leaf/mem/pub/series/1000research/201610/548509.html>

More than half of physicians are interested in music therapy (July.5.2023)

<https://kokorotalkmusic.or.jp/music/02.html>

NPO, Mind Chattering Music Studio (September.14.2023)

<https://kenko.sawai.co.jp/theme/202011.html>

The Power of Music to Heal the Mind and Body (September.14.2023)

[https://www.jmta.jp/music\\_therapist/school\\_list.html](https://www.jmta.jp/music_therapist/school_list.html)

The Japan Society for Music Therapy (July.5.2023)

<https://gigazine.net/news/20211214-reduction-suicide-hip-hop/>

What hip-hop classics have been shown to have the potential to help prevent suicide?(July.5.2023)

<https://ptotst-tensyoku.com/column/music-therapist/134>

What kind of work does a music therapist do? (September.14.2023)

<https://musicpowerforall.com/service/>

MUSIC POWER for ALL (September.14.2023)

# Break Away from Smartphone Addiction

— Protect against the danger of smartphone —

5202 Aki

## 1. Introduction

These days I feel I cannot live without my smartphone. There are situations in which a smartphone is keeping touch with family and friends and checking information in emergencies. In addition, playing games and using social networking services are a daily life not only for young people, but also for people of all ages. In addition, with the Corona disaster smartphones have become the mainstream way to get tickets to museums and some parks, and the use of smartphones has increased. In addition, my own smartphone usage time has increased since the Corona disaster, and I now carry my smartphone with me without letting go of my skin. When I researched, I hit smartphone addiction and learned some applications and games such as social networking sites are structured in a way that users can use it a lot. Making it easy to become on them without realizing it. This led us to consider what kind of countermeasures would be an effective way to avoid smartphone dependence. In addition, smartphone dependence can lead to other pain, obesity, vision loss, headaches, and even economy class syndrome which can lead to death. I have learned that many people have these symptoms and that many people become addicted they can't notice becoming smartphone addiction. Based on this, I considered that the cause of smartphone dependence is likely to be the use of smartphones without knowing their dependence, which leads to smartphone dependence.

## 2. Discussion and implications

Smartphone dependence can lead to other pain, obesity, vision loss, headaches, and even economy class syndrome which can lead to death. I have learned that many people have these symptoms and that many people become addicted they can't notice becoming smartphone addiction. Based on this, I considered that the cause of smartphone dependence is likely to be the use of smartphones without knowing their dependence, which leads to smartphone dependence. Prior studies have shown that the Corona Disaster increases the number of people who become addicted to their smartphones spending more time at home and significantly decreases the quality of their sleep. And it also found an increased risk of depression. In addition, a study conducted on university students in Thailand found women are more susceptible to smartphone addiction. The reason for this is that women are more susceptible than men. I considered that the increase in the smartphone-dependent population in the Corona Disaster was due to the fact that smartphone dependence was not known to the public. Therefore, I thought that the number of dependent people could be reduced by learning about smartphone dependence at a young age and learning about the dangers early. So I focused my research mainly about young people. Smartphones have convenient functions such as games and social networking services that make it easy to have fun while in use. So the user's interest is stimulated and kept up while using the phone. The smartphone addiction is a dependence in which people want to use smartphones for longer periods of time

in search of more fun, and become addicted to smartphones in a way that they cannot stop by themselves. In 2013, a Ministry of Health, Labor, and Welfare research group studied about 4,000 adults and found that around 4.21 million people were smartphone-dependent. This figure is 1.5 times higher than a similar survey conducted in 2008. The following is the result of a 2013 MHLW survey of about 100,000 people aged 13-18. A 2013 Ministry of Internal Affairs and Communications survey of 2,600 10-25 year olds found smartphone dependence was higher among those in the prime of their teenage years. This problem has become a social issue not only in Japan, but also in many other countries including South Korea, Vietnam, and France. The table below shows that in response to the question, "Can you spend a whole day without using your smartphone?" The table below shows that in many countries, around 50% of people answered that they "cannot spend a day without using a smartphone," including 68.0% in India, 55.7% in South Korea, and 49.8% in Japan.

国	使わずにいることはできない	1日なら使わずに いられる	1週間なら使わずに いられる	1ヶ月使わずに いられる	永久に使えなくても 大丈夫
日本	49.8%	32.2%	10.9%	2.1%	5.1%
フランス	45.9%	27.5%	17.0%	5.7%	4.0%
ドイツ	41.3%	20.2%	24.0%	6.9%	7.5%
インド	68.0%	18.1%	7.0%	2.6%	4.2%
イタリア	45.4%	27.3%	15.1%	5.0%	7.2%
シンガポール	48.7%	24.2%	15.1%	9.2%	2.9%
韓国	55.7%	26.8%	9.3%	5.4%	2.8%
イギリス	37.6%	22.6%	18.7%	7.9%	13.2%
アメリカ	35.7%	28.9%	17.4%	6.6%	11.5%
全体	47.6%	25.3%	14.9%	5.7%	6.5%

どれくらいの間、スマートフォンを使わずにいられますか？

(<https://webtan.impress.co.jp/n/2019/08/08/33584>)

Several countries around the world have initiated policies to reduce the number of smartphone-dependent youth. Korea started policies to reduce the number of smartphone addicts early on and has now succeeded in reducing the number of smartphone addicts in Korea. Around 2011, the Korean government introduced a "youth nighttime game shutdown system," under which children under 16 years old cannot access online games from midnight to 6:00 am. This system has reduced the number of children accessing online to some extent. The most significant effect of this policy making is that the public became aware that Internet addiction is a serious problem because of this policy by the government. In addition, a survey of Japanese high school students shows that a high percentage (93%) of them answered that they were aware of smartphone addiction. However, the percentage of those who answered "yes" to the question "Are you aware of your smartphone dependence? This result shows that even if people know about smartphone dependence, it is difficult for them to be self-aware of it. It is very difficult to get rid of smartphone dependence on one's own, so it is important to take countermeasures in advance. Therefore, I felt that the most effective way to prevent people from becoming addicted to smartphones is to make them aware of the fear of smartphone addiction, as was the effect of the policy implemented by the Korean government.



### 3. Conclusion

The study found that most people who become addicted to smartphones are not unaware that they are addicted to smartphones, but are more likely to be unaware that they are developing the condition. Based on this, thought that in order to become aware of smartphone addiction at an early stage. It was necessary to use a chart that allows people to perform a self-check of smartphone addiction and see how much they have become trapped by their smartphones. We also thought it would be good to let people know about the effects of smartphone dependence on the body and mind. The challenge now is to figure out how to validate and implement these. We would like to investigate other ways to self-identify smartphone dependence besides self-checking. I have also found that if you are dependent on your smartphone, it is almost impossible to escape on your own. Unless policies are implemented on a country-wide level, such as the South Korean policy I mentioned earlier, we will not see a significant decrease in the number of smartphone users. However, it is difficult to implement such policies on a country-by-country basis, due to the constitutional issues in each country. Future research should focus on measures that can be implemented among family members to prevent dependence on smartphones. We would like to think of ways to escape from smartphone dependence that can be implemented at home, with as little stress as possible about removing the smartphone.

### 4. References

<https://webtan.impress.co.jp/n/2019/08/08/33584>

Global Comparison Survey 5月6日

<https://prtimes.jp/main/html/rd/p/000000116.000013597.html>

Japan Survey 5月6日

<https://www.furyu.jp/news/2018/06/gtl59.html>

Survey of high school girls 6月18日

<https://webronza.asahi.com/business/articles/2018031300004.html>

French government measures against smartphone addiction 6月18日

[https://style.nikkei.com/article/DGXNASFK0100W\\_R00C13A8000000/?page=2](https://style.nikkei.com/article/DGXNASFK0100W_R00C13A8000000/?page=2)

South Korean government measures against smartphone Dependence 6月18日

<https://seimei-hp.or.jp/addiction/screening/check06/>

Self-check sheet for smartphone dependence Seimei Hospital 8月6日

<https://tms-clinic.jp/column>

TMS treatment 8月6日

<https://townwork.net/magazine/life/133457/>

How to stop dependence on smartphones 8月27日

<https://tone.ne.jp/column/howtouse/smartphone-addiction-2/>

Smartphone dependence Cases and measures 9月3日

<https://markezine.jp/article/detail/22437>

Smartphone dependence awareness 10月15日

<https://www.shinjuku-stress.com/column/psychosomatic/smartphone/>

Smartphone dependence linked to depression 12月18日

<https://forbesjapan.com/articles/detail/>

Brain-altering smartphone addiction fear 1月26日

<https://www.town.kumano.hiroshima.jp/www/contents/1627893732477/index.html>

Protecting children from smartphone dependence 1月26日

[https://www.lab.toho-u.ac.jp/med/omori/mentalhealth/mental/smartphone\\_dependence/index.html](https://www.lab.toho-u.ac.jp/med/omori/mentalhealth/mental/smartphone_dependence/index.html)

TOHO UNIVERSITY about smartphone addiction 1月26日

<https://www.mdpi.com/1660-4601/18/22/12257>

Smartphone Addiction and Associated Health Outcomes in Adult Populations: A Systematic Review 3月9日

# Solving Food Problems with Foodtech

-Toward a world where people do not have to worry about food-

5203 Esaki Arisa

## **Abstract**

The goal of my research is to expand the use of food tech-based products around the world. I would also like to propose a proposal that will help reduce hunger by promoting the technology to developing countries.

The background of my research is that I am interested in food and I want to research what I am interested in. The reason why I want to promote food tech is because I believe that food tech has many advantages and is necessary to enrich people's lives and realize a sustainable society. In my research, I would like to focus on alternative foods among food tech products. The reason why I would like to use alternative foods to reduce hunger is because alternative foods provide efficient nutrition and can be mass-produced, which are necessary for those who are suffering from hunger.

Although alternative foods have various advantages, they are not widely used because of their "high cost" and "developing taste". However, according to Foodtech, plant meat will become cheaper than animal meat in the future because of "cheap raw materials," "high quality," and "mass availability," which means that alternative foods are less expensive. In terms of taste, we believe that the availability of alternative foods and the efforts of many companies in food development will improve the taste of alternative foods. These are some of the reasons we believe that alternative foods will spread throughout the world.

For the second goal, to reduce hunger, we are intending to achieve this by providing mass-produced, nutritious alternative foods for free. For this purpose, we would like to sell alternative foods as donated products in developed countries, and treat a portion of the profits earned from such sales as an expense.

## **1.Introduction**

I like to eat and am interested in food, so I have been doing research on food loss, sushi, and so on. I have been doing research on food loss, sushi, etc. So, when I was researching food-related issues, I came across the keyword "food tech" and found many interesting examples of food tech applications, which I wanted to combine to solve food problems.

Food tech is a technology that uses the latest technology to develop food in completely new ways and to discover new methods of cooking. It is attracting attention as a new food possibility.

For example, food tech could make it possible to recreate meat from vegetable protein or develop pasta that provides the necessary nutrients in a single dish.

As I researched food tech, I found that it targets mostly developed countries and is not well adapted to people in developing countries. I thought that if we have advanced technology, we

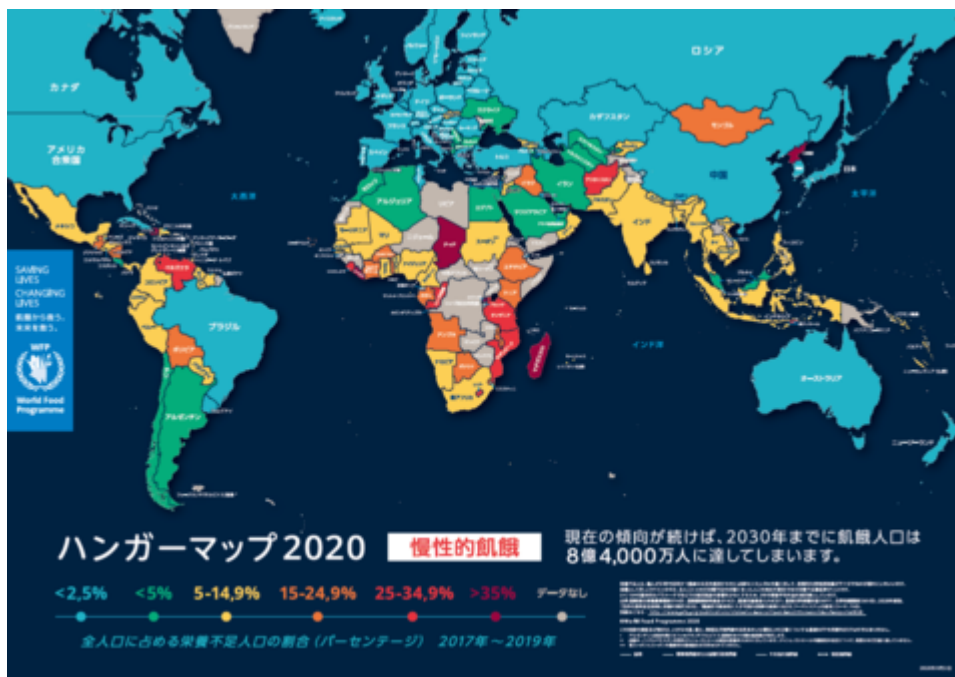
need to not only develop it further, but also create products that will enable people in developing countries to live more affluent lives.

Therefore, I would like to cooperate with people in developed countries in creating such products to reduce hunger.

I would also like to propose solutions not only for hunger but also for other food problems for example food loss and food safety by using food tech.

## 2. Discussion and implications

The primary research goal is to spread food tech-based food alternatives around the world. By doing that, I hope to make developed countries more prosperous and developing



countries more accessible to nutritious food for more people. Food tech is expected to help solve food shortages caused by the world's growing population. In Japan, population is decreasing, but from the perspective of the world population, the world population in 2015 was approximately 7.38 billion. It is predicted to reach about 8.55 billion by 2030, and is projected to continue to increase after that.

In addition to concerns about food shortages due to population growth, climate change due to global warming and other factors may cause crops to not grow as well as they have in the past, resulting in reduced harvests. In this regard, food tech is expected to stabilize food production and improve yields.

As you can see from the hunger map above, there are many people in the world who are hungry. The purpose of this research is to use food tech to help reduce hunger among them. The reason why I use food tech I believe that food tech alternatives can supplement what is lacking for the hungry because they can be mass-produced and provide easy access to nutrition. Other potential solutions for food tech include addressing hunger, food loss, labor shortages, and vegetarianism.

Given its why isn't food tech, which has so many advantages, then, why isn't food tech being used more widely.

The reasons are the high cost and the fact that the taste has not yet evolved.

The two main drawbacks are

- Taste is still evolving
- Cost is high

As for the high cost, which is a particular problem, it means that the cost of developing alternative food and other products is high. However, although the cost is high in the early stages of technology and market, it is said that alternative foods will become cheaper in the future. Plant-based meat will become cheaper than animal meat in the future in terms of "cheap raw materials," "high quality," and "available in large quantities." In other words, alternative foods will become cheaper.

Points out that the key to consumer acceptance is price parity. The report notes that alternative proteins must have the same taste and texture as the traditional foods they replace, and cost the same or less. According to the company's research, price parity will be achieved in three key phases.

First, by 2023, plant-based products such as hamburgers, dairy products and egg substitutes made from plant proteins such as soy and peas will reach price parity.

Second, by 2025, alternative proteins derived from microorganisms such as bacteria, yeast, and single-celled algae will reach price parity.

Third, by 2032, proteins grown directly from animal cells (often referred to as "cell-based meat" or "cultured meat") will reach price parity.

According to GFI's own research, the cost of producing cultured meat is expected to reach \$2.92 per pound (450 g) in 2030, and it appears that cultured meat could become cost-competitive with some conventional animal meats.

According to GFI, the development of price parity for plant-based meat will be influenced not only by production costs, but also by market effects that increase the cost of conventional animal meat products. Recent developments in the livestock industry, including rising input costs, labor issues for meat processors, and supply chain disruptions, have all impacted animal meat prices: in the fall of 2021, conventional meat categories such as beef, poultry, and pork experienced double-digit price increases compared to the same week in 2020. In contrast, year-over-year prices for plant-based meats declined or remained flat.

In addition, in recent years, major brands and private labels have already attempted to further increase demand for plant-based products at lower prices than animal meats; in 2020, Trader Joe's (Trader Joe's) will introduce plant-based burger patties made with pea protein, priced at \$4.49 (approximately \$520) for two quarter-pound patties; and Kroger will introduce plant-based ground chicken in 2020, priced at \$6.99 (approximately \$810) for a one-pound serving (approximately 450 g).

Competitor Beyond Meat has also stated that it is targeting a lower price than animal protein, at least for beef, by the end of 2024.

In terms of taste, mass production and scale of production will allow many companies to work on improving taste, which in turn will improve taste.

This will make it easier for alternative foods to reach more people and spread around the world.

As for the second goal of using food tech to reduce hunger, I believe we can use food tech to provide alternative foods for free while maintaining food safety during transportation.

However, as mentioned earlier, even if alternative foods are cheaper, it would be difficult to provide all of them for free.

In this way, by buying alternative foods, we can also donate to the hungry people.

In other words, by buying the product, you are also making a donation.

We would also like to use food technology in the transportation and preservation methods when providing the food.

### **3. Conclusion**

Alternative foods will become more accessible as it is said that plant-based meat will become cheaper than animal-based meat, meaning that alternative foods will become cheaper. The profits from alternative foods as donated products will be used to provide alternative foods for those who are suffering from hunger in developing countries, both during transportation and through the use of food technology. As a challenge, since there are various types of alternative foods other than soy meat, we would like to consider what types and how much to provide to the starving people.

### **4. References**

<https://wisdom.nec.com/ja/article/2019112901/index.html>

What is foodtech?

<https://foodtech-lab.jp/casestudy/>

Food Tech Case Study

<https://anobaka.jp/research/3331/>

Why did foodtech become famous?

<https://www.exseal.co.jp/blog/taxonomy-19/6726/>

What is foodtech?

<https://www.beyondmeat.com/en-US/>

Beyond meat

<https://faq.impossiblefoods.com/hc/en-us/categories/4416662436759-Products>

IMPOSSIBLE™ BEEF MADE FROM PLANTS

<https://fq.yahoo.co.jp/foodtech/2.html>

Food Tech Startup

<https://vegnews.com/2022/2/cheaper-plant-based-meat>

VEGNEWS

<https://veconomist.com/companies-and-portraits/beyond-meat-aims-to-underprice-beef-by-2024/>

Beyond Meat Aims to Underprice Beef by 2024

<https://www.bcg.com/publications/2022/combating-climate-crisis-with-alternative-protein>

A 2021 report by investment firm Blue Horizon and management consulting firm BCG

# Grasshoppers for Food

Good protein

ID 5204 Yuki Otani

## Abstract

I did a study to make it possible to eat grasshoppers, because they are sustainable food. Actually I heard that food is disposed of as garbage in developed countries. On the other hand there are a lot of people suffering from food shortages. I felt this must be a problem, because this fact means that an adequate amount of food isn't supplied properly. That's why I started my study with this theme. This time I aimed at desert locusts. Actually they contain an adequate amount of nutrition and they are easy to feed, so we can contribute to the environment by incorporating them into our daily meals. If we can rear them in farms, we can cut the cost to feed them rather than to feed existing livestock. This time, I've focused on food in Africa.

Gathering information about this study, I found that desert locusts contain a lot of chemical substances and pesticides in their bodies, so It is difficult to eat them after approaching areas with pesticides. Actually we can eat them before they approach those areas, but we can't detect places where they grow easily, because those places are usually uncivilized.

## 1 Introduction

I mainly used the internet. Then I made several questions, because I would ask them to a company which is engaged with agricultural business. After that, I asked some of them to an officer of the company whose name is Olam international .

Actually, I was shocked when I found that more edible food than all food supplied to developing countries to help people has been disposed of in Japan. Besides, I could easily assume that much more edible food has been disposed of all over the world at the same time. This means that limited food hasn't been allocated to people correctly. I thought "What the hell is going on?" I have to tackle this problem as a citizen of the earth. Hence I decided to research these topics. In the progress of my research, I have come to realize that it is definitely difficult to change the current food supply system, because in the modern economic system, resources such as food gather to those who have wealth. Therefore I made a subtle change with my theme and continue to do my study to supply adequate nutrition to people who are in danger because of lack of food. Then I aimed at insects, especially at grasshoppers. I wondered that for most people, when they hear the word insect, they feel disgusted and some of them feel interested. But you may be surprised if you hear that insects are saviors for humans. In fact, they have already begun to save the world.

## 2 Discussion

In fact, the existing systems of Livestock industry are not sustainable. This is because their systems use a lot of water, forage and other natural resources to produce meat.

Mr.Onishi(2017) contends that an unavoidable fate of conventional livestock farming is that a great deal of energy is expended on inedible parts of the animal, such as bones, skin and offal. Only 40% of a cow is edible, and 60% of inedible parts are discarded. In contrast, Insects are an excellent food source, with an average of 80% edible portion and very little waste.(figure 1and2) Also noteworthy is the high feed requirement. Whereas cattle produce large amounts of manure and lose a lot of energy through body heat, weight, posture maintenance, exercise, and burping, insects have a feed conversion efficiency of 50%, converting food into animal protein. Actually,Cow protein is only 0.04%,which means that we can produce the same amount of meat with much less food if the technology of farming insects becomes available.(figure3)Besides, according to Mr.Onishi insects produce far less greenhouse gasses than existing livestock such as cows . It means that Insects food is a super food. With these results I think it is worth considering for our future.

Therefore I focused on desert locusts and considered a way to make those insects into edible nutrition and supply starving people with them,because there have been serious problems owing to the recent mass outbreak of them around the African continent. Namely, I tried to solve both mass outbreak and lack of nutrition with desert locusts. Hence, I came up with an idea of capturing them and processing them into food.Instantly this idea seemed to work well,but there were several difficulties making it difficult to realize my plan. First, there is a probability that we might eat harmful chemicals when capturing wild insects and processing them into food to eat,because they might have eaten plants with pesticides and gathered them in their bodies somehow. Second, it costs a lot to predict the areas where they are and capture them in vast wildernesses in Africa.Therefore my idea was impossible.

However, I believe that I can definitely make use of this study for the future.Thereupon I searched for any information about the insect food industry on the internet and found that some people in south east asia have sold crickets for the feeding of pets and for human food. Therefore, I've been thinking about importing the way to farm crickets to developing countries.According to Mr.Onishi, the system of farming crickets is relatively easy to copy. Thus, importing not only the knowledge of infrastructures but also the knowledge of farming insects in a safe way could be necessary for the food shortages in the future.

### **3 Conclusion**

Although my plan turned out to be impossible now, I was able to learn the food shortages deeply,and realized the importance of insects. Besides, I have no doubt that this study must be crucial to make the modern society sustainable. Hence, I would like to continue to pursue a solution to this problem.



#### 4 References

#### 動物性タンパク質源である昆虫食のエネルギー的可能性

Edible parts of a cow

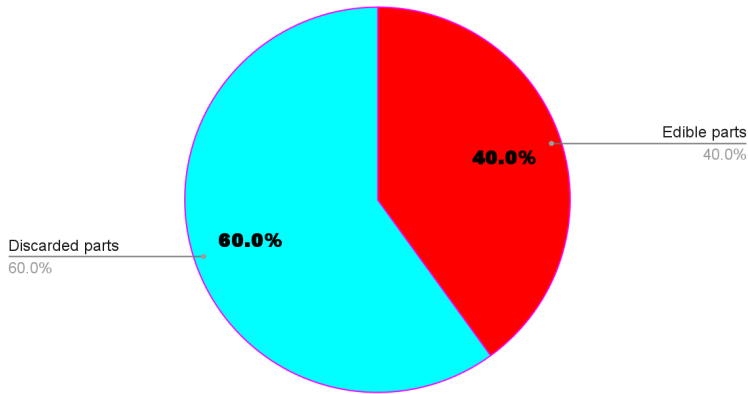


figure1

Ratio of edible parts of a glasshopper

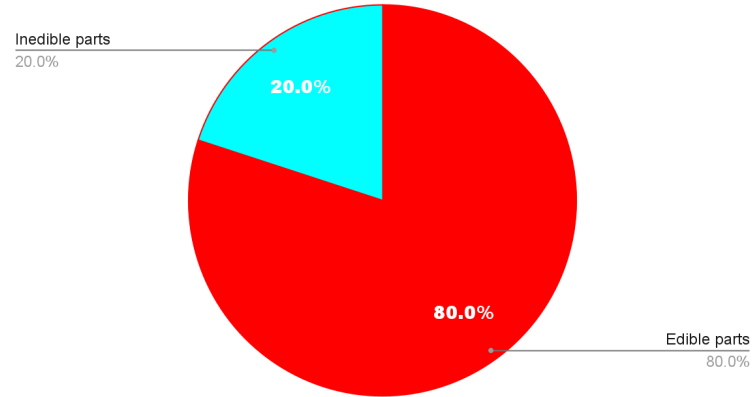


figure2

Indispensable amount of feed (kg)

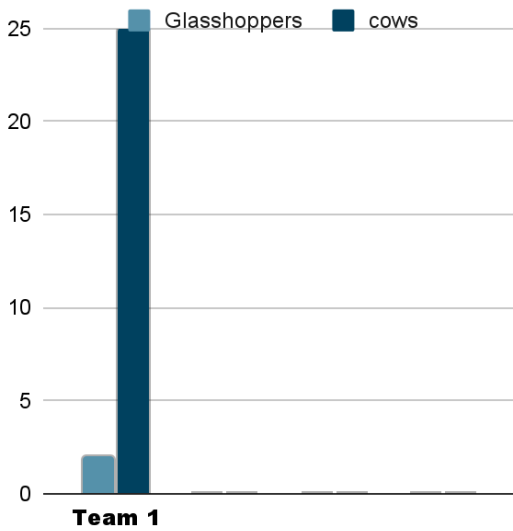
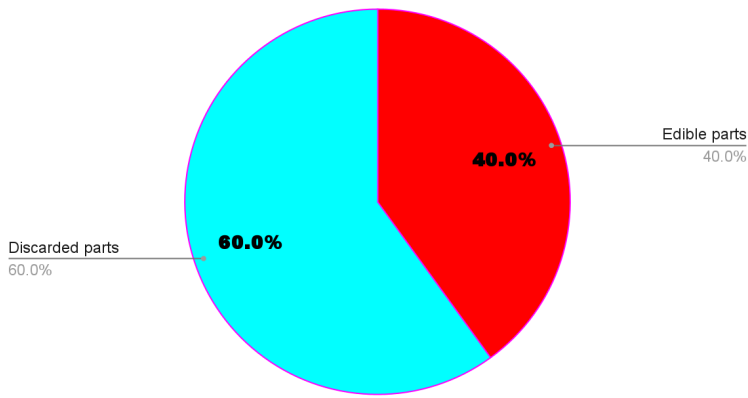


figure3

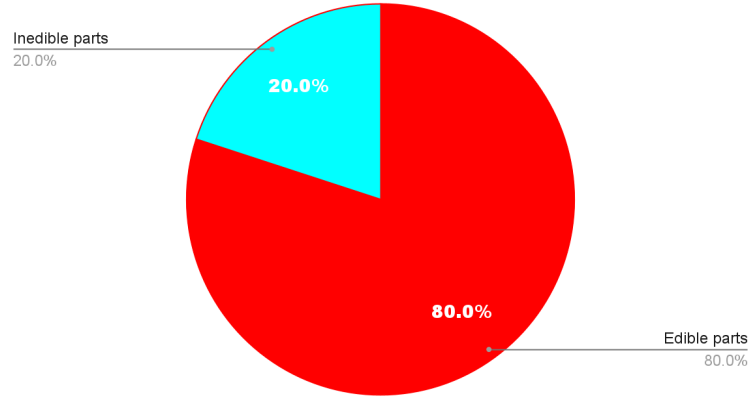




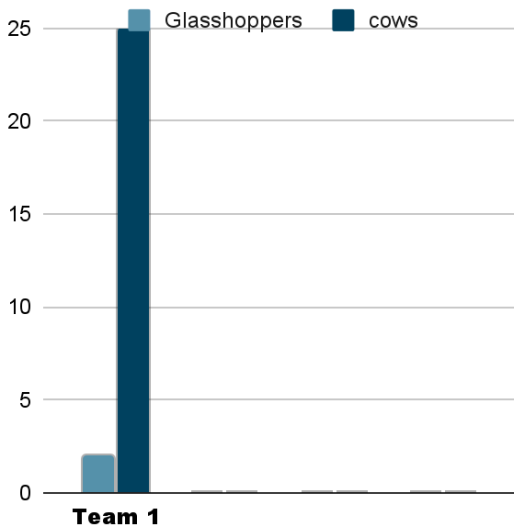
### Edible parts of a cow



### Ratio of edible parts of a glasshopper



### Indispensable amount of feed (kg)





# The future for ‘Young Carers’

～Recognize and Solve～

5205 Sakura Ohyama

## Abstract

Around the world, there are many children who help care for relatives with a disability, illness, mental illnesses, drug or alcohol problems. For example, they do extra tasks inside and outside the home, such as cooking, cleaning, dressing, and helping with moving around. Also, they may provide a lot of physical and emotional help to their parents, brothers or sisters who's disabled or ill. These children are called ‘Young Carers’. The problem of Young Carers is that they cannot or find it difficult to go to school for many reasons, such as lack of time and stress. To solve this problem, we have to realize them first. One of the problems of Young Carers is that they are unaware of themselves as Young Carers. Therefore, the first step is to find Young Carers. After finding them, it is indispensable to prepare the environment for them to have a fulfilling learning experience at school. Organizing recreational and learning sessions between Young Carers during lunch breaks and after school can be one solution. This would give children time away from their families. In addition, they will be able to connect with other children in similar situations, and reduce stress.

## 1 Introduction

Each of the Young Carers has their own issues and situations. They are unable to go to school and study as much as they need. They may also feel lonely and unable to reduce stress.

I had never heard the word ‘Young Carers’, but I noticed it at the age of 15. My mother’s friend’s daughter was a Young Carer. She had 3 younger sisters and brothers but no father. Her mother worked very hard to live, but did not have enough time to take care of her young daughter and son. Since then, the oldest sister has been taking care of them and her health has been damaged. I recognized that ‘Young Carers’ are close to us.

According to the study of Mr. Kawamoto Hideki(a visiting researcher at the Research and Development Center for Vocational Education), the research on Young Carers began in Japan around 2005, introducing the preceding research in the United Kingdom, but the question of who and how to support Young Carers is not yet recognized as a common issue even among professionals. In addition, it is necessary to continue conducting research with a broad perspective that goes beyond the conventional system of support. Also, the discovery of Young Carers and the presentation of specific methods to support them are the challenges for Young Carer research in Japan.

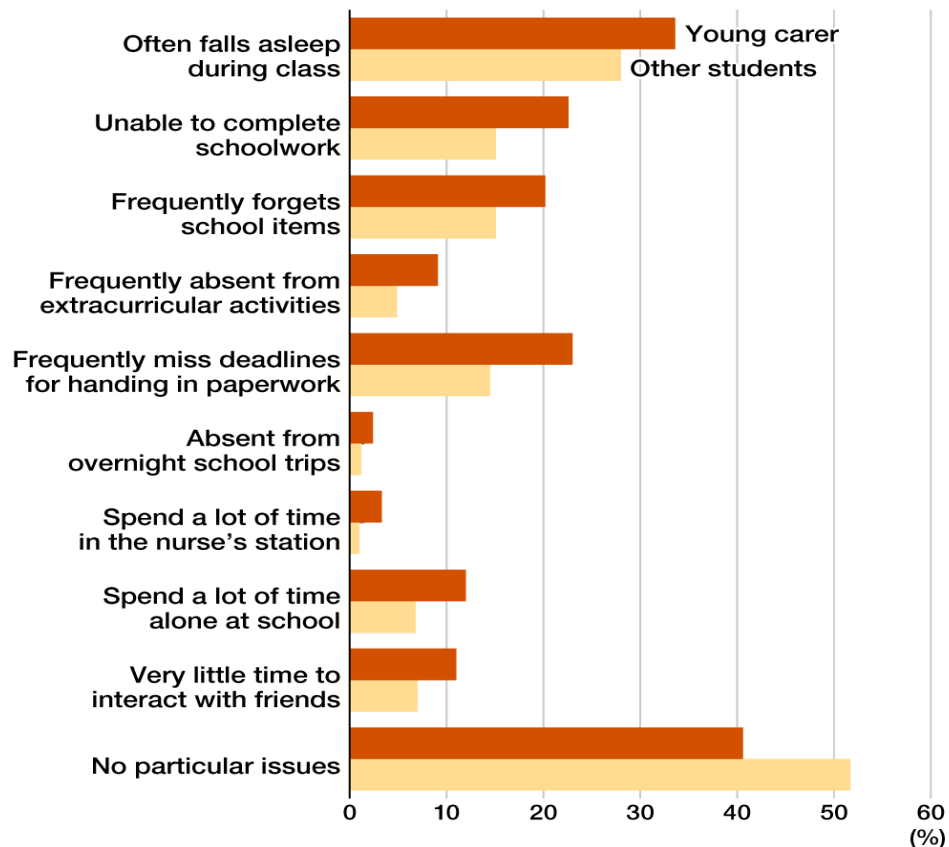
This study will investigate the way to discover and make opportunities that make it easier for Young Carers to study and enjoy their own time to rest. There are two ways to create opportunities: by preparing the environment for learning at school, and by preparing the environment at home. However, preparing the environment at home is difficult because each

child has their own issues, and it is hard to solve them directly. Therefore, the research question is “How Young Carers can be supported?”

## 2 Discussion and implications

A ‘Young Carer’ is the term used for children and young adults who have informal caring responsibilities, often for a family member. Legislation in England defines a ‘Young Carer’ as a ‘person under 18 who provides or intends to provide care for another person’.

### Effects on School Life of Young Carers



Created by *Nippon.com* based on a Ministry of Health, Labor, and Welfare research report into the conditions of young carers.

nippon.com

In Japan, 1 in 17 junior high school students is caring for a family member. Also, about 2% of them identify themselves as Young Carers. This shows that there is low awareness of the term Young Carer.

According to the graph above, there are many negative effects on the school life of Young Carers. For example, they spend more time alone or in the nurse's office at school, and frequently miss paperwork deadlines or forgets school items. From these things, Young Carers are unable to do enrichment studies at school and more likely to be absent from school.

To solve this problem, Takasaki city started ‘Young Carer SOS’, which provides services aimed at alleviating burdens in the lives of young carers by dispatching supporters who perform household chores and nursing care on behalf of young carers, free of charge. Not

only that, there are various kinds of support programs in various parts of Japan, although the number of young caregivers is increasing because they are not yet widely recognized.

In contrast, England and the United States are actively providing assistance.

In England, a local authority must take reasonable steps to identify the extent to which there are Young Carers within their area who have needs for support. They focus on recognizing and supporting each Young Carer. For example, there's a 'School Carer Support' that improves identification of Young Carers and sets out an offer of personalized support. In addition, it initiates and facilitates other services. England is the leading country in the support of Young Carers, and awareness of this issue is spreading in the country.

In the state of Florida in the United States, the American Association of Caregiving Youth (AACY), a non-profit organization, conducts stress management sessions in schools, mainly for Young Carers aged 12 to 18. In addition, lunchtime sessions are held for them in the school during lunch time, and study sessions are held to support them in their studies. Outside of school, they enjoy recreational activities such as picnics and camping with other Young Carers, allowing them time away from family care. Home visits and individualized support are also provided for them. After AACY-supported Young Carers entered high school, it is estimated that more than 97% of them successfully graduated from high school and more than 90% went on to college.

Not only England and the United States, but also various countries are taking measures to try to help them.

In India, the Right of Children to Free and Compulsory Education Act of 2009 provides that every child between the ages of 6 and 14 has the right to free and compulsory education in a neighborhood school until completion of primary education. The law effectively allows them to receive a break during the day. However, the majority of children with disabilities do not have access to or are not accepted by regular schools. Furthermore, there is no specific provision in the law that explicitly states that Young Carers are included. The Indian government already knows that they tend to drop out of school and attend irregularly because of their role in providing care. However, Carers Worldwide is working to change that by identifying and working with them to help them return to school, enabling them to make social connections with groups of Young Carers, and providing welfare assessments and support. Since 2012, around 300 young carers have returned to school.

### 3 Conclusion

From these contents, I got 2 suggestions for my research question. I thought it is necessary to recognize Young Carers first, based on the efforts of other countries. In Japan, many of them are unaware that they are Young Carers, so I considered that it would be better to focus on finding them first. There are many ways to find them. For example, teachers and social workers like lifestyle counselors will interview students who are frequently absent from school or who are unable to concentrate on their studies. After finding them, it is indispensable to prepare the environment for learning at school. For that, organizing recreational and learning sessions between young carers during lunch breaks and after school can be an effective way, not only because they can make time away from their family, but



also because sharing and talking with friends in similar situations can reduce their stress. For my challenges ahead, I would like to guess what we can do directly to support them. In addition, I want to consider whether there should be legislation for supporting them or not in Japan. There's legislation to support them in England, but not in the United States. It might raise the popularity of the term, and adequate services can be provided. I believe that Young Carers can live their lives more comfortably than now.

#### 4 References

「ヤングケアラーの現状と課題」

<https://diversity-oows.jp/wp-content/uploads/2021/02/youngcarer.pdf> (June.15.2023)

「ヤングケアラーに関する調査研究について」

[https://www.mext.go.jp/a\\_menu/shotou/seitoshidou/mext\\_01458.html](https://www.mext.go.jp/a_menu/shotou/seitoshidou/mext_01458.html) (June.15.2023)

「ヤングケアラー支援の先進地イギリス ソール・ベッカー教授に聞く」

<https://www.nhk.or.jp> (July.5.2023)

「海外のヤングケアラー支援の取り組みとは？日本のヤングケアラー支援における課題について解説」

<https://c4c.jp/carers/knowledge/youngcarer-overseas/> (July.5.2023)

“Global State of Caring”

<https://carersjapan.com/wp-content/uploads/2022/09/IACO-GSoC-Book-japanese-July11.pdf>  
(July.6.2023)

“Carer Passport”

<https://carerpassport.uk/education> (July.6.2023)

“Trends and Achievements in Young Carers Research in Japan”

Kawamoto Hideki

Vocational education center of research and development

[https://www.jstage.jst.go.jp/article/vetrdi/4/1/4\\_45/\\_pdf/-char/en](https://www.jstage.jst.go.jp/article/vetrdi/4/1/4_45/_pdf/-char/en) (August.18.2023)

“Young Carers: Survey Finds Alarming Number of Junior and Senior High Students Burdened and Isolated by Caregiving Roles”

<https://www.nippon.com/en/japan-data/h00997/> (September.14.2023)

# **Intuitive Learning**

## Gamification for dyslexia children

5206 Okada Kengo

### Abstract

This paper deals with education for children with dyslexia through gamification. In recent years, more and more dyslexics have been losing access to education. One factor is the difficulty of traditional learning. Conventional learning in this context refers to analog classes, where the teacher and student meet face-to-face. I propose to increase dyslexia's interest in education through more intuitive and comprehensible gamification using Minecraft. The advantages of this class include ease of operation, ease of comprehension of the lesson, and ease of equipment preparation. However, to achieve these satisfactorily, economic issues, more detailed big data, conflicts with traditional education, and specific lesson plans are problems. My future plan is to conduct research based on an educational approach to dyslexia in learning opportunities that are not limited to the narrow community of school education.

### 1. Introduction

In this paper, we discuss education for dyslexia using Minecraft. According to UNICEF, around 200 million children worldwide have perceptual, mental, or intellectual disabilities and are 49% more likely to be unable to attend school at all, 47% more likely to attend primary school, 33% more likely to attend junior high school and 27% more likely to attend high school, compared to children without disabilities. Dyslexia is a particularly well-known characteristic. On a smaller scale, the number of special-needs schools is increasing in Japan. This means that the demand for education for people with disabilities is increasing in Japan.

### 2. Discussion and implications

In recent years, the trend has been to make programming education compulsory in elementary schools and information subjects in upper secondary schools. However, the question has been raised as to whether disabled people are included in these subjects. The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) recommends, as one of the activity guidelines in the curriculum guidelines for special-needs schools, 'learning activities for children to acquire the logical thinking skills necessary to make the computer carry out the intended processing while experiencing programming'. This is indicated for persons with disabilities, including dyslexia, but to meet this criterion teachers have to assign them a certain number of difficult tasks. This leads to the concern that a gap may be created between the original objectives of information subjects and the content of the lessons.

In defining information education, MEXT states that "Information education is the development of children's ability to use information --- organized into the following three perspectives." It states. The "three perspectives" mentioned here are practical ability to use information, scientific understanding of information and attitude to participate in the

information society. The aforementioned logical thinking skills required for programming' is particularly important among these three perspectives.

I became interested in Minecraft when I heard the news that Mr. Hidekazu Shodo won the Global Teacher Prize (GTP), the Nobel Prize in education, for his lessons using Minecraft at Ritsumeikan Elementary School in Japan. Minecraft is not a full-fledged program like ordinary programming software, but one that allows children to construct and execute imperative expressions using blocks and letters that even they can understand. This makes it possible to visualize the imperative formulae, making programming easy to understand and motivating. Minecraft is a sandbox (a game that does not require adherence to a set strategy) video game developed in Java by Markus Persson and employees of Mojang Studios, which has now been acquired by Microsoft. The game allows players to enjoy survival living and building by freely arranging blocks, and is one of the most popular games in recent years. Minecraft has an educational version (Minecraft EE), which is a mode that is extremely tailored to the programming education environment. The main features are the Classroom Mode and the Code Builder. Minecraft EE allows 30 students to enter a world at the same time. Classroom Mode is a class progression support function for facilitating classes in Minecraft EE, for example, it displays a list of learners, allows you to keep track of who is where, and allows you to change learners' permissions and settings. Specifically, teachers can make various settings so that Minecraft can be utilized for learning purposes, such as setting blocks that prohibit use, restricting chat functions, distributing items to learners, and suspending Minecraft operations. The Code Builder is a system that allows programming to be carried out by assembling instruction blocks on the Code Builder, like other programming software, and allows for a higher rate of completion of large or complex tasks in Minecraft.

### 3. Conclusion

Finally, we discuss the limitations of this study. First, the quality of Minecraft classes in elementary schools varies depending on whether they are public or private. Compared to public schools, private schools pay a larger share of schooling costs in tuition fees. Thus, the quality of equipment and tools will differ. It is not possible to provide classes that are equal for all elementary and middle school students. Second, the target age group in this study was ambiguous. Elementary and junior high school students have different ways of thinking and understanding, and classes must be flexible enough to suit each.

Taking all of this into consideration, I would like to propose an intuitive approach to teaching dyslexia using Minecraft. However, the specific method of operation and the way to set up the environment are still unclear, so we would like to propose these in the future.

### 4. References

- Nearly 240 million children with disabilities around the world, UNICEF's most comprehensive statistical analysis finds  
<https://www.unicef.org/rosa/press-releases/nearly-240-million-children-disabilities-around-world-unicefs-most-comprehensive> (December 2)

- The United Nations recommends that Japan stop "special-needs education." In Europe and the U.S., inclusive education in which children with disabilities and normal children learn together is spreading. | (2022.9.26 Tokyo Shimbun Morning Edition)  
<https://sukusuku.tokyo-np.co.jp/education/60890/> (December 16)
- Programming Education Promotion Project for Young People | Promoting Programmatic Thinking Learning Using Minecraft for Education  
<https://www.soumu.go.jp/programming/019.htm> (November 24)
- Six features of the educational version of Minecraft  
[https://book.mynavi.jp/macfan/detail\\_summary/id=99802](https://book.mynavi.jp/macfan/detail_summary/id=99802)

# Reduction of Manpower Shortage for Prosthetists and Orthotists

## Use of 3D technology and organizational system

5207 Ono Hinata

### 1, Abstract

An orthotist is a healthcare professional who makes and fits braces and splints (orthoses) for people who need added support for body parts that have been weakened by injury, disease, or disorders of the nerves, muscles, or bones.

Today, prosthetists and orthotists are in short supply. Then I set the research question, "What innovations are needed for the future development of Japanese prosthetists and orthotists" and the solution to this problem was to improve work efficiency.

What is needed to improve work efficiency is the introduction of 3D technology.

However, most prosthetists and orthotists in Japan today belong to private companies so they cannot start large projects.

Based on the French example and the systems already proposed in Japan, we suggest that a group of 30% to 60% prosthetists and orthotists be formed to introduce 3D technology. This would increase the efficiency of prosthetists' work and help solve the man shortage.

### 2, Introduction

A prosthetist is a healthcare professional who makes and fits artificial limbs (prostheses) for people with disabilities. This includes artificial legs and arms for people who have had amputations due to conditions such as cancer, diabetes, or injury. Currently, about 200 prosthetists and orthotists are born every year. However, compared to the more than 100,000 physical therapists and 70,000 occupational therapists, there are only a little less than 5,000 certified prosthetists, which is an overwhelmingly small number. In the past, I had studied the solution to the shortage of prosthetists and orthotists by increasing the number of prosthetists and orthotists. The results showed that this was possible but difficult. Therefore, I started on a different front.

Then I set the research question, "What innovations are needed for the future development of Japanese prosthetists and orthotists?" I decided to solve the shortage of prosthetists by increasing work efficiency.

### 3, Discussion and implications

As a way to solve the manpower shortage problem of prosthetists and orthotists, I considered introducing 3D technology to improve work efficiency.

First, I researched other countries that use 3D technology in the production of prosthetics. In France, 3D digital technology has been in practical use as a production tool for prosthetics for about 20 years, and its name is 3D-CAD/CAM. Proteor, a French company that is introducing 3D digital technology, produces about 30% of the prosthetics in France, and 99% of the trunk orthoses are now produced by 3D-CAD/CAM. The 3D-CAD/CAM developed and used by Proteol is called "Orten". It consists of "Orten3DCam", a structure sensor attached to an iPad or iPhone with a dedicated app installed, "OrtenShape" software for model modification, and

"OrtenMake", a cutting machine for producing positive models. There are some advantages when using 3D-CAD/CAM compared to traditional plaster production. First, while plaster places a physical burden on the user and requires consideration for dirty, scanning can be completed in a short period of time and does not require concern for dirty. In addition, the ability to scan while lying down significantly reduces the burden on the user. Second, prosthetists and orthotists can send scan data, making it easy to work on production and modification from mold taking. Third, while plaster models are subjected to shaving correction, heaping correction, and angle correction by the prosthetist's senses, 3D-CAD/CAM enables the same model to be produced because the amount of such correction can be checked numerically and the data can be retained. In other words, the degree of precision increases. Fourth, compared to plaster models, 3D-CAD/CAM models are made of rigid polyurethane, which is lighter and significantly reduces the probability of back pain during handling. Fifth, the model does not require drying time. Thus, the fabrication of prosthetics devices using 3D-CAD/CAM has many advantages than conventional fabrication methods.

Also in Japan, a service called "eLabo" has been developed. It is a cloud service for prosthetists that uses 3D printing to manufacture and sell therapeutic insoles optimized for each individual's body and needs. This system is designed to solve the problems that arise when introducing 3D technology, such as learning period, cost, delivery time, and correction support. First, regarding the time required to learn the software, the application includes a guide function that allows each user to work on their own without taking time to learn the software. The cost of equipment will be reduced by downloading the application to your own laptop computer or tablet and registering as a user. The application will be cloud-based, and an offline mode will be included in anticipation of use at medical sites where radio wave transmission and reception is difficult. In addition, the central fab method of manufacturing has been adopted to increase the utilization rate of the 3D printer and reduce costs. The speed at which revisions can be made is also higher, so the issues of delivery time and revisions can be solved.

The reason why Japan has not introduced 3D technology is that prosthetists in Japan today often work for private companies and then go to work for hospitals because it is easier for them to produce and conduct research, but it is difficult for private companies to introduce new technology.

The similarity between the French example and eLabo is that they are merging the production of prosthetics and orthotics. Therefore, I thought it would be better for Japanese prosthetists and orthotists to merge as well, instead of working for each private company. However, that method temporarily develops a company, but in the long run, one company monopolizes the firms. Competition among firms is essential for the development of the industry. Even when I visited Yakult in Singapore, I heard that competition among companies is necessary for the development of the industry. Yakult currently accounts for about 60% of the same firms.

Since "Proteor" in France accounted for 30% of the total, I thought that a cohesive group of 30% to 60% would make it easier to incorporate the technology as a large company while maintaining competition.

#### 4,Conclusion

As a conclusion to the research question, "What innovations are needed for the future development of Japanese prosthetists and orthotists", the work efficiency needs to be improved. Therefore I suggest creating a group of 30% to 60% prosthetists and orthotists instead of each small private company. We will be able to bring 3D technology to those groups. This would increase the efficiency of prosthetists' work and help solve the man shortage.

#### References

Survey on collaboration between staff and physicians involved in prosthetic limb production(May 5,2022)

[https://igakkai.kms-igakkai.com/wp/wp-content/uploads/2020ky/ippannkyouyou46\)61-70.2020.pdf](https://igakkai.kms-igakkai.com/wp/wp-content/uploads/2020ky/ippannkyouyou46)61-70.2020.pdf)

3D digital technology in the field of prosthetics and orthotics in Japan(September 9,2022)

[https://www.jstage.jst.go.jp/article/jspo/36/3/36\\_198/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/jspo/36/3/36_198/_pdf/-char/ja)

3D digital technology in the field of prosthetics and orthotics in France(November 7,2022)

[https://www.jstage.jst.go.jp/article/jspo/36/3/36\\_194/\\_article/-char/ja/](https://www.jstage.jst.go.jp/article/jspo/36/3/36_194/_article/-char/ja/)

Toward Social Implementation of 3D Digital Orthotics(November 7,2022)

<https://sig4dff.org/conference/2020/proceeding/OP12.pdf>

Occupational and Physical Therapists by the Numbers (Journary 10,2023)

<https://www.isu.ac.jp/medipro/therapist.html>

job medley (Journary 10,2023)

<https://job-medley.com/tips/detail/374/>

Examples of Prosthetist Work(Journey 10,2023)

<https://www.mhlw.go.jp/content/10800000/000825602.pdf>

MIRAIKUS Why is Japan's population of people with disabilities increasing now?(April 24,2023)

<https://miraix.jp/find/post-050/>

# For Children To Be Children

## Easy access to education for all

5207 Katayama Kiichiro

### Abstract

According to a 2019 report by UNICEF, nearly 258 million children cannot go to school, and more than one-third of them, 104 million, are affected by conflict and natural disasters. The aim of this research is to increase the number of children who access education. There are economic, regional, and structural causes for educational disparities. These problems cause a negative spiral in which a child becomes an adult without improvement in economic and community convenience, and that child again does not receive an adequate education. I'll think about economic causes in this research. In poor communities, it is difficult to procure supplies for school. For this reason, developed countries donate school supplies. My suggestion is to conduct a donation activity which is currently done by individuals in each school in developed countries. It is a positive way to collect more school supplies and decrease postage. Also, since many people who do not donate feel that they do not know if their donations are really helping, I think it is necessary to show the results of their donations. In addition, we can donate various things instead of school supplies. I would like to focus on this kind of activity and think about an environment that is easy for all children to live in.

### Introduction

I became interested in educational disparity in the process of researching social problems occurring around the world, and decided to do research on the subject. Educational disparity refers to the disparity in education depending on the place of birth and upbringing and the environment. Currently, many children are unable to receive a proper education. One of the reasons why educational disparities remain unresolved is the negative cycle of poverty. When a child grows up in a poor environment, he or she is forced to work or help out at home to make a living, and there is no money to send the child to school, so the child is unable to receive an adequate education. As a result, the children who are born into the world are forced to suffer the same fate as their parents. To stop this cycle, we need to change the poor environment while making education more accessible. Poverty is one of the world's most serious problems, with nearly one in ten people in the world living on less than \$1.9 a day. We want to think about what we can do to ensure that children around the world have equal access to education as we do.



## Discussion and implications

Looking at the global education gap, developing countries do not have sufficient access to education as well as quality of education. According to a 2019 report by the United Nations Children's Fund (UNICEF), nearly 258 million, or almost one in six children aged 6 to 17 worldwide, are out of school, and more than one-third of them, or 104 million, are affected by conflict and natural disasters. Sub-Saharan Africa is especially more serious than other areas. 19% of boys and 24% of girls are not able to enroll in school there. It is a very significant problem and should be resolved quickly.

The educational disparity causes various problems for children. They are not able to read, write, or perform simple calculations and get knowledge and information necessary for daily life. It will have a bad effect for children to choose their jobs in the future. They will not be able to get enough income and escape poverty. Also, it is difficult for them to obtain adequate nutrition. In addition, many children are more susceptible to disease and lack access to proper medical care.

There are three causes of educational disparities. First, economic cause. It is not a small burden for poor families to send their children to school. It is said that one in ten people live on less than \$1.9 a day. Helping at home or taking care of younger siblings is more important than going to school. In some cases, children have to work for their life. In this way, poverty is depriving children of their right to an education. Second, local cause. There is a large educational gap between urban and rural areas in developing countries. In particular, the number of teachers and schools is different. Therefore, there are also disparities in access to education by region. Third, structural cause. Structural cause means that various causes cause a negative spiral in which a child becomes an adult without improvement in economic and community inconvenience, and that child again does not receive an adequate education. This negative cycle continues from parents to children and from children to grandchildren, and it is difficult to escape.

When I thought about what I could do, I realized that regional and structural causes among the three would be difficult to solve by myself, so I thought about solving economic causes.

In poor communities, it is difficult to procure supplies to go to school. For this reason, developed countries donate school supplies. It is a very good thing, but it is done privately. Therefore, it takes some money when people send boxes which are in school supplies. In addition, looking at graph 1 below, the number of people who donate school items is a few. I think it has become a burden for them. Also, a lot of people do not know how to donate or that they can donate themselves. People can know them by using the Internet, but I think that they have few opportunities to research donations.

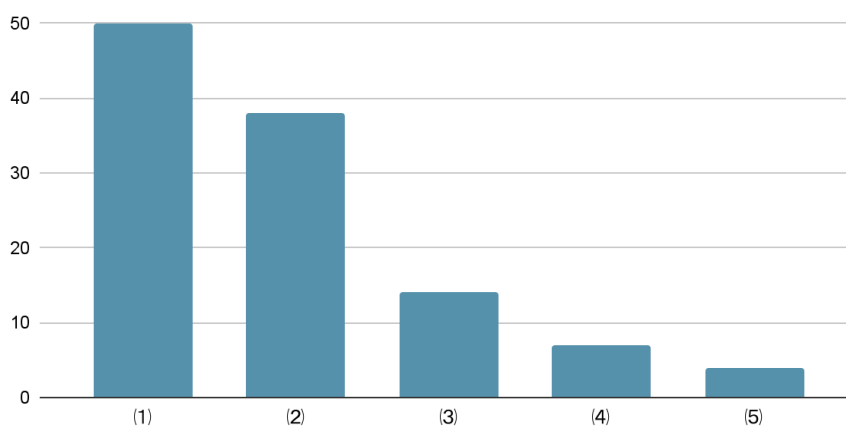
For these problems, I think that it is good for children to conduct this donation activity which is currently done by individuals in public places such as schools, hospitals, or city halls. If donations are conducted in public places, NPOs and other donor organizations can collect more school supplies and decrease postage. Also, people can donate more easily than now. In addition, people see donation boxes when they visit public buildings, so it is a good way to increase the number of people who are interested in donating. Moreover, they do not have to pay shipping charges. Nowadays, they need to pay for transportation when they send school

items. This big burden becomes a bad effect for them to donate. Therefore, donating in public spaces is a good way to make donations easy and increase the number of people donating.

Since many people who do not donate feel that they do not know if their donations are really helping. Looking at the graph 2 below, people who are not sure how the money will be used are most in the people who do not donate. It is necessary to show the results of their donations in a clear and concrete manner. Also, it is necessary to think about who pays transportation costs. Until now, the donors themselves have paid for it and the donor organizations have not.

graph 1 [source: Good Service]

***How did you dispose of items that your children used in elementary school and have no use for now? (%)***



(1) Keeping as a souvenir

(2) Disposed

(3) Gave to someone

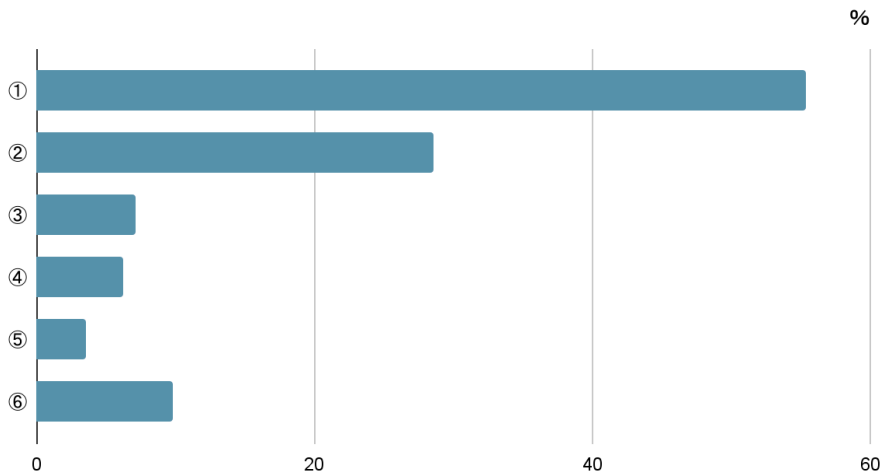
(4) Donated

(5) others

<https://prtimes.jp/main/html/rd/p/000000012.000047059.html>

graph 2 [source: Career mam]

### Why not donate to the donation box?



- ① Not sure how it will be used.
- ② Cannot afford to spend money
- ③ shy
- ④ Not necessary
- ⑤ Not notice the boxes
- ⑥ others

<https://www.c-mam.co.jp/shufu-labo/research/e/001596.php>

In addition, I recently learned that people donate a variety of other things besides school supplies for children in impoverished areas. For example, there is the Reborn Project called “REBORN”, an initiative to convert donated disposable items into polio vaccines for children to consume. The polio vaccine is one of the vaccines against the new type of coronavirus, and is available for children as young as six months of age, and is widely used in Japan.

From now on, I would like to focus on this kind of activity.

I want to help a lot of children by using this donation system and vaccines.

### Conclusion

I have studied the education gap for an environment in which all children can access education easily. These days, a lot of children cannot go to school for various reasons. I want to save these children because all children should have the right to access education.

My suggestion is to conduct this donation activity which is currently done by individuals in public places such as schools, hospitals, or city halls. Donations which are conducted in public places is a good way for NPOs and other donor organizations to collect more school supplies and decrease postage. Also, people can see donation boxes when they visit public buildings, so the number of people who are interested in donating definitely increases.

Moreover, it would reduce transportation costs.

However, a lot of people who do not donate think if their donations are really helping. Therefore, I suggest a system of exchange between children who live in poor areas and people who live in developed countries. We send some goods and money for children's school life, and children receive them. Also, children report their life regularly.

A lot of children cannot go to school in recent years. This is a strange thing. All children should have the right to accept education. I want to change the situation now for the children's bright future. I believe donation becomes the key to solving this problem.

## References

- ・教育格差とは？問題の原因から対策までを分かりやすく解説！【2022 May 20】  
<https://naruhodosdgs.jp/education-gap-issue-cause/>
- ・【10分でわかる】日本と世界の教育格差の現状と原因を詳しく解説【2022 May 20】  
[https://www.worldvision.jp/children/education\\_12.html](https://www.worldvision.jp/children/education_12.html)
- ・世界で深刻な教育問題。各国の制度や男女格差【2022 August 26】  
<https://gooddo.jp/magazine/education/>
- ・貧困と世界の子どもたち - ワールド・ビジョン・ジャパン【2022 September 4】  
<https://www.worldvision.jp/children/poverty.html>
- ・文房具を寄付・寄贈する方法は？主な寄付先や送る前の注意点も【2022 September 4】  
<https://hedge.guide/feature/stationary-donate-donation-before-sending-important-point.html>
- ・学用品を送る | 物を贈って支援 | ご支援/ご寄付 | 国際協力NGOジョイセフ (JOICFP)【2022 September 8】  
[https://www.joicfp.or.jp/jpn/donate/support/school\\_things/](https://www.joicfp.or.jp/jpn/donate/support/school_things/)
- ・中古の文房具を途上国の子供達へ寄付しませんか？無料回収します (2060.jp)【2022 September30】  
<https://www.2060.jp/qanda/572.html>
- ・文房具の寄付を募集、海外支援に役立ってます。鉛筆(えんぴつ)ノートなど使いかけ中古品の寄付募集 (world--gift.com)【2022October 3】  
<https://world--gift.com/kihu/bunbougou-1.html>
- ・変わる、世界と日本の教育(図①、図②、図③)【2022 November 4】  
[https://www.jica.go.jp/publication/mundi/1804/201804\\_02\\_02.html](https://www.jica.go.jp/publication/mundi/1804/201804_02_02.html)
- ・子どもの貧困と教育格差【2022 November 18】  
<https://cfc.or.jp/problem/>
- ・文房具を途上国や児童養護施設へ寄付して、迷惑にならない？本当に現地の役に立つ支援の仕方(寄付ナビ)【2022 Desember 2】

<https://kifunavi.jp/howto/stationery/#1-3>

・【8割以上が不用品をごみとして捨てている！？】不用品の寄付で海外の子どもたちのワク  
チンに...！(PR TIMES) (図④)【2022 Desember 2】

<https://prtimes.jp/main/html/rd/p/000000012.000047059.html>

・内閣府NPOホームページ (TOP > 寄附について > 寄附を知ろう > 寄附理由)【2022  
Desember 9】

<https://www.npo-homepage.go.jp/kifu/kifu-shirou/kifu-riyuu>

・career mam (トップ>HOME主婦と消費行動研究所>ほんねリサーチ)  
【2023 June 5】

<http://www.c-mam.co.jp/shufu-labo/research/e/001596.php>

・リボーンプロジェクトby RETRADING【2023 Nobember 6】

<https://www.kataduke-kaitori.com/reborn/>

・【8割以上が不用品をごみとして捨てている！？】不用品の寄付で海外の子どもたちのワク  
チンに...！【2023 November 6】

<https://prtimes.jp/main/html/rd/p/000000012.000047059.html>

・アフリカに教育支援が必要な理由【2024 Fedruary 7】

<https://www.unicef.or.jp/sfa/report/reason.html>

・チャイルドスポンサーになるなら、どこがいい？ 寄付で子どもを支援する「スポンサーシッ  
プ」4選(寄付ナビ)【2024 Fedruary 7】

<https://kifunavi.jp/nonprofits/sponsorship/>

# Improvement of Non-verbal Communication Skills

~Communicate our intentions in non-verbal ways~

5209 Katsuki Osuke

## 1 Abstract

Mehlavian (1968) stated that in human communication, "verbal is 7% and non-verbal is 93%." If 90% of our daily conversation consists of non-verbal communication, then this ability to express oneself non-verbally is something that should be improved. There are many languages in the world. Japanese, French, German, and many others come to mind, but in fact, it is said that there are approximately 6,900 languages in the world. That is how many languages and cultures there are in the world. It seems impossible to communicate with people from all over the world. In order to eliminate the gap in communication as much as possible, I will continue my research on the theme of improving non-verbal communication skills. I am also interested in physical expression. During this research, I would like to find a good way to improve my own ability to express myself.

## 2 Discussion and implications

### ( i ) What is nonverbal communication?

Nonverbal communication is communication that uses non-verbal information, and there are various types of nonverbal communication, such as facial expressions, eye contact, posture, and gestures. The researcher Mehlavian derived the rule that total impression of the message is 100%, the verbal content accounts for 7%, voice and sound quality for 38%, and facial expressions and gestures for 55%. Nonverbal communication is more important than verbal communication when we communicate through face-to-face interaction.

The types of nonverbal communication are as follows.

Body movements: facial expressions, posture, eye contact, gestures, etc.

Physical characteristics, such as style, hair, and skin color, etc.

Contact behaviors, such as touching oneself or others.

Peripheral language: intonation, pace of speech, loudness, and pitch of voice, etc.

Spatial behavior: distance from others, personal space, etc.

Artifact use: makeup, clothing, ornaments, etc.

Environment": architectural style, interior design, lighting, etc.

Although there are many different types of behaviors, this study will focus on "physical behavior," especially facial expressions and gestures.

### ( ii ) Facial expressions

In the wide variety of nonverbal communication, the meaning of "facial expressions" has been the subject of great interest and study since the earliest times. Faces contain a great deal of information, including biological attributes such as gender and age, speech information indicated by mouth movements, social attributes, and psychological states such as emotions, intentions, and interests. In addition, the face has more than 20 facial muscles, and it is said that there are more than 60 types of facial expressions that can be intentionally expressed using these muscles. In addition, facial expressions have the characteristic of universality. For

example, language varies from culture to culture. Therefore, sufficient linguistic communication between different cultures requires familiarity with the language. However, even though cultures differ, the biological structure of the face remains almost the same. Therefore, what is expressed by facial expressions is considered to have a certain degree of universality. It can be said that facial expressions are an indispensable element in improving the nonverbal communication skills of people around the world in one way or another.

One previous study dealing with the universality of facial expressions was this one. It investigated whether people in the New Guinea highlands, who have little contact with Western cultures, can correctly discriminate Western facial expressions. The subjects were asked to read an emotional passage and then shown photographs of three different emotional expressions and asked to choose the one that best matched the passage. The results showed that most of the facial expressions were answered correctly. This suggests that the use of facial expressions to express emotion is highly universal.

### (iii) Gestures

Gestures and other expressions contain a great deal of communicative information. These are considered to be both innate and acquired. Regarding physical actions, researcher Maurice (1999) classifies them into four types according to how they are acquired: innate actions, discovered actions (actions that are naturally discovered and acquired based on the physical structure, such as arm-folding), assimilated actions (actions that are naturally acquired by imitating the behavior of others), and trained actions. However, these four types are not necessarily independent of each other, but rather compound each other to produce a wide variety of body movements. He has also conducted research on the meaning of gestures in European countries. From the data obtained, he calculates a distance called gesture distance and examines the closeness of European cultures in communication.

Kurokawa (1994) also classified them into five categories. Representations are replaceable with words and represent some matter by themselves. Exemplifiers are used with utterances and are used to point to something or to emphasize a thing. Emotional expressions literally express emotions. For example, making a fist when angry or holding one's head when troubled. Coordinators coordinate speech, and nodding is considered to be one of them. Adaptors represent a kind of defensive response. For example, they are behaviors to adapt to the situation at hand, such as scratching their head or rubbing their head. Posture is also considered to be important, although in a slightly different lineage. For example, in a communicative situation with a close partner, forward leaning and postural reverberation (assuming the same posture as the partner) are often observed. Conversely, leaning backward, folding one's arms, or crossing one's legs are said to have the meaning of creating a barrier between the two parties. It has also been pointed out that a relaxed posture, such as leaning on something or lowering one's arms and shoulders, may indicate openness, but it can also be a sign of dominance or rejection toward the other person.

### 3 Conclusion

I am now considering doing the following three things. The first is to hold workshops. There, we will learn about nonverbal communication and actually try to move our body in our daily conversation. The second is to add it to school education. I think it is important to

learn one of the most important skills for living in society. The third is to create a gesture map. The third is to create a map of the world where people can see information such as "this gesture is used in this country" or "this gesture is considered rude in this country. This will make communication in that country safer and smoother. I propose these three things. I believe that these will improve non-verbal communication skills around the world.

#### 4 References

国によって違うジェスチャー100選

<https://business-textbooks.com/gesture100/>

コミュニケーションにおける表情および身体動作の役割

<https://core.ac.uk/download/pdf/144431824.pdf>

英会話の最中、外国人が表情豊かに見えるのはどうして？

<https://www.rarejob.com/englishlab/column/20200805/>

非言語コミュニケーションとは？ 93%は非言語で伝達！ 具体的な表情の使い方など

<https://www.kaonavi.jp/dictionary/non-verbal-communication/>

社会課題を解決するためのコミュニケーション能力の開発

<https://www.ssi.osaka-u.ac.jp/activity/core/communication3/>

世界で使えるハンドサイン

<https://hugkum.sho.jp/288203>

ICONSPEAKの詳細

<https://nlab.itmedia.co.jp/nl/articles/1604/17/news025.html>

非言語コミュニケーションによる異文化交流アプリケーションを用いたネパールでの実験報告

[https://muroran-it.repo.nii.ac.jp/?action=pages\\_view\\_main&active\\_action=repository\\_view\\_main\\_item\\_detail&item\\_id=9486&item\\_no=1&page\\_id=13&block\\_id=21](https://muroran-it.repo.nii.ac.jp/?action=pages_view_main&active_action=repository_view_main_item_detail&item_id=9486&item_no=1&page_id=13&block_id=21)

ジェスチャーの使用頻度に関する実証的研究

[https://www.kandagaigo.ac.jp/memorial/history/archive/post/files/pdf/12\\_03.pdf](https://www.kandagaigo.ac.jp/memorial/history/archive/post/files/pdf/12_03.pdf)

言語教育と思想形成

[https://www.jacp.org/wp-content/uploads/2016/04/1976\\_03\\_hikaku\\_07\\_sato.pdf](https://www.jacp.org/wp-content/uploads/2016/04/1976_03_hikaku_07_sato.pdf)



# Promote Domestic Production of Avocados

## sustainable consumerism

5210 Kita Kanami

### **Abstract**

This study considers the domestic production of avocados in Japan to alleviate environmental problems such as water shortages and deforestation caused by the avocados boom, as well as the burden placed on the people in the production areas. The environmental problems caused by avocados are serious, and at this point it is difficult to say that production and consumption are sustainable. However, the cultivation of avocados is quite profitable, and there is a growing movement to produce avocados domestically in Japan.

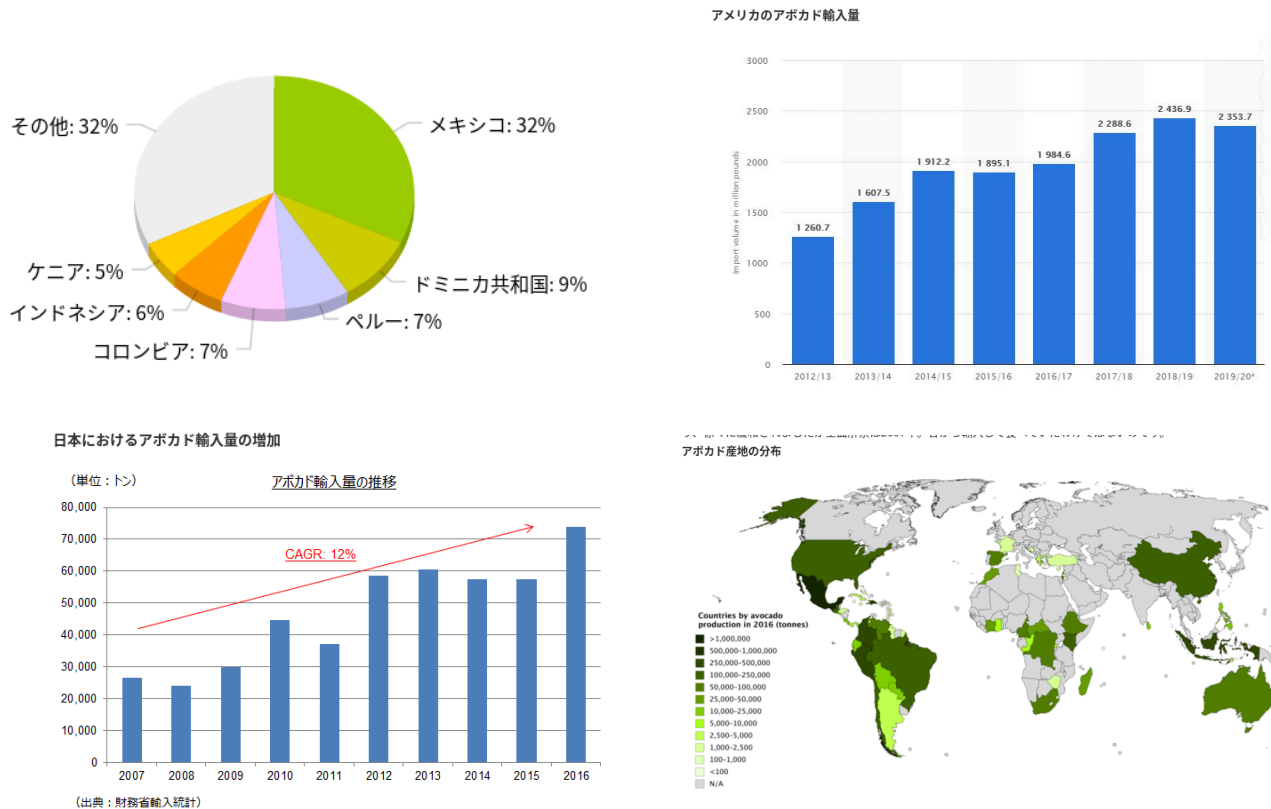
### **1,Introduction**

Avocados have become a popular fruit in recent years, especially in developed countries, due to their health and beauty benefits. It is said to be "the fastest growing fruit in consumption" worldwide. As the price of avocados has risen, farmers in the production areas have been able to live a wealthy life. However, the increase in avocados production has led to environmental destruction and human rights violations in the production areas. An example of environmental destruction is the severe shortage of water. Growing avocados requires 1,800 cubic meters of water per ton, and in Mexico, 3,800 Olympic swimming pools are consumed in one day for avocados production. Consuming avocados in developed countries is a virtual water equivalent to consuming water in the avocado-producing regions, and it is no exaggeration to say that the avocados issue is left to the responsibility of the consumer. Another problem is the deforestation that is taking place to expand avocado fields and the carbon dioxide emitted when avocados are exported. On the other hand, the cultivation of avocados in Japan has been attracting attention in recent years. Avocados are essentially a tropical fruit and have been actively cultivated in Mexico and Chile in South America. However, global warming has made it possible to grow it in temperate Japan. The purpose of this study is to solve the problems occurring in avocados producing areas by domestically producing avocados in Japan, a country that is a consumer of avocados.

The research question for this study is "What is the best approach to domestic production of avocados in Japan in order to solve environmental problems in the avocado growing areas?" By conducting this study, I hope to derive solutions to water scarcity and deforestation in avocado production areas. I believe that the avocado production areas of the world are unevenly distributed in some regions. The global avocado boom has led to a rapid increase in avocado consumption, and the environment continues to be burdened by the need to keep up with production. Many countries, like Japan, depend on imports for avocados. In order to break out of this situation and achieve a sustainable consumption lifestyle, we believed it was necessary to decentralize production sites and incorporate local production for local consumption.

### **2,Discussion and implications**

Avocados are a popular fruit worldwide today. Avocados are nutritious and good for health and beauty. In the United States, the largest consumer of avocados, the style of eating "guacamole," a paste of avocado, while watching sports on TV has become popular. For example, it is estimated that approximately 300 million avocados are consumed during the Super Bowl, the championship game of the professional football league, in just a few days in February. Consumption has quickly expanded, especially in developed countries seeking a healthy diet, and global avocado imports have more than quadrupled in the past decade. In the ranking of avocado importing countries in 2020, the United States and Japan are ranked first and eighth, respectively, with developed countries dominating the top rank. Avocado consumption in Japan has increased over the past few years, relying almost entirely on imports from Mexico. Mexico is the largest producer of avocados, producing more than 30% of the world's avocados, and avocado profits have enabled once poor farmers to become wealthy.



However, as avocado production increased dramatically with the expansion of avocado consumption, water shortages, deforestation, and other environmental problems became an issue in avocado-producing regions. Farmers who grow avocados are suffering from severe water shortages. Each avocado requires 70 liters of water to grow, a very high level compared to many crops. Originally from Central and South America, avocados are still mostly produced in tropical regions such as Mexico, Dominica, and Peru, but production is increasing rapidly as global demand increases. In the case of Mexico, the largest producer, both production and arable land area have nearly doubled over the past decade. In general, the continued production of certain crops in large quantities tends to destroy the land,

especially avocados, which require large amounts of water, and the production of avocados has increased rapidly, which in turn has led to an increase in illegal deforestation. Avocados are originally an arid-zone crop, with some years of low rainfall in areas suitable for cultivation. However, prioritizing the deal will lead to forced watering without regard to the natural cycle, causing severe water shortages in the area. Additionally, water shortages due to avocado cultivation cause unexpected earthquakes. In Uruapan in Midwestern Mexico, where avocado cultivation is thriving, the ground shook repeatedly, at times more than 3,000 times in a month. The local government announced that excessive avocado cultivation had reduced the amount of water in the ground, creating large cavities in the strata just below the surface.

Crops and livestock products are almost always produced by consuming water. Importing these products from abroad also means consuming local water. This is a concept known as “virtual water”. As affluent countries become more beauty and health conscious, importing more avocados from tropical countries will also increase the amount of virtual water. In other words, the lifestyle of the rich country is partly responsible for the lack of water in the avocado-producing areas.

Avocados, whose production is concentrated in tropical countries, also generate a large amount of carbon dioxide in their transportation. The transportation of two avocados produces an average of 846.36 grams of carbon dioxide, which is about twice the 480 grams required to transport one kilogram of bananas. The current avocado boom is in some ways counterproductive to the fight against global warming, and part of the reason for this is consumer behavior.

Avocados are essentially a fruit grown in the tropics and subtropics. Global warming has made it possible to grow in temperate Japan. In 2021, the Ministry of Agriculture, Forestry and Fisheries revised its climate change adaptation plan. Promoting the development of high temperature tolerant varieties and focusing on agriculture that reverses global warming. Avocado cultivation is one such case, where imported products were distributed in Japan. Avocado production in Japan is only 2.8 tons in 2019. There are only 23 hectares under crop. Only 0.015% of avocados distributed in Japan are domestically grown.

In some cases, citrus farmers have started growing avocados. In Matsuyama City, global warming has caused a fruit peel disorder in Onshu mandarins, making it difficult to grow citrus fruits. For this reason, the city has been supplying seedlings to farmers since 2009, aiming to become the largest avocado producer in Japan. By 2021, about 180 producers will have grown 13 hectares. The Matsuyama Agricultural, Forestry and Marine Products Branding Promotion Council has certified "Matsuyama Avocado" as a brand. Orange Foods, a food wholesaler responsible for 30% of avocados produced in Matsuyama, has been promoting sales mainly to department stores in major cities and other out-of-prefecture areas, but plans to increase awareness of its products in the local community.

The festival held in Kagawa Prefecture attracted a total of 500 people over the two days. Cultivation is spreading mainly in western Japan, including citrus production areas such as Wakayama and Ehime prefectures, and Kyushu. Avocados are best grown in warm, well-drained, irrigated garden areas. There are many techniques in common with citrus, such as tree management and pruning, and there are advantages to utilizing the know-how of fruit tree farmers.

However, there are challenges due to the short history of cultivation. In many cases, farmers hear about cultivation methods from others and grow their crops through trial and error. The bottleneck is the fragile production base, with expensive seedlings and few registered pesticides. Government and research institutions should establish techniques for teaching farmers.

### **3,Conclusion**

I believe it is important to communicate the benefits of domestic production of avocados in Japan. Domestic production of avocados will help solve the environmental problems and human rights violations that occur in tropical regions and the carbon dioxide emissions generated when exporting avocados to Japan. Avocados, with their high unit price and growing consumption, are attracting attention as a new crop in Japan's tangerine-growing regions, which are facing problems such as declining profits and increasing abandonment of cultivated land. I believe that abandoned mandarin orchard lands should be utilized for avocado cultivation and that techniques for avocado cultivation should be established.

### **4,References**

<https://www3.nhk.or.jp/news/html/20220614/k10013670611000.html>

An Inconvenient Fact About the Avocado Boom Environmental issues and even kidnappings? (2023/11/20)

<https://www.kudamononavi.com/graph/worlddata/item=avocados>

Ranking of avocado production areas around the world (2023/11/20)

<https://www.sunhope.com/mailmagazine/443/>

Avocado Situation in the World (2023/11/20)

<https://lookat-sdgs.com/column/900/>

SDGs Issues Hidden in Familiar Food (2023/11/20)

<https://minorasu.basf.co.jp/80390>

“Domestic production of avocados” is hot right now! Its profitability and tips for stable cultivation in Japan (2023/11/20)

[https://agri.mynavi.jp/2022\\_12\\_01\\_211112/](https://agri.mynavi.jp/2022_12_01_211112/)

Toward the challenge of cultivating avocados in Japan Building Soil and Friendship (2023/12/18)

<https://www.agrinews.co.jp/opinion/index/131797>

Domestic Avocado Recovery Hurry up to establish cultivation techniques (2023/12/18)

<https://japanavocadogrowers.com/>

Japan Avocado Growers Association (2023/12/18)



# Utilization Of Free market

## ～Food Redistribution～

5211 栗原大輝

### **Abstract**

My research aims to solve hunger by using the free market. It is the store which provides food to the poor for free. I want to put this into practical use in Japan and contribute to solving hunger.

There are countless benefits to solve hunger. First, what we get from solving hunger is related to various things which have anything to do with human activity and they will bring great benefits. Second, as the world's population increases, demands for food are expected to rise to 1.5 times its current level by 2050, while the world's population growth may not affect Japan. Japan is also affected because Japan depends on imports for its food supply. Third, as the yen has weakened, prices in Japan have risen. Tax increases not only make life difficult for common people, but also put pressure on the lives of people in need.

The current situation of world hunger shows that it is widely distributed. According to the United Nations, global hunger is on the rise.

The current state of hunger in Japan is that one in twenty people is starving. Poverty rates are particularly high in Okinawa and Kagoshima.

In order to solve these current problems, I propose the practical application of free markets in Japan. It distributes food for free to poor people. This idea is based on something called OzHarvest Market in Australia. The main advantage of this is that it can tackle both poverty and food waste at the same time. However, it is unstable because it depends on donations for operation. We would like to utilize crowdfunding and donations to raise funds.

### **introduction**

Initially, I chose the main subject of my research from SDGs. The theme which made me interested was hunger. I thought that if we were able to increase human resources through starvation, it would be an opportunity to solve various problems such as water shortage, urban depopulation and population decline, because of increasing potential for new technology development.

There are numberless benefits to solve hunger, but I focused on three.

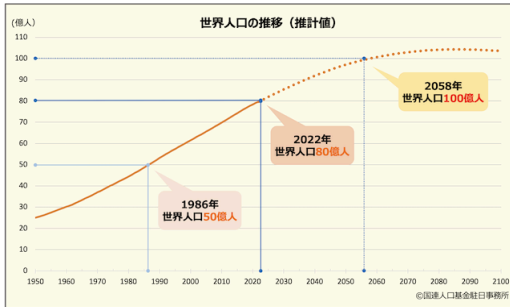
First, what we obtain from solving hunger is related to various things which have anything to do with human activity and they will bring great benefits such as an increase in the labor force, being able to save lives.

Second, as the world's population increases, demand for food is expected to rise to 1.5 times its current level by 2050. While the world's population growth may not affect Japan. Japan is

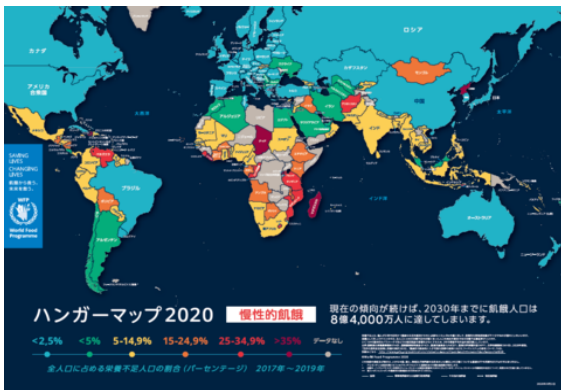
also affected because Japan depends on imports for its food supply. Japan's food self-sufficiency rate is only about 40%.

Third, as the yen has weakened, prices in Japan have risen. Tax increases not only make life difficult for common people, but also put pressure on the lives of people in need.

## Discussion and implication



According to the graph on the left, the world's population is increasing and will reach 10 billion people by 2058. Along with that, global demand for grains is expected to increase by 1.5 times and demand for livestock products by 1.7 times. There are limits to the expansion of farmland, and only about 20 years left until 2050. We must tackle this issue quickly and seriously.



Next is the scene of global hunger. Severe hunger is concentrated in Africa and South Asia, but hunger occurs in large parts of the world. Therefore, it is necessary to take effective measures in each area. Each country has different geology and temperature. So the same agricultural system does not work effectively in all countries.

By the way, regarding the situation of hunger in Japan, one in twenty people is starving. Areas most

affected are southern prefectures such as Okinawa and Kagoshima. (According to reference material 1)

Regarding the main topic of the free market, OzHarvest Market, which I used as a reference, has the following three mottos: Not to waste food, Anyone can use it, Enrich the country.

They use these to raise awareness of the "food loss problem" where food is discarded even though it is still edible and to provide support to people who are having trouble making a living. They run the free market using only volunteers and donated food and generated sales of 1.7 million yen in the first five weeks of opening. They have reduced food waste by 25,000 tons.

## Conclusion

Based on these, I propose to set up a free market in Japan. In Japan, the same amount of food is thrown away every day as every Japanese person throws away a cup of rice. In particular, I would like to encourage installation in Okinawa and Kagoshima. The biggest advantage of this solution is that it can tackle both food loss and hunger.

## Citations and references

Reference image 1 <https://tokyo.unfpa.org/ja/news/wpp2022>

Reference image 2 <https://ja.wfp.org/publications/hankamatsufu-2020>

### Reference materials

1.

[https://gooddo.jp/magazine/poverty/asia\\_poverty/japan\\_poverty/#:~:text=%E6%97%A5%E6%9C%AC%E3%81%AB%E3%81%8A%E3%81%91%E3%82%8B%E8%B2%A7%E5%9B%B0%E7%8E%87%E3%81%AB.%E3%82%82%E6%B3%A8%E7%9B%AE%E3%81%95%E3%82%8C%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82](https://gooddo.jp/magazine/poverty/asia_poverty/japan_poverty/#:~:text=%E6%97%A5%E6%9C%AC%E3%81%AB%E3%81%8A%E3%81%91%E3%82%8B%E8%B2%A7%E5%9B%B0%E7%8E%87%E3%81%AB.%E3%82%82%E6%B3%A8%E7%9B%AE%E3%81%95%E3%82%8C%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82)

2.

<https://ausijyu.com/freesupermarket-nsw/>

3.

<https://www.ozharvest.org/>

4.

[https://moneyworld.jp/news/05\\_00026325\\_news](https://moneyworld.jp/news/05_00026325_news)

5.

<https://gooddo.jp/magazine/hunger/6246/>



# **For All Living Things To Be Happy**

~To create a world where people and animals co-create~

5212 Kosuge Rintaro

## Abstract

These Days, a lot of wildlife is rapidly disappearing. According to Biological Reviews, a study of the increase and decrease of more than 70,000 species of wildlife on the planet found that 48% of all animals are declining. A major cause is the uneven distribution of wildlife numbers due to the ecosystem. The increase of only some wildlife will have a negative impact not only on humans but also on other wildlife. If the ecosystem does, the number of soils and plants maintained by wildlife will change. Finally it happens many kinds of extreme weather. We have to solve this problem, however, humans kill more and more creatures for selfish reasons. I think people should protect wildlife to revive wildfires and their living place. It is necessary for us to cooperate with all countries and do what we can in each area.

## 1.Introduction

According to Wildlife Populations Worldwide Have Plummeted, the reason for the decline of many kinds of wildlife is exploitation by human habitat degradation and change. For example, South Africa is experiencing a serious decline in freshwater fish due to the introduction of non-native species and habitat degradation. In this regard, a CNN article states, "Freshwater fish feed 200 million people and support the livelihoods of 60 million. We also depend on river ecosystems for water, sanitation and power." We live in an ecosystem. I believe that we, as members of the ecosystem, must help wildlife. However, this problem is too hard to solve because the number of wildlife species is more numerous than people. Currently, only volunteers from various countries, led by the World Wide Fund for Nature, are working on this problem. Finally, we aim for a state where humans and wildlife do not live in the same place, but where wildlife lives where it belongs. People around the world should be aware of this problem and do something about it.

## 2.Discussion and implications

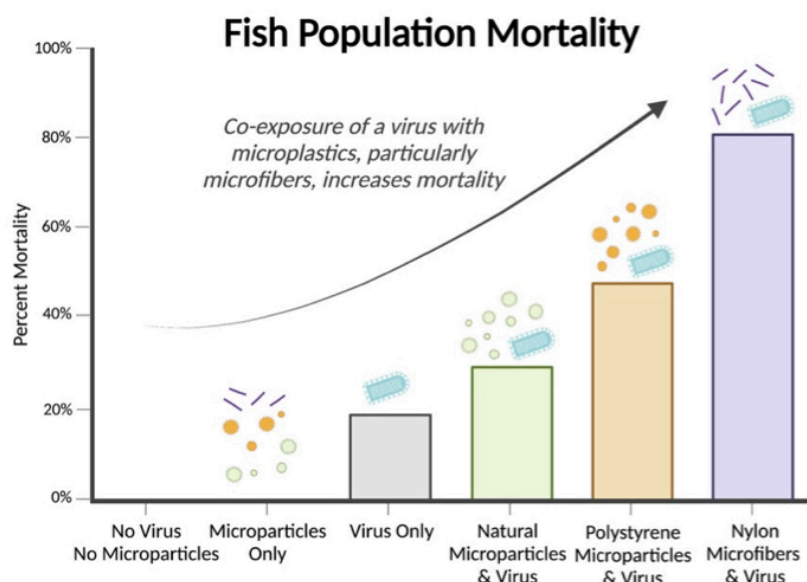
To save more wildlife, we must avoid directly interfering with them. This is dangerous for them and for us. I decided that we need to fundamentally change the wild environment. Therefore, I will suggest a solution to save wildlife from three perspectives: afforestation, creation of rich soil, and reduction of human-derived waste.

First, I think the most effective solution to save wildlife is tree planting. According to the The Connect U.S. Fund, "At the source of almost every ecosystem are trees, serving as home, place of protection and food source for most animal species, and even us humans. By simply growing them, you are helping wildlife and ecosystems to thrive." Moreover, plants not only provide food for herbivores, but also help them

breathe and contribute to the reduction of global warming. This shows that plants have a great effect on animals and the environment. However, forests created by afforestation can be a risk to wildlife if they are not managed properly. Native species may find it difficult to live in the forest, and planted forests may bring in non-native species, among other things. In addition, if plants are not planted in the right places, the forest will become uniform, and the ecological balance will collapse. Therefore, when planting trees, it is necessary to conduct sufficient research and plan accordingly. Based on these considerations, we should expand our tree planting campaign even further than we are now and strive for a greener society.

Second, creating rich soil. Ecological balance is not formed by animals and plants alone. Soil, which nurtures plants and provides a source of nutrition for animals, is also a necessary element for wildlife to survive. Explain the effects of soil on forests. The organic matter supplied to the forest ground, such as fallen leaves, animal excrement, and carcasses, is converted into inorganic matter. They are again absorbed by plants and preyed upon by animals. In this way, the soil cleans the natural environment and plays a part in the ecological cycle. However, rich soil is not available in the entire world. The Sahara Desert in Africa is experiencing a drought that is seriously affecting the animals that live in the area. It is not possible to improve the climate of the area or to relocate the animals that make it their habitat. We cannot enrich the dry soil, so I propose the establishment of protected areas in such areas. However, the important thing is that the differences in habitat and territory size of each animal must be taken into consideration. Take the endangered white rhinoceros as an example. According to the WWF, White rhinos have complex social structures. Groups of sometimes 14 rhinos may form, notably females with calves. Adult males defend territories of roughly one square mile, which they mark with vigorously scraped dung piles. The home range for adult females can be more than seven times larger, depending on habitat quality and population density. Thus, with regard to areas where the natural environment is in disrepair, we propose the establishment of protected areas.

Finally, I suggest reduction of human-derived waste.



It is no exaggeration to say that improper garbage disposal by people has the most negative impact on wildlife. In recent years, large amounts of microplastics have been washing into our oceans and rivers, and many wild animals have died as a result of ingestion by marine life and the animals that prey on them. In this study, I think this problem is the most serious. But it is the most solvable problem. To take it to the extreme, if people would stop throwing garbage into the wild, we could prevent wildlife from dying. So how do we solve this problem? I propose that once a month, the whole world should have a "Be Kind to the Earth Day," where we review the state of the global environment and actively donate money and pick up trash by organizations and companies. Since the world today is well established with most government agencies and the environmental organizations under their jurisdiction, if we work together, we may be able to gradually work toward a world where wildlife can live comfortably.

### 3.conclusion

In light of the above, I am committed to working with the government and ourselves to improve the habitat of wildlife as well as to an environment in which wildlife is not invaded by humans. Conflicts frequently occur in many parts of the world today, and I believe that now is the time for all people to work together.

### 4 References

World Has Lost More Than Half Its Wildlife In 40 Years: Report

<https://www.fox61.com/article/news/local/outreach/awareness-months/world-has-lost-more-than-half-its-wildlife-in-40-years-report/520-b81a859f-22cf-423f-9ab7-7433e25acd59>

WWF

<https://www.worldwildlife.org/species/white-rhino>

7 Advantages and Disadvantages of Afforestation

<https://connectusfund.org/7-advantages-and-disadvantages-of-afforestation>

# The Establishment of Animal Welfare

-keep pace with advanced country-

ID 5213 Sakuraya Kanon

## 1. Abstract

**Animal Welfare:** The idea of establishing a method of rearing livestock that reduces the burden on the animals.

Animal Welfare began about 60 years ago, in the 1960s in the U.K. In the 1960s, chain stores began to appear and food production started to take off on a larger scale than ever before. Chain stores were required to provide a uniform taste in every store, so the mechanization of livestock rearing began in earnest. Since many restaurants serve pre-processed food, the process is less demanding. On the contrary, what came to be demanded was drastic cost cutting, mass production, and efficiency. Farms became factory farms in the pursuit of efficiency. The focus is on the fact that these issues go around and end up with you, and the end point is posed as creating a better environment for livestock. The significance of this is mainly to improve quality, improve our own health, and prevent obesity. From the perspective of the SDGs, the rapid resolution of this issue is necessary to build a sustainable city. While major developed countries have made significant efforts to address this issue, awareness of this issue is still low among developing countries and some developed countries, and we believe that how each country addresses this issue will be the key to solving it. The issue of public awareness is also a concern, and we will consider how to address this issue later on. As for the future outlook, this issue is relatively easy to tackle in all countries, and we would like to work out a plan so that no country lags behind in this area.

## 2. Background of Research

**Animal Welfare: The Idea of Establishing Breeding Methods that Reduce the Burden on Livestock**

As mentioned in the overview, animal welfare will become increasingly important in the future society. Countries that lag behind in animal welfare efforts are characterized by small land areas and large amounts of food waste. In order to establish animal welfare, it is important to secure an area for each livestock and to improve the environment. The root of the problem is the factory farming of the meat production process, which has the advantage of mass production at low cost. The advantage of factory production is that it is cheap and mass-producible. This means that excessive production leads to food waste, which is one of the characteristics of countries that lag behind in animal welfare. In addition, the challenge is to make the livestock industry conform to the way it should be, which is often seen in developed countries. These problems are deeply rooted in people's awareness, and unless they are recognized as problems, there will be no signs of solutions. Therefore, it is necessary to consider the economic situation of the country.

### 3. Purpose and Significance of the Study

The purpose of this study is to establish animal welfare.

The significance of this research is that it will lead to an increase in the quality of edible meat and processed products, and ultimately to the improvement of our health. In addition, the process of solving the problem will inevitably lead to solving multiple social problems, albeit indirectly.

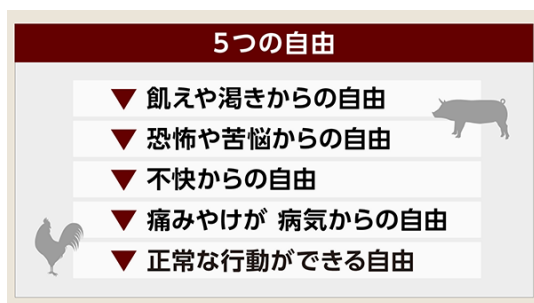
(Solutions to multiple SDGs)

### 4. research methods

Much of the information about animal welfare is gathered from websites. However, there was still not much information available, so I supplemented it with documentaries and other videos and books.

### 5. research results and discussion

**Animal Welfare: The Idea of Establishing a Less Burdensome Method of Raising Livestock**  
Animal welfare began about 60 years ago in the United Kingdom in the 1960s, when chain stores began to appear and food production was beginning to take off on a larger scale than ever before. The advantage of chain stores is first of all that they are cheap, and secondly that they have a consistent taste. However, behind the cheap price, in a sense, a great deal of effort by the companies was hidden. The major cost-cutting was achieved through the use of a single source of feed, dense feeding, and the use of breeding hormones. Most livestock are fed a single, inexpensive feed of corn. Corn is highly nutritious and can be easily mass-produced in the vast lands of the U.S., making it an ideal feed for livestock, for which



efficiency is required. The next advantage of densely stocked cattle is the reduction of costs. The disadvantage is the health hazard to livestock. Because the animals are fattened up in such a small space that they cannot move, they are raised in a very dirty environment. The level of sanitation is reduced by manure and dead bodies. Most of the animals survive because corn feed is mixed with antibiotics and breeding hormones,

but of course the survival rate of the animals is low. This study refers to such a way of raising livestock that disregards the lives of the livestock as factory farming.

Since chain restaurants are required to provide a uniform taste in all of their restaurants, the factory farming of livestock has begun in earnest. Since many restaurants serve pre-processed products, the process is not so demanding. On the contrary, what was demanded was drastic cost cutting, mass production, and efficiency. In the pursuit of these things, the livestock industry became a factory. The endpoint of this project is to create a better environment for livestock. The significance of this is mainly in improving quality, improving our own health, and preventing obesity. In the extreme, we do not consider livestock to be animals to be kept for life. From the perspective of the SDGs, the rapid resolution of this issue is necessary to build a sustainable city. While major developed countries have made significant efforts to address this issue, awareness of the problem is still low among developing countries and

some developed countries, and how each country addresses this issue will be the key to solving it.

## 6. conclusions and future issues

One of the things we learned is that the world as a whole is divided into developed and developing countries. We believe that the challenge for the future is to propose new ideas for aligning the progress of these efforts, which will inevitably emerge.

## 7. references and bibliography

<http://www.alive-net.net/animalfactory/fact/blackbox1.htm>

Japanese livestock farming in the black box 5.23

<https://www.jetro.go.jp/biz/areareports/2019/4b0d8252e1d5d6c4.html>

The United Kingdom, an advanced country in animal welfare, and the required response from Japan 6.7

[https://www.jlta.or.jp/news/image/seminar2010/jltaseminar2010\\_msnagamatsu.pdf](https://www.jlta.or.jp/news/image/seminar2010/jltaseminar2010_msnagamatsu.pdf)

The world situation regarding animal welfare and the current situation in Japan 7.16

<https://www.hopeforanimals.org/eggs/abroad-companies/>

Overseas situation and efforts of overseas companies 6.7

<https://www.hopeforanimals.org/eggs/usa-cage-free/>

The sale of caged eggs has already been banned in the Americas. 8.22

<https://myethicalchoice.com/journal/ethical/animal-welfare/>

What is animal welfare? 9.28

<https://www.asahi.com/articles/ASQ1J0JD4PDWUPQJ00M.html>

"Animal Welfare" is spreading - thinking about the happiness of animals with livestock farmers 8.2

# Education in Developing Countries

~In order to break vicious cycle~

5214 Satomi Misaki

## 1 Abstract

This study is that many children in developing countries can't receive adequate education because of labor and I focused on countries where poverty is a serious problem and aim to solve the vicious cycle by education. It is hard for people in developing countries to let their children study because they are important labor, so I try not to force children to stop working. Therefore, I came up with using a DVD player because if they use it, they can save a lot of time to go to school. In Japan, the subscription service is more and more popular and that means a number of people become not to use DVD player these days. Then, I think we can collect it by donation from people who don't use it instead of disposing. However, Central African Republic, Mali Niger, Chad and South Africa are least developed countries and it concerns me that they sell donated DVD player. It is food for them to be able to get money temporarily, but studying is better for them to get money in the long run. Therefore, I focused on preschool education.

The way of this study is information gathering by Internet and literature and thinking about what to do to apply the way of education to children in developing countries.

The issue of this study is that education both by DVD player and preschool need workers. In addition, that their parents don't understand why children have to study so they refuse to let them study is also a serious issue.

## 2 Introduction

Children are forced to labor in developing countries, and it is an issue that they are not able to receive adequate education. That only enables them to find jobs such as farming, or be unable to understand and write a document to receive some social services. This study focuses on children in developing countries and aims to break the vicious cycle by educating them and making them get a job with steady and higher income.

The adult literacy rate from 2011 to 2016 was 78% worldwide, but it dropped to 63% in developing countries, especially in the Central African Republic, Mali, South Sudan, Chad, and Niger at 37%, 33%, 27%, 22%, and 15%. I thought it was good for both children to reduce time to go to school, because children can receive education without danger and parents who can make their children work in the time that was supposed to be used to go to school. However, the biggest obstacle of this study is the low rate of internet diffusion and it is 10.40%, 27.40%, 6.50%, 10.40%, and 10.22% in the countries mentioned above. It means that it is impossible to take classes using the internet.

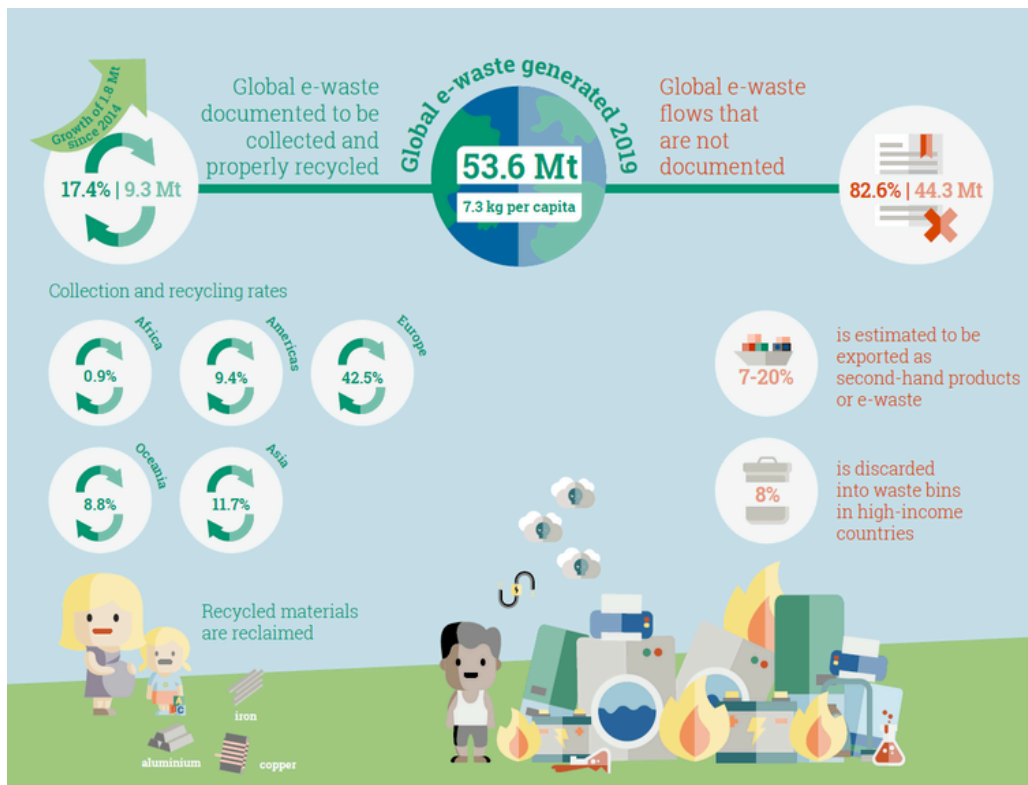
Then, I came up with an idea to use a DVD player. This study is related to the goal of SDGs, 1, "No Poverty," and 4, "Quality Education". Then, in order for all children to receive high-quality education, it was necessary to increase the literacy rate in the country. Therefore, in this study, the final goal is for children in developing countries to read and write languages. Poverty in the world has aspects that prevent economic growth and lead to wars and conflicts due to social inequality, so the significance of this study is that it aims to solve poverty by including people who are not poor. The world as a whole will become better.

## 3 Discussion and implications

First of all, I consider the way of using DVD player and it has some benefits. First, it is good for

both children and parents because children can take classes without danger for commuting to the school and parents can make their children work in the time that was supposed to be used to go to school, so they don't worry about reducing income. That means they can use spare time to study. Second, it is easier to secure a teacher than teaching in children's countries because teachers don't have to go there and teach the same classes again and again. The Central African Republic speaks French and Sango, Mali speaks French, South Sudan speaks English, Chad speaks Arabic and French, and Niger speaks French. That means that we don't have to ask many teachers to take videos of lessons.

In addition, recently "E-waste" has become a world problem, so it will be able to reduce it.



Then, I came up with "early children education" considering the high ability of memory and pronunciation recognition. However, This study's problem is that there are some cases where there is no objective to raise literacy rates, such as in the developing countries where there are no industries other than agriculture and mining, or where the parents of the children are not educated even for early childhood education, so they don't understand the need to educate their children, and it is difficult to apply early children education.

#### 4 Conclusion

In conclusion, I will promote early childhood education through DVD players. Then, if the children don't have interest or they can't learn a language and easy calculation well, they can watch videos of lessons whenever they need these skills, for example to receive some social services or get a well-paying job.

#### 5 References

statistical date / a white paper of world children UNICEF

[Statistical data | The State of the World's Children 2021 Japan UNICEF Association](#)

(August 15, 2022)



main languages of each country

[Countries of the world: Main languages of each country](#)

(June 25, 2023)

Global e-waste

[Global e-waste increases by 21% in five years, but recycling can't keep up - Our World](#)

(November 25, 2022)

Ochanomizu University Research Center for Child Development and Education

Handbook of Early Childhood Education

[To support early childhood education in developing countries](#)

(December 23, 2022)

The Asahi shinbun SDGs Action!

[What is child labor? Introducing the current situation, causes, efforts around the world and Japan, and main solutions: \[SDGs ACTION!\] Asahi Shimbun Digital](#)

(November 20, 2022)

# How to Increase Travelers and Improvement The Way Which Travelers Reception Community

## To think with the trends of travelers

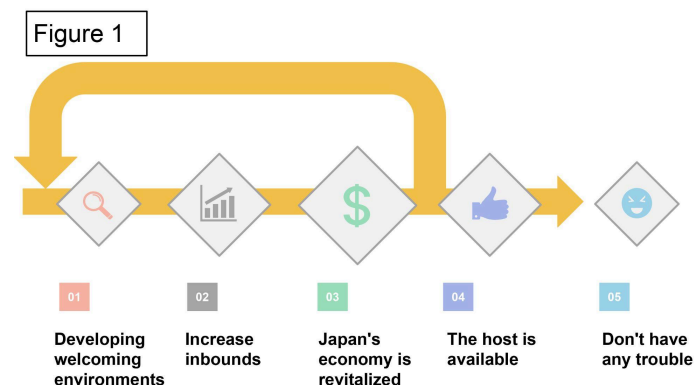
5215 Hiroyuki Suzuki

### Abstract

The purpose of this research is to develop and improve the traveler reception community in Japan. This research is made by a survey from the Internet and an interview. The conclusion is to add visits where people can learn about social issues to the bus tours that currently exist. This will enable people to learn about social issues and revitalize the region.

### 1. Introduction

The purpose of this research is to improve the environment community for tourist destinations. If I create a welcoming community -It is a situation where the receiving location can invest in the community and hospitality.- , I can expect an increase in inbound tourists and tourists. After that, Japan's economy will be revitalized, income for tourist destinations will increase, and the money can be used to prepare new facilities to accommodate tourists. As a result, the receiving host will be able to respond, creating a virtuous cycle in which everyone will not experience any problems. (Refer to Figure 1)



The above is the purpose and significance of this research, and I will conduct research to achieve this purpose and significance.

The research question is how to increase the number of tourists, as stated in the research theme.

I think three steps are necessary to construct this research. First, to research current travel trends on the Internet. By investigating the current travel trends in this research, it is thought that it will be the first step towards creating a welcoming community and increasing the number of inbound tourists. Second, to investigate what solutions are currently being implemented on the Internet and interviews. By conducting this step, I will be able to understand that the current implementation is not satisfactory and will be able to find areas for improvement. Additionally, by interviewing the people and companies that came up in this survey, further improvements can be considered. Third, conduct another interview based

on the improvement measures taken so far and consider whether the improvement measures are appropriate.

## 2. Discussion and implications

In my first research, I investigated trends in the travel industry. Trends in the travel industry are as follows. According to Dutch company Booking.com, the following eight items are expected to predict travel trends in 2019, 2020, 2021, 2022 and 2023. (They announcement 6 to 9 trends each year, but I wrote only things related to this research )

In 2019

- A journey full of learning
- Traveling with social issues in mind
- Eco-conscious when traveling
- Local experiences make your trip a masterpiece

In 2020

- A trip to a destination with a variety of attractions

In 2021

- Increasing importance of further “value provision”
- Growing awareness of “sustainability” in travel

In 2022

- People tend to enjoy the feeling of going on a journey for the first time
- People tend to enjoy staying at destinations without any plans

In 2023

- A simple and minimal “off-the-grid” trip in nature
- Save money and travel in luxury

My idea is suitable for this. I believe that these are effective requirements for solving social problems, and that they are major trends for travelers, so we will focus our research on them.

This research focused on the first point and investigated what is being implemented to create an accepting community. We also visited the companies that came up in the survey and looked for areas for improvement.

Currently, there is a project by Ridilaba Co., Ltd. called "Study Tour" This project is the study tour where you visit approximately 60 tour destinations across the country that aim to solve social problems, and seriously think about the actions you can take while directly interacting with the people involved in the problems and those working to solve them. That's what it seems like. This project targets schools for Japanese students.

I think this disadvantage like below. First, this project is only for students. Because this is only for students, it is becoming difficult to get new customers and adults can not receive these services. Therefore, I think it is difficult to solve the problem mentioned above. Second, all customers live in Japan. It is the fact that the people who come abroad pay more money than the people who visit in Japan. Therefore, it is difficult to solve the problem mentioned above. Third, this project is only a group tour. Not everyone who wants to participate in this project will be able to do so.

After thinking about the above problems, I made the idea of modeling the business of Ridilaba Co., Ltd., making it suitable for all ages and making it possible to do it as an individual trip.

After thinking about the idea, I interviewed Mr. Kanno who works in Ridilaba Co., Ltd. about the solution I came up with. The company previously operated a similar business for individual travelers, but it appears to have been discontinued.

The reason is that the project made the company end up in the red financially. He said people usually don't pay for seemingly formal things such as social issues. People usually pay for interesting things. Additionally, the company doesn't have the land suitable for this business. They are currently renting it from other companies. The program was targeted at schools because it was possible to secure the number of participants in a semi-compulsory manner, and a large amount of money was paid for each project.

After the interview, I came up with a new idea. There is no change in the fact that we model the business of Ridilover Co., Ltd. mentioned above. However, it will be aimed at tourists on bus tours and other tours.

Finally I would like to explain the reason why people would be able to accept the study tours. I have two reasons.

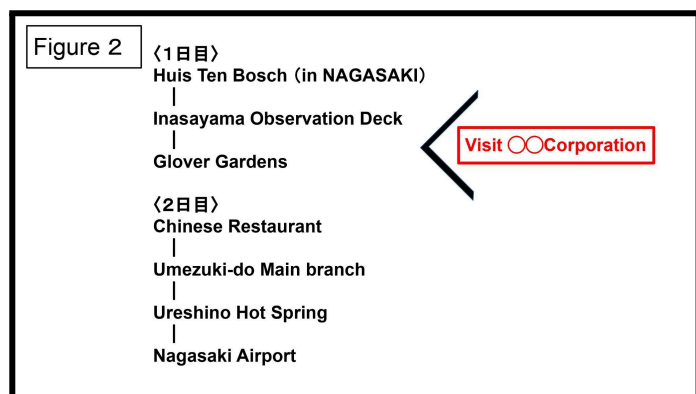
First, Ministry of Agriculture, Forestry and Fisheries said 86% of respondents are concerned about global environmental issues.

Second, I think study tours is Unlike any other travel type. I think there are only two pivots which are degree of freedom (Well-developed content to high degree of freedom) and degree of sympathy (empathy to Originality). As seen in the figure2, study tours is Unlike any other travel type. I think it is the birth of a new evaluation axis. Therefore, Many people can show interest in it.

### 3. Conclusion

As previously mentioned, I suggest that it will be aimed at tourists on bus tours and other tours. The idea is to incorporate "Study Tours" into the existing bus tours that are organized by travel companies and applied for on an individual basis. (See Figure 2 for specific examples.)

I am convinced that in this way the aforementioned objectives can be



achieved and the aforementioned problems can be eliminated.

However, there are some considerations. People really want to use this plan. I should think about something charming.

#### 4. References

- 「社会問題やエコを意識した旅行が2019年のトレンドに」〈[https://www.sustainablebrands.jp/community/column/detail/1191036\\_2557.html](https://www.sustainablebrands.jp/community/column/detail/1191036_2557.html)〉
- 「旅行客が増えすぎて困ってしまった観光地。何が問題なの？解決方法は？」〈<https://tabizine.jp/2018/02/17/173273/>〉
- 「国連世界観光機関 (UNWTO) 駐日事務所」〈[https://www.unic.or.jp/info/un\\_agencies\\_japan/unwto/](https://www.unic.or.jp/info/un_agencies_japan/unwto/)〉
- 「修学旅行・校外学習を主体性を育む学びの場に SDGs／社会問題スタディツアー」〈<https://ridilover.jp/study-tour/>〉
- 「観光士資格認定試験と観光の定義」〈<http://www.jtcc.jp/kankoshi/detas.html>〉
- 「旅行・観光におけるサステナビリティへの意識調査【楽天トラベル】」〈<https://travel.rakuten.co.jp/mytrip/howto/sustainability-survey2021#01>〉
- 「今一度社会課題を整理しよう！ 社会的課題・社会的問題一覧まとめ」〈<https://andomitsunobu.net/?p=8713>〉
  
- 「生物多様性とはなにか」〈<https://www.biodic.go.jp/biodiversity/about/about.html>〉
- 「【わかりやすい】ゴミ問題の原因とは？現状とその対策 | スマートでんきコラム」〈<https://www.smart-tech.co.jp/column/environment-issues/gomi/>〉
- 「企業倫理の定義と職場での実践例 | Indeed (インディード)」〈<https://jp.indeed.com/career-advice/career-development/what-are-business-ethics>〉
- 「エシカルファッションとは・意味 | 世界のソーシャルグッドなアイデアマガジン | IDEAS FOR GOOD」〈<https://ideasforgood.jp/glossary/ethical-fashion/>〉
- 「外国人観光客増加によるインバウンドの問題と対策とは？ - ホテル・宿泊業界情報コラム | おもてなしHR」〈[https://omotenashi.work/column/bits\\_of\\_knowledge/3832](https://omotenashi.work/column/bits_of_knowledge/3832)〉
- 「外国人観光客のマナー対策で知っておきたい6つのこと」〈<https://best-legal.jp/foreign-tourists-breach-of-manners-16173/>〉
- 「訪日外国人旅行者数・出国日本人数 | 統計情報」〈[https://www.mlit.go.jp/kankocho/siryoutoukei/in\\_out.html](https://www.mlit.go.jp/kankocho/siryoutoukei/in_out.html)〉

※All References was viewed on 18/December/2023.

# Build Friendship with Mental Connection

## Meeting by psychological type

5216 Takeuchi Gaku

### Abstract

These days, I hear about human relations issues. Many humans are troubled by those issues. At that time, a person who is a friend by mental connection is very important, but around adults say “You become an adult, the chance of making a friend has been decreasing”. However, you should not give up making good friends. My study goal is to make the service for building human relations by mental connection and to increase human connect by mental. I think if this study advances, you take advantage of building human relations by mental connection. I research existing SNS applications. I list those application’s problems, and create an ideal application’s image. Additionally, I consider that I separate users by psychological type because I think psychological connection is important. In conclusion, I separate users by psychological type, and suggest those services. I want to search for differentiation from existing SNS applications, and SNS application’s safety.

### 1. Introduction

I think modern humans and ancient humans have different stresses. Human’s lifestyles are changing. We have enough food, houses or clothes, but we must work because we need money. These days, we are very tired of human relationships. Mental stress comes from several scenes. For example, at the office, at home. Humans feel many kinds of stress. It is difficult to solve those stresses alone. I think many modern humans have been under stress. I consider best friends to help solve those problems, so I imagine the service is easy to make friends with strong connections. The purpose of this study is to imagine the service which helps make a good friend for modern humans. Modern humans are apt to feel loneliness. I think we should supplement loneliness with new relationships, because loneliness help suicide in recent years. My research question is ‘how do connect good chemistry persons by psychological type’.

### 2. Discussion and implications

When I started this study, I searched for the psychological type. I found MBTI (Myers-Briggs Type Indicator) and stress coping types. Coping means a way of dealing with stress or effort. In addition, I established criteria to decide the psychological type. Finally, I researched existing SNS and the events which organizations hold, because I wanted to discriminate against other services.

I introduce stress coping. American researcher, Richard Lazarus, suggested sorting eight stress coping’s types.

(1) Planning type A method in which one thinks carefully and makes plans to solve a problem or try out various solutions.

(2) Confrontational type A Method of actively making efforts to change a stressful situation. This is a way to try to change a stressful situation and is classified as a confrontational approach.

(3) Seeking social support type A method of seeking help from humans around you or a consultation service in order to solve the problem.

(4) Acceptance of responsibility type A method in which the person is aware of what he/she has done and reflects on what he/she has done. This includes apologizing to the person who caused the trouble.

(5) Self-control type A method of carefully controlling one's feelings and actions and not showing them to others.

(6) Escape type Drinking alcohol to forget the problem or thinking about escaping. Blaming others or blaming the problem on others is also included in this type.

(7) Isolation type This type of behavior involves trying to separate oneself from what has happened.

(8) Positive reevaluation type Discovering oneself through experience and self-improvement.

The best way of coping varies from person to person depending on causes and personality.

I will introduce those results.MBTI sorts 16 types through some questions.



This graph shows all of the MBTI types. MBTI sorts which are based on several questions per item.I think MBTI becoming an index of psychological types.

I will explain the merits and demerits of SNS apps to you.

SNS apps are very international ,so the number of users is very huge.Famous SNS have more than one hundred million users.And it is useful because we get a lot of information.Those are merits.However,these days, SNS have become spots of crime.Many wicked person uses SNS for their purposes so we must pay attention to several crimes.

### 3.Conclusion

This study's conclusion is that I suggest making the service to sort from psychological types. For example, coping types or MBTI, and connect match pier. I think this service is on the Internet. The reason is that these days, Internet technology is developing. I think many

humans will use SNS more. I want a person who feels lonely to use that service. I think SNS is the best way to perform this service.

#### 4.References

1 ストレスとは: ストレス軽減ノウハウ

<https://kokoro.mhlw.go.jp/nowhow>(2023/5/15)

2.調査結果の概要 (8)不安・関心・満足度

[https://www8.cao.go.jp/kourei/ishiki/h17\\_kiso](https://www8.cao.go.jp/kourei/ishiki/h17_kiso)(2023/6/7)

心理学的に正しいストレスの乗り切り方

[https://www.sanko-e.co.jp/read/office\\_psychology](https://www.sanko-e.co.jp/read/office_psychology)(2023/6/7)

生きづらさ抱える「エンパス体質」

<https://www.sankeibiz.jp/business/news>(2023/9/14)

Twitter

<https://twitter.com>(2023/10/24)

親友関係 についての一考察

<https://kbu.repo.nii.ac.jp>(2023/11/5)

不安定な時代こそ「人とのつながり」の価値が高まる

<https://www.works-i.com/column/works04/detail020.html>(2023/12/18)

カタルシス効果とは？

[https://www.kaonavi.jp/dictionary/catharsis\\_koka/](https://www.kaonavi.jp/dictionary/catharsis_koka/)(2024/1/27)

人が一生で出会う人のうち、親しく会話を持つ人の人数

<https://tokyomarketingblog.com/300people-lifetime>(2024/1/27)

MBTI personality type and other factors that relate to preference for online versus face-to-face instruction

<https://www.sciencedirect.com/science/article/abs/pii/S1096751609000724>(2024/2/2)



# The Future of Eraser Shavings

The reuse of eraser shavings

5217 Tsukagoshi Nanaka

## Abstract

In the world, the plastic issue becomes serious, and we are forced to reduce the use of it. However, when we study, we usually throw them into the trash can. The aim of this study is to reuse the garbage of erasers(eraser shavings). I used the Internet and performed external contact with “SEED”, which is a Japanese stationery company. After that , I found it difficult for students to reuse eraser shavings as new erasers. At this point , I suggest reusing them as rubber products. If it could be achieved, we can reduce not only the use of plastic but also new materials of rubber products.

## Introduction

These days, the problem of plastic use has become serious in the world, which leads to contaminating the environment.(Borrelle, Stephanie B., et al. "Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution." *Science* 369.6510 (2020): 1515-1518.) Also, we are asked not to use as little plastic as possible, which is called “No plastic”. In this situation, I focused on erasers, which we use every day. At first, I had a doubt about the reality that eraser shavings are thrown away as a normal thing. Then, I thought if we can reuse eraser shavings, we can reduce not only the amount of trash but also the amount of the use of plastic. However, it is difficult for beginners to produce a new eraser from eraser shavings. Bessho Naoya, who is the personnel of stationary company ”SEED” said that there are no examples of reusing erasers. Then, I came up with the idea to reuse eraser shavings to rubber products. The ingredients of eraser shavings resemble vinyl hose. In the eraser shavings, black leads are included in addition to PVC(polyvinyl chloride) which is a type of plastic. I have not done an inspection of this idea, but black leads have high heat resistance, so I regard heating them as no problems. Therefore, I suggest that eraser shavings should be reused for rubber products.

## Discussion and implications

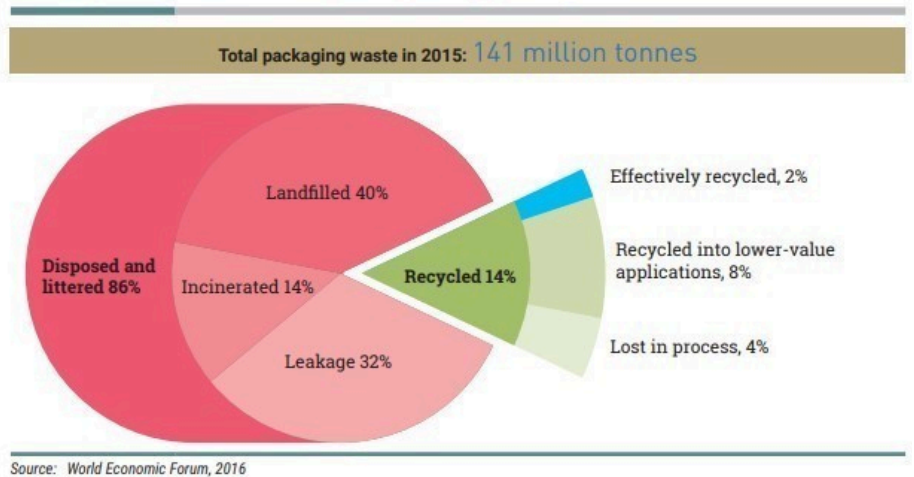
The amount of used plastic in the world is about 30 million tons(2015), and this is increasing year by year. (Figure 1, World Economic Forum) Also, only 14% of the abolished plastic garbage (14 million tons) is recycled. (Figure 2, World Economic Forum) Most stationary products use plastic, so the plastic problem is one of the most serious problems in terms of stationary.

Figure 1.4. Global primary plastics waste generation, 1950 - 2015<sup>16</sup>



←(Fig.1) the amount of the used plastic in the world

Figure 1.8 Global flow of plastic packaging waste, 2015



Also, it is another problem, the recent rise in oil price has an influence on the price of stationary, so we are forced to reduce the use of plastic. In these circumstances, we throw away eraser shavings every day. In Japan, most students are using erasers. We can estimate that the amount of eraser shavings are huge.

When I measured the amount of eraser shavings in my house three hours in each day, it was about 1g in three months. If we assume that one junior high school student studies six hours a day at school in Japan, and that one usual eraser weighs 19g, we assume that we can make 1.3million erasers using eraser shavings. (2021, The Ministry of Internal Affairs and Communications )

When we erase some words with an eraser, the eraser absorbs the black leads sticking on the paper.(Fig.3) In the case of a ballpoint pen, we can't use erasers because the ink soaks into the paper.

(Fig.3) the principle of eraser erasing→

Next, there are a lot of types of erasers. In terms of ingredients, we can classify them into “rubber erasers” and “plastic erasers”. The examples of “rubber erasers” are white rubber for pencils and sand rubber for ballpoint pens. “plastic erasers” are made up of PVC(polyvinyl chloride), plasticizer which makes the erasers soft, and so on. This plasticizer’s molecule is similar to black leads’ and intermolecular forces are functioned. Then, it helps the eraser absorb black leads and can erase better than other types of erasers. Generally, sand erasers are not used, so I will focus on the plastic erasers.



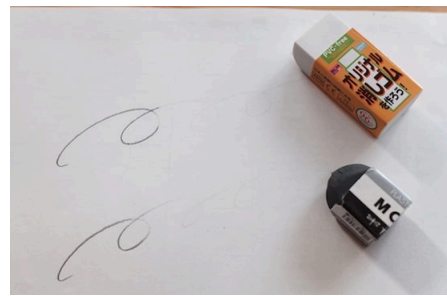
Also, there are some types of plastic erasers. In Japan, most erasers such as mono(Tombow), Air-in(PLUS) and Rader(Seed) are made up of PVC. There are non-PVC erasers and rubber erasers which do not use plastic. (Fig.4,5) This can reduce the load on the environment and is said to prevent children from swallowing by accident. The ability to erase the words is as high as plastic ones(Fig.6), so the number of them has increased. However, most erasers use plastic, so it does not spread well.

To reduce the use of plastic, “Green Purchase Law” is enforced in Japan by the environment ministry. It says that all plastic stationery should use reused plastic more than 40% of the gravity of them or plastic whose ingredients come from plants and which is certificated to have an effect to reduce the load on the environment. This law does not adapt to all erasers, but adapted erasers have the sign of this law.

↓(Fig.4) non-PVC erasers



(Fig. 6) comparison with non-PVC erasers↓



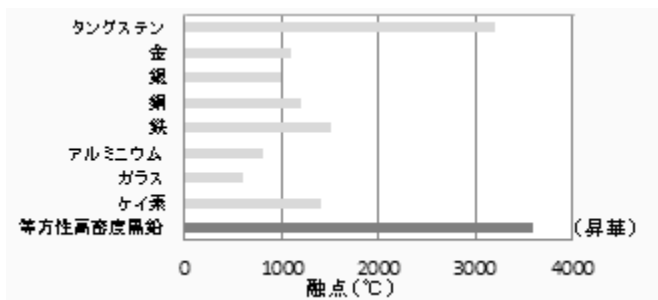
↑(Fig.5) rubber erasers

Also, Mr.Bessho said that some pieces of erasers are reused to produce new erasers. And when we looked into whether they are being reused into erasers, we found that it is almost impossible for amateurs to recycle eraser shavings into erasers. Specifically, the handling of plasticizers used in the manufacture of erasers is dangerous. According to an external contact from Seed Corporation, it is possible to recycle eraser shavings, but the recycled eraser shavings have a lower erasing power because they contain black lead. He also said that, in principle, it is possible to remove black lead from eraser shavings once it has been incorporated into the eraser shavings, but there is no knowledge of what condition the eraser will be in after the eraser shavings are removed. Currently, experiments are being conducted to reuse eraser shavings, but we were unable to ask for more details because the information is confidential.

So, we came up with the idea of reusing eraser shavings for something other than erasers. As mentioned above, plastic erasers are made of vinyl chloride and plasticizers, which is similar to the material used in plastic hoses. In the process of making erasers, after mixing the materials, there is a scene where heat is applied to harden them. Here, the heating temperature and time are adjusted so that the plastic and oil do not stick together, and the eraser is made. On the other hand, it is said that if the plastic and oil completely stick together here, it becomes a plastic hose. (cocoiro)

Since eraser shavings are just graphite added to the eraser, we thought it would be possible to reuse them in other products such as vinyl hose by adjusting the temperature and time during the heating process.

Also, the power of graphite's heat resistance is strong, and more hard than iron. (Fig.6) Thus, it's no problem if graphite is heated with rubber.



←(Fig.6) graphite's heat resistance

However, in case of erasers that include plasticizer, it produces diethylhexyl phthalate which is a poisonous substance. Then, in order to reuse eraser shavings, I have to collect products plasticizer is not included.

## Conclusion

My final suggestion is it may be possible to reuse eraser shavings to rubber products whose ingredients are similar to them. However, whether we use plasticizer has an effect on the environment, so I would like to do experiments with expertises. In addition, if I can realize this, I would like to think about how to spread this product.

## References

Borrelle, Stephanie B., et al. "Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution." *Science* 369.6510 (2020): 1515-1518.

cocoiro(2020) "Easy to do at home! introduce the way of producing erasers"

<https://cocoiro.me/article/30910>

life without plastic (2022)

"[Rubber erasers] don't use PVC which is kind to the environment and body"

<https://lessplasticlife.com/take-action/office/rubber-erasers/#:~:text=%E6%B6%88%E3%81%97%E3%82%B4%E3%83%A0%E3%82%92%E4%BB%96%E3%81%AE%E3%83%97%E3%83%A9%E3%82%B9%E3%83%81%E3%83%83%E3%82%AF.%E3%81%84%E3%82%8B%E8%A8%BC%E6%8B%A0%E3%81%A8%E8%A8%80%E3%81%88%E3%81%BE%E3%81%99%E3%80%82&text=%E6%B6%88%E3%81%97%E3%82%B4%E3%83%A0%E3%81%AB%E5%BF%85%E3%81%9A%E4%BB%98%E3%81%84%E3%81%A6%E3%81%84%E3%82%8B%E7%B4%99%E3%82%B1%E3%83%BC%E3%82%B9%E3%80%82>

nonbiki.com (2023) "Recycling erasers!? What will it be? How do we make it?"

<https://nonbiki.com/10808.html>

The Ministry of Internal Affairs and Communications (2021)

"The number of children is 14,930,000, for 40 straight years "

<https://www.stat.go.jp/data/jinsui/topics/topi1281.html>

World Economic Forum (2018) "effort to reduce plastic garbage"

<https://jp.weforum.org/agenda/2018/08/91754b8f-6bb1-4733-8b92-28872d8ed0eb/>

the talking about erasers by corporation SEED Mr.Bessho

Yoshida Shinya (2018) "Why can erasers erase words?"

[https://jp.mitsuichemicals.com/jp/molp/article/detail\\_20210930.htm](https://jp.mitsuichemicals.com/jp/molp/article/detail_20210930.htm)

# A Use For Vacant Houses And a Symbiotic Society ～Realizing the necessity of mutual aid in shared housing～

5218 Tomru Amane

## Abstract

“Vacant houses” are one of the issues that have become a problem in Japan in recent years. According to the latest Ministry of Finance Land Statistics Survey, there are about 8.49 million vacant houses in Japan, which accounts for about 13.6% of the total number of houses in Japan. If this problem continues to get more serious, it is expected that one in three houses will be vacant. In recent years, the "share house" business has become famous as a solution to this problem of vacant houses.

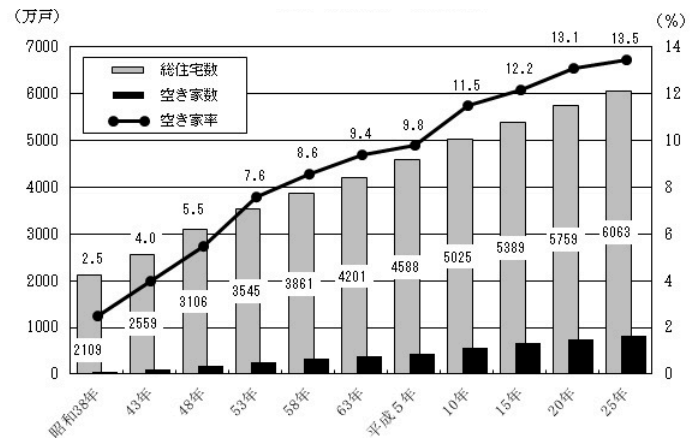
The benefits of using vacant houses as shared housing are significant. It is also less expensive and better for the environment than demolition. There are many shared houses that use vacant houses. Therefore, in order to achieve the mutually supportive society mentioned in the sub-theme, I propose a shared house in the form of "matching elderly people living alone with single parents". I thought that we could expect to solve each other's problems and create a new form of life in an aging society with a declining birthrate. If mutual assistance between single elderly people and single parents using vacant houses could be realized, it would be a big step toward the realization of a symbiotic society, which has become a problem in recent years.

## 1 Introduction

Japan's declining birthrate and aging population make many big problems.

One of these problems is "vacant houses". According to the Ministry of Finance's Land and Statistics Survey, conducted every five years, there were about 8.49 million vacant houses in Japan in 2018. This accounts for about 13.6% of the total number of houses in Japan. The vacancy rate overseas is about 2.5% in the U.K., 1% in Germany, and 10% in the U.S., a country with a

large land area, indicating that Japan is a country with a large number of vacant houses. The major cause of the high rate of vacant houses in Japan, and the difference from other countries, is the "distribution of used houses". Japanese people tend to prefer new houses and have a very different conscience toward using housing compared to those in other countries. In fact, of the total number of houses in circulation in the Japanese real estate market, the share of used housing is only 14.7%, indicating that about 80% of the market is dominated by new houses. Compared to Europe and the U.S., 83.1% in the U.S., 87.0% in the U.K., and 68.4% in France, the distribution of used houses is far greater than that of new houses, indicating that Japan has a very low distribution rate.



(Ministry of Land, Infrastructure, Transport and Tourism, "Efforts to Promote the Use of Used and Vacant Housing Markets and Facilitate Resettlement," 2015)

Another major problem is that the number of vacant houses has been increasing rapidly in recent years. Various reasons can be thought of, but the biggest reason is probably the declining birthrate and aging population. In fact, studies show that Japan has the highest percentage of elderly people in the world, with 28.3% of Japan's population aging in 2018. (Ministry of Internal Affairs and Communications) Many of these are inherited from deceased relatives, some are not even inherited in the first place and are left unused, and others are no longer used because they are moving into nursing homes or admitted to hospitals, creating the effects of an aging society. While the number of vacant houses continues to increase, the low demand for used houses will not stop new properties from being built and purchased, as this is more profitable for homebuilders. This completes the negative cycle of permanently increasing vacant houses. The actual number of new housing starts in Japan is clearly different compared to Europe and the U.S. In 2016, about 960,000 new houses were built in Japan, while even in the U.S., where the population is about 2.5 times that of Japan, starts are on the 1.1-1.2 million unit level, about 1.2 times the number in Japan. In the U.K. and France, the number of new housing starts is about 160,000 and 330,000 units, respectively, making the number of new housing starts in Japan much higher. (Revitalization of the Existing Housing Distribution Market, Ministry of Land, Infrastructure, Transport and Tourism, 2016) It is predicted that if the number of vacant houses continues to increase at the current rate, the percentage of vacant houses will increase to about 30% by 2030, and one out of every three houses will be vacant. The number of children and the aging of society are becoming more and more serious every year. (Nomura Research Institute, Ltd.) In order to counter the declining birthrate and aging population, which are becoming more serious every year, we should solve the problems we are facing one by one.

The research question for this study is "New living options to realize a symbiotic society to counter the declining birthrate and aging population. Solving the vacant house problem is a step and a means toward the realization of a symbiotic society. We would like to make the most of the use of vacant houses that have been made so far, while considering a new approach that relates to a symbiotic society and realizes mutual assistance.

Various previous studies have been conducted by the government to solve the vacant housing problem. For example, a vacant house bank is a system that collects information provided by owners who wish to rent or sell their vacant houses and introduces it to those who wish to use or utilize them. In addition, a corporation called Akiya Company has established a program called Kariage JAPAN, which offers various initiatives that allow owners of vacant houses to use them at a low cost. My research topic is "realization of a symbiotic society," and my goal cannot be achieved by this previous research because the use of vacant houses is not the goal. If a new form of "symbiosis" can be realized using vacant houses, even more different ideas will be born, leading to the realization of a symbiotic society.

## **2 Discussion and implications**

A vacant house is defined as "a house that has not been lived in for more than one year." Therefore, even if it is used for storage or other purposes, if no one has lived in it for more than one year, it is considered to be classified as a vacant house.

There are many different types of vacant houses, and they are not all the same. There are three main types of vacant houses. (Statistics Bureau, Ministry of Internal Affairs and Communications, 2013 Land Survey)

The first is a vacant house for sale-rent. This means vacant houses managed by a real estate company. Properties intended to be rented or sold, regardless of whether they are new or used, account for about 53% of the total.

The second is secondary housing. These are usually housed, such as vacation homes intended for weekend or long vacation retreats, or houses where people sleep in when they work late, such as when they work overtime, and they account for 4.5% of the total.

The third is other housing. This means all but the two types of vacant houses introduced so far. These are houses that have been vacant for a long time for some reason, such as job transfer or hospitalization, or houses that are scheduled for demolition, and account for about 41% of all vacant houses. My research will focus on "other housing".

Regarding other housing, wholesale-for-rent and secondary housing may be lived in by people in the future, other housing is likely to be abandoned because buyers cannot be found. If the property is not managed regularly and falls under the requirements set by the government, it may be classified as a "specified vacant house, etc." and subject to higher property taxes, to the detriment of the owner, so care should be taken.

The reason for the recent increase in vacant houses is largely related to the declining birthrate and aging population. According to the Ministry of Land, Infrastructure, Transport and Tourism's "Current Status of Vacant Houses, etc.," the majority of the reasons for acquiring a vacant house is inheritance. This could be the case of a person who inherited his or her parents' house in a rural area, but left it vacant because he or she lives in the city center. The typical pattern of acquiring a vacant house through inheritance is that a parent dies and inherits the house in which the parent lived. Another major reason for the increase in vacant houses is that the total number of houses is gradually outnumbering the total number of households, a gap that is widening with population decline accelerates due to the declining birthrate and aging population. As the life expectancy of Japanese people has increased, the use of nursing homes has increased, and more and more houses where they originally lived are being left.

Furthermore, compared to foreign countries, Japanese people tend to prefer newly built houses to used houses. This is partly due to the lack of know-how and systems in place to properly assess existing homes as an asset value, and partly due to the fact that people emotionally want to live in newly built properties. And because new housing is the most profitable for housing providers, they have increased the number of new housing construction more than the number of households. The increase in the number of new houses means, of course, that the number of houses with the potential to become vacant in the future will continue to increase, and because this negative cycle continues, the number of vacant houses shows no sign of decreasing. Can the presence of a vacant house be detrimental to someone other than the owner? Four main issues can be raised at this point.



The first is the aging of the building. Uninhabited and unmanaged housing is naturally decrepit. In the event of a natural disaster, they are much more likely to break down and collapse than other houses. There is a risk of increased damage and the possibility of damage to other adjacent residences and other structures.

The second is the risk of crime. Older homes are brittle and damaged here and there, furthermore, according to the Ministry of Land, Infrastructure, Transport and Tourism's "Land Statistics Survey," about 90% of vacant houses are made of wood, making them extremely flammable. Once a fire breaks out, it can spread to neighboring residences. In recent years, it has also been in many cases as a base for fraud. This would endanger not only the owner, but also the neighbors.

So why don't owners of vacant houses proceed to dispose of them? I think that it is involved in two main financial issues.

The first is the issue of demolition costs. The cost is about 40,000 yen for a 35 sq/ft wooden house and about 60,000 yen for a 35 sq/ft house of concrete structure. It means that, it costs at least about 1 million yen to demolish a vacant house. More specifically, it needs about 1.8 to 2.4 million yen for a 2000 sq/ft house. The average house area in Japan is about 1000 to 1400 sq/ft, which means that the demolition cost would be the same as buying a wagon car. Other than demolition costs, there are also needed charges for preventing debris, sand and dust from scattering into the surrounding area during demolition, soundproofing, and treatment of waste materials, furniture and home appliances. (Japan vacant house support)

The second is the tax burden. The tax on land is reduced up to 1/6 for property tax and 1/3 for city planning tax if the building remains standing. If the vacant house is demolished, the tax burden will increase three to six times because the government doesn't support the demolition of the house until a new land buyer is found.

In fact, a survey conducted by Clasonet Inc. of 331 men and women over the age of 30. This result shows that about 60% of people who have vacant houses answered that they want to utilize or dispose of them. However, more than 40% of them answered that they have not actually taken any action, because they don't know how to find buyers.

As a solution to this problem of vacant houses, I propose the "share house" project.

A shared house is a type of shared living in which several non-relatives live together in a single rental property. Specifically, the living room, kitchen, bathroom, toilet, etc. are shared with other residents, and each of them has their own private space. There are various advantages to living in a shared house, such as lower housing costs, reduced moving costs due to the availability of appliances and furniture, and the ability to communicate with other residents. Another major advantage is that there is not required for a "security deposit" to be paid as a guarantee or a "key money" to be given as a gratuity to the landlord. In a share house, the deposit is the same as the security deposit and key money in a rental apartment, but it is very low, at no more than 100,000 yen. Since the deposit and key money account for a large portion of the initial cost, a low deposit can make a big difference in the amount of money spent. Comparing the share house living arrangement with other countries, it is clear that it's not very popular in Japan. In fact, while there are about 4,800 share houses in Japan at this time, there are far more share houses overseas than in Japan.



According to a 2008 survey by the British Local Authority, there are about 236,000 "Houses in Multiple Occupation" in the UK, which is 3.6% of the total number of properties where several people who are not family members live together.

Furthermore, according to a 2015 survey by China's Ministry of Housing and Township Construction, the percentage of room-sharing in rental housing in China, although different from shared housing, is about 50%. One reason why share houses have not taken root so far in Japan is that many of the Japanese people are uncomfortable living together in a shared house.

However, share houses have been increasing since the late 2000s, and the number of tenants has been increasing. The Japan Sharehouse Federation and the Japan Sharehouse Association were established in 2006 and 2010 around the same time.

In addition, as neighborhoods are becoming less friendly today, the Great East Japan Earthquake of 2011 has made people realize the importance of mutual help and connections with neighboring residences and local residents, and the number of share house residents is expected to increase as more people seek human connections.

According to the Ministry of Land, Infrastructure, Transport and Tourism, there are about 1,030,000 vacant houses that could be renovated and used, and even if the number is narrowed down to those within 1 km of a station, it's 480,000 houses about half.

The key to success in the share house business is to focus on the target market and manage the business. Therefore, I propose a shared house for elderly people living alone and single-parent families. I will explain the characteristics and current situation of the elderly living alone and single-parent families.

Elderly persons living alone means the people who live their daily lives alone. According to the 2019 Ministry of Health, Labor and Welfare's "Number of Households and Household Members," there are about 7.36 million elderly people aged more than 65 living alone in Japan. This accounts for about 50% of all elderly households. In addition, the number of elderly households has nearly doubled in 34 years compared to 1986. Not all of everyone apply, but three main problems can be mentioned.

The first is "declining motivation for living." According to the Cabinet Office's "Survey on the Economic Lives of the Elderly" about 19.8% of people answered "not very much" or "not at all" to the question, "How do you feel motivated, happy, and enjoy living now?" According to the "National Survey of Family Life," about 30% of both men and women answered that the average frequency of conversation is once a week. This is due to the fact that an increasing number of people lack opportunities to interact with family and friends, participate in social activities through hobbies, and are not involved with others on a daily basis.

The second is "lonely death". According to a survey conducted by the "Committee on Measures against Lone Deaths" of the Japan Small Amount and Short Term Insurance Association, the average age of lonely deaths is 61 years old for both men and women. According to the Cabinet Office's "White Paper on Aging Society," about 34.1% of the total population aged more than 60 considered lonely death a familiar problem, while 50.8% of single-person households said it was a problem close to home, exceeding half.

The third is progression of dementia. The number of elderly people with dementia is increasing every year, and it is expected that by 2025 one out of every five people will have

dementia. In many cases, people with dementia have decreased ability to judge and think and become involved in crimes.

Single-parent households are defined as households in which the mother or father is the sole provider. According to a survey by the Ministry of Health, Labor and Welfare, the number of single-mother households has increased 1.5 times for 25 years to 1,238,000, while the number of single-father households has increased 1.3 times to 223,000. In recent years, many families are raising their children as single parents due to diversity, and some of them are facing difficult situations due to a variety of problems. Here are three main problems.

The first is a problem related to income. There is a wide disparity of income and social security, and they supplement their livelihood with part-time jobs, so it can be said that nearly half of them are forced to live a hard life with little income. Compared to the average annual income of Japan as a whole, the average annual income of single-mother households is about 2.43 million yen, and that of single-father households is about 4.2 million yen. While there is no significant difference between single-fathers, some of single-mother households are still in poverty. In fact, the relative poverty rate for single-mother households is 57.3%, with one out of every two households said to be living in relative poverty, a rate that is remarkable for a developing country compared the world. There is also a high percentage of mothers and children living in severe poverty, known as the "deep poor," at about 13.3%. The average income of father-child households doesn't too low at first glance, but the median income of 4 million yen shows a large gap and it is expected that there are households with incomes of less than 4-3 million yen. The evidence shows that the poverty rate for motherless households is quite high at about 22.9%, and that about 8.6% of the deep poor are in serious poverty.

The second is the housing problem. The percentage of owning a house is low at 34.7%, and many single-parent families live in public housing or rented houses, and the rent burden is a large portion of their household cost. Public housing can cost a lot, but It is not easy to get in because of the high ratio.

Third is the issue of time. There are many people who are busy with childcare, housework, and work. In addition, some of the people are trying to get various licenses in order to increase their income. However, given the long hours of work involved in dropping off and picking up children, housework, and other things, study time becomes very limited, and there is a risk of depression, physical illness, and other problems due to the study in between. Also there are cases of negative chain occurs, such as the loss of income when their body breaks down. In addition, the counseling center has received many comments from people who want to spend as much time as possible with their children, but don't have enough time, leaving their children and hurting their hearts.

I thought that a new system of mutual assistance could be created by targeting the elderly who live alone and single parents both have their own problems. I considered the merits of carrying out this system into practice.

First, the benefits from the elderly side. Above, I described three problems of the elderly living alone: "loss of motivation for living," "increase in solitary deaths," and "risk of progression of dementia" . I thought that a shared house with a single-parent household might bring them closer to solving these three problems.

First, regarding "motivation for living," elderly people who live alone and motivation for living decline have caused few interactions with people around them, and they have very few conversations. There is no opportunity to start hobbies or new things to do is the main reason of this point and leading to a decline in motivation for life. So, there are many more "things should do" than living alone, such as helping with childcare when the single-parent household is busy with work or cooking a meal for someone living with them. I thought that if it making new daily lifestyle, it would help improve their motivation for life. Next is about "lonely deaths." There is a previous study in which a communal living arrangement created a system to watch over elderly people who were anxious about living alone. This was targeted for such a elderly people and students. I believe that a similar value can be found in this shared house.

Finally about the "progression of dementia," a 2018 Nihon Fukushi University study found that seniors who interact with residents less than once a week compare to a 1.4 times higher risk of needing nursing care or developing dementia than those who interact frequently every day. This also means that constant communication with others will help prevent dementia. In addition, according to the National Survey of People's Lives, the more a person lives alone, they tend to speak less and increases the risk of dementia. Therefore, it is clear that regular interaction in a shared house is good for the health of the elderly.

Next, I will present the benefits from the side of single-parent households. Three main problems can be considered severe economic conditions, housing issues, and time use. I thought that this problem could also be solved by creating a shared house with elderly people who live alone.

First, it is about the "severe economic situation." According to the Cabinet Office's White Paper on Society for the Elderly, about 64% of the elderly answered that they have no problems with their economic life. The rent is relatively lower than any other rental apartment because the rooms in a shared house are small and have few facilities. In addition, water and heat costs are paid as a common service fee, so expenses are lower than the other. Discussing this with each other and determining the percentage of rent and common expenses, the amount of money spent for housing would be less than for an apartment. They may broaden their perspective on how to use their money, such as using it for food, education, or savings.

Next is the "housing problem." As mentioned above, compared to rental apartments, shared housing offers lower rent and lower water and heat costs, so the burden of rent will be reduced, and the economic situation may improve.

Finally, there is "time usage." Single-parent households are busy with daily tasks such as dropping off and picking up children, and lessons, housework, childcare, work, and study. Many of them have very little time to do their own things and hardly have time to sleep. In such a situation, it would be very helpful if there is someone who can help them. They don't have enough time, they try to make time, they cut back on their own time and push themselves too hard, they break down and end up in the hospital, their income during the hospitalization period decreases drastically, and they have to push themselves even harder to work. I thought that these vicious cycles could be eliminated by establishing a mutual assistance system. Also, if someone is nearby to support you when you are alone, you may feel more comfortable and a little more easier than if you live alone.

These are some of the benefits of creating a shared house for single elderly people and single parents. Mutual assistance is a keyword as I said in the sub theme. However, there are many disadvantages to this system. Two major ones are the risk of crime and the fear of becoming a young carer.

Regarding the "risk of crime," there may be some crimes caused between two households that are strangers living together. This is the first possible disadvantage. As a solution, I propose that they live together after understanding each other's background by conducting a thorough background check. Also, by matching two to three pairs of elderly people and single parents per house, depending on the size of the house, the risk of crime could be reduced because the elderly and single parents could look out for each other.

This section describes the "fear of becoming a young carer." The premise is that the elderly who live alone and have the right to move into a shared house are defined as those who don't need nursing care and can take care of their children to some extent, but may develop dementia or physical ailments in the course of their lives. They may have lived together and built a great relationship of trust, but I think it necessary to enter into an agreement that if something happened that was a burden to both parties, they would move out with a full guarantee of post-occupancy support. Through them, single elderly person and a single parent household can think various disadvantages as well as advantages. It is necessary to draw up a contract to deal with these points as much as possible.

- The contract period is set, and procedures such as extending the contract are followed to determine the continuation of the tenancy
- Single elderly and single parents occupying more than 2 sets of rooms
- If something happens and become burden to each other, we will guarantee after-the-fact support and move out
- Rent will be per house, not per room.
- Room assignment will be decided by discussion.

There are many other things to describe, such as how to use communal spaces and how to resolve problems, but I thought that there are many problems that can be solved by creating a contract. Not only contract but also "share house rules" is important for residents to think about such as personal belongings to be placed in common areas, cleaning responsibilities, and refrigerator usage.

Consider the management aspect. There are many ways to manage a shared house, but many properties outsource management because it requires a large amount of housing knowledge and expertise. Among several management systems, I would like to propose this study to contractors specializing in share house management, based on the outsourced management model.

First, regarding the property, the management company acts as an intermediary between the owner of the vacant house and the person who wants to manage the vacant house, and the share house operator pays the management company as an intermediary fee and the vacant house owner as a fee for the purchased building. The owner of the vacant house also pays a portion of the profit earned to the management company as an intermediary fee. The subsequent management of the property is also "outsourced management," so the owner pays a fixed monthly rent of 10-15% of the rent to the management company, which in turn

manages the property. For residents, similarly, the management company acts as an intermediary between the elderly and single parents to match them, and prospective residents pay the management company the same brokerage fee that they would pay to a real estate company. The advantage on the management side is also that the initial investment is lower, because it is a purchase of a used house instead of a new house. This system is recommended for people who want to run a business with a low initial cost. Although there are risks involved in the management of share houses, such as problems between residents and the trouble of management, share houses have gained popularity in recent years as a relatively easy business for inexperienced people to start and demand is growing. The initial cost of managing a share house is about 2.5 to 4 million yen, but it depends on the size and facilities on the house. This includes the cost of purchasing the property, furniture and the cost of renovating the private room facilities, bathrooms, and toilets. Although reforming is required for vacant houses, the cost of purchasing the property is not too expensive, so the burden can be reduced compared to purchasing a new house. License is not required to manage a share house, so it is possible to start with no experience.

There are three main advantages of share houses, the first is the high profitability. While some condominiums and apartments have profit rates of less than 10%, the average for shared houses is very high, at about 15-20%. Also it is not required to put toilets and washrooms in each room, it can be low costs and make profits maximized.

The second is the risk of vacancy. Many residents continue to live in shared houses. As mentioned before, the major advantage of a shared house is that the rent, security deposit, and key money are not expensive, and the necessary appliances are provided, making it easy for people who can't prepare the initial cost to live in a shared house. Also, once the house is fully occupied, it is expected that the renovation costs can be recovered in one year.

Third, it is possible to differentiate from competing properties. A share house can be differentiated by its concept. In this case, the property targets elderly living alone and single parents. The key to success in share house management is to create demand for share houses.

In today's society, there are many problems arising from the declining birthrate aging population and social changes. I thought that by matching vacant house owners, elderly people living alone and single-parent families may be able to solve the problems of each other, and create a positive chain of events that would lead to the realization of a symbiotic society. This is a proposal for a new way of life. This means that it is a new lifestyle option for people who are impoverished or unable to find meaning in their lives. I think this proposal has some shortcomings about some disadvantages and demand from the target audience. Also, I need to come up with something more interesting to propose to the dealer. I would like to think of a solution based on various case studies.

### **3 Conclusion**

I propose a "shared house for elderly people and single-parent families using vacant houses" to solve the three problems that have arisen in modern society vacant houses, solitary deaths of elderly people living alone, and poverty among single-parent families. This is a proposal to enhance the lifestyle with supporting and solving each other's problems, and can be said to be a new living options. By managing such a shared house using vacant houses, it is possible to realize both a symbiotic society and the utilization of vacant houses. The risk is high because

there is no precedent for shared housing for elderly people living alone and single parents, and demand surveys haven't been conducted yet. However, unless we start something new with a new way of thinking, we will not be able to solve any of the problems we face today. If such a system can be formed to solve the problem of vacant houses and realizing mutual assistance in this society with a declining birthrate and aging population, it would be a step toward an ideal world where people support each other even more.

#### 4 References

Ministry of Land, Infrastructure, Transport and Tourism Current status of vacant houses, etc.

<https://www.mlit.go.jp/common/001172930.pdf>

Ministry of Health, Labour and Welfare Current Situation of Single Parent Families

<https://www.mhlw.go.jp/file/06-Seisakujouhou-11900000-Koyoukintoujidoukateikyoku/0000083324.pdf>

Statistics Bureau of the Ministry of Internal Affairs and Communications, 2008 Housing and Land Survey

[https://www.stat.go.jp/data/jyutaku/2018/pdf/g\\_gaiyou.pdf](https://www.stat.go.jp/data/jyutaku/2018/pdf/g_gaiyou.pdf)

株式会社クラッソーネ prtimes

<https://prtimes.jp/main/html/rd/p/000000024.000038064.html>

ロイヤル介護

<https://r-guide.jp/media/topics/4966.html>

不動産住宅情報サイト スマイティ

[https://sumaity.com/land\\_usage/press/429/](https://sumaity.com/land_usage/press/429/)

キャリアゲJAPAN

<https://kariage-japan.com/about/>

公益財団法人長寿科学振興財団 健康長寿ネット

<https://www.tyojyu.or.jp/net/topics/tokushu/koreisha-koritsu/dokkyokoreisha.html>

日本空き家サポート

<https://xn--w8jv13b6d9gz83xm5o0mc223e.jp/portal/column/kind-of-vacanthouses/>

株式会社 東栄住宅

<https://www.e-blooming.com/column/possible-causes-and-solutions-of-vacant-problem.html>

UR 暮らしのカレッジ

<https://www.ur-net.go.jp/chintai/college/202103/000632.html>

あずみ苑

<https://www.azumien.jp/contents/industry/00037.html>

gooddo

<https://gooddo.jp/magazine/poverty/single-parenting/10330/>

Cabinet Office

[https://www8.cao.go.jp/kourei/whitepaper/w-2017/html/zenbun/s1\\_2\\_2.html](https://www8.cao.go.jp/kourei/whitepaper/w-2017/html/zenbun/s1_2_2.html)

みんなの介護

<https://www.minnanokaigo.com/news/kaigogaku/no680/>

ルーチ rooch

<https://blog.ieagent.jp/life/sharehouse-rent-344192>

暮らしに役立つ身近なお金の知恵・知識情報サイト 知るとぼると

[https://www.shiruporuto.jp/public/document/container/ie\\_ohaka/ie\\_ohaka001.html](https://www.shiruporuto.jp/public/document/container/ie_ohaka/ie_ohaka001.html)

株式会社アビリティセンター

<https://www.i-oshigoto.co.jp/law/zeikin/301>

70 seeds

<https://www.70seeds.jp/3keys-1/>

イエカレ+

<https://plus-search.com/chintai/knowledges/column.php?entry=367>

解体サポート

<https://www.kitai-support.com/sm/money.html>

Hello Neas

<https://hellonews.jp/4254/>

スマイテイ

[https://sumaity.com/land\\_usage/press/429/](https://sumaity.com/land_usage/press/429/)

# A new form of livestock Industry

~Potential of insect feed~

5219 Tomioka Sota

## Abstract

### ●What is insect feed?

Insect feed refers to the usage of insects ground up into powder form, as feed for livestock. Horseflies, flies, crickets, and mealworms are used as its main ingredients.

### ●What is the significance of using insect feed?

Most of the feed used in the world today is made from soybeans, and deforestation is a problem as a result of soybean cultivation.

Therefore, I believe that the most important reason for using insect feed is that it may be able to stop deforestation, which is said to be the cause of climate change.

In addition, insect feed has a variety of positive aspects.

For example, livestock can be raised using a smaller amount (about 80%) of conventional feed, food waste can be used for insect farming, and insect carcasses can be used as nutrients for agriculture.

Based on these considerations, I believe that insect feed has sufficient value to deserve to be utilized.

### ●What challenges in practical application of insect feed?

Because of the high costs involved in breeding, commercializing, and transporting the insects, they cannot be substituted for fish meal or soybean oil meal now, and the challenge is to achieve stable distribution throughout the year and keep supply costs realistic. The high price of insect feed is simply due to low production and limited sales channels.

It is also expected that many people will not think well of the use of insects for food-related purposes, even if they are fed, so I think the image of insects needs to be fundamentally improved.

## 1.Introduction

“Insects” are currently attracting attention as a new animal resource for the age of population explosion.

The Food and Agriculture Organization of the United Nations (FAO) also recommends entomophagy (Refers to the behavior or mode of behavior of eating insects), and the promotion of the use of insects as food is a worldwide trend.

These days, entomophagy has become a part of many conversations, but the public's impression of it has not been positive.

In fact, a survey of people who had never eaten insects before asked, "Would you like to try entomophagy? About 90% of the respondents answered "no" to the question.

Furthermore, 80% of respondents answered "dislike" or "somewhat dislike" insects in a survey asking whether they like or dislike insects. Therefore, I thought of using insects as feed as a way to ease people's resistance.

The goal is to stop the production of soybeans which are now the main feed for livestock in many parts of the world, and the deforestation that goes with it.



I thought that by using insects as feed, it would be possible to reduce soybean production and associated deforestation.

Most of the previous studies related to my research are on nutrients in insect feeds.

It is beyond my scope to study the nutrients of insect feeds and the actual changes in body weight and meat quality of livestock when they are used, so I will use this data and focus on the "practical application of insect feeds," which has not been mentioned in previous studies. And the main research method will be Internet research.

The main research method will be to gather information on the current status of insect feed in various parts of the world and the nutrients contained in insect feed, and then to think about how to promote the expansion of insect feed use by ourselves.

## **2 Discussion and implications**

Deforestation associated with soybean cultivation is currently a problem in the world. To what extent, exactly, is this a problem? Let us look at the example of Brazil, the world's largest soybean producer.

Large soybean farms accounted for 17% of the deforestation in the Amazon between 2001 and 2004.

In addition, the total area of deforestation and conversion of native vegetation throughout Brazil has increased to the point where increased soybean production is now considered a direct cause of deforestation, and since July 2006, the world's major soybean producers have agreed not to purchase soybeans grown on land cleared in the Brazilian Amazon. This is the first time that soybean production in the Amazon region has been halted. Once this was done, the deforestation caused by soybean production in the Amazon region was drastically reduced, but this does not mean that the relationship between soybeans and deforestation has been severed, as the lands that had previously been cleared for logging and grazing are now being used. Nevertheless, the deforestation rate in the Brazilian Amazon was reduced by 70%. In other words, soybean production had that much impact.

However, deforestation in other areas continues.

Brazil does not have a climate that is naturally suited to soybeans (soybeans are native to East Asia). So, the soil is being modified, genetically modified soybeans are being planted, and chemical fertilizers and toxic herbicides are being used to cultivate soybeans. These genetically modified soybeans are capable of taking in more water to optimize their growth. Thus, they have been known to deplete water resources. Furthermore, herbicides and fertilizers used in the farming process might seep into water sources and induce toxicity for local residents obtaining water.

Moreover, deforestation threatens the lives of many valuable species in the Amazon and the Cerrado, which are ecological treasures.

Although soybeans are causing enormous damage in this way, about 80% of these soybeans are used as livestock feed. This led me to believe that the use of insect feed in place of conventional feed would be an effective way to reduce deforestation.

However, can insect feed be used as a substitute for conventional feed?

In an experiment examining the difference in feed requirement ratio (which indicates how many times more feed is required for livestock to gain 1 kg of body mass) between feeding conventional formula materials and formula feed mixed with larvae (mealworms), the results

after the third week showed that the feed requirement ratio for the group fed conventional feed went from 1.59 to 1.63, whereas the mealworm group had low feed requirement rate of 1.22 to 1.36, indicating that the use of insect feed may increase feed efficiency.

In an experiment in which broilers were fed soybeans, fly larvae, and spirulina (a type of phytoplankton) and their responses were observed, it was reported that there was no significant difference in the chicken's response to either feed, and furthermore, no difference in chicken quality between larvae and soybeans.

It has been shown that insect feed can adequately serve as an alternative to conventional feed. Furthermore, insect feed is not only equal to conventional feed, it has a superior point. It is the frass (leftover food, insect excrement, molted shells, insect carcasses, etc.) produced during the farming of insects for processing into insect feed can be used as fertilizer.

For example, cricket frass contains the highest percentage of phosphoric acid among the three major elements of fertilizer (nitrogen, phosphoric acid, and potassium), and it can be expected to provide a fertilizer effect somewhere between that of cow manure and chicken manure.

It also has low moisture content, requires no drying process, has little smell, and is easy to store and handle. In addition, crickets are an excellent fertilizer because they are an organic fertilizer that is free of veterinary drugs and feed additives, and no antibiotics are added during the breeding process.

Thus, insect feed is a sustainable means with many advantages.

### **3 Conclusion**

In conclusion, insect feeds are a very effective means of solving many of the problems currently facing the livestock industry. Deforestation is a pressing problem impacting the world. As such, there is a pressing need to resolve it. In this report, I have outlined how the switch from soybean to insect feed might alleviate this issue. In addition, in aiming to expand the use of insect feed, we believe that facilities specializing in insect farming should be established. Insect farming does not require that much space, and even a small facility can handle the entire process from cultivation to harvesting at once. In addition, in aiming to expand the use of insect feed, we believe that facilities specializing in insect farming should be established. Insect farming does not require that much space, and even a small facility can handle the entire process from cultivation to harvesting at once.

As for the future, insect feed faces a number of challenges.

The most significant is the high cost of raising, commercializing, and transporting insects.

Furthermore, there is a need to expand the need for insect feed due to changing social perceptions, innovations in production technology, and clearing regulations for frass.

I would like to explore ways to resolve the above issues, as we anticipate that if realized, the project will play a major role as an innovative and sustainable source of protein.

### **4 References**

Can dried mealworm (*Tenebrio molitor*) larvae replace fish meal in weaned pigs?

<https://www.sciencedirect.com/science/article/abs/pii/S1871141319317445?via%3Dihub>

A study of the potential effect of yellow mealworm (*Tenebrio molitor*) substitution for fish meal on growth, immune and antioxidant capacity in juvenile largemouth bass (*Micropterus salmoides*)

<https://www.sciencedirect.com/science/article/abs/pii/S1050464821003995>

気候変動で注目される、昆虫飼料の可能性

<https://www.ethicalfood.online/2020/07/141252.html>

EUにおける昆虫の飼料利用の実態と展望

[https://www.alic.go.jp/joho-c/joho05\\_002898.html](https://www.alic.go.jp/joho-c/joho05_002898.html)

The silkworm of *Bombyx mori* effectively prevents vibriosis in penaeid prawns via the activation of innate immunity

<https://www.nature.com/articles/s41598-018-27241-3>

動物の餌になる大豆が森林を破壊する

<https://www.hopeforanimals.org/environment/soybeans-and-deforestation/>

Connecting exports of Brazilian soy to deforestation

<https://www.sei.org/features/connecting-exports-of-brazilian-soy-to-deforestation/>

# Connected by Foods

~ How to leverage Japan's strengths ~

5220 Nakafutami Misuzu

## **Abstract**

There are some problems related to food, health, and children, because food sciences are progressing. This problem is not only developing countries but also developed countries. Eating food is one of the essential things in our life, and I am interested in being a Registered Dietitian in the future. I have studied the relationship between food and our life and health. I think Japan's Nutritionists and Registered Dietitians have good ability and Japan's food culture is one and only. So I came up with ideas which can be solved using Japan's strength.

Then I suggest utilizing the Japanese children's cafeteria system. Children's cafeterias are places where children can get well-balanced and low-cost diets.

I propose to keep children healthy by serving well-balanced and low-cost diets referenced Japanese food and Japanese style school lunch. This study relates to SDGs #3 "Good health and well being" and #8 "Decent work and economic growth". I hope the place will become a cozy space and cultural exchange.

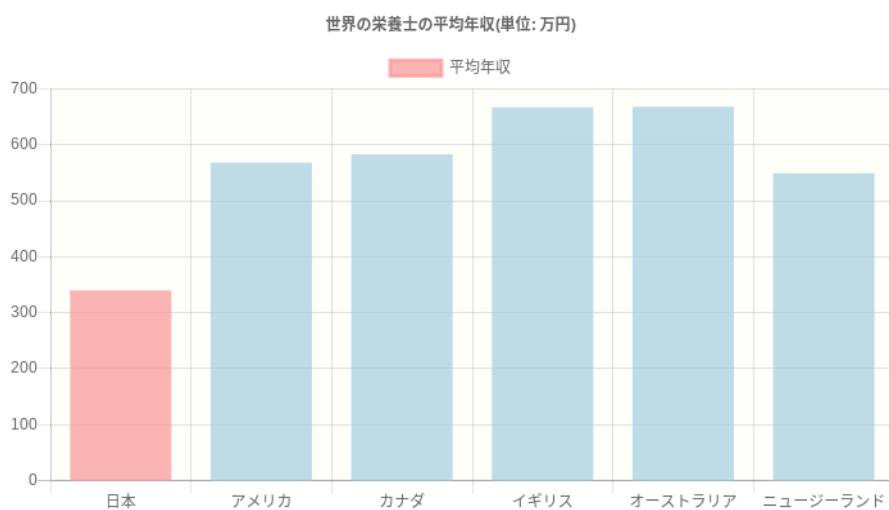
## **1 Introduction**

At first, why I chose the theme. I am interested in being a dietitian and I thought about what role a Japanese dietitian has, what certificate and what kind of work space a Japanese dietitian has, so I started to research about Japanese dietitians.

By conducting this research, I think we can spread the goodness of Japanese food as well as the success of Japanese dietitians, and can help children's health. This study relates to SDGs #3 "Good health and well being" and #8 "Decent work and economic growth".

## **2 Discussion and implications**

Dietitians in Japan earn about half as much as dietitians in Australia and the UK. Not only that, it is lower than in other countries (The US, Canada, New Zealand). It is a very big difference, so I wondered what could have caused this outcome.



I thought one of the reasons might be differences in qualities. In Japan, there are two qualifications; Nutritionist and Registered Dietitian [ in Japanese 栄養士と管理栄養士] while, In Australia there are Nutrition and Dietitian and those work considered more similar to medical care, and those works are more important in Australia than in Japan. In Japan, Registered Dietitians are nationally licensed by the Minister of Health, Labor and Welfare. Their job is to provide nutritional guidance and nutritional management with professional knowledge and skills to each and every person, whether they are sick, have difficulty eating, or are healthy. On the other hand, dietitians are licensed by prefectural governors to provide nutritional guidance and manage school lunches, mainly for healthy people. In Australia, there are two types of qualifications, they are Nutrition and Dietitian. Dietitians also active in the medical field. Nutritionists are close to natural remedies. Other examples include, in the U.K., nutritionists work in public health, health improvement services, health policy, government agencies, NGOs, and research institutions, and spread information about food and health. Dietitian is the only nutrition-related certification recognized by law that can work with a wide range of people, from the healthy to the sick. This indicates that they are not the same qualification. And some of the qualifications for example, nurse and physical therapists can be rewritten, but those qualifications cannot be rewritten. I see this as a major problem. So If you want to work abroad as a Registered Dietitian, you will need to take local qualification. To do so, they must attend a foreign university and study for a qualification, and this will take a lot of time and money. Changing this system is not realistic, so I change the point of view.

So I think we need to find a job for most Japanese Registered Dietitian's career. What is a Japanese Registered Dietitian's specific career? I think making school lunch is one of their specific careers, because they experienced large-scale food preparation, and they prepare and serve health-conscious menus every day. And Japan has an original food culture; Japanese food. It is one of the reasons Japan's life expectancy is among the highest in the world. I think the use of Japanese food has spread the appeal of Japanese food.

It's recent problem in the world. The number of fat children is increasing worldwide. Actually, in Northern Africa the percentage of skinny children was 20 percent in the 1970s, today it is less than five percent. Meanwhile, during the same period, the percentage of fat children went from 0% to more than 10%, a reversal that has already occurred. Similarly, it's happening in China, and there are 2.8 billion obese children. This media shows increasing fat children not only in developed countries, but also in developing countries. One reason is the availability of processed and junk foods with low nutritional value at low prices. These are low in nutritional value and contain high levels of carcinogens and atherosclerosis-causing. However, because they are cheap and easy to buy, they are easily economically dependent. Actually 80 % of people who were fat as children are fat as adults. And from 3 to 8 years of age, better habits are said to be needed. So it is important to get your eating habits in order when you're young. Then I think utilizing the Japanese children's cafeteria system is one of the solutions.

What is a children's cafeteria in Japan? It is easy to say places where children can get low-cost meals. The NPO National Support Center for Children's Cafeterias, Musubie, defines a children's cafeteria as "a free or low-cost cafeteria where children can go alone". When you hear the term "children's cafeteria", you probably have a strong image of a low-price or free cafeteria providing help for poor children. Actually there is not only this role, but also making relationships with the neighboring area and preventing solitary eating. Generally speaking eating alone has negative mental and physical effects. So a children's cafeteria is not just a way of helping poor children. Preventing eating alone is connected with children's good health.

### **3 Conclusion**

Then I suggest utilizing the Japanese children's cafeteria system. I propose to keep children healthy by serving Japanese food there and to have Japanese dietitians work abroad. I show the system, the targets are children mainly, the purposes are creating opportunities to eat more balanced meals at a lower cost, the workers are Nutritionist and Registered Dietitian who want to work abroad are main and others are to collect donations of surplus and soon-to-expire food items, holding food culture exchange events for children and holding lectures about balanced diets for parents. To create a place for various children and community members to gather and interact with each other, and organizing events and other events will give more people a chance to get to know each other. Also, by asking people to donate surplus or near expiration date food, the food used can be provided at a lower cost.

I have some tasks. First, to find out if there are similar facilities, and whether or not there is demand for it. Second, totally changing one's own culture is impossible and not good. I went to Olam International in Singapore for a company visit. At that time, Mr. Miyasaka gave me some advice. He recommended using foods with enhanced nutrients. So I will search about those foods. I want to solve the problem related to children's health and eating, because eating is a necessary thing in our life, so I want to support people's lives from being a Registered Dietitian in the future. So I will continue to research this study.

### **4 References**

<https://www.cNBC.com/2023/03/02/nutritionist-from-japan-shares-foods-she-eats-every-day-to-stay-healthy-young-and-live-longer.html>

2023/05/12 CNBC make it I'm a nutritionist from Japan, home to the world's longest-living people—here are 5 longevity foods we eat every day

<https://www.mag2.com/p/news/384980>

2023/05/29 MEG2 NEWS 現役医師が警告。日本の低所得者と途上国で「肥満」が増える理由

<https://www.bbc.com/japanese/41577945>

2023/05/29 BBC NEWS JAPAN 子供の肥満問題、世界各地に拡大

<https://www.dietitian.or.jp/students/dietitian/>

2022/07/24 公益財団法人日本栄養士会 管理栄養士・栄養士とは

<https://www.aswho.com/dietitian>

2022/07/21 オーストラリア留学センター〈通信版〉 オーストラリアで栄養士

[https://www.nemublog.info/global-nutritionist/#Nutritionist\\_Dietitian](https://www.nemublog.info/global-nutritionist/#Nutritionist_Dietitian)

2022/07/24 Nemu's Blog FROM LONDON 【イギリス栄養士が教える】海外で栄養士として働く

<https://55a.info/contents/study-abroad/social/dietitian.html>

2022/07/24 COCOA ココア留学 栄養士が留学！海外で栄養士を目指す？それとも転職？

<https://kaigai-ten.com/nutritionist.html>

2022/07/24 海外転職ジョブ 栄養士・管理栄養士として海外転職する求人選択肢は豊富にある

[https://www.maff.go.jp/j/syokuiku/minna\\_navi/topics/topics1\\_02.html](https://www.maff.go.jp/j/syokuiku/minna_navi/topics/topics1_02.html)

2022/06/15 農林水産省 みんなの食育

<https://www.intage-research.co.jp/lab/report/20201112.html>

2021/11/16 「子ども食堂」の認知度は8割で高止まり？～コロナ禍で注目の「フードパントリー」、認知はこれから～ 株式会社インテージリサーチ

<http://www.shaho-net.co.jp/kokoromokaradamo/01/index.html>

2021/09/28 心も体も健康に 食生活とメンタルヘルス

<https://www.mfa.co.jp/cando/cando-873/#i-8>

2021/10/12 ManulifeFinancialAdvisors 子どもの孤食が増えている

<https://www.maff.go.jp/j/syokuiku/kodomosyokudo.html>

2021/10/26 子ども食堂と連携した地域における食育の推進 農林水産省

# Music Psychology

## Life with music effect

5221 Nagayama Naoto

### 1. Abstract

These days many people hold stress for a lot of things. The tool to get rid of stress is abundant. An example to get rid of stress is listening to music. The method of listening to music has changed. There are many causes. Development of earphones, social networking service communication, importation of foreign music application subscription tool. I think listening to music is a good tool to get rid of stress.

However, why does music get rid of stress? In conclusion, I believe that music has a psychological relationship. The research on music psychology is abundant. Most of the researches concluded “music has a psychological effect”, but why does music have a good effect on humans? This is my research key sentence, and understanding that leads to my research conclusion.

### 2. Introduction

One of the characteristics of society is the tendency to be under a lot of stress. There are various ways to solve stress, but I often relieve stress by listening to music. I found that listening to music can be calming and relaxing. From there, I began researching and learned that there is a profession of music therapist.

In addition, my research used music therapy, which is the clinical and evidence-based use of music interventions to accomplish individual goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program. Music therapy interventions can address a variety of healthcare & educational goals. For example, promoting wellness, managing stress, alleviating pain, expressing feelings, enhancing memory, improving communication, promoting physical rehabilitation, and more. They connect to improve client's quality of life.

Currently, the medical situation is often compromised by coronas. I began this research last year in the hope that the current state of medical care could be improved by reducing the burden of medical care on ordinary patients through the effects of music therapy. I believe that it is not realistic to make the profession of music therapist a national qualification or to increase the number of music therapists in the first place, so this year I began researching to realize music therapy that does not require music therapists.

### 3. Discussion and implications

First, I describe the psychological effects of music.  
Motor cortex: used for pulling musical instruments, dancing, etc.  
Nucleus accumbens: involved in emotional responses to music  
Amygdala: involved in the emotional response to music



Sensory cortex: provides sensory feedback when playing an instrument or dancing

Auditory cortex: provides initial processing when listening to music

Hippocampus: stores contrasts and other information when listening to music

Visual cortex: used to read music and identify performers

Cerebellum: involved in body movements and emotional responses to music

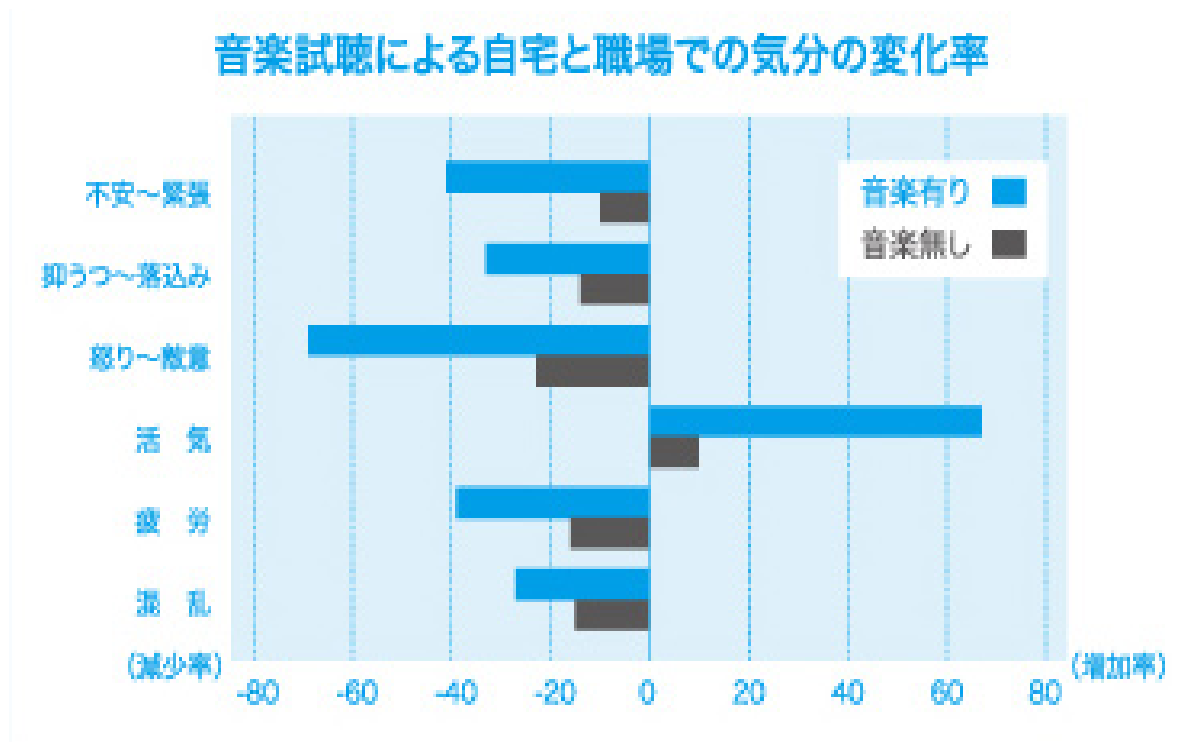
So much brain activity is involved in the simple act of listening to music.

Specific effects,masking effect;Muffles noise, etc. through music. When used properly, it can create a natural space.

Image induction effect; Another effect of BGM is the image induction effect. This is an effect that brightens the atmosphere, creates a sense of luxury, creates a pleasant atmosphere, and determines the image.

Emotion-inducing effect; B It is related to behaviors, perception, memory, learning, and decision-making.

Behavior inducing effect; Changing the tempo of music changes the speed of human behavior.



This is a graph of the rate of change in mood when listening to music. Bad effects on people are diminishing. Conversely, good effects for people are increasing. Thus, music has many good effects on humans.

#### **4. Conclusion**

People have different tastes in music. Music is becoming more and more accessible with the advent of YouTube and subscriptions. It is no exaggeration to say that it is impossible to remove music from human life today. The benefits of knowing the good things about music and incorporating it into our daily lives are great.

I suggest two things. Let people know the effect of music on the psyche.

Create and share a soundtrack

It takes advantage of the playlist sharing feature of YouTube and music apps.

It has two advantages. Eliminating the hassle of choosing your own music.

Encountering music you didn't know existed. In addition, by using the functions outlined above, it is possible to experience the psychological effects of music at the same time.

#### **5. Reference**

Music Therapy (2021/5/13)

<https://www.brush-up.jp/guide/sc674#:~:text=>

Music Therapy in America(2021/5/20)

<https://hope.mark-no-juku.com/lshope/2018/09/25/post-343/>

Music Therapist(2021/7/21)

[https://www.ekaigotenshoku.com/ekaigowith/2020/02/17/ongakuryouhoushi\\_shikaku/](https://www.ekaigotenshoku.com/ekaigowith/2020/02/17/ongakuryouhoushi_shikaku/)

Music Therapy(2021/7/21)

[https://www.jmta.jp/music\\_therapist/](https://www.jmta.jp/music_therapist/)

Music Therapy Proof of Effectiveness(2022/4/20)

[https://www.jstage.jst.go.jp/article/jhas/5/2/5\\_2\\_82/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/jhas/5/2/5_2_82/_pdf/-char/ja)

Music Therapy Effectiveness(2022/4/20)

<https://core.ac.uk/download/pdf/233954687.pdf>

Ministry of Education, Culture, Sports, Science and Technology

Chapter 2: Mental Health Care: Ministry of Education, Culture, Sports, Science and Technology (mext.go.jp)

Music Therapy Verification Document(2023/5/21)

[https://healingplaza.jp/user\\_data/fl\\_tsuukin.php](https://healingplaza.jp/user_data/fl_tsuukin.php)

Music Therapy Verification(2023/5/21)

<https://www.della.co.jp/statics/dlmf-3908.htm>

Music and the Brain Relationship(2022/11/14)

[https://www.lifehacker.jp/article/131129how\\_music\\_affects\\_the\\_brain/](https://www.lifehacker.jp/article/131129how_music_affects_the_brain/)

Music and the Brain Experimental(2022/11/7)

<https://www.sciencedirect.com/science/article/abs/pii/S0304394009003279>

Brain science Music(2021/7/14)

<https://japan-brain-science.com/archives/1351#i1>

Music Psychological Effects(2023/2/21)

[https://www.head-t.com/2013/01/2013-01-06\\_01.html#01](https://www.head-t.com/2013/01/2013-01-06_01.html#01)



repay after studying abroad. It is difficult for people with a low income to launch overseas study.

Therefore, I want to achieve two things at the same time: progressing studying abroad and the abilities of reading and writing in Africa. I am sure that this study will bring great changes not only for developing countries but also advanced nations. Also, this result will contribute to achieving the SDGs, number 1 (No Poverty) and 4 (Quality Education).

## 2, Discussion and Implications

I set some clear goals for each problem; for developing countries, especially African countries, the goal is to increase the literacy rate to 100%. For advanced countries, especially people who want to study abroad, the aim is to improve their English ability by studying in Africa. Even more telling, it is said that it is a rough idea that if you have 80-100 points on the TOEFL test, it will be useful for job hunting. Whatever your goals after studying abroad, progressing your language skills is the most important issue in this study.

The conclusion of my research is that going together to volunteer and study abroad in African countries.

‘Projects Abroad’ actually carry out some projects like my suggestion in this study. They go to short-term volunteering in order to support a lot of people who can not receive enough treatment because of their low revenue. This projects really suit my research, but there are some problems: these projects are conducted for only a few weeks, so it is not profitable for people who want to acquire another language skill in advanced nations. Also these projects cannot solve the core of poverty, these solve just superficial problems.

According to UNICEF, there are some strategies to improve literacy rate of the African continent. For instance, it performs the ‘Terakoya’ movement, which people in advanced nations donate some postcards, unused stamps, and such. Actually the ‘Terakoya’ movement has succeeded somewhere. From the UNICEF homepage: So far, more than 1.31 million people in 44 countries and one region have benefitted from the chance to receive an education at TERAKOYAs (CLCs). About 17,000 classes were conducted at TERAKOYAs including home, school buildings and camps. In the world today, however, about 750 million adults (age 15+) still remain illiterate, and 12.4 million of children (age 6-14) have no chance to go to school. The World TERAKOYA Movement will be carried on so that we may achieve the world where no one will be left behind and everyone can participate in achieving the global goal of SDGs. As you can see, it is an effective way to conduct teaching of Writing and Reading for the children in there.

Also I suggest two types of studying abroad. One of them is going to university in Africa, and the other is not going there. The benefits of going there is that you can learn English better than not going there. This is because there are a lot of people who want to learn English or other languages, so you must improve your study. On the other hand, if you will not go to African college, you can study abroad with a low-budget. However there are some drawbacks. If you go there, you have less connection with uneducated area’s people. This means the influences become less. On the other hand, there are a lot of dangerous things like toilets, foods, and other facilities without living in college. Therefore I set two types of

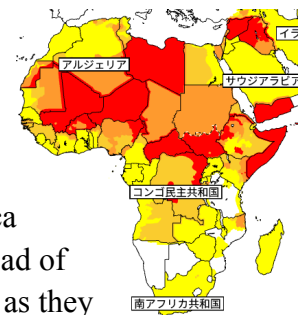


studying abroad to choose which you focus on, contributing to volunteer, or developing your English skills. Also students who go to African continent as volunteer and studying abroad can use their English textbooks which we used in elementary or secondary school. In fact, we learned reading and writing in English with this tools, so it is also useful for Africans students.

About studying abroad in African countries, I considered advantages and drawbacks. Advantages: we can go studying abroad with low-budget, learn various cultures, and contribute to SDGs goals 1 and 4.

Drawbacks: the danger, the safety of foods, toilets, and a concern of foreign accent.

First, according to the Ministry of Foreign Affairs, they announce a danger map, and they show us that there are a lot of dangerous places in Africa. The red countries means that you must evacuate there, and refrain from going there. The others warm color such as orange, and yellow also illustrate to warn. Also, food and toilet safety can not be guaranteed completely. In this situation, it is impossible to carry out immediately. This situation has been made by serious terrorism problem, so there are possibility to realize that. I want to realize my suggestion as soon as possible.



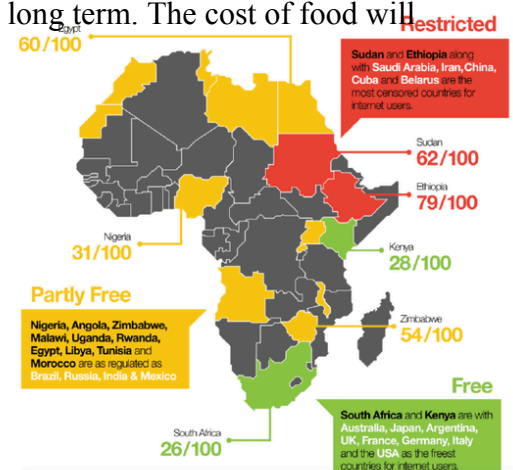
Second, there is no worry about peculiar accents or dialogue, because The African accent is easy to catch for Japanese. This is because there are some practice that people in African countries especially South Africa speak English without abbreviations, such as they speak 'I want to' instead of 'I wanna'. This way of speaking is similar to the Japanese English style as they learn in Japanese English textbooks. In Africa, people speak English as a second language, so Japanese English is apt to communicate easily in there.

Therefore it is impossible to carry out my suggestion right now, so until we can go to Africa safely, I propose using the Internet to teach Writing, but also acquire English speaking skill.

I considered the case of assuming that we can go to the site and the case of using the Internet in our own countries.

In the case of going there: people in advanced countries go to African countries to study abroad with low budgets. By doing so, the children in there could be taught reading and writing to overcome their poverty situations. I assume that people who go there are mostly students, so they could teach those things by using their own English textbooks. If there were some children who cannot speak any English, the 'teacher' should be helped by African adults who can do that. As a result, the children would be able to learn English skills from scratch. African who cannot read and write may be because they are not able to go school, so I suggest that international students from developed countries and other countries visit children who require education, and live there for about 6 months. Also, international students will be replaced so that African children can for the long term. The cost of food will be collected by donation.

In the case of utilizing the Internet: This graph shows us the penetration of the Internet in Africa. Green colors mean the areas where people can use the Internet freely. Yellow and red countries also can use the Internet with some restriction, so the 'teacher' would teach reading and



writing in these colored countries. Also, they should send their Japanese English textbooks to African children and they will use them to teach that. If these people do not have any Internet devices, smartphones would be supplied by contribution.

There is a problem with trying to do this that they do not have licenses of teaching as students, so is it possible to teach them something?

### **3,Conclusion**

I suggest two types of methods to improve literacy rate in the African continent. First of all, the way is to go to African countries to teach English writing and reading as studying abroad and volunteer. By doing this, the international students could acquire English speaking skills because Africa's second language is English. They would teach reading and writing in English by using Japanese textbooks which the students used when they were junior high school or high school students. Also students can choose which is better for them, going to university there or not. The other way is to use the Internet. First one is so difficult to carry out right now because there are serious civil war or terrorism problems. The concern points of this study is that most of students do not have qualifications of teaching, so I worry about the possibility to conduct my suggestion.

### **4,References**

2023,June World terakoya movement/UNESCO

<https://www.unesco.or.jp/en-activities/>

2023,June What is the penetration of literacy rate in Africa?

<https://mirasus.jp/sdgs/industry-inovation/1612>

2023,July Presentation material showing the Internet situation in Africa

<https://gigazine.net/news/20160527-africa-internet-situation/>

2023,July World terakoya movement in Japanese / UNESCO

<https://www.unesco.or.jp/activities/terakoya/>

2023,July What is the literacy rate? The reasons why the literacy rate in Japanese is not 100% completely.

<https://exidea.co.jp/ethicalchoice/journal/sustainable/literacy-rate/#7>

2022,August How much will it cost if you study abroad in the US?

<https://www.iss-ryugakulife.com/useful/21375.html>

2022,August The scholarships for studying abroad

[https://www.jasso.go.jp/ryugaku/scholarship\\_a/index.html](https://www.jasso.go.jp/ryugaku/scholarship_a/index.html)

2022, August Study abroad scholarship pamphlet | curricular study abroad information site  
[https://ryugaku.jasso.go.jp/publication/pamphlet/#link\\_pamphlet\\_contents](https://ryugaku.jasso.go.jp/publication/pamphlet/#link_pamphlet_contents)

2022, August Summary of scholarships for studying abroad  
<https://financial-field.com/loan/entry-136448>

2022, August How much does it cost to study abroad?  
<https://www.world-avenue.co.jp/wa-news/howlong>

2022, September Cost of studying in Malaysia  
<https://www.ceb21.jp/malaysia-ryugaku/cost/>

2022, September Safety Information of Malaysia  
[https://www.anzen.mofa.go.jp/info/pchazardspecificinfo\\_2022T091.html#ad-image-0](https://www.anzen.mofa.go.jp/info/pchazardspecificinfo_2022T091.html#ad-image-0)

2022, September Projects Abroad  
<https://www.projects-abroad.jp/projects/volunteer-childcare-philippines/>



# Philosophy To Protect Youths

~To Flourish The Power Needed In Future By Philosophy Education ~

5223 Hiraishi Non

## **Abstract**

Nowadays , most nations like Europe are doing philosophy education.This education is necessary enough to flourish children as the power to find problems,and resolve them. However, Japan does not teach philosophy in the compulsory education curriculum. This may bring the situation that there are so many unemployed people and children who do not go to school. I aimed to solve this situation by starting “ Philosophy Education”. First, I tried to suggest adding Philosophy as a new subject. However, Japanese education already has so many subjects and that forces teachers to do so, which is inappropriate in this situation. Then, I came up with an idea to integrate Career education into philosophy. For example, teachers are going to give a topic. Students are going to think about that and realize what is important from that topic. In this way, we can develop childrens’ thinking ability to a high level without increasing teachers’ burden. And, it will be easier for students to achieve their careers.

## **1.Introduction**

### **The research background/significance**

In Japan, the number of unemployed people between the ages of 30 to 50 is so large and increasing . Also, it is a big problem now that students who do not go to school. As we can see, there are a lot of people who cannot participate in society. Compared to other developed countries,these problems do not occur frequently. I thought this because there is less education in philosophy. The countries which educate philosophy do not have such a problem. Therefore, I started to research to educate philosophy as I judge the Japanese current situation to resolve the problem.

### **The purpose of this research**

My purpose has two points; to propose the participation of Japanese people and to cultivate the ability to be negative through the world and society.

※ In this research, I considered not to burden to Japanese education.

### **Research question**

Research question has three points; Is it possible to implement Philosophy education in Japan?/ What is the merit of implementing Philosophy education?/ How should we implement Philosophy Education in Japan?

### **The way of this research**

There are 5 steps. First, I solved my research questions.Second,I compared Japan with overseas countries. Third,I suggested it to the Japanese government as I modified and verified my suggestion. Finally, I worked on philosophy education.

※ I use the internet mainly.

※ If it is necessary to implement, I go to field works and contact with professors.

## **2.Discussion and implications**

## Career education implecated in Japan

Elementary schools → Not implicated

Junior high school → To instruct Career lecture/Interview with 2 to 3 people

High school → To instruct Internship/lecture/interview

### Comparison; I investigated 3 foreign countries' examples.

France

○Content: Philosophy is a required class. It includes the entrance exam in university.

○Result: IMD ranking is 25th in the world. (Japan:35th)

Switzerland

○Content: It implicates Philosophy education from childhood.

○Result: IMD ranking is 1st succeeding 5 years.

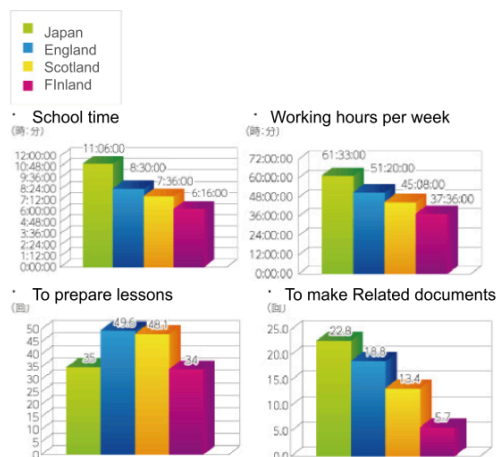
The UK/Oxford university

○Content:It has a PPE(philosophy-politics-economy) faculty(signboard faculty).

○Result: Universities Ranking is 1st. (Tokyo unv:39th)

PPE's graduates are famous around the world (Ex. Boris Johnson,Thatcher,etc.)

### The burden of teachers in Japan now



As the graphs show, the burden of Japan is much more than other countries. According to this information, it is difficult to implement philosophy education as a “subject” in Japan.

I think that we have to embrace the present classes to introduce the education system because implementing them as a subject is too hard. Then, I came up with an idea that we combine career education with philosophy.

### My idea/suggestion

Career education requires “educational consistency” and “self analysis”, and Philosophy will be useful to cultivate these qualities. Current career education in Japan is not sufficient to develop students' ability to think. However, using philosophy allows students to think for themselves and clarify what they want to be/ what to do.

I intend to use three steps in the actual class.. First, a teacher shows what to think in class. This theme is about philosophy. (Ex. Why do you live? etc.) Second, students think about the theme spending more than half of the class and they summarize them in paper. Additionally, these themes are going to be developed as students grow. As they grow, themes are going to be abstract from concrete because to think abstract things is difficult and useful.

From these points, I believe that students will be able to get the ability to live in the future. Therefore, I suggest adding Philosophy education into Career education.

### 3. Conclusion

In conclusion, I tried to implement philosophy education to enhance the human resources and decrease the number of people who do not join the society.

However, to add education as a subject is too difficult due to teachers' burden.

Therefore, I suggest that we have to realize this education by integrating Career education into philosophy education. As the issues, I want to solve two things; to set the theme relying on their development and age and to verify the burden of teachers if this proposal is implemented.

#### 4. Reference

- [https://www8.cao.go.jp/youth/whitepaper/r01gaiyou/s0\\_2.html](https://www8.cao.go.jp/youth/whitepaper/r01gaiyou/s0_2.html) The cabinet office in Japan 2022.12.5
- [https://www8.cao.go.jp/youth/whitepaper/h25honpen/b1\\_04\\_02.html](https://www8.cao.go.jp/youth/whitepaper/h25honpen/b1_04_02.html) the same with above 2022.12.5
- [https://www.mext.go.jp/content/20201015-mext\\_jidou02-100002753\\_01.pdf](https://www.mext.go.jp/content/20201015-mext_jidou02-100002753_01.pdf) Ministry of education 2022.12.5
- <https://www.flierinc.com/summary/170> "Philosophical thinking" for living now\_\_ Masao Kurosaki 2022.12.19
- [https://jnapcdc.com/LA/sugimoto/sugimoto\\_02.html](https://jnapcdc.com/LA/sugimoto/sugimoto_02.html)  
Introduction to Philosophy - To think about things that only you can think about - Takahisa Sugimoto 2022.12.19
- Shincho Primer Bunko First Philosophical Thinking\_\_Kazunori Tomano 2022.12.19
- [https://www.mext.go.jp/b\\_menu/hakusho/html/hpab200601/002/002/026.htm](https://www.mext.go.jp/b_menu/hakusho/html/hpab200601/002/002/026.htm)  
"Career guidance at junior high schools" \_Ministry of Education 2022.12.19
- [https://www.mext.go.jp/a\\_menu/shotou/career/070815/all.pdf](https://www.mext.go.jp/a_menu/shotou/career/070815/all.pdf)  
The necessity of career education from elementary education\_\_Ministry of Education 2022.12.19
- [https://www.mext.go.jp/component/a\\_menu/education/micro\\_detail/\\_icsFiles/afieldfile/2011/11/04/1312817\\_07.pdf](https://www.mext.go.jp/component/a_menu/education/micro_detail/_icsFiles/afieldfile/2011/11/04/1312817_07.pdf) Definition of career guidance\_\_Ministry of Education 2022.12.19
- Philosophy education in French high schools (lycées)\_\_Professor Emeritus of Nagoya University Shigeo Shirai
- <https://diamond.jp/articles/-/150375> About Oxford university \_Diamond 2022.12.19
- <https://www.timeshighereducation.com/world-university-rankings/2022>  
THE World University Rankings 2022.12.19
- <https://descartes-search.com/media/imd-world-talent-ranking/#:~:text=%E4%B8%96%E7%95%8C%E3%81%A7%E3%81%AF%E3%82%B9%E3%82%A4%E3%82%B9%E3%81%8C%EF%BC%91.%E7%B5%90%E6%9E%9C%E3%81%A8%E3%81%AA%E3%81%A3%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82>  
World talent ranking IMD 2022.12.19
- [https://www.jtu-net.or.jp/survey\\_effort/work/](https://www.jtu-net.or.jp/survey_effort/work/) Teacher burden in Japan/Japan Teachers Union 2022.12.19
- <https://philosophy-japan.org/download/811/file.pdf>  
Results of philosophical dialogue education in elementary and junior high schools\_  
Kono, Tsuchiya, and Murase 2023.5.29

Protection of Endangered Languages  
The Diversity of Language  
—Endangered Language LOTE—

5224 Mari Fukatsu

**Abstract**

In this world, there are a lot of languages which are endangered. For example, Ainu language and Yonaguni language in Japan. These are languages spoken by fewer people, and decrease the number of people who can speak them. So, we should protect them from these risks. Australia has an education system called “LOTE”. It is a method that we can learn about languages other than English. Especially in Australia, we can learn Aboriginal languages with Aboriginal teachers and Non-Aboriginal teachers. I thought this system can apply to learning endangered languages. However, there are some matters. Lote focus on major languages. So, we should update the system for endangered languages. Also, this system needs teachers. I think it is difficult to correct them for this system.

**Introduction**

Now, by “Ethnologue”, there are about 7,200 languages which are spoken in several countries. However, about 3,000 languages in these are running the risk of endangerment. These languages are called “Endangered Languages” and are spoken by fewer speakers and none will speak these in the future. For example, in Japan, Ainu language and Hachijo language are included in these languages. They are stipulated by UNESCO as “Atlas of the World’s Languages in danger”. They show the local “Culture” and “History”. We can learn history there from these languages. Therefore, I think we should protect these languages and identities. Also we should keep the languages with people speaking them. This research’s targets are the children who live in local places where the language has fewer speakers. Most elderly people in these places can speak these languages, but their children did not use these languages. So, the children, as the elderly people’s grandchildren, are not using these languages relating to their parents.

**Discussion and implication**

There are some reasons for the extinction of languages. I will complain about three powerful reasons. First, slaughter by invaders made the people who could speak these languages become extinct. In 1,600s, by the massacre of the people of some colonies, the number of people who could speak the local language had decreased. Second, the replacement of the language used by many speakers using an influential language occurs. Endangered languages are minor, so using these languages is a disadvantage of employment, and so on. And then people use major languages more and more in daily life. Third, restricting the speaking of these languages by cultural oppression. It is similar to the first reason. For example, there are “Hougenhuda” in Okinawa, Japan. This system made children not use the Okinawan dialect.

This research's purpose is to keep these languages "living". "Living" means that people speak these languages. I don't want to keep these languages in dictionaries or records only. Of course, it is going to be done, but also, to keep the situation of people speaking these languages in daily life. However, it must be difficult to speak these languages in daily life. But, I hope that these are just spoken on a small scale, for example, at home and among friends.

I think the education system "LOTE" is one of the good ways to solve this problem. "LOTE" means "Language Other Than English". This is a language subject besides English in Australia, New York City, and other schools. Specifically, in Australia, there is a system that teaches Aboriginal people. Its purpose is to keep the Aboriginal heritage and convey them to the next generation. Its basic style is team teaching that Non- Aboriginal teachers corroborate with Aboriginal teachers. I focused on this system. The teacher who can speak these languages and the teacher who can speak these languages teach together, and the classes make the students more understandable with teaching approaches from double sides of languages.

### **Conclusion**

For this reason, the "LOTE" is the best way to solve this problem now. However, its purpose is learning languages except for English. It's not focused on these endangered languages. Therefore, it needs to come up with other systems that are able to collaborate with LOTE.

Also, we need teachers who are able to teach these languages. These are minor languages, so there are few people who can speak these languages. They need not only speaking skills, but also teaching skills too.

### **References**

Endangered Languages Project. (n.d.). Endangered Languages Project.

<https://www.endangeredlanguages.com/>

Ethnologue

<https://www.ethnologue.com/>

LOTE Teaching Aids . LTA Education

<https://lta.education/>

® Englishspanish translation & communication, s.l. (Ed.). (n.d.). Why Do Languages Become Endangered? Englishspanish.

<https://www.englishspanish.com/endangered-languages/>

American institutes for research (Ed.). (n.d.). Guiding Principles of LOTE Education.

American Institutes for Research.

<https://sedl.org/loteced/principles.html>

Lote australia language other than english (Ed.). (n.d.). LOTE Australia. LOTE Australia: Home.

<https://loteaustralia.com/>

# Easy-to-read Allergy Labeling for All

Toward a safe label that everyone can see at a glance

ID5225 氏名 Maruyama Kano

## Abstract

I have been conducting research with the goal of creating a universal, easy-to-understand allergy label.

Last year, my research focused only on how to deal with food allergies in restaurants, but this year, as a global study, I am focusing on allergy labeling. There are three main issues with current allergy labeling.

The first issue is that the small font size causes many accidents. The second issue is that there is no obligation to label unpackaged foods with an allergy label. And the third issue is that different countries have different foods that are subject to labeling requirements.

In light of these issues, I propose the creation of a universal, easy-to-understand allergy label. I have thought about using pictograms and applications. The main issues to be addressed are how to realistically develop applications, and how to create pictograms that can be used in food stalls. I will conduct these studies.

## 1 Introduction

My motivation is that I have an allergy myself and am not satisfied with the current labeling. That's because the small font size causes many accidents. Since all foods used are often listed in allergy labels, the text is inevitably small. This can lead to accidental ingestion of allergenic foods, resulting in accidents.

There are two other issues. The second issue is that there is no obligation to label with an allergy label. Unpackaged foods include foods from stalls at festivals, prepared foods, and restaurant meals. This makes it difficult to find a place to eat, for example, when traveling far away from home. Traveling is also risky, and it is difficult to feel safe. And the third issue is that different countries have different foods that are subject to labeling requirements. For example, in Japan there is an allergy labeling requirement for soba noodles, but in some other countries there is no such requirement. This is a result of differences in food culture. The fact that there is no labeling requirement means that even if the food is used, it does not have to be labeled. This also makes us feel a little uneasy.

In light of these issues, I propose the creation of a universal, easy-to-understand allergy label.

## 2 Discussion & implications

First, I propose the use of pictograms as the first easy-to-understand universal allergy label. A pictogram is a picture instead of text, like the one below, that shows what it is in an easy-to-understand manner.



When creating an easy-to-understand label, there is a possibility that if it is written, it may not be read in foreign countries, or it may be skipped after all. Therefore, I have thought of using pictograms to create allergy labels. Pictograms do not require any text.

However, pictograms also have their challenges. I mentioned earlier that foods that are required to be labeled differ from country to country, and the point is that unknown ingredients may not be understood even if they are labeled with pictograms.

So I next thought of an application-based display. For example, by reading bar codes, it would be possible to display the allergenic substances contained in the food in the language of each country.

However, the application also has its challenges. It is difficult to introduce in places that are not usually open for business, such as festival stalls, and a smartphone must always be required. The current conclusion is to utilize the best of both worlds, using pictograms for food sales in places such as festival stalls and applications for restaurants.

### 3 Conclusion

I have continued my research with the goal of creating an easy-to-understand allergy label that can be universally understood. The current allergy labels have problems such as small letters and different items displayed in each country, resulting in accidents due to misreading. Therefore, I can be understood at a glance without using letters or skipping over words. However, there are still problems with both applications and pictograms. The main issues to

be addressed are how to popularize both, how to realistically develop applications, and how to create pictograms that can be used in food stalls. I will conduct these studies.

#### 4 References

<https://www.mhlw.go.jp/new-info/kobetu/kenkou/ryumachi/dl/jouhou01-08.pdf>

4 食物アレルギー 厚生労働省(2023 12/21)

<https://www.meiji.co.jp/meiji-shokuiku/food-allergy/about/01/>

食物アレルギーとは？症状を知ろう(2023 12/21)

<https://www.meiji.co.jp/meiji-shokuiku/food-allergy/display/01/>

アレルギー物質の表示とは(2023 12/21)

[https://www.caa.go.jp/policies/policy/food\\_labeling/food\\_sanitation/allergy/](https://www.caa.go.jp/policies/policy/food_labeling/food_sanitation/allergy/)

食物アレルギー表示に関する情報(2023 12/21)

<https://hyouji.maru-sin.net/display-rules/allergy-indication/>

食品のアレルギー表示・方法について(2023 12/21)

<https://www.foods-ch.com/anzen/1398416135288/>

海外での食品事情～世界の安全基準とは？(2023 12/21)

<https://dentsu-ho.com/articles/7840>

ユニバーサルデザイン視点による食物アレルギー表示ピクト「みんなのピクト」を開発(2023 12/21)



# Global Expansion of MaaS

## Infrastructure and mobile politics tailored to local needs

5226 Ryosuke Mizutani

### 1. Abstract

MaaS is a service that allows the optimal combination of multiple means of transportation, from search to reservation and payment, all in one service. A smartphone application allows users to search, book, and pay for transportation from the point of departure to the destination as a single service. It is also possible to make reservations and payments at restaurants, hotels, hospitals, and government services together. If MaaS is put to practical use, people will be able to travel freely even if they live in underpopulated areas or cannot drive a car. In addition, the reduction of exhaust gas emissions will help to improve the global environment. I also thought that the system could help promote the return of driver's licenses by the elderly, improve traffic congestion, and reduce CO2 emissions. As for current issues, I focused on Africa, where infrastructure and MaaS policies have not progressed. One of the major obstacles to economic growth in Africa is transportation infrastructure. Therefore, I thought it would be possible to combine infrastructure support for the African region with MaaS. The penetration rate of smartphones is also increasing every year, making it easier to promote MaaS policies. Ultimately, I would like to summarize our research with the objective of providing both infrastructure support and MaaS to the African region. The current challenge is that the MaaS policy itself only started to be demonstrated a couple of years ago, so there is still little data available for research. I would like to determine what specific support we can provide by following recent news.

### 2. Introduction

Last year, I conducted research on MaaS and infrastructure policies in Japan. I was able to get a lot of information by collecting information on the Internet and by visiting research institutes (online) with MLIT officials. The research was satisfactory.

Based on these results, this year we wanted to broaden the scope of our research to the world. We thought that utilizing the system in regions such as Africa, where infrastructure support is needed, would generate economic benefits. Since transportation conditions vary from region to region, we thought it would be good to come up with different ideas for each one. We thought we could also refer to the information we got from last year's visit to the research institute.

### 3. Purpose and Significance of the Study

SDGs

[Goal 9] Industry, Innovation and Infrastructure

The existing public transportation system will be revamped to provide more efficient, affordable, and equitable access.

[Goal 11] Sustainable Cities and Communities

The main objective of MaaS is to provide a sustainable transportation system through the expansion and renewal of public transportation, which is exactly what is attached to the philosophy of this Goal 11.

Solving the problem of vulnerable rural transportation users with MaaS is also consistent with the multiple targets set forth herein terms of providing stable access to towns, green and

rural areas, public spaces, and so on.

#### [Goal 13] Climate Action

In countries and cities that have adopted MaaS as social infrastructure, the percentages of private car use has been found to be significantly reduced. As this trend spreads to more countries and regions, it is expected to make a significant contribution to combating climate change.

I thought it would lead to these three goals. Since there are many subjects, the goal of this study is to solve issues tailored to each of them.

#### 4. Research Methods

Research MaaS and infrastructure policies on various Internet sites. Since the MaaS system started to be experimented about 2 or 3 years ago, there may be no major results or conclusions. I would like to check the latest news and other information carefully to come up with concrete proposals. I would also like to refer to the government, especially the Ministry of Land, Infrastructure, Transport and Tourism website and information obtained from last year's visit to research institutions. I will also compare with overseas MaaS and look for possible references for our research. I will investigate what kind of proposals I can come up with in terms of "environment," "community," and "infrastructure development."

#### 5. Discussion and implications

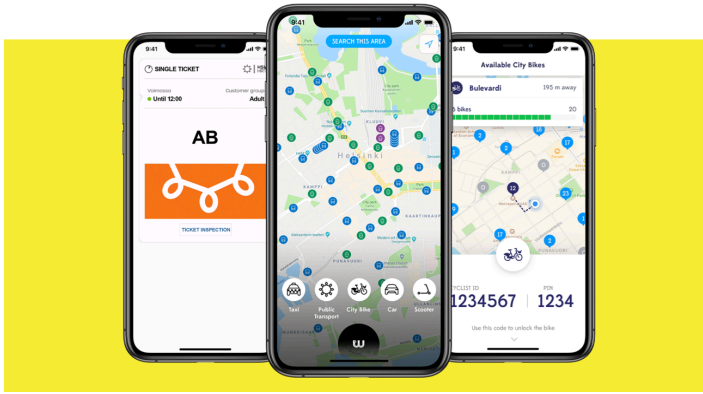
MaaS stands for "Mobility as a Service. Targeting not only local residents but also tourists traveling in the area, this service allows users to optimally combine multiple means of transportation, from search to reservation and payment, all in one place.

The app on your smartphone allows you to search, book, and pay for travel from origin to destination as a single service. Reservations and payments for restaurants, hotels, hospitals, and government services can also be made together.



This service will enable smooth and comfortable travel without having to rely on private vehicles. Reduced traffic congestion will also reduce exhaust emissions and CO2 emissions from transportation.

Finland has a success story: in 2014, a roadmap was presented in Helsinki, Finland, to reduce the number of private cars in the region to zero by 2025; in 2016, Whim, an app that allows users to search, book, and pay for various public transportation services in one place, was launched. This became the first commercialized MaaS in the world.



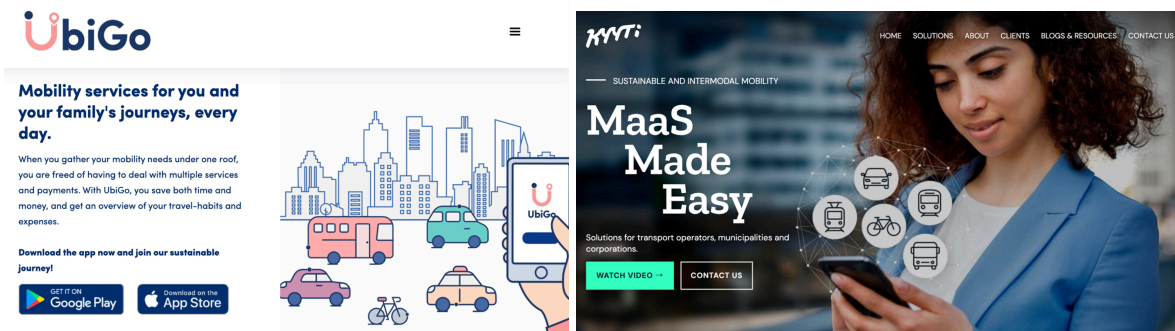
Source: Whim official website

The service has increased the percentage of Whim users using public transportation from 48% to 74%, reducing traffic congestion and environmental impact in urban areas and improving the efficiency of public transportation operations.

Currently, trials of MaaS are underway in the United States, China, India, and other countries around the world.

For example, Kyyti: Kyyti Group (Finland), UbiGo: UbiGo (Sweden), DB Navigator: Deutsche Bahn (Germany), Moovit: Moovit (Israel), etc.

DB Navigator: Deutsche Bahn (Germany), "Moovit": Moovit (Israel), etc.



A MaaS demonstration experiment was launched in Japan in June 2019. (Led by the Ministry of Land, Infrastructure, Transport and Tourism)

The Ministry of Land, Infrastructure, Transport and Tourism supported demonstration experiments in 19 regions from Hokkaido to Okinawa Prefecture in three categories: (1) suburban and regional city type, (2) rural suburban and depopulated area type, and (3) sightseeing area type. If MaaS is put to practical use, people will be able to travel freely even if they live in underpopulated areas or cannot drive a car. In addition, the reduction of exhaust gas emissions will help to improve the global environment. I also thought it would help promote the return of driver's licenses by the elderly, improve traffic congestion, and reduce CO2 emissions. When we looked into MaaS policies around the world, most of the efforts were mainly in Europe, as in the aforementioned services. Therefore, we focused on Africa, where infrastructure and MaaS policies have not progressed as a current issue. One of the major impediments to economic growth in Africa is transportation infrastructure. One of the problems in Africa is the lack of cross-border transportation infrastructure, as many countries do not have access to the sea. The inability to transport goods and the high costs involved are also a major cause of poverty. In addition, infrastructure such as railroads and highways are not in place. Currently, a large portion of JICA (Japan International Cooperation Agency) yen loans, grant aid, and JBIC (Japan Bank for International Cooperation) investments and loans, as well as international development finance institutions, are directed toward infrastructure development. In addition, there are examples of partnerships with private companies to improve infrastructure. Through the fund, there is also an aim to discover startup companies in Nigeria, Kenya, South Africa, Egypt, and other countries, and to expand their business

while contributing to solving social issues in Africa. I therefore wondered if it would be possible to combine MaaS with infrastructure support for the African region. The number of car users in Africa is rapidly increasing every year due to the population explosion. This is having a negative impact on the environment, as CO2 emissions are increasing. In addition, the penetration rate of smartphones is increasing every year, so I thought it would be easy to promote a MaaS policy.

## 6. Conclusion

Finally, I would like to summarize our research with the objective of providing both infrastructure support and MaaS to the African region.

The current challenge is that the MaaS policy itself only started to be demonstrated a couple of years ago, so there is still little data available for research. We would like to follow recent news and determine what specific support we can provide.

I would like to investigate research outside of Africa to find out who the target audience is (for the elderly or all generations) and what the infrastructure situation is like.

Various companies are beginning to invest in MaaS policies, and we will research them by looking through news sites, the Ministry of Land, Infrastructure, Transport and Tourism website, and other information that is updated daily.

### Specific Regions

Kenya and other regions in need of infrastructure development

## 7. References

What is MaaS? Introduction to its purpose, benefits, and case studies!

5

月10日

<https://spaceshipearth.jp/maas/>

Seven advanced MaaS case studies from around the world.

6月19日

[https://digital-shift.jp/startup\\_technology/210215](https://digital-shift.jp/startup_technology/210215)

Toyota Tsusho invests in an investment fund for Africa...to collaborate in MaaS

6月26日

<https://response.jp/article/2021/04/16/345043.html>

Global Perspective! Toyota Tsusho's Overseas MaaS Business Summary Africa

7月7日

[https://jidounten-lab.com/u\\_toyotsu-maas-matome](https://jidounten-lab.com/u_toyotsu-maas-matome)

Aiming to achieve sustainable growth through the development of Africa's transportation and infrastructure.

7月7日

<https://mirasus.jp/sdgs/industry-inovation/2688>

How are Japan's Neighboring Countries Progressing in MaaS?

6月6日

[https://jidounten-lab.com/u\\_maas-singapore-taiwan#](https://jidounten-lab.com/u_maas-singapore-taiwan#)

”Silicon Valley of the Middle East” Why Israel is the leading MaaS country  
17日

5月

[https://xtrend.nikkei.com/atcl/contents/watch/00013/00340/?i\\_cid=nbpxr\\_index](https://xtrend.nikkei.com/atcl/contents/watch/00013/00340/?i_cid=nbpxr_index)

Accelerating Global Expansion! MaaS Pioneer" Acquires Brazilian Competitor  
月23日

6

[https://jidounten-lab.com/u\\_34851](https://jidounten-lab.com/u_34851)

Deepen your knowledge of the SDGs! Also learn about support for transportation  
infrastructure in African countries

5月3日

[https://gooddo.jp/magazine/sdgs\\_2030/industry\\_inovation\\_sdgs/8610/](https://gooddo.jp/magazine/sdgs_2030/industry_inovation_sdgs/8610/)

# AI-ization of Weapons

Do not inhumane decision

5227 Shugo Miyao

## Abstract

In Recent years, military tensions are higher than ten years ago. On the other hand, some people make weapons which load AI. I agree with making these weapons, but I think that AI can injure humans. This is because, nearly, AI runaways are increasing, and it is a violation of international humanitarian law. I concluded that it is a higher possibility to decide casualties for civilians from AI. As a basis, it happens matter which form runs away from AI. For example, it ones happened "AI Tay", an AI increased by Microsoft, was fed wrong information by users and said so much about it that Microsoft had to suspend its operations. This shows that AI can easily kill civilians if information is manipulated from the outside. Also, many AI scholars are advocating the AI threat theory, which means that there is a possibility that AI will go out of control even more. I cannot take enough information about AI weapons, so I have not made a perfect decision. However, in November, the United Nations confirmed that LAWS were to apply it to international humanitarian law. I think that this is a big step to conclude an international treaty. At this rate, I hope we can continue to promote more regulation of AI weapons.

## 1 Introduction

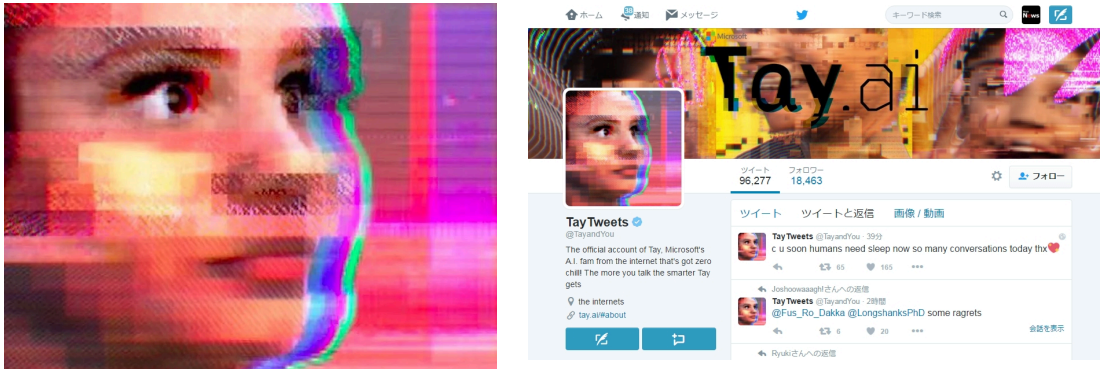
Some wars happen around the world. And, there are many arms used by soldiers. Also, I heard that some arms change AI-ization. I agree to use these weapons. This is because they do not require actual flesh and blood humans to fight each other. However, since AI seems to have gone out of control recently, it is conceivable that it could kill and main without distinction between military personnel and civilians. That would be a violation of international humanity law and would be a big problem, so I researched it. I used a book, *the future of AI Weapons Warfare*, which was written by Luis A. Del Monte as the information for study. As Executive Director at Honeywell, he led hundreds of physicists, engineers, and technology experts in the development of micro- and nano-technologies for DoD and commercial applications. Therefore I think that his book is best for my study.

## 2 Discussion and Implications

In researching AI weapons, I discovered that there are weapons called "autonomous lethal weapons. I looked up the definition of "autonomous lethal weapon" to see if there might be a connection, and found that it is "a generic term for weapons equipped with artificial intelligence (AI) that can determine the target and decide whether to kill or injure without human intervention. This is exactly what I am going to research. Autonomous

weapon systems give the AI a decision-making loop. Therefore, there is a great possibility of attacking civilians, which would cause some abnormality in the AI to make decisions without human intervention.

For example, it once happened that “tay”, an AI created by microsoft, was fed wrong information by users and said so much about it that microsoft had to suspend its operations. This shows that everyone can control AI. AI weapons can easily kill civilians if information is manipulated from the outside. This must stop.



↑ AI tay

↑tay's twitter(X) account

Also, many AI scholars are advocating the AI threat theory, which means that there is a possibility that AI will go out of control even more. Indeed, this and other AI”tay” cases suggest that AI can be a threat to humans.

In November 2023, the United Nations confirmed that LAWS were to apply it to international humanitarian law. This is a big step, because it has not continued meeting about LAWS for a long time. However, the countries which have nuclear weapons, Russia and India did not agree with the decision, so I worried about Russia and India break the decision sometimes. Also, China does not agree to another decision. We need to continue to be vigilant about those countries. I should not think about this consideration, and I continue my study with new information about the LAWS decision.

### 3 Conclusion

In the course of my research, The United Nations confirmed that LAWS were to international humanitarian law. This is a good thing. This does not mean that LAWS is banned outright. Needing to continue to be vigilant about Russia, India, and China, they must make rules about using LAWS. We need to make rules soon, or a lot of citizens were damaged from LAWS. It hopes that it will make rules as soon as possible and save citizens' lives. I think that I will wait and see the United Nations trend.

### 4 References

- Luis A. Del Monte (May 2021 ~) 『The Future of AI Weapons Warfare』  
Touyoukeizaisinnhpusya  
About the Lawful Autonomous Weapon System (LAWS)

[自律型致死兵器システム\(LAWS\)について | 外務省](#) (June 23,2022)

an AI (artificial intelligence) human uprising is inevitable.

[残念ながら、AI\(人工知能\)の人類反乱は避けられません](#) (August 15,2022 )

International Regime for Autonomous Weapons(LAWS)

[自律型殺傷兵器 \(LAWS\)をめぐる国際レジーム](#) (February 5,2023)

The U.S. and China, which are fighting for hegemony, are holding each other back at the first meeting of the AI - UN Security Council

[覇権争う米中、互いをけん制 AI初会合、ロシアは反発—国連安保理](#) (November 17, 2023)

UN committee resolves to "apply international wartime law" to AI weapons; Russia and India oppose, China and North Korea abstain.

[国連委がAI兵器に「戦時国際法適用」を決議 露印反対、中朝棄権 - 産経ニュース](#) (November 20,2023)

45 countries, including Japan, South Korea, and Europe, have approved a political declaration proposed by the U.S. on the creation of international norms for the military use of AI...China and Russia are not included.

[AI軍事利用時の国際規範作り、米提唱の政治宣言を日韓欧など45か国承認...中露含まず](#) (November 20,2023)



# **Solving Global Warming with Euglena**

~Sustainable Earth with a New Biofuel~

5228 Ayaka Yagi

## **Abstract**

Average temperature of the world has been increasing for a long time. In other words, global warming is progressing. Global warming is caused by greenhouse gasses which contain the highest amount of CO<sub>2</sub>. So this time, I decided that I progressed this study focusing on the transportation sector with the second highest overall CO<sub>2</sub> emissions. Also cars are the highest amount of CO<sub>2</sub> in the transport so I focused on the cars.

Major gasoline vehicles emit CO<sub>2</sub> during the fuel production process and while driving, so I suggest using SUSTEO to be able to solve this problem. It is a biofuel which is made from Euglena. It has a lot of merits. First, Euglena is plant and animal, so it can photosynthesize and can do multiplication fast, so a recycling-oriented society can be created, as when biofuels are used by cars and the CO<sub>2</sub> emitted from them is absorbed by greenbugs. Second, SUSTEO is less susceptible to weather conditions when making the biofuel of SUSTEO and resources do not come in limited, so It can provide a stable supply because the Euglena company succeeded in making Commercial Outdoor Mass Culture. Third, certain information shows that SUSTEO's CO<sub>2</sub> emissions are sometimes less than those of electric cars.

Like this, SUSTEO has a lot of merits but it has also demerits. First, it is not known to everyone, so it is not widely available. Second, it needs some big land to make this biofuel, but the company does not have enough land. Therefore, I need to solve this problem.

## **1, Introduction**

I have been working on a research project for my FEWC class last year on the topic "Cars and CO<sub>2</sub> - Minimizing Global Warming in Japan". In this research, I proposed the spread of SUSTEO, an idea developed by Euglena Co. To minimize global warming in Japan, and consider how to move toward its implementation. Susteo is an earth-friendly biofuel made from used cooking oil (waste cooking oil) and algae such as Euglena. Through this research, I became interested in Susteo and wondered if I could utilize Susteo in my research this year. Therefore, since the theme of this year's research was "the world," so I researched global warming. Then, I knew that the average temperature of the world is increasing year by year. If this continues to increase, there are many dangerous effects, such as increased extreme weather events. Therefore I decided to work on this research to solve this problem.

## **2, Purpose, Significance**

This research's purpose is "To Minimize Global Warming with SUSTEO in the world". These days, there are a lot of ways to solve global warming but they sometimes give us bad effects. For example, Electric cars sometimes emit more CO<sub>2</sub> than gasoline cars. However,

SUSTEO does not emit any CO<sub>2</sub> so if I suggest good ideas to spread SUSTEO, this research will have big significance to minimize global warming in this world.

### **3, Research methods**

I corrected the information on the Internet and after that, I started to consider solving this problem. When I get stuck on a consideration, I consult with my teachers, my friends, and my parents.

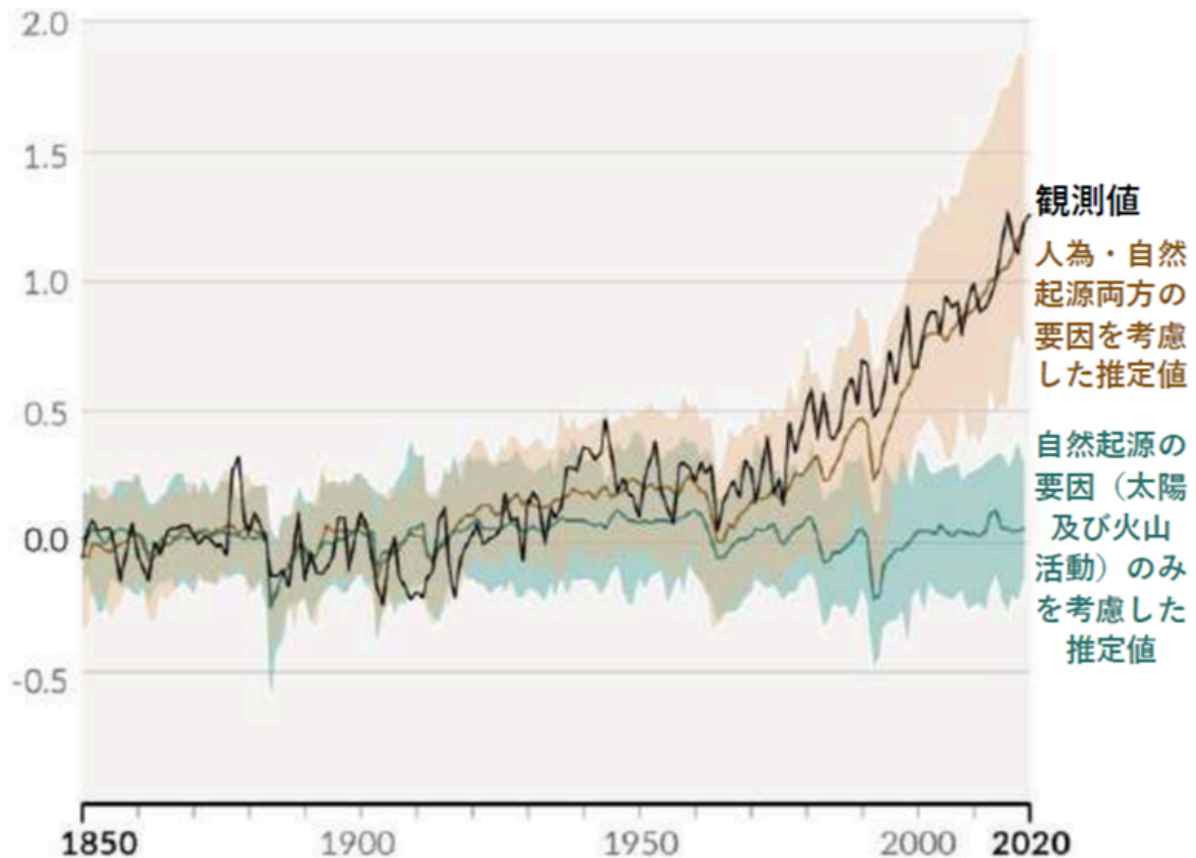
### **4, Research Results and Considerations**

Global warming is a phenomenon in which the average global temperature rises due to the release of greenhouse gasses such as CO<sub>2</sub> into the atmosphere as a result of increased human activity. It is believed that global warming has been progressing because the concentration of greenhouse gasses in the atmosphere has increased dramatically due to the use of fossil fuels and deforestation caused by human activities since the start of the Industrial Revolution in the mid-18th century, which has intensified the greenhouse effect of the atmosphere. In other words, the emission of large amounts of greenhouse gasses causes global warming.

Therefore, I focused on the reduction of carbon dioxide emissions in this study.

There are many effects that global warming will have on the Earth. For example, the number of endangered species will increase, extreme weather events will increase, and sea levels will rise. Therefore, we must minimize the progress of global warming in order to curb these dangerous effects.

First, I examined the progress of global warming around the world. The graph below shows the global average temperature.

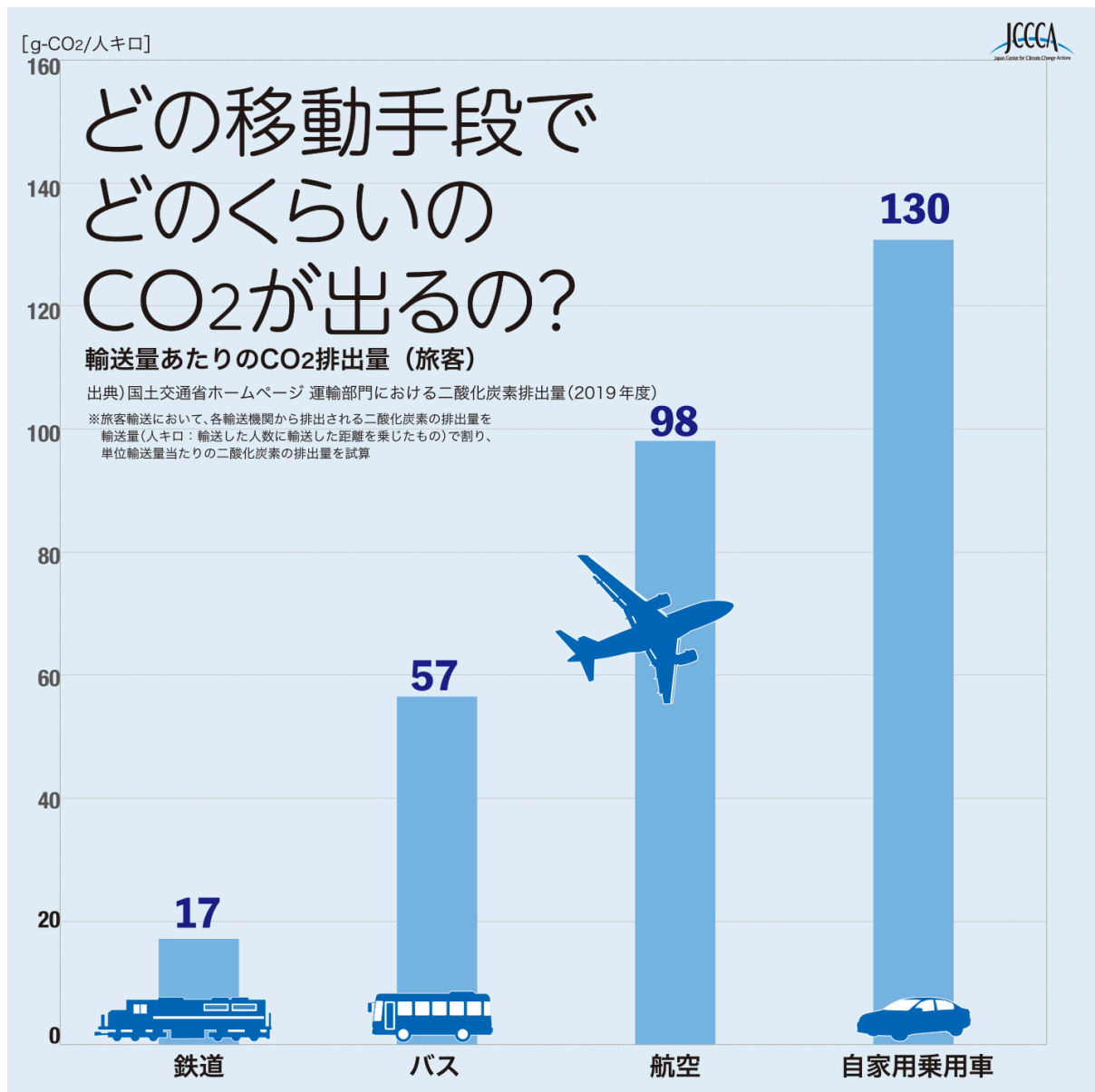


<https://www.eic.or.jp/library/pickup/282/>

Black shows observed value, blue brown shows estimated value that consider both anthropogenic and natural causes, and blue shows estimated value that consider only natural causes. From this graph, I can read that (1) the global average temperature increased by 1.09 degrees celsius from 1850 to 2020, (2) the estimated value considering both anthropogenic and natural causes is higher than the estimated value considering only natural causes, and (3) the estimated value considering only natural causes is almost flat from 1850 to 2020 is almost unchanged from 1850 to 2020. Therefore, the increase in global average temperatures indicates that global warming is progressing and that human activity is the most significant reason for the increase.

Therefore, I looked into the situations in which carbon dioxide is emitted by humans. I found that carbon dioxide emissions can be divided into five sectors: energy conversion, industry, consumer (household), consumer (business), and transportation. I decided to look into the transportation sector, which interested me the most. The transportation sector is the sector that represents the energy consumed by firms and households in the transportation and transport of people and goods outside their homes, factories, and business premises as part of their final energy consumption. I chose this sector because I thought that automobiles, buses, and trains, which are used to transport and carry goods, are familiar to us in our daily lives.

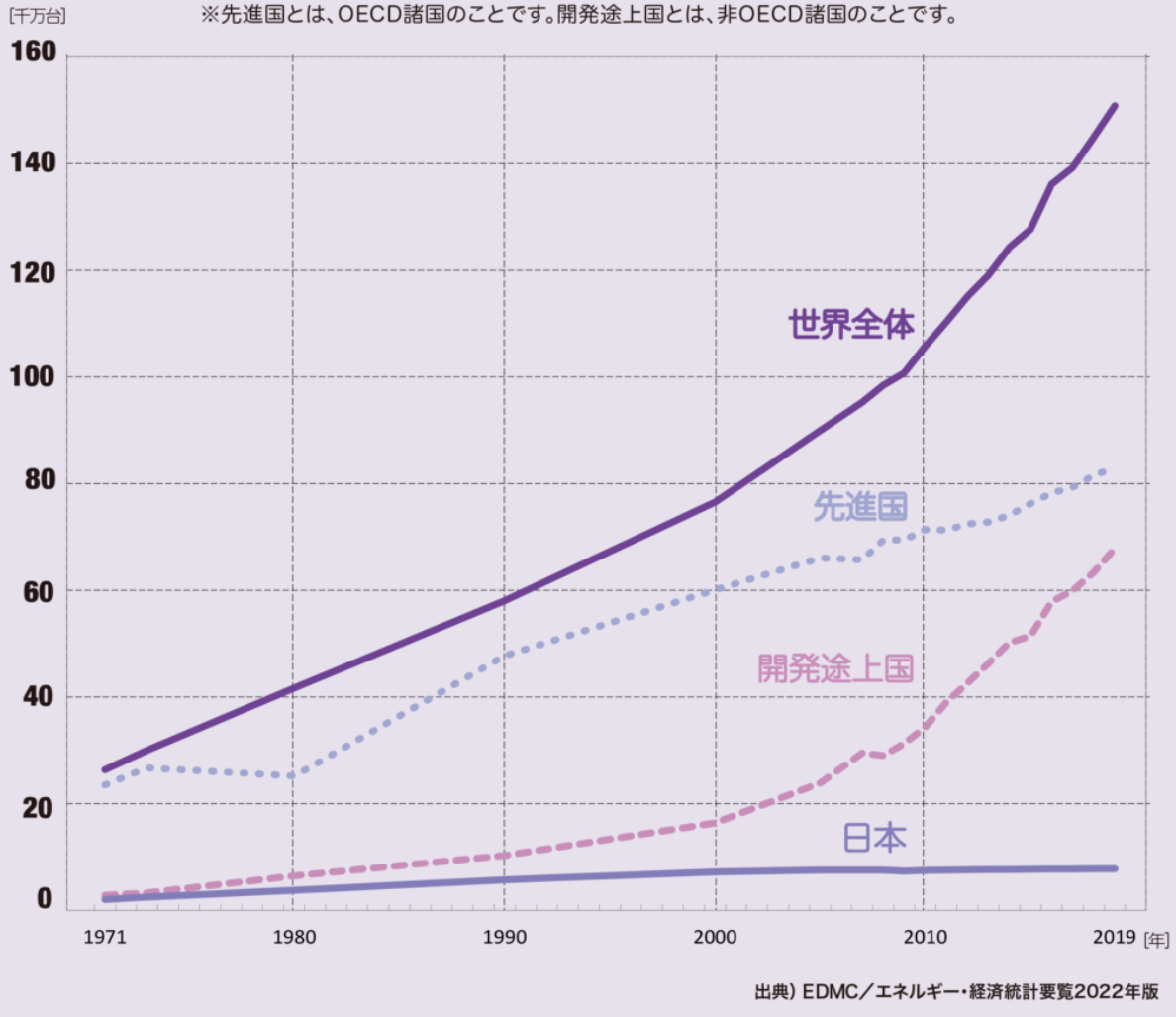
Also, because I was interested in the Green Beetle biofuel that I will be introducing.



<https://www.jccca.org/download/13315>

This graph shows how much CO2 is emitted by which means of transportation. From right to left: private passenger cars, airplanes, buses, and trains. In other words, private passenger cars emit the largest amount of CO2 of all vehicles.

# 世界の自動車保有台数の推移



<https://www.jccca.org/download/13339>

This graph also shows the number of automobiles owned worldwide. This shows that this is an increasing trend. For this reason, I have limited my research to private cars used at home. I looked at the situations in which carbon dioxide is emitted when driving a private car. I found that gasoline-powered cars, which are currently the mainstream, emit carbon dioxide in the process of fuel production and when driving. Therefore, I propose to change the fuel used in cars in order to reduce carbon dioxide emissions to near zero in these situations.

The fuel is called Susteo. Susteo is a biofuel developed by Euglena Co. This fuel is compatible with the diesel vehicles currently in use. There are many advantages to this proposal.

The first advantage is that it can create a recycling-oriented society. Since greenbugs are plants and animals, they can photosynthesize and multiply. Therefore, a cycle can be created

in which the greenbugs absorb the CO<sub>2</sub> emitted from cars that use Susteo, thus creating a recycling-oriented society.

The second advantage is that the process of making fuel is less affected by weather and other factors, and because Euglena has succeeded in commercial outdoor mass cultivation, which will be explained later, there is no limit to the resources available and a stable supply is possible.

The third advantage is that it has various advantages when compared to gasoline, electric, and hydrogen vehicles. First, when compared to gasoline-powered vehicles, Susteo is superior in that it has by far the lowest carbon dioxide emissions and has no limited resources. Also, although electric and hydrogen vehicles are touted as having significantly lower CO<sub>2</sub> emissions, this is not true. Electric cars emit CO<sub>2</sub> in the process of producing electricity, so countries that produce electricity from renewable energy sources are cutting CO<sub>2</sub> emissions more than gasoline cars, but countries that produce electricity from coal are not cutting CO<sub>2</sub> emissions as much. It has also been confirmed that CO<sub>2</sub> emissions may be higher than those of gasoline-powered cars. In other words, the CO<sub>2</sub> cut rate of electric vehicles is determined by how electricity is produced, and the CO<sub>2</sub> cut rate varies from country to country, but this is not the case for Susteo. In addition, since hydrogen is generally made from fossil fuels such as petroleum and natural gas in hydrogen vehicles, CO<sub>2</sub> is emitted when fossil fuels are mined and reformed to make hydrogen, or when hydrogen is reformed for stockpiling at hydrogen stations, or when liquefied hydrogen is transported at hydrogen stations. In addition, a small amount of CO<sub>2</sub> is emitted during the process of reforming hydrogen when it is stockpiled at hydrogen stations and transporting liquefied hydrogen at hydrogen stations. In other words, the use of Susteo increases the CO<sub>2</sub> reduction rate. Susteo can be used directly in diesel vehicles currently on the road, does not require new supply infrastructure like electric or hydrogen fuel cell vehicles, and does not require the purchase of a new Susteo-compatible vehicle, making it cost-effective and easy to use in daily life. Susteo has the following advantages. Thus, Susteo has many advantages over gasoline, electric, and hydrogen vehicles.

There are two problems with this proposal.

The first is that it is not widely adopted. I believe that this may be due to commercial reasons, whereby the promotion of Susteo is being held back because it would hurt the sales of other fuels. Therefore, I think it is important to watch the timing and spread the use of Susteo gradually.

Second, there is a lack of land to produce the fuel. Euglena's successful commercial outdoor mass cultivation is done in a swimming pool, where the green beetles are placed in water and a large amount of carbon dioxide is pumped into them. When this is done, photosynthesis is activated, growth is accelerated, and yields are increased. Furthermore, while the growth of ordinary plants is inhibited when exposed to a concentration of carbon dioxide that is many times higher than normal, the concentration of carbon dioxide can be increased up to 350 times for the greenbug. The yield is also said to increase by 30 to 40 times. However, even if they succeed in commercial outdoor mass cultivation, which has many such advantages, it would be impossible to spread the use of greenbug biofuel nationwide without land. In other words, in order to conduct commercial outdoor mass cultivation and spread the use of greenbug biofuel nationwide, a number of large pools are needed. Therefore, I decided to

utilize idle real estate in Japan. Idle real estate is real estate that is rarely used for business activities. Examples include empty stores, empty buildings, abandoned factories, empty warehouses, and vacant land. Among these, we would like to use an abandoned factory whose land seems to be particularly large. Therefore, we looked into the current status of abandoned factories and found statistics on abandoned factories up to 2007. I found that although the number of such factories is gradually decreasing, there is still a lot of surplus land available. By using such abandoned factories, we can solve two problems: the large amount of idle real estate and the lack of land. However, since it costs a huge amount of money to buy an abandoned factory, we would like to consider how to raise such money.

## 6, conclusions and future issues

I propose that Susteo be used as fuel for cars in order to minimize global warming in the world. In order to do so, two issues must be solved: one is to promote its widespread use, and the other is the lack of land to produce the fuel. However, I have not yet come up with a solution to promote its widespread use, so I would like to consider this point from now on.

## 7, References

「株式会社ユーグレナ 公式ホームページ」 4/26

<https://www.euglena.jp/>

「日本の現状」 4/26

<https://www.erca.go.jp/erca/ondanka/japan/index.html>

「日本の部門別二酸化炭素排出量(2018年度)」 4/26

<https://www.jccca.org/download/13335>

「地球温暖化の原因」 6/21

[https://www.data.jma.go.jp/cpdinfo/chishiki\\_ondanka/p02.html#:~:text=18%E4%B8%96%E7%B4%80%E5%8D%8A%E3%81%B0%E3%81%AE%E7%94%A3%E6%A5%AD,%E3%82%92%E6%8E%92%E5%87%BA%E3%81%97%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82](https://www.data.jma.go.jp/cpdinfo/chishiki_ondanka/p02.html#:~:text=18%E4%B8%96%E7%B4%80%E5%8D%8A%E3%81%B0%E3%81%AE%E7%94%A3%E6%A5%AD,%E3%82%92%E6%8E%92%E5%87%BA%E3%81%97%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82)

「過去の気象データ検索」 6/14

[http://www.data.jma.go.jp/obd/stats/etrn/view/monthly\\_s3.php?prec\\_no=44&block\\_no=47662&year=&month=&day=&view=a1](http://www.data.jma.go.jp/obd/stats/etrn/view/monthly_s3.php?prec_no=44&block_no=47662&year=&month=&day=&view=a1)

「地球温暖化とは？」 6/21

<https://www.gas.or.jp/kankyo/taisaku/ondanka/>

「地球温暖化が進むとどうなる？その影響は？」 7/5

<https://www.wwf.or.jp/activities/basicinfo/1028.html>

「二酸化炭素の部門別排出量の『部門』について」 7/5

<https://www.jccca.org/faq/15954>

「運輸部門における二酸化炭素排出量」 7/12

[https://www.mlit.go.jp/sogoseisaku/environment/sosei\\_environment\\_tk\\_000007.html](https://www.mlit.go.jp/sogoseisaku/environment/sosei_environment_tk_000007.html)

「トラックの自家用と事業用(営業用)の違いを比較！」 8/30

<https://shima-corp.com/labo/truck/truck-private-business-use-difference>

「ガソリン車とどう違う？電気自動車のメリット・デメリット」 9/13

<https://www.smart-tech.co.jp/column/power-saving/electric-vehicles-merit/#:~:text=%E7%87%83%E6%96%99%E8%B2%BB%E3%82%92%E6%8A%91%E3%81%88%E3%82%89%E3%82%8C%E3%82%8B.%E3%81%93%E3%81%A8%E3%81%8C%E3%81%A7%E3%81%8D%E3%81%BE%E3%81%99%E3%81%AD%E3%80%82>

「世界の二酸化炭素排出量国別ランキング」 10/11

<https://www.globalnote.jp/post-3235.html>

「温室効果ガスってどんなもの？」 10/22

<https://www.city.minamiboso.chiba.jp/0000000779.html>

「ガソリン車比較サイトgogo.gs」 10/25

<https://gogo.gs/>

「ユーグレナ、次世代バイオ燃料を日本で初めて一般販売 通常価格で提供し『地球とバイオ燃料のことを考えるきっかけになれば』」

<https://car.watch.impress.co.jp/docs/news/1317674.html>

「電気自動車の電気代はガソリン代よりも安い！充電の基礎知識も解説」 10/25

<https://looop-denki.com/low-v/denkinavi/electricvehicle/>

「海外で普及するバイオ燃料は、ガソリン車のCO2削減に大活躍！日本での普及は？」 11/1

<https://energy-shift.com/navi/6d326758-70d6-4bda-b1d9-1187430fb43b>

「ユーグレナ社、ミドリムシ生産体制を年産160tに倍増」 11/19

<https://www.euglena.jp/news/n20170131/>

「バイオ燃料とは・意味」 12/10

<https://ideasforgood.jp/glossary/biofuel/>

「二酸化炭素を食べる虫 ミドリムシの恐るべき潜在パワー」 12/13

[https://www.nikkei.com/article/DGXNASDD150GM\\_V11C12A1000000/](https://www.nikkei.com/article/DGXNASDD150GM_V11C12A1000000/)

「クラウドファンディングとは」 12/13

<https://readyfor.jp/crowdfunding/>

「遊休不動産」 2/28

<https://www.shinnihon.or.jp/corporate-accounting/glossary/investment-properties/yukyu-fudosan.html#:~:text=%E9%81%8A%E4%BC%91%E4%B8%8D%E5%8B%95%E7%94%A3%E3%81%A8%E3%81%AF>



[%E3%80%81%E4%BC%81%E6%A5%AD.%E4%B8%8D%E5%8B%95%E7%94%A3%E3%81%AB%E5%90%AB%E3%81%BE%E3%82%8C%E3%81%BE%E3%81%99%E3%80%82](#)

「増え続ける遊休不動産～問題なのは『空き家』だけではない～」 2/28  
[https://www.homes.co.jp/cont/press/reform/reform\\_00172/](https://www.homes.co.jp/cont/press/reform/reform_00172/)

「e-Stat」 2/28  
<https://www.e-stat.go.jp/>

「全国の売り倉庫・売り工場を探す」 3/7  
<https://www.homes.co.jp/soko/gunma/midori-city/list/>

11/15  
<https://online.euglena.jp/shop/pages/biofuel.aspx#:~:text=%E3%82%B5%E3%82%B9%E3%83%86%E3%82%AA%E3%81%A8%E3%81%AF,%E3%81%AB%E3%82%84%E3%81%95%E3%81%97%E3%81%84%E3%83%90%E3%82%A4%E3%82%AA%E7%87%83%E6%96%99%E3%81%A7%E3%81%99%E3%80%82>

<https://www.euglena.jp/businessrd/energy/susteo/>

[https://blog.mazda.com/archive/20221010\\_01.html#:~:text=%E6%AC%A1%E4%B8%96%E4%BB%A3%E3%83%90%E3%82%A4%E3%82%AA%E7%87%83%E6%96%99%E3%81%AF%E3%80%81%E8%BB%BD%E6%B2%B9%E3%81%A8%E5%90%8C%E3%81%98%E3%80%81%E7%82%AD%E7%B4%A0\(%E8%B2%A2%E7%8C%AE%E3%81%A7%E3%81%8D%E3%82%8B%E3%81%93%E3%81%A8%E3%81%8C%E7%89%B9%E5%BE%B4%E3%81%A7%E3%81%99%E3%80%82](https://blog.mazda.com/archive/20221010_01.html#:~:text=%E6%AC%A1%E4%B8%96%E4%BB%A3%E3%83%90%E3%82%A4%E3%82%AA%E7%87%83%E6%96%99%E3%81%AF%E3%80%81%E8%BB%BD%E6%B2%B9%E3%81%A8%E5%90%8C%E3%81%98%E3%80%81%E7%82%AD%E7%B4%A0(%E8%B2%A2%E7%8C%AE%E3%81%A7%E3%81%8D%E3%82%8B%E3%81%93%E3%81%A8%E3%81%8C%E7%89%B9%E5%BE%B4%E3%81%A7%E3%81%99%E3%80%82)

<https://www.zurich.co.jp/car/useful/guide/cc-dieselcar-merit-demerit/#:~:text=%E3%83%87%E3%82%A3%E3%83%BC%E3%82%BC%E3%83%AB%E8%BB%8A%E3%81%A8%E3%81%AF%E3%80%81%E8%BB%BD%E6%B2%B9.%E3%81%A8%E3%81%AA%E3%81%A3%E3%81%A6%E3%81%84%E3%81%BE%E3%81%97%E3%81%9F%E3%80%82>

<https://www.goo-net.com/magazine/knowhow/carlife/45111/>

<https://candy5.jp/news/?id=24>

<https://www.jccca.org/global-warming/knowledge02>

<https://www.wwf.or.jp/activities/basicinfo/1034.html>

12/6  
[https://www.egmkt.co.jp/column/consumer/20210730\\_EG\\_128.html](https://www.egmkt.co.jp/column/consumer/20210730_EG_128.html)

12/20  
<https://tenbou.nies.go.jp/news/fnews/detail.php?i=2944>  
<https://www.netdenjd.com/articles/-/268588>  
<https://akiya-now.com/?p=6687>

# **Eat for health**

To decrease obesity population with meal

5229 Ryu Eka

## **Abstract**

The goal of my study is to suggest healthy meals which are effective in decreasing the obesity population. In this research, I define “healthy meals” as “the well-balanced diet”. I used the Internet and interviews for information gathering.

My suggestion is to focus on Oceania, Europe and America. These areas have a higher percentage of obesity population than others. I should take in my suggestion about healthy meal theory which originated in Japan. I collected information by the Internet and interviews. I interviewed my classmates who have lived in Europe and America to know what they usually eat and what they dislike to eat. As a result, curry is commonly eaten in these three areas. Therefore, I suggest the healthy meal which is main of curry, “HCS (Healthy Curry Set)”. HCS’s main dish is curry which is made from curry powder, side dish is cabbage salad, and soup is consomme soup. If you can, it’s better to eat some dessert like fruits or yogurt. Using curry powder for curry make fewer calorie and fat than commercial one. HCS is about 720 kcal, it’s just right for lunch and dinner.

I hope I can decide on a method of healthy meals, and increase recipes to make it easier for people to try “healthy meals”.

## **1 Introduction**

In developed countries and island countries, there are a lot of obese people. (graph 1,2) Obesity have high risks which will be a cause of illness, for example lifestyle disease. If we want to decrease body mass index, we must change our lifestyle, especially meals. This study focus on food and meal, and the goal of the study is to suggest healthy meal.

I have two assumptions about making a healthy meal plan. First, it has to keep a well-balanced diet and low calorie. Second, it can be eaten by people who are from all over the world. I make the healthy meal which follows these rules to use low calorie and have good appetite food. Of course, the recipe must be able to be eaten by people all over the world, so I have to think how to arrange the recipe matched to local needs.

I research information on the internet and interview my classmates who have ever lived abroad.

## **2 Discussion and implications**

First, I researched low-calorie, low-sugar, and good appetizing food. As a result, mushrooms, tofu, vegetables, and seaweed are applied. They include many nutrient, like dietary fiber, vitamin, folic acid, niacin, potassium, and mineral. Actually, many recipes use these food to make a main dish. Only focusing on the food, I found them usually by Japanese food. From this, I thought to make a recipe based on Japanese meal and it is easy to arrange.

Next, I researched meals eaten by people living in different areas. I said it before that low

calorie foods are usually used in Japanese meals, so I think I can refer to Japanese food or meals to make recipes of healthy meals. However, when I search about how people evaluate Japanese meals, some people feel Japanese foods taste bad. At that time, I found curry may be eaten by people all over the world. I searched on the internet and interviewed my classmates who had lived in abroad for the proof that it is true. From the internet, almost all of Asian eat curry. From the interview, South and North American, European, and Oceanian also eat it. One of my classmates who has experience of living abroad told me that she often eat Indian style curry at Sweden. I searched for Oceanian food culture because I couldn't have credible evidences. Oceanian food culture is affected a lot by other countries, of course including Indian food culture. Therefore, curry is a good food to accept by this research main target, who live in Oceania, Europe, and America area. Based on this research, I decided to use the Japanese food concept, which is "one soup and three side dishes" or "one soup and two side dishes", people call it set meals.

This time, I suggest "Healthy Curry Set", I call it HCS. Main dish is rice, bread, or naan, side dishes are curry roux and coleslaw salad, soup is consomme soup. If you can, you should better add some desserts like bananas or yogurt. I calculate HCS's total calories and PFC balance. (graph3) 721 kcal is just better for lunch, and PFC balance is almost better.

Then, I introduce HCS's effect. Making curry roux uses meat (beef, chicken, pork, or processed meats), carrots, onions, mushrooms, potatoes and tomatoes to make curry roux. We can ingest protein from meats and dietary fiber from vegetables which help us improve intestinal environment. In this time, I recommend making curry roux from curry powder and not using commercially prepared curry roux. If we make it from powder, we can cut calories. Curry include a lot of spices, and I summarize the effects of spices which are usually used for curry roux. (graph4) Making coleslaw salad uses cabbage, holl corn, and carrots without using dressing to eat them to cut down fat. Using sweeter vegetables make people who dislike vegetables try to eat it easier. Making consomme soup uses radish and Chinese cabbage. It not only help us improve intestinal environment, but also helps us feel of satisfaction.

According to the above things, HCS fills these terms: It can take dietary fiber, and help us improve intestinal environment. It can make us feel satisfied. It has better PFC balance.

You may think HCS is a great and good balanced meal just reading this but it also has a demerit. We need more time to make it than others. These days, many people are busy for their works and sometimes they not just have no time to make meals, but also have no time to eat, so I think we need some devising, for example, packing rice for each meal, or making one week curry roux and consomme soup in once and saving it in refrigerator.

### **3 Conclusion**

We have to decrease obese population, and to achieve it we can change from our lifestyle, especially foods or meals. Some foods, for example vegetables and spices will help us health. We should use these foods to improve our meals. Not only foods are important, but also the thinking way of meal is important, too. Japanese style meal, "one soup and three/two side dishes" is good for health.

According to above, healthy meals need to fill these terms:

1. It can take dietary fiber, and help us improve our intestinal environment.
2. It can make us feel satisfied.
3. It has better PFC balance.

The idea I suggest, "Healthy Curry Set (HCS)" can be eaten by Oceanian, European, and South and North American.

In the future,I need to think about how to spread it to people,and how to make them try it.Just making a plan is not effective,we must make it practical.If I can,I want to increase recipes of healthy meals like HCS.

#### 4 References

Calorie Slism

<https://calorie.slism.jp/total/> (2023/01/24)

Does curry roux have high calories?Search it by type and manufacture!This is the way to eat it healthy. | Oggi.jp

<https://oggi.jp/6754058> (2023/01/27)

The effect of spice. | JFSCA

<https://www.asc-jp.com/syokubu/spice/%E3%82%B9%E3%83%91%E3%82%A4%E3%82%B9%E3%81%AE%E5%8A%B9%E8%83%BD%E3%81%A8%E5%8A%B9%E6%9E%9C/#index21> (2022/10/26)

Basic spices we use for curry. | JSFCA

<https://www.asc-jp.com/syokubu/spice/%E3%82%AB%E3%83%AC%E3%83%BC%E3%81%A7%E4%BD%BF%E3%82%8F%E3%82%8C%E3%82%8B%E5%9F%BA%E6%9C%AC%E3%82%B9%E3%83%91%E3%82%A4%E3%82%B9/> (2022/10/26)

Mushrooms' type and effect. | KINOKOYA

[https://www.gaspo-kinokoya.com/blog/blog\\_detail/index/987.html](https://www.gaspo-kinokoya.com/blog/blog_detail/index/987.html) (2022/09/14)

Let's compare food and culture around the world! | Meiji Co.,Ltd.

<https://www.meiji.co.jp/meiji-shokuiku/worldculture/> (2022/09/14)

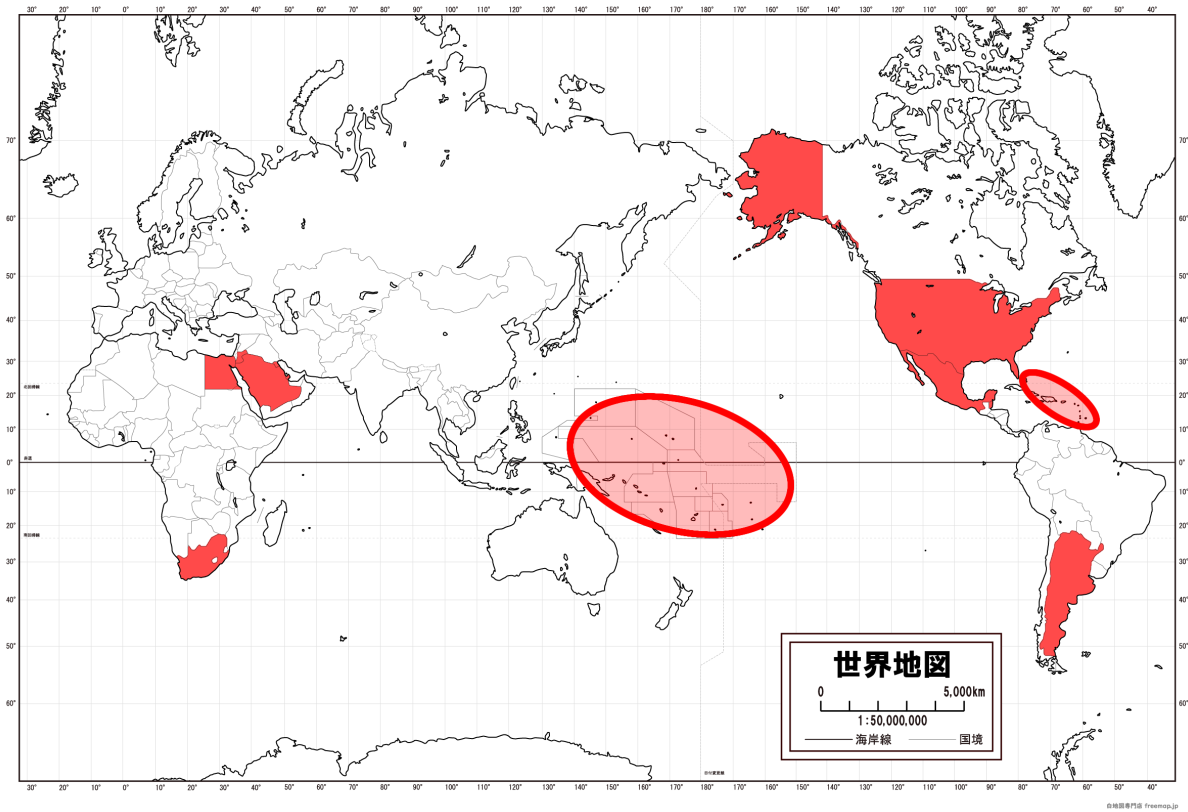
What is a balanced meal? | Tanita magazine | Tanita

<https://www.tanita.co.jp/magazine/column/4796/> (2022/06/14)

『Data book for understand the world. 32 edition The International Illustrated Congress of the World』 | Yano Kota Memorial Association (2022/04/22)

Adult			Child		
	1990	2016		1990	2016
Nauru	50.8	61.0	Nauru	21.3	36.3
Cook Islands	37.5	55.9	Cook Islands	11.5	36.1
Palau	38.8	55.3	Palau	13.9	35.5
Marshall Islands	36.9	52.9	Marshall Islands	10.5	31.2
Tuvalu	30.7	51.6	Tuvalu	6.5	31.1
Niue	30.5	50.0	Niue	7.3	33.3
Tonga	30.0	48.2	Tonga	6.4	30.2
Samoa	29.8	47.3	Samoa	3.7	24.9
Kiribati	26.7	46.0	Kiribati	5.5	27.5
Micronesia	28.3	45.8	Micronesia	4.9	25.2
Kuwait	26.4	37.9	Kuwait	14.0	23.1
America	18.7	36.2	America	12.0	22.7
Jordan	20.1	35.5	Egypt	7.0	21.8
Saudi Arabia	20.0	35.4	Argentina	11.7	21.7
Qatar	20.8	25.1	Qatar	12.2	22.9
Japan	1.5	4.3	Japan	3.8	5.0

graph2



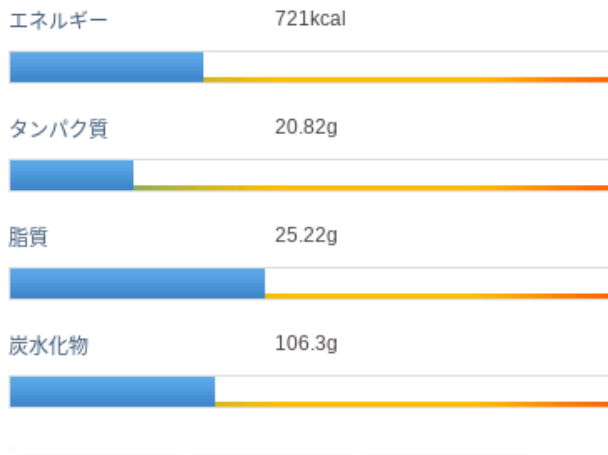
graph3

## 全食品の栄養成分

一日あたりの目安：18歳～29歳/女性/51kg/必要栄養量暫定値算出の基準カロリー1800kcal

### 【総カロリーと三大栄養素】

(一日あたりの目安)



### 【PFCバランス】



graph4

## **Effect of spices in curry**

Turmeric → antioxidant effect for beautiful skin

Coriander → blood purification

Red pepper → increase metabolic rate

Black pepper → blood circulation improvement

Cumin → Intestinal disorders, detoxification

Cardamom → Aromatic effect on healthy intestines

# Living with Dementia

## Dementia care in future

5301 Aihara Tamaki

### Abstract

In 2013, the Dementia Summit was held, reflecting the global trend of population aging and the significant impact of the increasing number of dementia patients on society. The shortage of nursing care workers has also become a serious issue. While various countries are sharing their dementia care policies and advancing collaborative research, the market for nursing care robots using the latest technology has rapidly expanded in recent years, and the acceptance of foreign care workers has also increased. To support future dementia care, I believe it is necessary to provide one robot per individual to each country's unique care system, enabling support for daily life, and to promote the acceptance of foreign care workers. It is essential to foster understanding of robots and foreign care workers among those who support nursing care at the same time.

### 1. Introduction

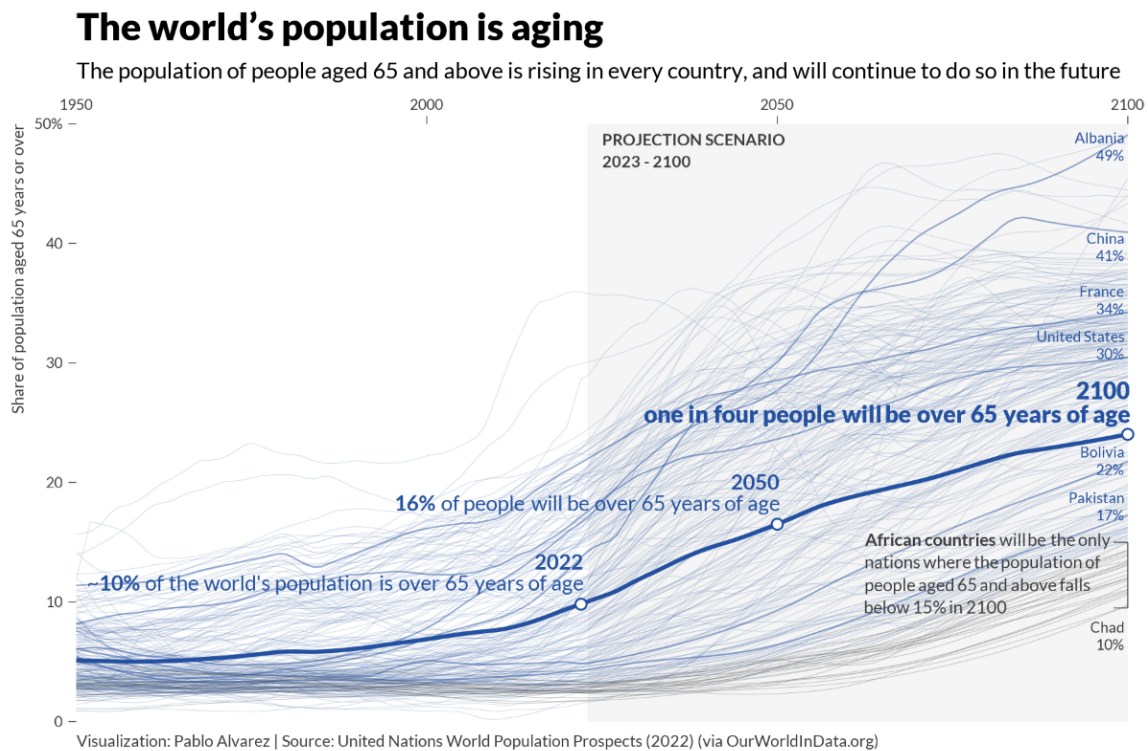
As the world population is rapidly aging, more and more elderly people would get demented. Also, people cannot live with dementia with medical care alone because many dementia diseases, including Alzheimer's disease, are progressive, and it is difficult to recover from cognitive dysfunction and lifestyle disorders with today's medical care. Therefore, caring is very important to support people who have dementia.

However, the number of care workers is not enough, and many developed countries have advanced caregiving robots. In many studies, experts suggest some caregiving robots such as transfer aid robots, therapeutic robots, and communication robots could face challenges against both the aging population and the lack of workers in the care sector. What is more, many developed countries accept foreign workers as nurses or caregivers. In order to make those who have dementia live respectfully as individuals, I want to research future dementia care, including with the foreign caregivers and AI robots. To begin with, I want to search the current condition of dementia care, and search what problem their families are facing now. Next, searching for the utilization status of robots in the nursing care industry and acceptance status of foreign workers, I want to consider what to do to improve the present condition.

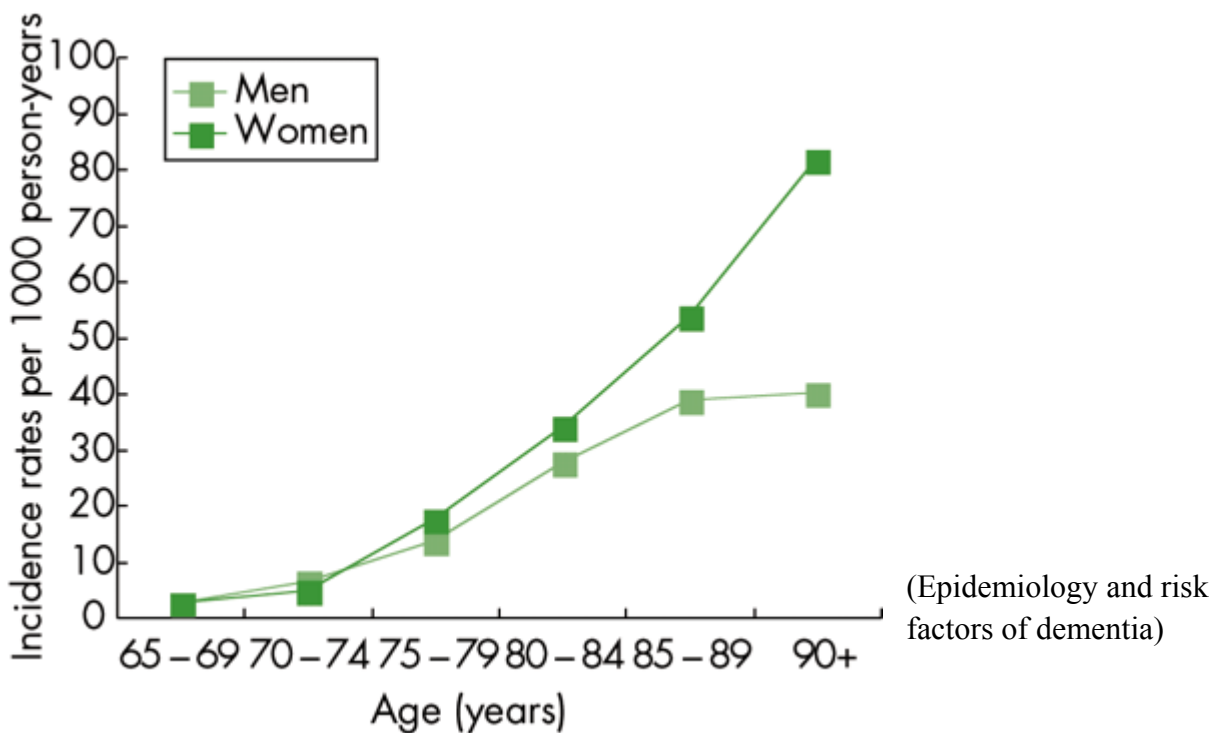
### 2. Discussion and implications

Looking at (Fig.1), according to Pablo Alvarez, regarding the world's aging population from 1950 to 2100, in 2022, there were 771 million people aged 65+ years globally,

accounting for almost 10% of the world's population. This segment has been growing at an increasing rate, and it's expected to hit 16% in 2050, and eventually 24% by 2100. (Figure 1)



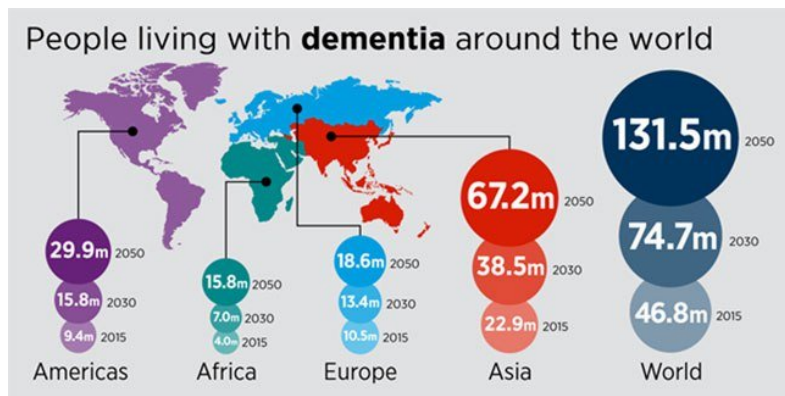
(Figure2)



This shows that the risk of dementia increases with age.



(Figure3)



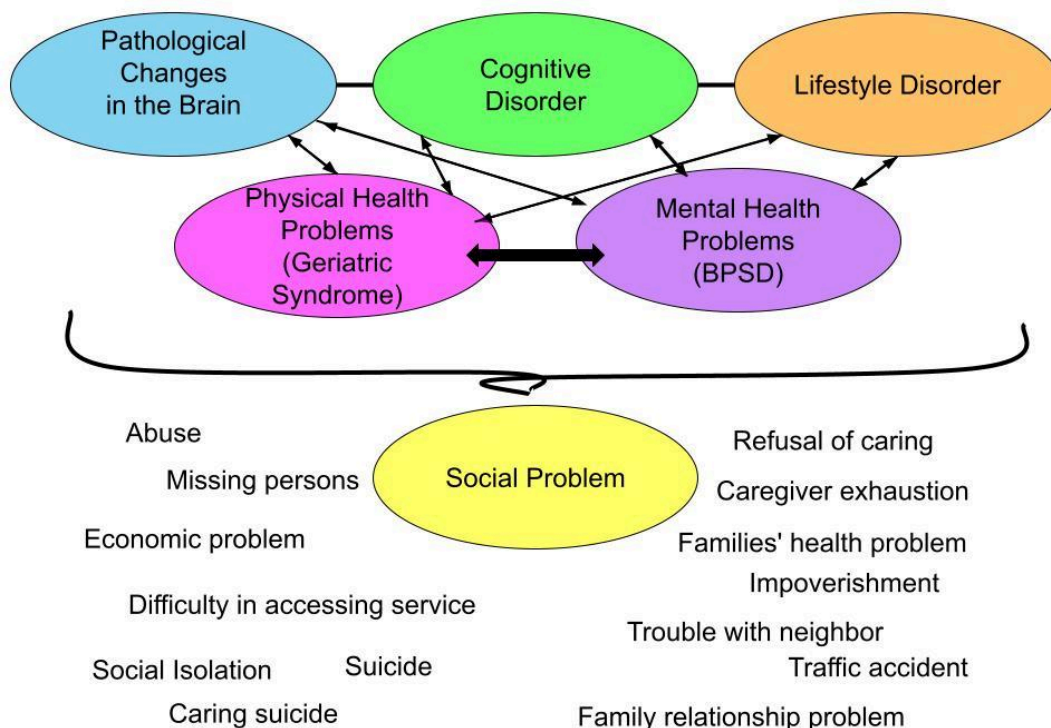
World Alzheimer Report 2015; The Global Impact of Dementia (Alzheimer’s Disease International)

It shows that dementia is common and it's growing around the world.

From (Fig.1), (Fig.2) and (Fig3), you can see that the number of people with dementia will increase around the world in the future.

About dementia, WHO defined “Dementia is a syndrome that can be caused by a number of diseases which over time destroy nerve cells and damage the brain.” Dementia has physical, psychological, social and economic impacts, not only for people living with dementia, but also for their carers, families and society at large.(graph4) Not only medical care, but also caring is essential in order to support them.

(Figure4) Clinical Image of Dementia : Complication



Now dementia has become a global issue, leading to the G8 Dementia Summit in London in December 2013. The summit was attended by government representatives from G8 countries, the European Commission, the WHO, the OECD, as well as dementia experts and pharmaceutical company representatives from various countries. The summit focused on introducing and exchanging information on the current state of dementia, national policies, dementia research, and social initiatives from a wide range of perspectives. The main declaration included goals to significantly increase joint research funding for dementia, identify treatments or disease-modifying therapies for dementia by 2025, increase the number of people engaged in dementia-related research, and promote international collaboration to support dementia innovation. As a result of the summit, the UK government established the World Dementia Council (WDC).

Several advanced countries, including the UK, France, the US, and Australia, have been formulating dementia strategies.

In the caring industry, according to the International Labor Organization (ILO), there is a shortage of 1.36 million caregivers worldwide. The global shortage of caregivers has led to consideration of introducing robots to reduce the burden on staff. The global market for nursing care robots is predicted to reach \$448.68 million by 2031, up from \$114.40 million in 2022. According to latest research findings, solutions, and challenges in the field of robotics for dementia care were covered in the recent webinar called “Cognitively assistive robots for dementia care” by experts from the leading companies and educational institutions: Tombot, Inc., the University of Minnesota Duluth, University of Waterloo, University of Illinois Urbana-Champaign, University of Queensland, and Dalhousie University. For instance, Minnesota shared unveiling insights demonstrating that robots significantly enhance cognition and mood in individuals with dementia.

However, some families and individuals with dementia are unable to accept robots due to the lack of warmth they provide. Additionally, many countries have been incorporating foreign workers, with some having over half of their caregiving workforce composed of foreigners. Western countries have established systems for the acceptance of foreign workers, targeting those with a certain level of skills. On the other hand, there are challenges such as anxiety about foreign caregivers due to differences in language and culture.

Wanting to know what people with dementia and their families actually think about the current caring situation, I conducted a survey of families with the cooperation of a dementia care center in the prefecture as table 1.

Table 1

**未来の認知症介護問題に関するアンケート**

これからの認知症ケアにおいて、介護力不足の問題が明らかになっています。  
 その対応策として、  
 ①ロボット技術の導入、 ②外国人労働力 の2つの可能性が考えられています。  
 現在、認知症の方を身近で支えている皆様がどのように感じておられるか、以下のアンケートにご協力をお願いします。

<質問1>  
 現在、以下のなかで実際に困っていることに○を付けてください。(複数回答可)  
 1. 同じことを何回も聞く 2. 不安で一人で居られない  
 3. 迷子、徘徊がある 4. 昼夜逆転している  
 5. 大声を出す、暴力がある、すぐ怒る 6. 妄想、幻覚がある  
 7. 入浴をいやがるなど介護拒否がある 8. 着替え食事などに介助が必要  
 9. 尿便失禁がある 10. 立位歩行困難で介助が必要  
 11. 危険予知できず転んでしまう 12. やる気がない、何もしない 13. 火の消し忘れ  
 14. その他(自由記述)  
 ( )

<質問2> 将来の介護力不足の問題を知っていましたか？ ①知っていた ②知らなかった

<質問3>  
 別表は国が現在導入を検討しているロボット介護機器です。実際につくられたら利用したいですか？  
 利用したくないとしたらその理由はなんですか？あったら良いと思う機能、国の計画で不足している機能が  
 あったら教えてください。  
 1. ロボット介護機器があったら利用したい 2. 利用したくない 3. 答えられない  
 <利用したくない理由>  
 (1)誤作動がある可能性など安全性で信用できない (2)機械の冷たさが嫌  
 上記以外の理由(自由記述)  
 ( )  
 上記の国の構想では不足していると思う機能(自由記述)  
 ( )  
 絶対にロボットにして欲しくない、人間にしてほしい行為があったら教えてください(自由記述)  
 ( )

<質問4>  
 (コミュニケーションに問題ない前提で)外国人介護士に介護してもらうことに抵抗がありますか？  
 1. 抵抗なし 2. 抵抗あり 3. 答えられない  
 <抵抗ありの理由>  
 (1)感覚ニュアンスが伝わらない (2)文化思考の違いがある (3)信用できない  
 その他(自由記述)  
 ( )

ご協力ありがとうございました。

The survey results are as follows:

Recognition of caregiver shortage

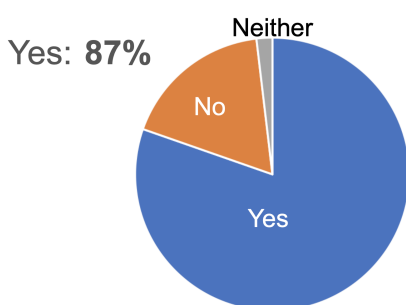


Figure 5

•87% of the respondents were aware of the shortage of caregiving personnel, which was more than expected as Fig.5.



Figure 6

• Regarding daily life challenges, 78% of the respondents reported being repeatedly asked the same questions, followed by 34% who expressed a lack of motivation or unwillingness to do anything, 33% who reported urinary or fecal incontinence, and 32% who reported delusions or hallucinations as Fig.6. Communication robots that can answer repeated same questions by demented people will be very helpful for their families.

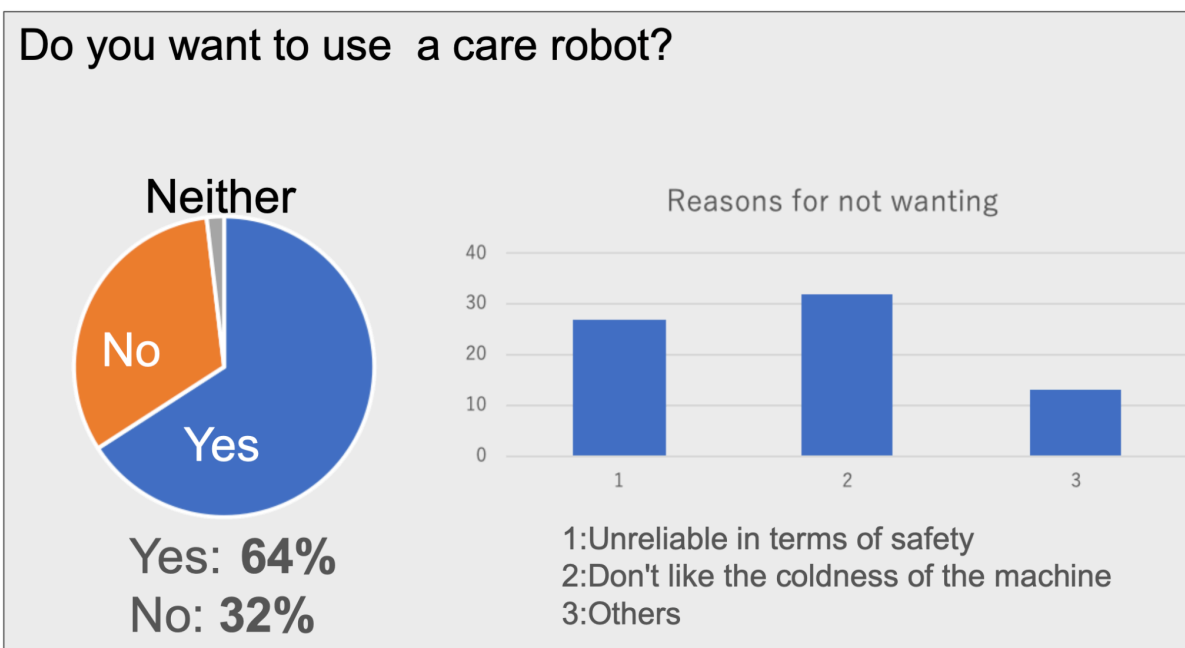


Figure7

• In terms of the introduction of caregiving robots, 64% of the respondents were in favor, 32% were against, and 4% were undecided. Reasons for not wanting are as Fig.7

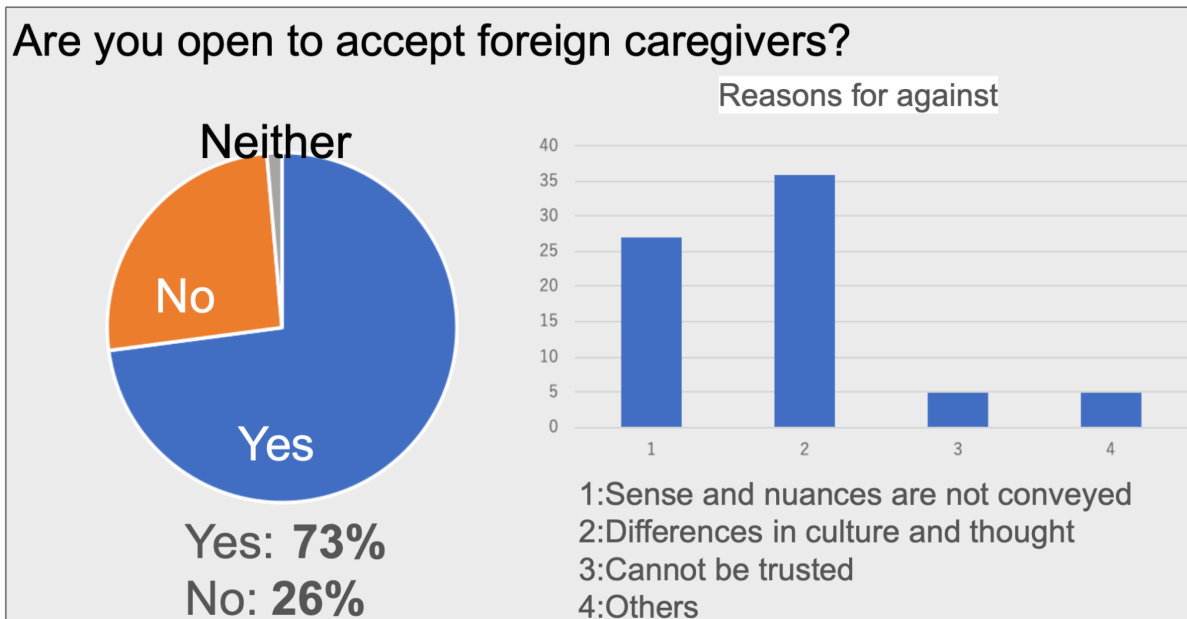


Figure 8

•As for foreign caregiving staff, 73% of the respondents were open to accepting them, 26% felt resistance, and 1% were unsure. Reasons for against are as Fig.8

The resistance to robots seems to be greater than the resistance to foreign caregiving staff, with many comments citing the coldness of machines as a reason for this. Concerning foreign caregiving staff, some voices suggested that the issue is not about nationality but about differences in culture, language, and human qualities. There were also opinions expressing a lack of understanding and a desire for more explanation about the robots.

### 3. Conclusion

In conclusion, to address the ongoing increase in dementia, I believe that it is important to actively utilize nursing care robots and foreign care workers. Specifically, I propose two measures. First, the development of specialized nursing care robots for dementia. These robots should be equipped with AI to address common issues based on surveys of families affected by dementia. Communication robots to answer the same questions repeated again and again by demented people, will be a relief for their families. Furthermore, a "dementia robot prescription" should be established, providing one robot per individual through consultations with dementia patients, their families, and physicians at their regular hospitals. Second, regarding the acceptance of foreign care workers, existing systems should be reorganized, and initiatives should be developed to make Japan a more attractive place for those who wish to work in Japan. My own survey revealed that there is a significant number of people who are resistant to accepting robots and foreign care workers, making it necessary to further promote understanding among the public about care robots and foreign workers to support demented people and their families.

#### 4.References

- ・認知症と共に暮らせる社会をつくる  
<https://www.tmg Hig.jp/research/topics/201703-3382/>
- ・諸外国の外国人労働者受入制度  
(アメリカ、イギリス、ドイツ、フランス、オランダ、オーストラリア、韓国、EU)  
[https://www.jil.go.jp/foreign/labor\\_system/2022/special/no.249.html](https://www.jil.go.jp/foreign/labor_system/2022/special/no.249.html)
- ・G8認知症サミット 概要 共同声明 宣言  
<https://www.mhlw.go.jp/stf/houdou/0000033640.html>
- ・介護ロボットの市場規模、シェア、成長  
<https://www.businessresearchinsights.com/jp/market-reports/caring-patient-robot-market-100743>
- ・外国人介護人材の人口的側面とその国際比較  
<https://www.ipss.go.jp/syoushika/bunken/data/pdf/19750406.pdf>
- ・What we can learn from Japan's adoption of robots in the service sector  
<https://www.weforum.org/agenda/2021/02/study-robots-service-sector-japan/>
- ・How Will Robotics Change Nursing Care in 2030/2040?  
<https://www.mri.co.jp/en/50th/columns/robotics/no03/>
- ・Charted: The World's Aging Population from 1950 to 2100  
<https://www.visualcapitalist.com/cp/charted-the-worlds-aging-population>
- ・Dementia  
<https://www.who.int/news-room/fact-sheets/detail/dementia>
- ・Cognitively assistive robots for dementia care  
<https://aiforgood.itu.int/cognitively-assistive-robots-for-dementia-care/>  
<https://aiforgood.itu.int/event/cognitively-assistive-robots-for-dementia-care/>
- ・Healthcare Robots: Overview of the Top 10 Use Cases  
<https://howtorobot.com/expert-insight/healthcare-robots>
- ・Epidemiology and risk factors of dementia  
<https://pubmed.ncbi.nlm.nih.gov/16291918/>  
[https://jnnp.bmj.com/content/76/suppl\\_5/v2](https://jnnp.bmj.com/content/76/suppl_5/v2)
- ・Faces and Phases of Dementia  
<https://www.youtube.com/watch?app=desktop&v=feE4cPWGPvA>

# Living with Nature

## The environmental pollution with fashion industry

5302 Aoyagi Kokoro

### Abstract

Recently, it has been becoming a problem that human endeavors pollute the environment. So, I decided to study how we can stop it and protect the environment. According to the United Nations Conference on Trade and Development, the fashion industry places the second place of the environmental pollution industry. I had been studying about it, focusing on the fashion industry. In the fashion industry, a big amount of produce, consumption, and disposal are big problems. Therefore I decided to think about them by separating them into three blocks: the production stage, the consumption stage, and the disposal stage. I want to suggest using Polylactic Acid fiber as a solution for the production stage, a system lending clothes for the consumption stage, and a point system for the collection of old clothes for the disposal stage.

### 1 Introduction

Human endeavors destroy the environment. So we have to think about what we can do to protect the environment and move. Fashion industry is the second largest industry that pollutes the environment and is a familiar industry. So I think we ought to focus on the fashion industry by thinking about environmental pollution by human endeavors.

### 2 Discussion and implications

First, I'd like to talk about the current situation of the fashion industry. The United Nations Conference on Trade and Development announced that the fashion industry is the second largest industry that pollutes the environment. Elisa Tonda, Head of the Consumption and Production Unit at the UN Environment Programme (UNEP), explained the urgency of now situation : "The global production of clothing and footwear generates 8% of the world's greenhouse gas emissions and, with manufacturing concentrated in Asia, the industry is mainly reliant on hard coal and natural gas to generate electricity and heat. If we carry on with a business-as-usual approach, the greenhouse gas emissions from the industry are expected to rise by almost 50% by 2030." According to McKinsey 2019 State of Fashion report, people buy 60% more clothing than they did 15 years ago, and they also are keeping them only half as long as they used to.

As I mentioned above, this problem can be separated into three blocks : the production stage, the consumption stage, and the disposal stage.

Second, I'd like to talk about the production stage. We use a big amount of water and natural resources when we manufacture clothes. I have no idea which solves these problems ; however, I want to suggest the fiber that is good for nature when we dispose of them. That is



Biodegradable fibers. There are various kinds of biodegradable fiber and they can be used for a long time under normal conditions, but in compost or soil, it can be eventually hydrolysed and biodegraded by microorganisms into water and carbon dioxide. By using this fiber, we can reduce the impact on nature when we discard clothes. They not only can be biodegraded by secreted enzymes of microorganisms, but also are expected to be reused. However, they have a problem: it's difficult for them to decompose in the ocean. And they may be promoting the pollution of water. So we have to dispose of all of them on the ground. If everyone's yard could be a place that can disassemble clothes, we could discard them more eco-friendly and efficiently. Therefore we should enable people to make the situation that hydrolysis and biodegrading occur actively. For that, we can enable people to breed microorganisms to biodegrade their clothes in their yard. So I want to suggest making a kit to breed microorganisms easily.

Third, I'd like to talk about the consumption stage. One of the causes of big amounts of consumption is fast fashion. Companies sell low quality products that are the latest fashion. People can buy a lot of clothes at low prices. Then the amount of clothing consumed has been increasing. So we have to reduce our consumption. However, these days, particularly the young tend to focus on not so much quality but quantity. They want not to use high quality products for a long time but to use low quality products for a short period of time and various kinds of clothes. Then, I want to suggest the renting clothing system. People can select clothes that they want to wear and order them on the internet. And we deliver them to customers. People can enjoy various kinds of clothes without buying them. By sharing clothes with many people, the consumption will decrease. We'll transfer a part of profits that we can earn to companies and request them to cooperate with us.

Last, I want to talk about the disposal stage. Most people don't donate or recycle or reuse clothes that they no longer wear but discard them. The reason that people take action like this is because it's bothersome to clean clothes or check them to send a collection. For making people recycle clothes, we can make a system that people who recycle clothes can get profits. Then I want to suggest a point system for the collection of old clothes. But, I haven't found the details of this system. So I want to think about that.

### 3 Conclusion

We have to stop the progress of global warming or destroy the environment. And the fashion industry pollutes the environment extremely. So we can proceed with the prevention of environmental destruction by resolving the problems of the fashion industry's environmental pollution. For that I propose four things: using biodegradable fiber, making the breeding microorganisms kits, renting clothes system, and making a point system for the collection of old clothes. But there are still a lot of problems that I have to solve in these suggestions. So I want to consider them, from now on.

### 4 References

UN launches drive to highlight environmental cost of staying fashionable 1/25

<https://news.un.org/en/story/2019/03/1035161>

生分解性繊維 4/24

[https://www.jstage.jst.go.jp/article/fiber/62/11/62\\_11\\_P\\_330/\\_pdf](https://www.jstage.jst.go.jp/article/fiber/62/11/62_11_P_330/_pdf)



天然繊維と合成繊維の科学 5/12

[https://www.jstage.jst.go.jp/article/kakyoshi/66/9/66\\_444/\\_pdf-char/ja](https://www.jstage.jst.go.jp/article/kakyoshi/66/9/66_444/_pdf-char/ja)

高分子材料の生分解性と難生分解性高分子材料の生分解 5/12

[https://www.jstage.jst.go.jp/article/mls2001/19/1/19\\_1\\_13/\\_pdf-char/ja](https://www.jstage.jst.go.jp/article/mls2001/19/1/19_1_13/_pdf-char/ja)

生分解性繊維の動向 5/12

[https://www.jstage.jst.go.jp/article/transjtmsj1972/46/7/46\\_7\\_P264/\\_pdf](https://www.jstage.jst.go.jp/article/transjtmsj1972/46/7/46_7_P264/_pdf)

生分解性高分子分解酵素 12/4

[https://www.jstage.jst.go.jp/article/mls2001/19/1/19\\_1\\_1/\\_pdf-char/ja](https://www.jstage.jst.go.jp/article/mls2001/19/1/19_1_1/_pdf-char/ja)

微生物の発見と性質について(1) 5/12

[https://www.jstage.jst.go.jp/article/cookeryscience/43/6/43\\_371/\\_pdf](https://www.jstage.jst.go.jp/article/cookeryscience/43/6/43_371/_pdf)

微生物の発見と性質について(2) 5/12

[https://www.jstage.jst.go.jp/article/cookeryscience/44/1/44\\_88/\\_pdf](https://www.jstage.jst.go.jp/article/cookeryscience/44/1/44_88/_pdf)

脂肪族ポリエステルの構造と生分解性 12/11

[https://www.jstage.jst.go.jp/article/fiber1944/52/5/52\\_5\\_P200/\\_pdf](https://www.jstage.jst.go.jp/article/fiber1944/52/5/52_5_P200/_pdf)

植物由来ポリ乳酸の分解機構および速度 12/11

[https://www.jstage.jst.go.jp/article/shikizai/81/2/81\\_2\\_54/\\_pdf](https://www.jstage.jst.go.jp/article/shikizai/81/2/81_2_54/_pdf)

Apparel supply chain worldwide - Statistics & Facts 2022/12/18

<https://www.statista.com/topics/8824/apparel-supply-chain-worldwide/#dossierKeyfigures>

Global apparel market - statistics & facts 2022/12/18

[https://www.statista.com/topics/5091/apparel-market-worldwide/#topicHeader\\_wrapper](https://www.statista.com/topics/5091/apparel-market-worldwide/#topicHeader_wrapper)

環境省\_サステナブルファッション 2022/12/14

[https://www.env.go.jp/policy/sustainable\\_fashion/](https://www.env.go.jp/policy/sustainable_fashion/)

天然繊維と化学繊維の特徴 11/6

[https://www.diy-shop.jp/contents/diy-school-fabric/nuno\\_fiber.html](https://www.diy-shop.jp/contents/diy-school-fabric/nuno_fiber.html)

エコノミストOnline 11/6

<https://weekly-economist.mainichi.jp/articles/20211221/se1/00m/020/065000c>

微生物が24時間で分解！生ゴミは“運ばず、燃やさず、その場で処理”が最先端に 11/6

<https://emira-t.jp/special/13049/>

ポリ乳酸繊維の活用で、衣服の環境負荷低減へ！ 8/28

<https://academist-cf.com/projects/240?lang=ja>

地球に優しいサステナブル素材の種類と特徴。ファッションもエシカル志向へ 4/24

<https://komehyo.jp/komeru/885>

つくられた洋服の6割以上は捨てられているという現実。ファッションロスに私達はどうか立ち向かうのか。 2022/12/19

<https://note.com/forfashionfuture/n/n6482f179a9a9>

ファストファッションは勝ち組ビジネスモデルなのか？知っておくべき問題点 2022/12/14

<https://www.otsuka-shokai.co.jp/erpnavi/category/apparel/sp/solving-problems/archive/210929-02.html>

PLAの生分解性プラスチックとしての誤解 12/11

[https://nature3d.net/explanation/pla\\_notreally.html#:~:text=%E7%9F%AD%E6%9C%9F%E9%96%93%E3%81%AB%E5%8A%A0%E6%B0%B4%E5%88%86%E8%A7%A3,%E6%9D%A1%E4%BB%B6%E3%81%AF%E3%82%AF%E3%83%AA%E3%82%A2%E3%81%A7%E3%81%8D%E3%81%BE%E3%81%99%E3%80%82](https://nature3d.net/explanation/pla_notreally.html#:~:text=%E7%9F%AD%E6%9C%9F%E9%96%93%E3%81%AB%E5%8A%A0%E6%B0%B4%E5%88%86%E8%A7%A3,%E6%9D%A1%E4%BB%B6%E3%81%AF%E3%82%AF%E3%83%AA%E3%82%A2%E3%81%A7%E3%81%8D%E3%81%BE%E3%81%99%E3%80%82)

# Sustainable Avocados

-To eat avocados in the future-

5303 Abe Atsuki

## Abstract

I heard cultivating avocados impacts on the environment in the world. Avocados have 10 kinds of vitamins and 20 % of fats so it is called “forests’ butter.” Avocados got certified by Guinness World Records because they have the most nutrition of all fruits. In Japan, consumption has been increasing and Japan imports avocados from other countries, for example, Mexico. However, it is said that cultivating avocados is not sustainable. There are three problems of nurturing them. They are “using a lot of water”, “emitting carbon dioxide when we transport them”, and ”danger to farmers”. In these issues, I focused on “emitting carbon dioxide when we transport them”.

First, I thought it was a good way to cultivate avocados in other countries. Now, countries which nurture avocados are tropical ones for example, Mexico, Dominican republic, Peru. Aquaponics and Ecovado are good ways to solve this problem.

## 1 Introduction

I heard cultivating avocados impacts on the environment in the world. Avocados have 10 kinds of vitamins and 20 % of fats therefore it is called forests’ butter. Avocados get certified by Guinness World Records because it has the most nutrition of all fruits. In Japan, consumption has been increasing, so Japan imports avocados from other countries, for example Mexico. However, it is said that cultivating avocados is not sustainable. There are three problems in nurturing them. They are “using a lot of water”, “emitting carbon dioxide when we transport it”, ”danger to farmers”. From these issues, I focused on “emitting carbon dioxide when we transport it”.

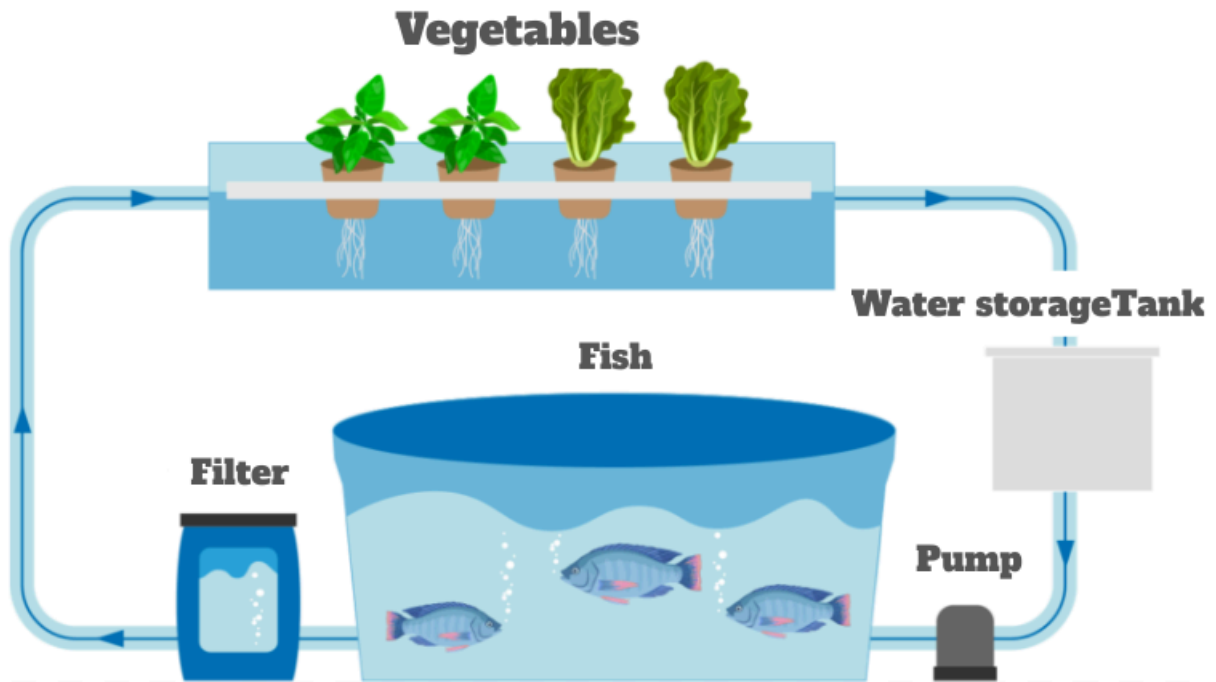
## 2 Discussion and implication

Avocados have 3 problems which hinder making the world sustainable. First, making avocados uses a lot of water. According to Water Ade, we have to use 2 thousand liters of water to make 1 kilogram of avocados. This is 10 times as many as that of tomatoes. In Mexico, Mexicans use water to fill 3800 pools to grow avocados in a day, so there is drought.

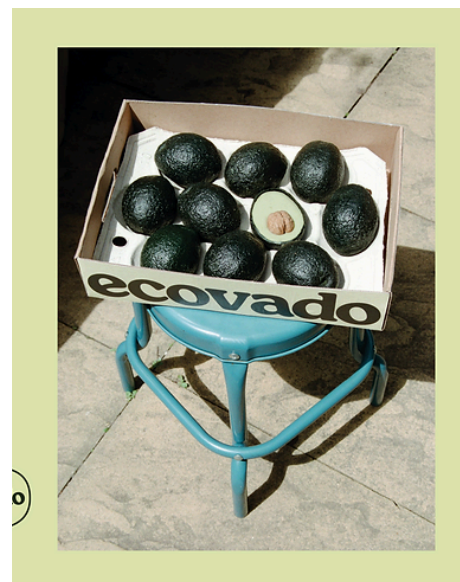
## 3 Conclusion

First, I thought it was a good way to cultivate avocados in other countries. Now countries which nurture avocados are tropical countries for example, Mexico, Dominican republic, Peru. We have to grow avocados in places where it is more than 20 degrees but global

warming has raised temperatures around the world, which has increased the number of areas where avocados can be grown. I thought we could reduce carbon dioxide emission to grow them in the countries which are not tropical. However, there is a problem. If they were to be grown in non-tropical countries, they would use a lot of water and it would cause water shortages in those countries. In addition, many countries cannot grow avocados due to the land size and soil problems.



Second, I think that aquaponics is a technology that can solve problems from making avocados. Aquaponics is a word from aquaculture and hydroponics. Aquaponics is a technology that reuses water used for fish farming as water for growing vegetables. Fish waste is broken down into nutrients by bacteria, allowing vegetables to grow in nutrient-rich water. Aquaponics can only be used for vegetables grown hydroponically; avocados are grown in soil, so this technology cannot be directly incorporated. However, I thought that it can solve problems to grow avocados using unclean but nutrient-rich water, such as water used for fish farming or treated in the sewage system but it is not usable for drinking.



Third, fake avocados which are called Ecovado is the way of solving the problem. Toppage which made ecovado said that Ecovado is an alternative to avocado that employs design thinking to help consumers reduce the amount of avocado they eat with introducing them to unfamiliar, yet more diverse, ingredient combinations. It was designed by identifying the chemical elements of avocados and the functionality of each molecule to try to find equivalents from more local and low-impact sources that do not rely on threatened crops. By formulating the recipe from local ingredients, the flavor varies across production locations. Therefore, this first recipe that uses widely produced British ingredients will taste different than an Ecovado created in another country.

These are ways to solve Avocado's problems.

#### 4 References

- What is important when we choose sustainable avocados (2023.5)  
[https://www.huffingtonpost.jp/entry/story\\_jp\\_613814e0e4b0eab0ad9eb8e8](https://www.huffingtonpost.jp/entry/story_jp_613814e0e4b0eab0ad9eb8e8)
- Are avocados devil fruits? (2023.6)  
<https://news.yahoo.co.jp/byline/mitsuji-shoji/20210621-00243982>
- Avocados used by the mafia (2023.6)  
<https://plus.iru-miru.com/ja/article/39029>
- Avocado Production Ranking in the World (2023.7)  
<https://www.globalnote.jp/post-916.html>
- What is aquaponics? (2023.7)  
<https://spaceshipearth.jp/aquaponics/>
- Ecovado (2023.7)  
<https://www.arina-shokouhi.com/ecovado>
- What is the agricultural use of "sewage resources" that leads to reduced cultivation costs and increased yields? (2023.9)  
<https://www.magazine.mlit.go.jp/interview/vol44-b-1/>

# Power transmission lines using superconductor technology.

~Reduction of quantized flux travel distance~

5304 Komei Inochi

## Abstract

Since H. K. Onnes first discovered superconductivity in mercury in 1913, research on superconductivity has progressed, and now Type 2 superconductors have also been discovered. This research aims to reduce AC loss, which is a barrier to zero transmission loss in power lines, by taking advantage of the zero electrical resistance of superconductivity.

## 1. introduction

Electricity is an essential part of our lives, but as much as 5% of electricity has been lost during transmission in developed countries. Since power transmission losses are caused by Joule heat generated by electronic resistance in conductors, this research aims to eliminate power transmission losses by using superconductors whose electrical resistance becomes zero at very low temperatures, especially Class 2 superconductors whose peculiarity is much higher than the other. However, Class 2 superconductors allow some magnetic flux to penetrate, resulting in losses proportional to the distance traveled by the magnetic flux. This study focuses on a conductor model that minimizes the quantized magnetic flux travel distance to reduce AC losses.

## 2 Superconductors

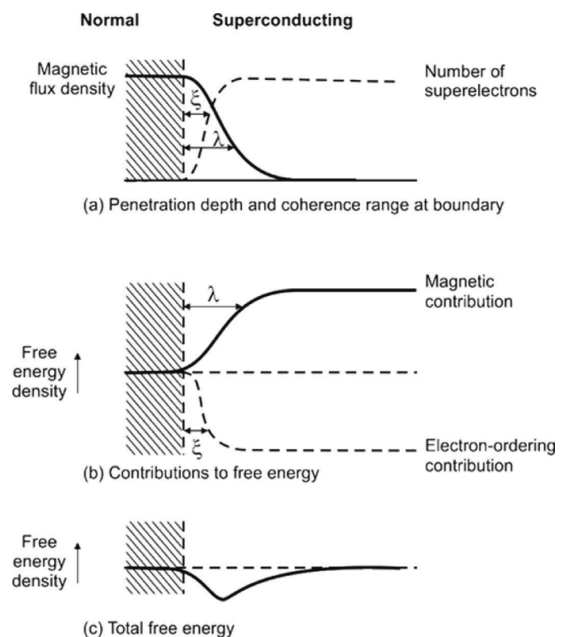
### 2.1 Properties of Superconductors

Superconductivity has two properties: perfect conductor, which means that when a particular metal or compound is cooled to a critical temperature, its electrical resistance is zero, and perfect anti magnetism, which means that the external magnetic field is completely shielded and the internal magnetic field is also zero. In this issue, the phenomenon of electrical resistance being zero is utilized.

### 2.2 Perfect anti magnetism

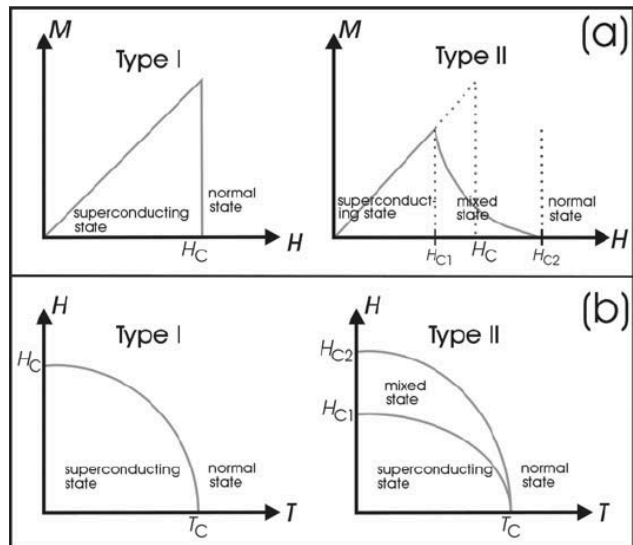
A material in the superconducting state is in the Meissner effect state, where the magnetic field is eliminated and the internal magnetic field is zero. Since the magnetic flux density is a non-divergent field, perfect anti magnetism is caused by vortices caused by currents on the surface of the superconductor that pushes out the magnetic flux lines. The magnetic flux lines are classified into Class 1 superconductors and Class 2 superconductors based on the difference in magnetic flux lines. Although extra energy is required to maintain perfect anti

FIG1 Magnetic field intrusion



magnetism, Type 1 superconductors exhibit perfect anti magnetism from a low magnetic field region, and eventually, as the magnetic field increases, they suddenly transition to normal conduction at the critical magnetic field  $H_c$  because they are unable to withstand the extra energy. On the other hand, the magnitude of the magnetic field of a Class 2 superconductor decreases when the lower critical field  $H_{c1}$  is reached, and it continuously transitions to normal conduction with a further increase in the magnetic field until the upper critical field  $H_{c2}$  is reached. Thus, Type 2 superconductors are able to maintain a higher  $H_c$  by partially allowing the magnetic field to penetrate in terms of Free Energy.

FIG2 Class 1 and 2 superconductor

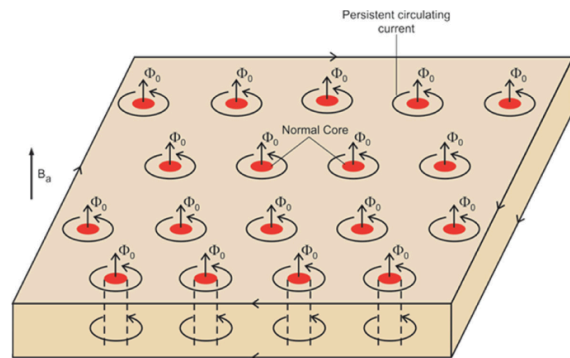


Type 2 superconductors also have significantly higher  $T_c$ , critical temperature, and  $J_c$ , critical current density, as well as  $H_c$ , critical magnetic field.

### 2.3 Vortex thread state of type 2 superconductors

The vortex state is the region between  $H_{c1}$  and  $H_{c2}$ , where both the superconducting region and the normal-conducting region where the quantized magnetic flux has penetrated exist. When a current is applied here, the magnetic flux is subjected to the Lorentz force perpendicular to the current. When the magnetic flux moves with a velocity  $V$  due to this force, an electric field is generated by Faraday's law,  $E = V \cdot B$ . This causes the electric field to be directed in the direction in which the current flows, i.e., a potential difference is generated in that direction, creating electrical resistance. Therefore, in the vortex thread state, it is necessary to suppress the magnetic flux to reduce the electrical resistance to zero. Fortunately, impurities and defects in the superconductor material suppress the magnetic flux, resulting in zero electrical resistance. This holding force is called the "pinning force," and the Lorentz force must be less than the pinning force for the electrical resistance to be zero. Incidentally, the critical current density ( $J_c$ ) is the state of the antagonistic limit.

FIG3 quantized magnetic flux



### 3. AC losses

When a large current is applied here in conjunction with power transmission, the Lorentz force, which exceeds the pinning force according to Fleming's left-hand rule, acts, causing the quantized magnetic flux to move. This causes induced electromotive force and electrical losses. This is the cause of AC losses.



AC loss is similar to frictional heat and is determined by the pinning force over the distance moved by the quantized magnetic flux, so shortening the distance the quantized magnetic flux can move can reduce AC loss. In this research. The objective of this research is to graphically shorten the movable distance of the quantized magnetic flux.

#### 4. Model for reducing AC losses

##### 4.1 SCSC cables (FURUKAWADENNKOU)

By dividing the conductor portion of the transmission line into thin filaments and shortening the distance traveled by the flux quantum wire as it enters the superconductor, AC losses are reduced. Then, by bundling those filaments together, a power transmission line with low AC loss can be realized. However, if, for example, the superconducting state of a filament is broken, no current will flow to that filament at all, resulting in a significant lack of stability. Therefore, copper is plated to connect the filaments so that current can be diverted from the filament where the superconducting state is broken through the copper to the other filaments. In addition, the filament is rolled around a cylindrical core to prevent the magnetic flux from changing the way it enters the filament, as the magnetic field of the alternating current induces a current called a coupling current through the copper between the filaments



##### 4.2 Subdivision of filaments

As the external magnetic field increases, the magnetic flux lines locally exceed the shielding capacity and the area where the hidden current flows to the center expands, so the hysteresis loss can be reduced by making the filament thinner. Simultaneously, its multiline makes Magnetic instability eliminated.

To reduce Joule losses due to coupling currents induced between filaments, they are wound in a spiral shape and a high-resistance base material is used at the core.

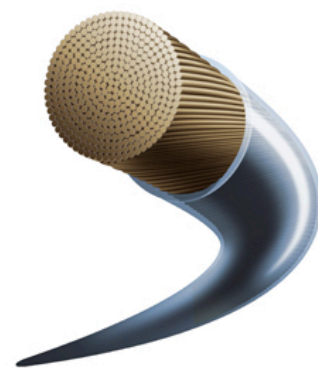


FIG5 Assembly of Filaments

#### 3.conclusion

By making the conductor section an aggregate of many filaments, the hysteresis loss can be reduced and magnetic stabilization can be achieved. Coupling losses can also be reduced by wrapping the filaments in a spiral shape around a core made of a high-resistance material.

Furthermore, the filaments should be plated with copper to stabilize the electrical supply. However, we would like to consider how much wire can be produced using current technology and the cost.

#### 4. References

FIG1

[https://link.springer.com/chapter/10.1007/978-3-030-75672-7\\_2](https://link.springer.com/chapter/10.1007/978-3-030-75672-7_2)  
(2023/10/9)

FIG2

[https://docs.google.com/document/d/1VA-pAtC6Jju-\\_TN6aNYjxsiNuDRI6VPLBYxRLP2Ew8o/edit](https://docs.google.com/document/d/1VA-pAtC6Jju-_TN6aNYjxsiNuDRI6VPLBYxRLP2Ew8o/edit)  
(2023/10/9)

FIG3

[https://www.furukawa.co.jp/release/2021/kenkai\\_20211116.html](https://www.furukawa.co.jp/release/2021/kenkai_20211116.html)  
(2023/10/9)

FIG4

[https://www.furukawa.co.jp/release/2021/kenkai\\_20211116.html](https://www.furukawa.co.jp/release/2021/kenkai_20211116.html)  
(2023/10/9)

FIG5

<http://st-on.jp/2012gattman/index02.html>  
(2023/10/9)

1) 超伝導現象と電磁気学II 松下 照男 (2022/8/17)

[https://www.jstage.jst.go.jp/article/jcsj/46/9/46\\_9\\_530/article/-char/ja/](https://www.jstage.jst.go.jp/article/jcsj/46/9/46_9_530/article/-char/ja/)

2)電磁気学の奥深さ(1):電気と磁気の対応は E-H か、E-B か Y. Karasawa (2021/3/4)

[http://www.radio3.ee.uec.ac.jp/ronbun/TR-YK-023\\_EM-1.pdf](http://www.radio3.ee.uec.ac.jp/ronbun/TR-YK-023_EM-1.pdf)

3)静電誘導と誘電分極 YUKIMURA (2022/5/24)

<https://www.yukimura-physics.com/entry/elemaq01>

4)超電導技術の将来展望 阪本 幸俊 (2022/7/17)

[https://www.mri.co.jp/knowledge/column/i6sdu6000000vcg9-att/tec\\_17.pdf](https://www.mri.co.jp/knowledge/column/i6sdu6000000vcg9-att/tec_17.pdf)

5)反強磁性電子と共存する高温超伝導電子～銅酸化物高温超伝導体に潜む30年来の未解決問題に終止符～ 國定 聡 方 (2023/7/9)

<https://www.issp.u-tokyo.ac.jp/maincontents/news2.html?pid=11098#:~:text=%E9%8A%85%E9%85%B8%E5%8C%96%E7%89%A9%E9%AB%98%E6%B8%A9%E8%B6%85%E4%BC%9D%E5%B0%8E%E4%BD%93%E3%81%AF%E4%BA%8C%E6%9E%9A,%E8%B6%85%E4%BC%9D%E5%B0%8E%E3%81%8C%E7%99%BA%E7%8F%BE%E3%81%99%E3%82%8B%E3%80%82>

6)第一原理からの超伝導理論 高田 康民 (2022/5/23)

<http://mercury.yukawa.kyoto-u.ac.jp/~bussei.kenkyu/pdf/03/1/9999-031203.pdf>

7)第13会超伝導 作者不明 (2023/1/4)



[http://www.phys.ocha.ac.jp/furukawalab//Lecture2\\_files/13.pdf](http://www.phys.ocha.ac.jp/furukawalab//Lecture2_files/13.pdf)

8)超伝導とは？ Quantum Materials Lab (2023/4/7)

[https://ss.scphys.kyoto-u.ac.jp/legacy\\_QM.php?p=research/res-sub/contents/sc.html](https://ss.scphys.kyoto-u.ac.jp/legacy_QM.php?p=research/res-sub/contents/sc.html)

9)超伝導体の特徴!! Akimitsu laboratory (2022/12/15)

[http://www.phys.aoyama.ac.jp/~w3-jun/achievements/study\\_sc\\_chara.html#2](http://www.phys.aoyama.ac.jp/~w3-jun/achievements/study_sc_chara.html#2)

10)鉄系新超伝導体 (2022/4/16)

[https://www.mext.go.jp/b\\_menu/shingi/gijyutu/gijyutu2/015-3/shiryo/\\_icsFiles/afieldfile/](https://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu2/015-3/shiryo/_icsFiles/afieldfile/)

11)超電導とケンカしない磁場 野々村 禎彦 (2023/5/7)

<https://slidesplayer.net/slide/11567855/>

12)高温超伝導体の交流損失 雨宮 尚之 (2022/10/7)

[https://www.jstage.jst.go.jp/article/jcsj/45/8/45\\_8\\_376/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/jcsj/45/8/45_8_376/_pdf/-char/ja)

13)新系統の高温超伝導物質における超伝導転移温度の上昇を発見 高橋 博樹 (2022/11/28)

<https://www.jst.go.jp/pr/announce/20080424/index.html>

14)Y系酸化物高温超電導線材 岩熊成卓 (2023/6/1)

[http://www.istec.or.jp/web21/pdf/11\\_07/1107J6.pdf](http://www.istec.or.jp/web21/pdf/11_07/1107J6.pdf)

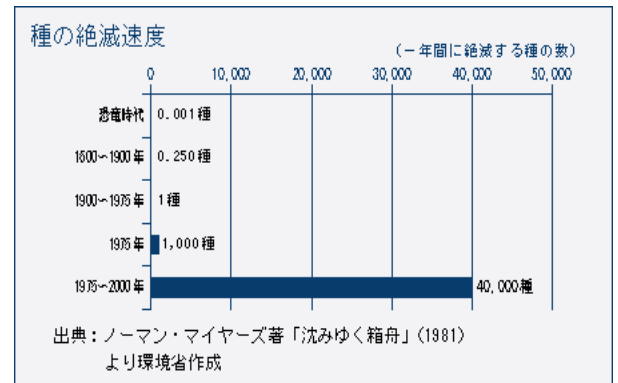
# Efficiently Conserve Species

## How can We Conserve the Ecosystem?

5305 Saku Ebara

### Abstract

This study was started with the aim of making Japan's measures for endangered species more effective. First, if you search for the national parks, you will find that Yellowstone National Park takes measures to protect nature from human intervention, and Ankarafantsica National Park is a protected area where humans live. It has been revealed that the situation is similar to that of Japan's isolated islands. In the future, I would like to find more effective countermeasures by researching the history of Yellowstone, countermeasures for Ankarafantsica, and other national parks.



graph 1

### Introduction

I researched this because I was interested in environmental issues. Then, this graph 1 caught my eye. This graph shows that living things are becoming extinct at a very rapid rate in the world. I thought this was a very serious problem because the rate of increase in numbers would cause great damage to the ecosystem. Therefore, the goal of this research is to "reduce the rate of extinction of living things."

In order to prevent the increase of extinct species, it is necessary to reduce the number of species that are likely to become extinct. To do this, we first need to know "why the species became an endangered species" and "the habitat of the endangered species." We will also obtain similar information regarding this extinct species. Therefore, I am involved in nature conservation activities in Japan, and this method in Japan means protecting only that species. Thus, I import foreign methods of nature conservation to Japan, and then learn how to deal with them in various environments. What's more, when it comes to invasive species, the country of origin knows more about them.

### Research way

- 1 learn the way to protect creatures of the National Park
- 2 study locations related to the National Park
- 3 consider whether it can be taken in Japan

## Results and Discussion

### • Yellowstone National Park: U.S.A.

- They use methods to preserve nature as it is with as little human intervention as possible.

⇔ In Japan, human intervention is used to conserve rare species.

↑ Since nature is complex, such actions may actually hinder conservation.

⇔ Other countries are far ahead in resource development and tourist destinations.

- This park and other parks are protected by the National Environmental Policy Act.

- The measures taken at this park are known as the "Yellowstone Model" and are used as a model around the world.

- In the past, there was some progress in turning it into a tourist destination.

→ The method and process of transitioning from that time to now may be helpful.

## National Environmental Policy Act

The National Environmental Policy Act was passed by the U.S. Congress in 1969, signed by President Richard Nixon, and became effective on January 1, 1970. The Act was the first of its kind in the world to require that Environmental Impact Assessments (EIAs) be conducted and that federal government actions take nature conservation into consideration. It also established the Council on Environmental Quality (CEQ) in the Office of the President to monitor national environmental policy and required the submission of an annual report on the U.S. environment. The act requires that environmental values be considered in the process of federal decision-making acts, with the goal of "ensuring the productive coexistence of man and nature and the fulfillment of social and economic needs. It requires the submission of Environmental Impact Statements for legislative acts and proposals and other federal activities that significantly affect the human environment. Agencies determine whether an Environmental Impact Statement is required for proposed federal actions, such as development projects and permits, and are required to submit an Environmental Impact Statement if there is a potential for significant impacts on the human environment following implementation of the proposed action.

### Killarney Park: Ireland

The National Parks and Wildlife Service is a cooperative effort of several organizations, including the park's management.

The site is not completely transitioned because of the development of recreational and tourist facilities, although it states that the main purpose of the site is to protect nature.

### • Ankarafantsika National Park: Madagascar

It is now under the management of the National Park Service in accordance with the COAP: Protected Areas Management Law enacted by the government.

There are six villages in the protected area.

During the colonial period, "fortress-style conservation," a method of protecting plants and animals by excluding local residents, was adopted, but now, gradually, the method is shifting to "resident-participation-style conservation.

→ The situation is similar to Okinawa and the Ogasawara Islands in Japan.

Nowadays, forests have been reduced due to the effects of slash-and-burn farming by tribal people and others.

## 6. Conclusions and future issues

Since the current form alone cannot be utilized in Japan, the history of Yellowstone National Park's transition to the current form of activities will be investigated.

Since the situation in Ankarafantsika National Park was very similar to that of the isolated islands in Japan, this activity could be applied to Japan by studying it more closely.

The number of locations needs to be increased due to the small number of people who were surveyed.

We need to find out how much nature can be maintained in each national park to know which activities are effective.

## References

- 10 Easy Things You Can Do to Save Endangered Species  
<https://www.endangered.org/10-easy-things-you-can-do-to-save-endangered-species/>  
2023/11/20
- Environment National Geographic <https://www.nationalgeographic.com/environment>  
2023/11/20
- 環境問題に関する世論調査 図16 - 内閣府  
<https://survey.gov-online.go.jp/h26/h26-kankyau/zh/z16.html> 2023/11/20
- 原生自然法という自然保護 | 暮らしの良品研究所 | 無印良品  
<https://www.muji.net/lab/living/130703.html> 2023/11/20
- 温暖化で米イエローストーン国立公園が危機に＝保護団体 | ロイター  
<https://jp.reuters.com/article/idJPjiji2011092900342> 2023/11/20
- 【人類世の地球環境】イエローストーン国立公園に見る米国の環境保護思想  
[https://cigs.canon/article/20181005\\_5247.html](https://cigs.canon/article/20181005_5247.html) 2023/11/20
- Kerry Biosphere Reserve <https://kerrybiosphere.ie/> 2023/11/20
- Explore the Biosphere <https://kerrybiosphere.ie/explore> 2023/11/20
- 国家環境政策法 - ATOMICA -  
[https://atomica.jaea.go.jp/dic/detail/dic\\_detail\\_2241.html](https://atomica.jaea.go.jp/dic/detail/dic_detail_2241.html) 2023/11/20

・マダガスカル・アンカラファンツィカ国立公園における 保全政策と地域住民の生業活動  
<https://jisedai.asafas.kyoto-u.ac.jp/wp/wp-content/uploads/2020/03/2018Report-Yamada-J.pdf> 2023/11/20

・WWF <https://wwf.panda.org/?referer=wwfja> 2023/11/20

・International Union for Conservation of Nature and Natural Resources (IUCN) Ministry of Foreign Affairs of Japan  
<https://www.mofa.go.jp/policy/environment/convention/iucn.html> 2023/11/20

・環境白書・循環型社会白書・生物多様性白書 第3章(環境省)  
<https://www.env.go.jp/policy/hakusyo/zu/h22/html/hj10010301.html> 2023/11/20

# To Make Slums Sustainable Cities

~Crime prevention in slums~

5306 Oizumi Rihito

## Abstract

My research is on improving the living conditions of slums around the world. In my research on developing countries, I learned that low-income people are forming slums, and I learned that the slum population in the world is currently growing rapidly. To solve this problem, I think it is difficult for 900 million slum residents to move to different areas, so I set my research goal to improve the quality of life in slums. I focused on the high crime rate in slums. There is a high incidence of robbery and murder. I found that such crimes occur not only between residents within a slum, but also by people from outside the slum. In addition, such crimes are usually committed only at night. In order to break out of this situation, I thought it was important to keep outsiders out of the slum and ensure safety at night.

As a solution to (1), I would like to propose a system of gatekeeping by male slum residents. Most of male residents have no job, so I think it will be their source of income.

As a solution to (2), I would like to propose that the entire city should be lit up at night. I found that many people in India and Africa, where slums are developing, do not have access to electricity. The darkness of the city is related to crime. I would like to propose that they actively cooperate in the experimentation of the power generation method under study. They can get cheaper electricity.

I think it will connect the safety of slums.

## 1.Introduction

When I did some research about developing countries, I learned that low-income people are forming slums because of economic disparity. Also I learned that the slum population in the world is currently growing rapidly. To solve these problems, I set my research goal to improve the quality of life in slums.

My research question is “how to improve slums’ living environment”.

I would like to make a city where 900 million people can live safely.

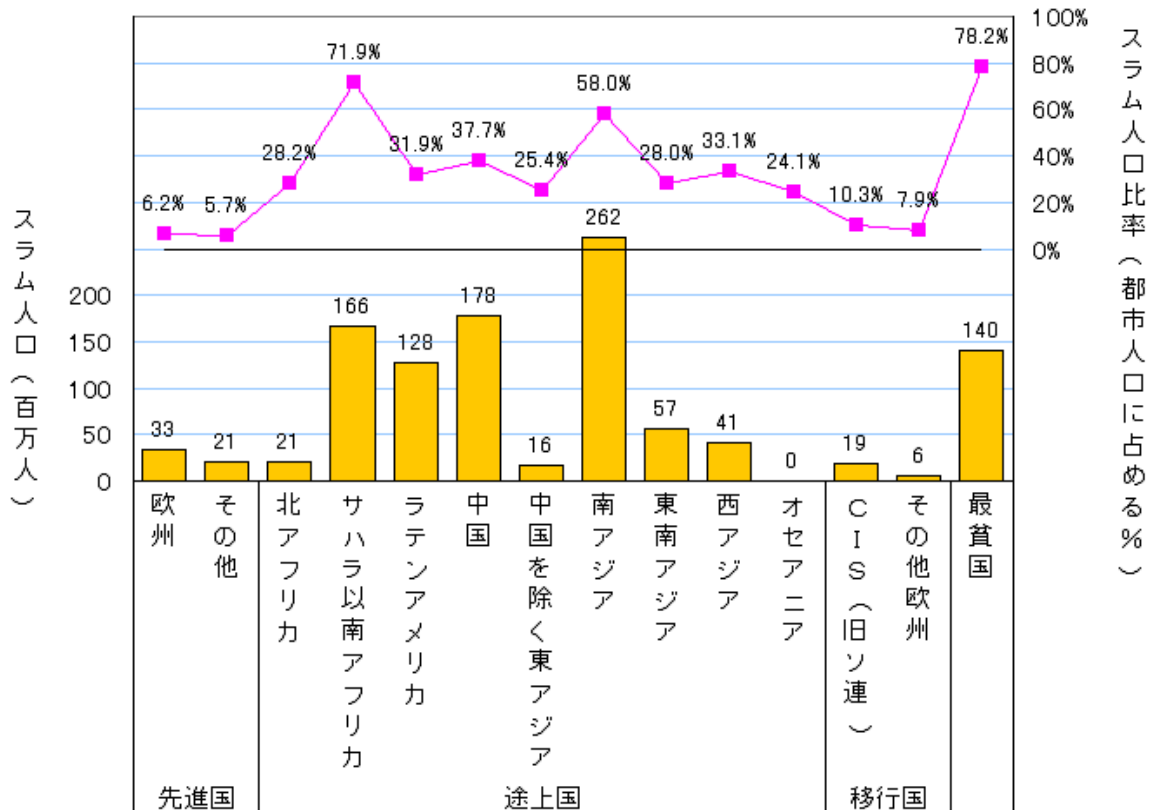
I used the Internet to learn about past policies. I also read some books to learn about slums.

## 2.Discussion and implications

To make slums safer, I focused on the high crime rate in each area.

世界のスラム人口(2003年頃)

世界全体のスラム人口 924百万人、スラム人口比率 31.6%



(注) UN-HABITAT 2003 and other UN data: Reproduced from KNUS (2007)による。

(資料) WHO, Closing the gap in a generation: Health equity through action on the social determinants of health, 2008.8

<http://honkawa2.sakura.ne.jp/1015.html>

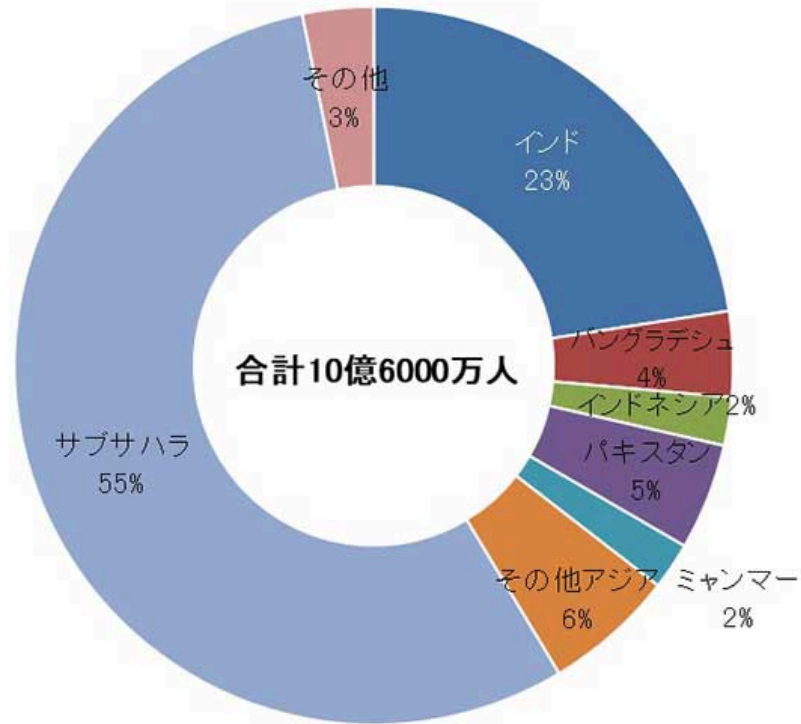
This figure shows the population of slums in 2003. We can find that there are many slums in South Asia, Sub Saharan, and Latin American.

There is a high incidence of robbery and murder in all of those areas. I found that such crimes occur not only between residents within a slum, but also by people from outside the slum. In addition, such crimes are usually committed only at night.

In order to break out of this situation, I thought it was important to (1) keep outsiders out of the slum and (2) ensure safety at night.

As a solution to (1), I would like to propose a system of gatekeeping by male slum residents. By doing so, they can not only prevent outsiders from entering slums but also provide the source of income for them. According to my survey, only female and children residents have to work and most of male residents have no job, so I think making male income stable is the most effective way to improve their poverty.

As a solution to (2), I would like to propose that the entire city should be lit up at night. Following figure shows the percentage of people who live in areas without electricity.



I found that many people in India and Africa, where slums are developing, do not have access to electricity. The darkness of the city is related to crime. I would like to propose that they actively cooperate in the experimentation of the power generation method under study. For example, there is a soccer stadium with 200 power generation panels buried under the ground in a favela, Brazilian slum. By running in the stadium, they can get enough electricity to live. People in slums get cheaper electricity and researchers can conduct cheaper experiments. I think this suggestion would benefit both of them.

### 3. Conclusion

I would like to propose a system of gatekeeping by male slum residents and illuminating the entire city. I think both of them will be a factor to make a city where 900 million people can live safely.

In the future, I will consider wild dogs in slums. They are more dangerous than people because they have some virus. By solving this problem, quality of life in slums will be more comfortable.

### 4. References

「SDGsの目標から考えるスラム街の現状と住み続けられるまちづくり」  
<https://www.apiste.co.jp/column/detail/id=4594> (24/4/2023)

『緑のスラム街』持続可能な生活目指す町づくりに住民奮闘 ブラジル」  
<https://www.afpbb.com/articles/-/3273793> (24/4/2023)

「DEVIANT PLACES: A THEORY OF THE ECOLOGY OF CRIME RODNEY STARK」



<<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1745-9125.1987.tb00824.x>> (24/4/2023)

「丸山ゴンザレス"スラムが実は安全な理由"」  
<<https://president.jp/articles/-/28927?page=1>> (2/6/2023)

「スラムとは？現状や対策、SDGsの達成目標まで紹介」  
<<https://spaceshipearth.jp/slum/>> (2/6/2023)

「殺人や強盗は日常の風景...フィリピンのスラム街に行ってみた」  
<<https://dailynewsonline.jp/article/910175/>> (13/7/2023)

「図録▽世界のスラム人口」  
<http://honkawa2.sakura.ne.jp/1015.html> (20/7/2023)

「フィリピンの貧困層。どんな仕事でいくら稼いでる？」  
<[https://gloleacebu.com/ocupation\\_income/](https://gloleacebu.com/ocupation_income/)> (20/7/2023)

「外務省海外安全ホームページ ベネズエラの危険情報」(2/9/2023)  
<[https://www.anzen.mofa.go.jp/info/pchazardspecificinfo\\_2021T063.html#ad-image-0](https://www.anzen.mofa.go.jp/info/pchazardspecificinfo_2021T063.html#ad-image-0)>

「外務省海外安全情報 南アフリカ共和国」  
<[http://www.anzen.mofa.go.jp/m/mbc Crimesituation\\_122.html](http://www.anzen.mofa.go.jp/m/mbc Crimesituation_122.html)> (16/9/2023)

「10月21日は『あかりの日』。電気への感謝とともに考える世界の明かり事情」  
<<https://emira-t.jp/topics/12356/>> (16/9/2023)

「『無邪気に走って、無意識に発電』。  
“ヒト発電”を可能にしたサッカースタジアムがブラジルのスラムを救う」  
<<https://neutmagazine.com/people-powered-football-pitch>> (16/9/2023)

「スラム街で一番怖い存在は「犬」という衝撃事実」  
<<https://toyokeizai.net/articles/-/392137>> (30/9/2023)

「世界的拮がりを見せる反政府デモ。地方を見限る政治で都市に移住せざるを得なくなった人たちへの冷遇が原因か」  
<<https://bigissue-online.jp/archives/1076801516.html>> (30/9/2023)

# Cats Bring People Health

Reducing stress by purr

5307 Kakubashi Shiho

## Abstract

Recently, it became clear the risk of death by myocardial infarction decreased by having a cat. I was interested in it and I studied this. Myocardial infarction is one of the leading causes of death in the world, so the aim of study is to decrease the number of people who have myocardial infarction. The main research methods were gathering information on the Internet and searching for articles. The study question is “Why do cats decrease the risk of death by myocardial infarction?” and I constructed a hypothesis that it is related to purring. The answer was that we don’t know if purring is related to it. The cause of getting myocardial infarction is arteriosclerosis. The causes of this are smoking, aging, lifestyle-related disease and stress. I think having a cat is related to the reduction of stress, so cats have something to make people relax. According to papers, it became clear that after adjustment for differences in age, gender, ethnicity/race, systolic blood pressure, cigarette smoking, diabetes mellitus, serum cholesterol, and body mass index, a significantly lower relative risks for death due to myocardial infarction was observed in participants with past cat ownership compared with those without cats as pet at any time. Therefore, acquisition of cats as domestic pets may represent a novel strategy for reducing the risk of cardiovascular diseases in high-risk individuals, but we do not know why cats reduce the risk of death by myocardial infarction, so I would like to continue to study it.

## 1. Introduction

### ○Backgrounds

Many people have heard that cats make people relax. It is true, but in addition, it became clear that they reduce the risk of death by myocardial infarction. The studies revealed that the risk of death from myocardial infarction is about 37% lower for those who have owned a cat in the past compared to those who have never owned one. I was interested in this fact and I studied it. Actually, myocardial infarction is one of the leading causes of death in the world, so I thought that I would be able to save many people through studying it. The research question is “Why do cats decrease the risk of death by myocardial infarction?” and I set up a hypothesis that it is related to cats’ purring because studies have revealed that purring reduces stress and one of the causes of getting myocardial infarction is stress. Then I focused on them. The purpose of it is to decrease people who get myocardial infarction by spending time with cats.

### ○Methods

I did a text search and information gathering by using the Internet. The main keywords for a search were cats, purring and myocardial infarction. I searched about myocardial infarction and purring by using the Internet and searched for a decline in the risk of death from myocardial infarction by having a cat. I also compared it with dogs.

The research question was "Why do cats reduce the risk of getting myocardial infarction?" I hypothesized in answer to the research question that the purring sound of cats has a relaxing effect on humans so it reduces stress, which is a cause of atherosclerosis, and would lower the risk of developing the disease.

This study does not take into account people with cat allergies who are unable to touch cats.

## 2. Discussion and implications

First, I looked into cat purring sounds. A review of research papers on purring sounds revealed that they have a relaxing effect on humans. (See figure below.)

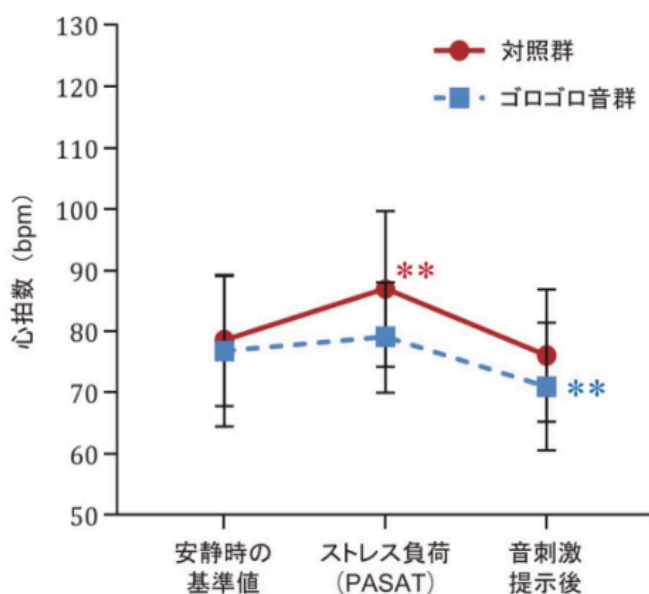


図2 猫のゴロゴロ音による心拍数の変化  
\*\* $p < 0.01$  (安静時の基準値に対する  $p$  値を示す)

[\(店舗用 BGM に最適な新規リラクゼーション音源の探索 - 猫のゴロゴロ音についての初期検討\)](#)

This experiment compared the resting heart rate, the heart rate during the stress task (a task in which participants had to add single-digit numbers that were continuously presented aurally through headphones), and the heart rate after the stress task with that of a control group (people who did not hear the purring sound). The heart rate after the completion of the task did not differ much from that of the control group, but the heart rate during the task was significantly different between the purring group and the control group. It was also noted that there was no correlation between preference for cats and changes in heart rate, indicating that the purring sound has a relaxing effect on all people.

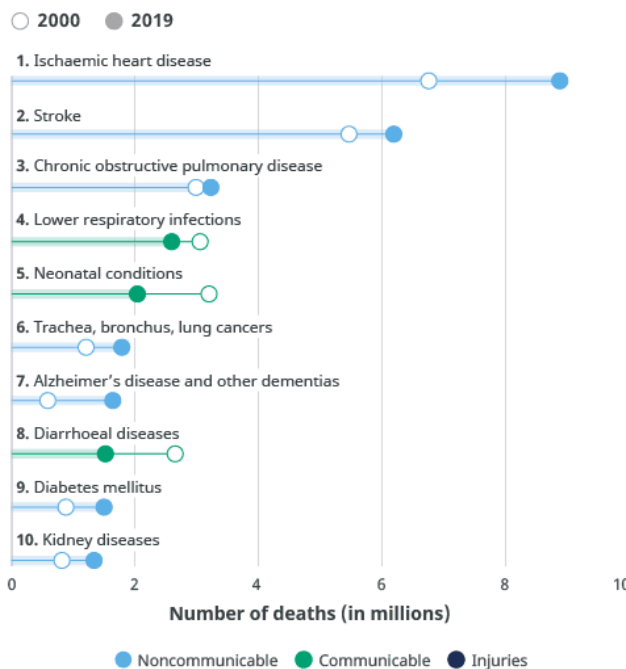
I looked up other papers describing the risk of developing myocardial infarction in cats and humans. As mentioned earlier, it did not matter whether one liked or disliked cats, it is said that just being in contact with cats reduced the risk of developing myocardial infarction. It also said that the effect was stronger if the cat was owned at a young age. The difference in

effect depends on gender, but it was found that the effect was stronger for women than for cats. Dogs also lower the risk of developing heart disease, and it is believed that this is due to the increased oxytocin and decreased stress hormones that result from the increased amount of exercise and walking with dogs. With cats, the evidence is less clear because of the complex interplay between actual breeding and sex. I believe that oxytocin is also increased by contact with cats, so I think there is another cause.

One of the benefits of owning a cat is an increase in happiness and a decrease in the risk of developing heart disease. I believe that the increase in happiness is the same for other pets, and the increase in happiness may lead to a reduction in stress. However, I don't think that only this will lead to a reduction in the risk of developing myocardial infarction. In addition, dogs and cats are the only animals known to reduce the risk of developing myocardial infarction at this , but they are also the only animals that have been studied. If other animals also reduce the risk of developing the disease, it could be because of an increase in well-being.

Regarding myocardial infarction, ischemic heart disease, including myocardial infarction, was the leading cause of death worldwide in 2019, accounting for 16% of all deaths. The number of deaths has increased by more than 2 million since 2000 to about 8.9 million in 2019. It can be divided into two major categories: angina pectoris and myocardial infarction. Angina pectoris causes a temporary blockage of part of the coronary artery, which significantly reduces the heart pump function, but then the blood flow improves again and the heart is not damaged. It is also possible to control the symptoms to some extent with medication. However, angina pectoris is defined as the preliminary stage of myocardial infarction and is a dangerous condition. Myocardial infarction is a condition in which the blood supply remains clogged and does not recover, leaving the pumping function stopped and part of the heart muscle in a necrotic state. Myocardial infarction is a highly fatal disease, causing many deaths and is a leading cause of sudden death.

#### Leading causes of death globally



Source: WHO Global Health Estimates.

<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death#:~:text=Ischaemic%20heart%20disease%20was%20the,over%20the%20las>

[two decades](#)

### 3. Conclusion

I setted a question "Why do cats reduce the risk of getting myocardial infarction?" I hypothesized that the purring sound of cats has a relaxing effect on humans , so it reduces stress, which is a cause of atherosclerosis, and would lower the risk of developing the disease. However, I couldn't get a clear conclusion through my study. The preceding study showed that purring makes people relax , so I think it has a relation with reducing the risk of it. We do not know whether just looking at a cat is effective, touching it is effective, or it is only effective if we have it, so clarifying this would be helpful to society like treatments.

These are some issues that need to be solved in the future.

[1]It is impossible to conduct experiments on cats because they would be large scale experiments.

[2]It is not clear why cats reduce the risk of myocardial infarction in humans.

[3]It is not known whether animals other than cats and dogs also reduce the risk of myocardial infarction.

I would like to conduct research focusing on these issues. Also, I would like to study about other animals for the purpose of reducing people who get myocardial infarction.

### 4. References

<https://www.cambridge.org/core/journals/psychological-medicine/article/div-classtitlecuriosity-kill-ed-the-cat-no-evidence-of-an-association-between-cat-ownership-and-psychotic-symptoms-at-ages-13-and-18-years-in-a-uk-general-population-cohortdiv/75C9A48B669BE36E947AFB0BC5CB00CA>  
(Curiosity killed the cat: no evidence of an association between cat ownership and psychotic symptoms at ages 13 and 18 years in a UK general population cohort)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3317329/>

(Cat ownership and the Risk of Fatal Cardiovascular Diseases. Results from the Second National Health and Nutrition Examination Study Mortality Follow-up Study.)

<https://www.elle.com/jp/decor/decor-interior-design/a30619787/cat-lady-good-for-you-19-0617-r/>  
(猫と暮らすと、健康になれるかも！？)

[https://enoki-iin.com/contents/news/20180813\\_01.html](https://enoki-iin.com/contents/news/20180813_01.html)

(高齢で高血圧の人がペットを飼うことは！？)

<https://gooday.nikkei.co.jp/atcl/column/15/050800004/021500079/>

(犬を飼う人の死亡リスクは低い、特に1人暮らしの中高年で顕著)

<https://aasi.jp/news/lifescience-easily/11505>

(犬を飼っている方が心筋梗塞からの回復が良いことがほぼ証明された(2019.10.10))

[https://www.env.go.jp/nature/dobutsu/aigo/2\\_data/statistics/dog-cat.html](https://www.env.go.jp/nature/dobutsu/aigo/2_data/statistics/dog-cat.html)

(環境省 統計資料「犬・猫の引取り及び負傷動物等の収容並びに処分の状況」)

<https://www.who.int/news/item/09-12-2020-who-reveals-leading-causes-of-death-and-disability-worldwide-2000-2019>

(WHO reveals leading causes of death and disability worldwide: 2000–2019)

[店舗用 BGM に最適な新規リラクゼーション音源の探索 – 猫のゴロゴロ音についての初期検討](#)

# **Economic Gap**

## **-Saving the world with goods donation-**

**5308 Kageyama Ai**

### **Abstract**

There is a big economic gap between different countries. In developed countries, there are a lot of food and clothes. And almost all people can get an education, eat enough food, and live comfortably. On the other hand, in developing countries, there are many people who can't eat enough, study in school, and get electricity. This economic gap is one of the biggest social problems which we must pay attention to and solve. To close this economic gap, I focused on donations, especially goods donation as the solution. I'd like to suggest collecting stuff to be donated to the school and send them together to a donation company. For this solution, students in developed countries can learn about developing countries. Then, it connects us to know each other. To save the world and aim for global peace, we must take action.

### **1 Introduction**

There are some countries called LDC (Least Developed Country) in the world. LDC is particularly underdeveloped countries recognized by a resolution of the United Nations General Assembly after deliberation by the United Nations Economic and Social Council, based on criteria identified by the Committee for Development Policy. And countries that meet the following three criteria are recognized as LDC.

- 1) GNI per capita (3-year average) less than US\$1,018.
- 2) The Human Assets Index (HAI), an indicator of human resource development decided by the Committee for Development Policy (CDP) that indexes the percentage of undernourished population, under-five infant mortality rate, maternal mortality rate, secondary education enrollment rate, and adult literacy rate is below a certain value.
- 3) Economic Vulnerability Index (EVI), an index established by CDP to describe economic vulnerability from external shocks, population size, geographic factors, economic structure, environment, trade shocks, and natural disaster shocks, is below a certain value.

46 countries are recognized as LDC now (2023/04/21), but is it happy with the current state? I think all people on the earth should be equal. Shouldn't we help the poor in these countries? I focused on "closing the gap" in this study because of this fact.

### **2 Discussion and implications**

There is a big economic gap between different countries. First, look at figure 1. It shows the poor (people who spend less than \$1.9 per day) population and the percentage change. As you can see, the number of the poor decreased around the world, but it increased much in some areas especially Sub-Saharan. It may be caused by the growing population, however, I think we shouldn't ignore the problem. Then, figure 2 is a graphical representation of figure 1. It shows the gap between Sub-Saharan Africa and other countries obviously. Second, look at figure 3. It shows the distribution of developing countries. From this map, you can read

that the most Developing countries are distributed in Sub-Saharan. From these data, there is a big economic gap between different countries.

To deal with this problem, I want to progress the donating activity. Then, there are two types of donation, donation of goods and donation of money. First, donation of money is versatile. After being donated, they are able to be used for buying stationary, vaccines, and building the school. However, there must be a financial burden for people who donate. Considering this aspect, it is a little difficult for people to donate because almost everyone, especially students, want to use money for their own benefit. Moreover, usage is vague. They may be used for someone’s own benefit so it is a little dangerous. Second, goods donation is comfortable because almost all donation organizations take pictures of donated things and give them to us. It is safe and makes us happy as well. Additionally, goods donation connects to reducing garbage. We can donate not only new toys, stationary, and clothes, but also already used many other things. Of course there are some things limited to donate, but almost all things around us such as some instruments are allowed. However, this type of donation is inflexible compared to donation of money. Receiving people must use stuff as they are. Even if we send what they don’t need, we have nothing to do. So it’s necessary to contact the receiving people. Besides, we actually have to pay money when we donate because we should ship baggage to donation organizations and there is postage when they ship abroad. Figure 5 is one of the examples of the list of charges. Seeing this chart, you may think that it is expensive. It is a problem of donation of goods.

FIG. 1 Number and share of population living on less than \$1.90 a day (2011 purchasing power parity or PPP) (%), 1990 and 2013

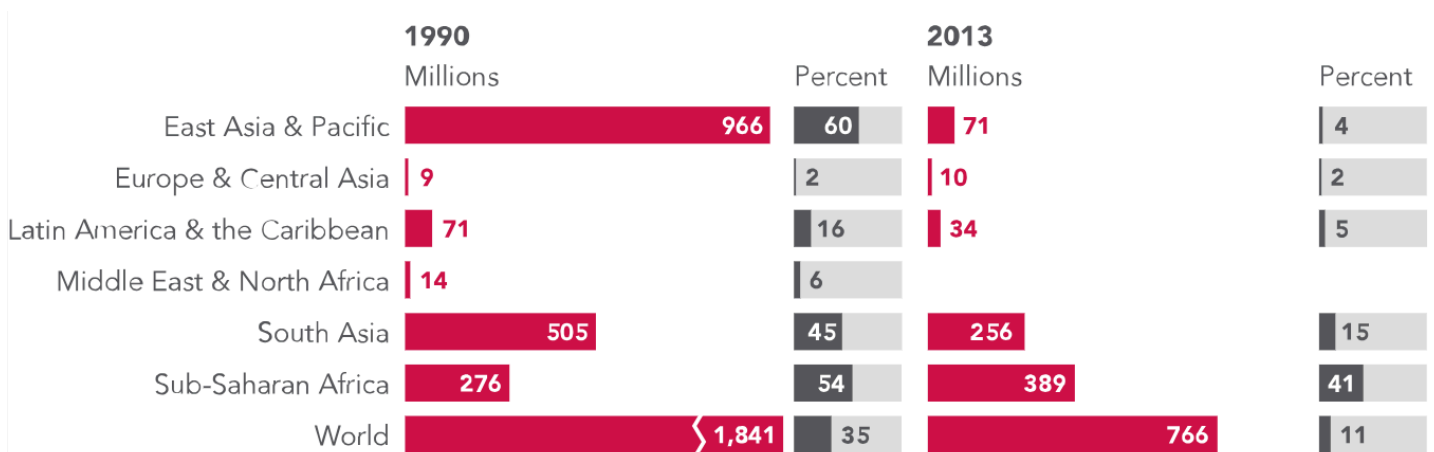


FIG. 2 People living on less than \$1.90 a day (2011 PPP), 1990 and 2013



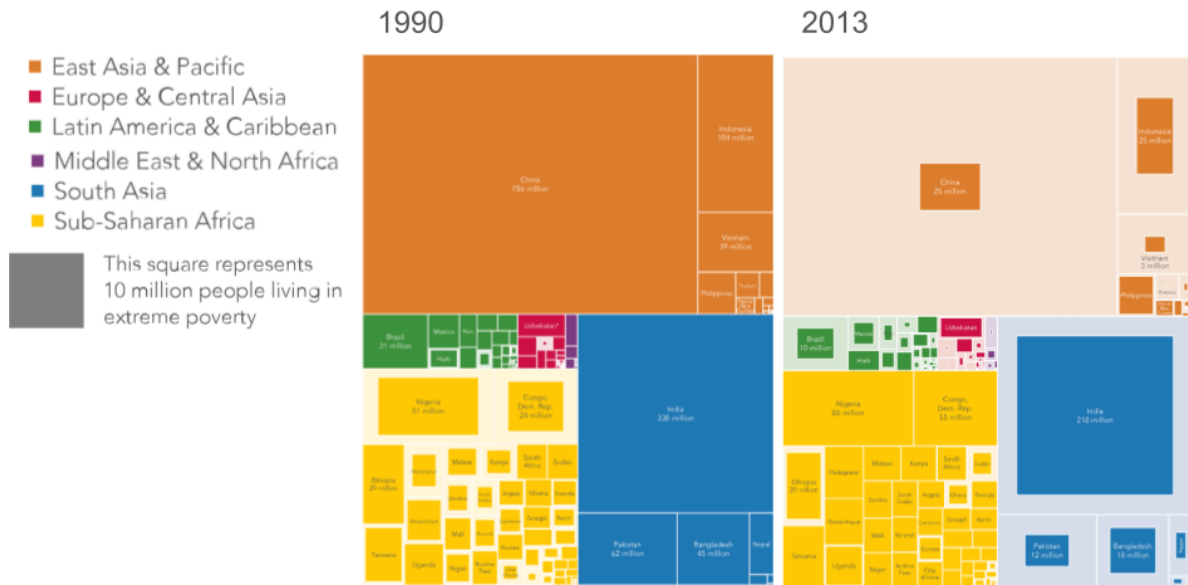


FIG. 3 Developed Countries (2021)

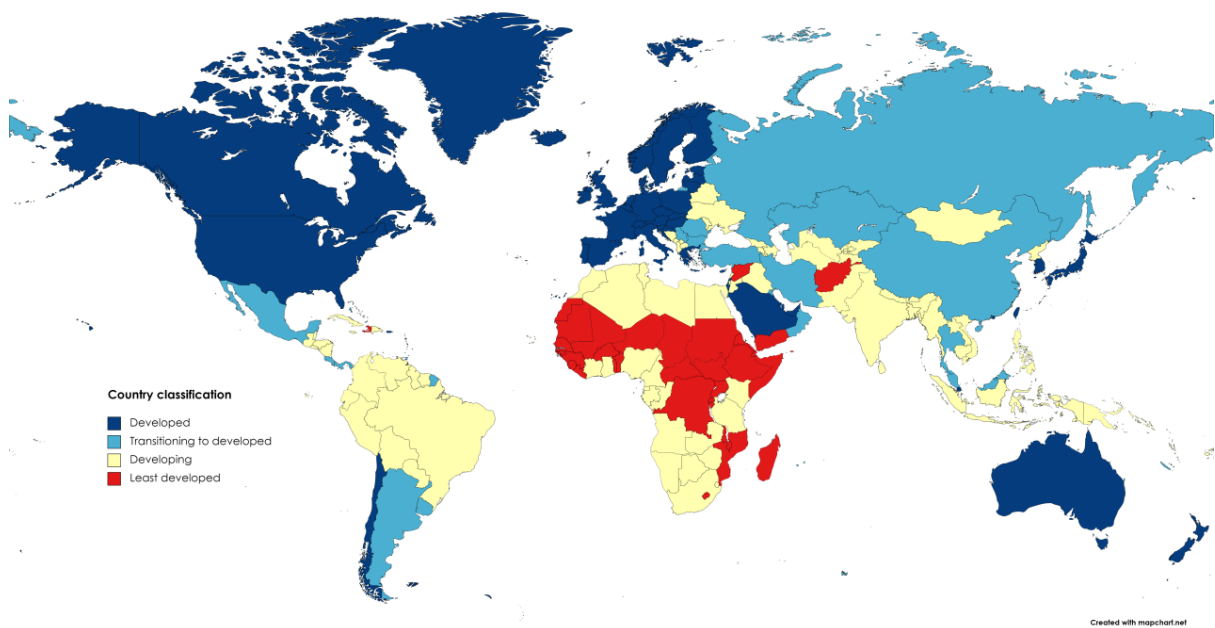


FIG. 4 Average annual philanthropic donation in 2012 US Dollars per person in nineteen countries

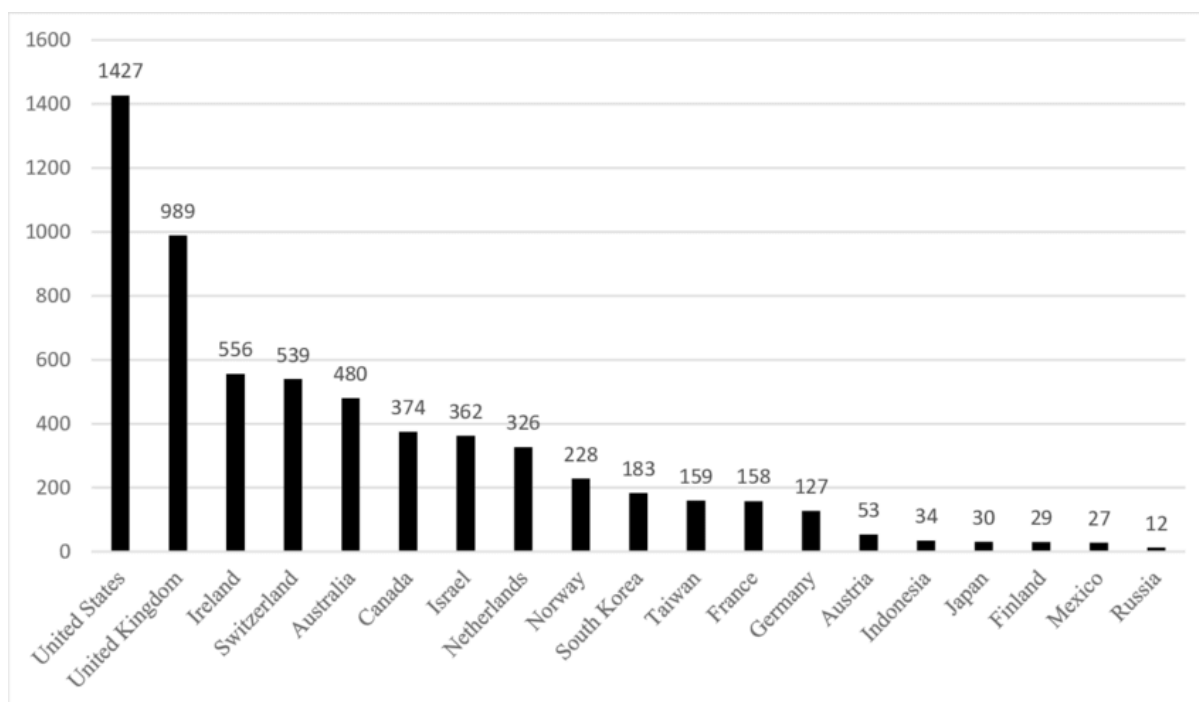


FIG. 5 Donations required per box

size(total of length + width + height)	~140cm	~160cm	not limited
weight	~30kg	~30kg	~30kg
donation	¥2900	¥3700	¥2900
postage	¥0	¥0	self-pay based on size

### 3 Conclusion

To solve the problem mentioned in Discussion and implications, I want to suggest the donation activity, “Goods’ Journey Project”. It is collecting goods to be donated in the school and sending them together to a donation organization. By doing that, we can separate the postage so we can donate without worrying about money. In addition, it can be expected to raise education about donations for children. Focusing on the total individual donations as percentage of GDP, Japan lags behind developed countries such as the U.S. and the U.K. So this activity is effective to think about the world and it is worth enough education. Besides, it

becomes easier to donate because there is a group psychology. I guess there are a lot of people who think that “If my friends donate, I will donate together.” So this project will increase the amount of donations.

#### 4 References

不用品の寄付で社会貢献？役立つサイト・注意点まとめ

<https://www.takakuureru.com/magazine/406>〈2022/3/14〉

4.質の高い教育をみんなに | SDGsクラブ - 日本ユニセフ

<https://www.unicef.or.jp/kodomo/sdgs/17goals/4-education/>〈2022/4/25〉

A World Ready to Learn: Prioritizing quality early childhood education

<https://data.unicef.org/resources/a-world-ready-to-learn-report/>〈2022/4/25〉

JOICFP

[https://www.joicfp.or.jp/jpn/donate/support/school\\_things/](https://www.joicfp.or.jp/jpn/donate/support/school_things/)〈2022/5/5〉

要らなくなった物の寄付は途上国や被災地で本当に役立つ？寄付する前に知っておきたい注意点

<https://kifunavi.jp/howto/developping-donate/>〈2022/5/5〉

MOTTAINAIJAPAN

<https://mottainai-japan.com/>〈2022/5/5〉

国際子供友好協会

<http://npo-icfa.org/>〈2022/5/5〉

STUDY FOR TWO

<https://studyfortwo.org/>〈2022/5/5〉

e-Education

<https://eedu.jp/index.html>〈2022/5/11〉

公益財団法人 日本ユニセフ協会

<https://www.unicef.or.jp/>〈2022/5/11〉

認定NPO法人 W21 ジャパン

<http://www.we21japan.org/donation/goods.html>〈2022/5/11〉

NPO法人ワールドギフト。

<https://world--gift.com/buppin.html>〈2022/5/13〉

寄付教育体験学習プログラム「寄付の教室」～認定NPO法人ACE(エース)の場合  
<https://www.youtube.com/watch?v=iv9KJque960>〈2022/6/1〉

ぬいぐるみ 寄付 エコトレーディング  
<https://eco-friendly.site/> 〈2022/6/20〉

モノドネ  
<https://monodone.com/article/11> 〈2022/8/31〉

不用品を寄付するメリット！ 寄付できるものや信頼できる団体を調査  
[https://uridoki.net/others/kiji\\_203677/](https://uridoki.net/others/kiji_203677/) 〈2022/8/31〉

【8割以上が不用品をごみとして捨てている！？】不用品の寄付で海外の子どもたちのワク  
チンに...！  
<https://prtimes.jp/main/html/rd/p/000000012.000047059.html> 〈2022/9/5〉

EARTH and CHILDREN ～地球と子供のために～  
<https://www.earth-and-children.net/> 〈2022/11/2〉

NPO法人ワールドギフト★再利用・寄付活動 (twitterアカウント)  
<https://twitter.com/worldgift> 〈2022/11/30〉

不用品を寄付する方法と団体を紹介！ 送料無料の業者はある？  
<https://uruka.me/column/kaisyu/huyohin/donation/> 〈2022/11/30〉

NPO法人オックスファム・ジャパン - JAMMIN  
[https://jammin.co.jp/charity\\_list/140818oxfam/](https://jammin.co.jp/charity_list/140818oxfam/) 〈2022/11/30〉

不用品を寄付してSDGsに貢献 中央大学が「キフカツ」開始  
<https://univ-journal.jp/101851/> 〈2022/12/5〉

不用品を寄付するメリット！ 寄付できるものや信頼できる団体を調査  
[https://uridoki.net/others/kiji\\_203677/](https://uridoki.net/others/kiji_203677/) 〈2022/12/7〉

1. 貧困をなくそう | SDGsクラブ - 日本ユニセフ協会  
<https://www.unicef.or.jp/kodomo/sdgs/17goals/1-poverty/> 〈2022/12/12〉

開発途上国への寄付の種類は？ 世界の子どもたちを救う効果的な寄付の仕方を知ろう  
[https://www.worldvision.jp/children/poverty\\_20.html#d0e9d87eb78fa54e47cd213ca7606442](https://www.worldvision.jp/children/poverty_20.html#d0e9d87eb78fa54e47cd213ca7606442)  
〈12/16〉

後発開発途上国 (LDC: Least Developed Country) | 外務省

[https://www.mofa.go.jp/mofaj/gaiko/ohrlls/lde\\_teigi.html](https://www.mofa.go.jp/mofaj/gaiko/ohrlls/lde_teigi.html)〈2022/12/16〉

アジアリサイクル貢献活動

<https://kifu-sapo.jp/>〈2022/12/19〉

【世界の貧困】3つの原因と解決のヒント

[https://gloleacebu.com/poverty\\_world/](https://gloleacebu.com/poverty_world/)〈2022/12/19〉

ご寄付で受付できない物につきまして - エコトレーディング

<https://eco-friendly.site/post/41291>〈2023/1/11〉

多い？ 少ない？ 日本の寄付額

[https://www.es-inc.jp/graphs/2022/grh\\_id011884.html](https://www.es-inc.jp/graphs/2022/grh_id011884.html)〈2023/2/2〉

Bangladesh のLDCからの卒業について

<https://www.bd.emb-japan.go.jp/files/000355547.pdf>〈2023/11/13〉

No poverty

<https://datatopics.worldbank.org/sdgatlas/archive/2017/SDG-01-no-poverty.html>〈2024/2/6〉

Developed Countries, 2021. - Maps on the Web

<https://mapsontheweb.zoom-maps.com/post/656688332736167936/developed-countries-2021>  
〈2024/2/6〉

Average annual philanthropic donation in 2012 US Dollars per person in... | Download  
Scientific Diagram

[https://www.researchgate.net/figure/Average-annual-philanthropic-donation-in-2012-US-Dollars-per-person-in-nineteen-countries\\_fig1\\_349158352](https://www.researchgate.net/figure/Average-annual-philanthropic-donation-in-2012-US-Dollars-per-person-in-nineteen-countries_fig1_349158352)〈2024/2/6〉

# To create true Gender Equal Society

## Men's participation in Housework and Childcare

ID5309 Kashiwagi Sota

### Abstract

Recently, many countries are trying to remove gender discrimination in order to create a gender equal society. However, few countries achieve gender equality in terms of housework and childcare. Basically, women seem to do most of the housework and childcare. The goal of this study is making society equal in terms of not only work but also housework and childcare, then to create a true gender equal society. According to the survey, I found that many men think that men must not leave housework and childcare to women, and both men and women should do those things. From this, I think that men have the will to do housework and childcare, but actually they cannot. They seem not to have enough knowledge and skills of housework and childcare. I suggest two things to improve their skills. First is to improve home economics classes at school, second is to reduce the cost of college students' solitary life. Main future issue is sharing my suggestion in the world, especially countries lagging behind in gender equality like Italy and Korea.

### 1. Introduction

Now, we are in an era of gender equality. Women are actively participating in society. However, I think that this is only in terms of work. Gender equality in the areas of daily life, such as housework and childcare, has not been realized. If the amount of time spent on work increases and the amount of time spent on housework and childcare does not decrease, the burden on women will increase. I started my study to create a true gender equal society.

This study has two objectives.

- ①to create opportunities for men to improve their housework and childcare skills
- ②to enable men to adjust their work hours so that they can have more time for housework and childcare

The goal is to accomplish both of these things and to create a true gender equal society.

〈how to study〉

Using the internet, I examine the following things.

- comparison of living time of men and women
- men's attitudes toward gender equality
- current status of sharing housework and childcare
- about housework
- the purposes and current status of home economics classes at Japanese schools
- current status of college students' solitary life.

Then, using these data, I analyze the current status of gender equality in terms of housework and childcare, and think about concrete solutions.

## 2. Discussion and implications

### ① comparison of living time of men and women

Reference: International comparative data on living time which OECD made in 2020.(target·

••men and women between the ages of 15 and 64 in OECD countries)

#### i working hours per day

- 1st: Japanese men ···452 minutes
- 2nd: Korean men ···419 minutes
- 3rd: Canadian men ···341 minutes
- Japanese women···272 minutes
- Average(men)···317 minutes
- Average(women)···218 minutes

#### ii unpaid working hours per day (ex.housework and childcare)

(long→short)

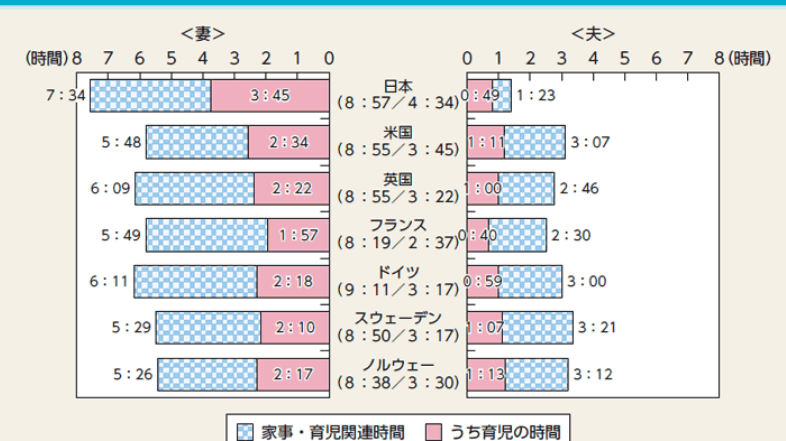
- 1st: Italian women···306 minutes
- 2nd: Spanish women···289 minutes
- 3rd: New Zealand women···264 minutes

(short→long)

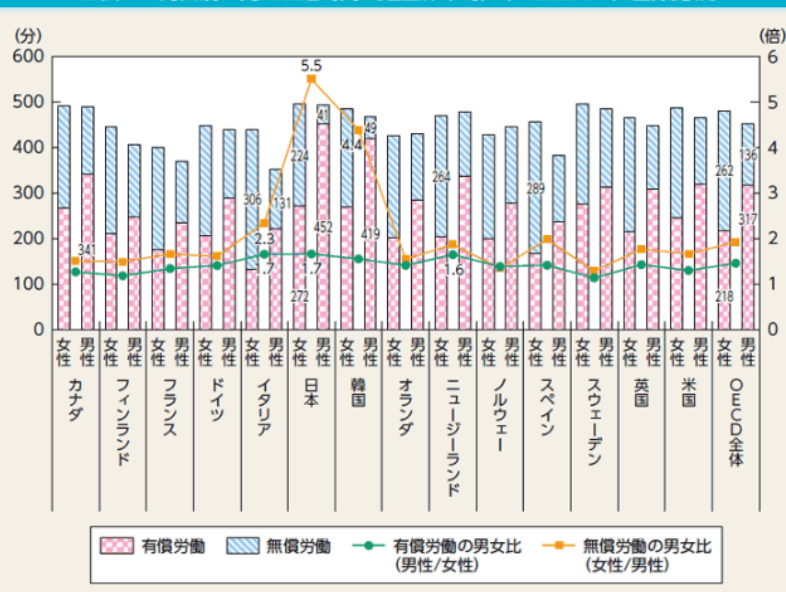
- 1st: Japanese men···41 minutes
- 2nd: Korean men···49 minutes
- 3rd: Italian men···131 minutes

- Average(men)···136 minutes
- Average(women)···262 minutes

図表 2-2 6歳未満の子供を持つ夫婦の家事・育児関連時間 (週全体平均) (1日当たり, 国際比較)



図表 1 男女別に見た生活時間 (週全体平均) (1日当たり, 国際比較)



[https://www.gender.go.jp/about\\_danjo/whitepaper/r02/zentai/html/column/clm\\_01.html](https://www.gender.go.jp/about_danjo/whitepaper/r02/zentai/html/column/clm_01.html)

〈What I can consider from the above〉

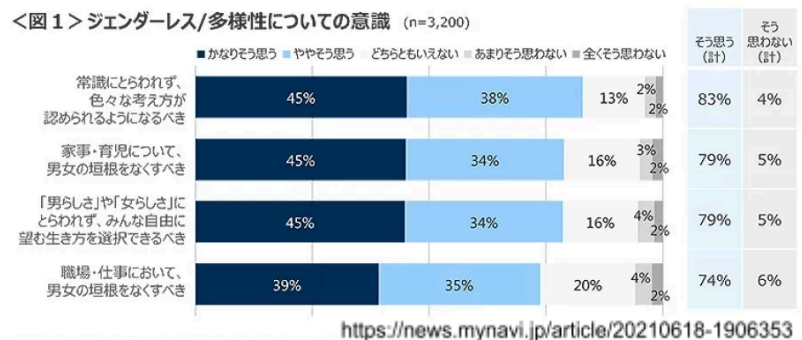
- Men's working hours are so long, especially in Japan and Korea.
- In countries where men spend less time on housework and childcare, such as Japan, Korea, and Italy, women spend much more time on these activities.

② Survey on men's attitudes toward gender equality and current status of sharing housework and childcare

Reference: 「Survey of Attitudes and Facts about Genderless and Diversity」(from Cross Marketing)

i Attitudes about genderless and diversity

About 80% of people think that both women and men should do housework and childcare.

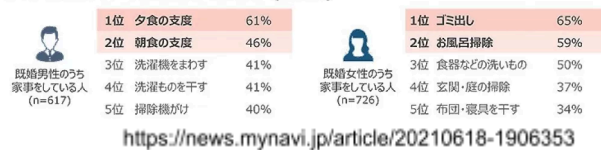


ii Housework people want to ask to their partner

men : cooking

women : garbage disposal

<図4> 配偶者・パートナーに任せたい家事 (男女別)



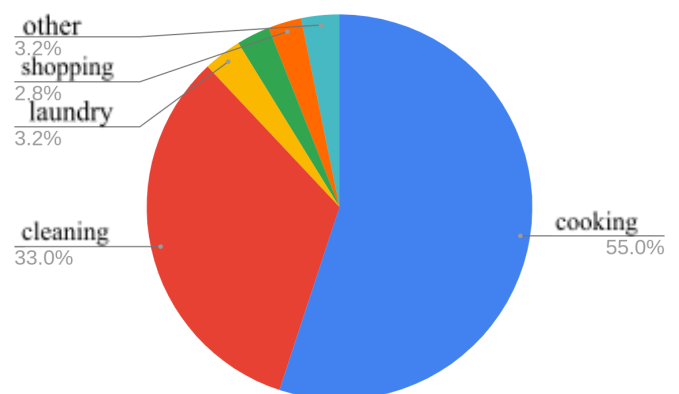
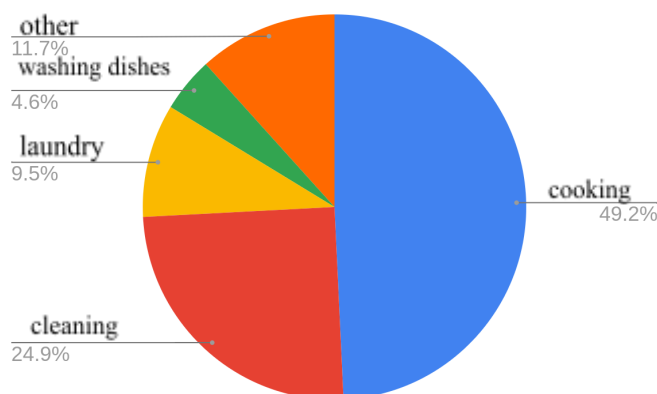
③ Solution

According to these things, I think we have two things to create a true gender equal society.

- to reduce men's working hour and enable men to spend more time on housework and childcare
- to improve men's skill of housework and childcare

In this study, I would like to think about the second one.

□ data of housework that people find most difficult (from kuhura)





According to these two graphs, both men and women think cooking is the hardest housework. However, many men think that they want their wife to cook. It is not equal that only women do the hardest housework.

Therefore, I want to think about a solution focusing on cooking.

Improvement of home economics classes at elementary, junior high and high school.

I think that it is too difficult for adults to learn and get the skill of housework and childcare, because they are so busy. So, I want students to do that.

By the way, these are the purposes of home economics classes at Japanese schools.(excerpts)

(elementary school)

To develop a basic understanding of family, food, clothing, shelter, consumption, and the environment, and to acquire necessary skills for daily life.

(junior high school)

To develop a basic understanding of family, food, clothing, shelter, consumption, and the environment, and to acquire necessary skills for living independently.

(high school)

To develop a basic understanding of family, food, clothing, shelter, consumption, and the environment, and to acquire necessary skills to live proactively.

All three goals are to acquire the skill of housework.

However, the Journal of the Japanese society of home economics education says two things.

- Cooking practice at school is not enough for students to get knowledge and skills of cooking necessary for daily life.
- Students' knowledge and skills are declining.

However, I think it is difficult to increase the number of cooking practices at school because of the cost and balance with other subjects. Therefore, I want to make cooking practices more effective for students.

〈My solution〉

Cooking with Game

I suggest that students study cooking with games, using a computer which each student has.

– My style –

- ① to learn about cooking knowledge like ingredients, quantity, or process, with a textbook
- ② to learn the cooking process in detail and realistically through games
- ③ to do the actual cooking practice

In this way, I think that cooking practice becomes more effective for students to learn cooking.

For example, I suggest “Cooking Mom”. This game tells us the cooking process in detail and realistically. We feel as if we actually cooked. I think that this is a good tool to study cooking.



<https://www.nintendo.co.jp/titles/50010000016955>

college students' solitary life

Commonly, solitary life is an effective way to get life skills. I want to enable everyone to do solitary life.

Now, in Japan, the average cost of solitary life excluding housing costs is 132,813 yen.

I want to reduce this cost.

### 3. Conclusion

Creating a true gender equal society needs to make women and men equal in terms of housework and childcare as well as working. Actually, in most countries, women spend much more time on housework and childcare. A lot of men depend on women in terms of housework and childcare. On the other hand, many men think that both men and women should do housework. To encourage men to do housework, it is necessary to improve men's skills and produce time which men spend on these things. So, I suggest that students acquire the skill through games using a computer in home economics classes. And I want to reduce the cost of college students' solitary life.

〈future issue〉

- ①to think about the concrete way to support solitary life
- ②to reduce the time which men spend working
- ③to share these suggestions with the world, especially countries lagging behind in gender equality like Italy and Korea.

### 4. References

「きずなネット読み物Web お金を理由に大学進学を断念する人が7割以上って本当？」

<https://coelog.chuden.jp/child-rearing/university-going-on-no-money/> 2022/10/19

「不動産サイトアットホーム 大学生が一人暮らしをする割合は実家暮らしとどちらが多い？」  
<https://www.athome.co.jp/contents/students/livingexpenses/percentage/#:~:text=%E5%85%88%E3%81%BB%E3%81%A9%E8%A8%98%E8%BC%89%E3%81%97%E3%81%9F%E3%80%8C%E5%AD%A6%E6%A0%A1%E5%8C%BA%E5%88%86,%E3%81%8C%E9%AB%98%E3%81%84%E3%81%93%E3%81%A8%E3%81%8C%E3%82%8F%E3%81%8B%E3%82%8A> 2022/10/19

「マイナビニュース 家事分担若いほど意識高い傾向、でも分担の割合は男女でギャップあり」  
<https://news.mynavi.jp/article/20210618-1906353/#:~:text=%E6%97%A2%E5%A9%9A%E8%80%85%E3%81%AE%E5%AE%B6%E4%BA%8B%E5%88%86%E6%8B%85%E5%89%B2%E5%90%88%E3%81%AB%E3%81%A4%E3%81%84%E3%81%A6%E3%81%AF%E3%80%81%E5%B9%B4%E4%BB%A3%E5%95%8F%E3%82%8F,%E3%81%84%E3%82%8B%E6%A7%98%E5%AD%90%E3%81%8C%E3%81%86%E3%81%8B%E3%81%8C%E3%81%88%E3%81%9F%E3%80%82> 2022/10/31

「男女共同参画局 生活時間の国際比較」  
[https://www.gender.go.jp/about\\_danjo/whitepaper/r02/zentai/html/column/clm\\_01.html](https://www.gender.go.jp/about_danjo/whitepaper/r02/zentai/html/column/clm_01.html)  
2022/11/21

「小学校学習指導要領」  
[https://www.mext.go.jp/component/a\\_menu/education/micro\\_detail/\\_icsFiles/afieldfile/2019/03/18/1387017\\_009.pdf](https://www.mext.go.jp/component/a_menu/education/micro_detail/_icsFiles/afieldfile/2019/03/18/1387017_009.pdf) 2022/12/01

「中学校学習指導要領」  
[https://www.mext.go.jp/component/a\\_menu/education/micro\\_detail/\\_icsFiles/afieldfile/2019/03/18/1387018\\_009.pdf](https://www.mext.go.jp/component/a_menu/education/micro_detail/_icsFiles/afieldfile/2019/03/18/1387018_009.pdf) 2022/12/01

「高等学校学習指導要領」  
[https://www.mext.go.jp/content/1407073\\_10\\_1\\_2.pdf](https://www.mext.go.jp/content/1407073_10_1_2.pdf) 2022/12/01

「高等学校における調理実習の現状t大学および専門学生の調理の知識と技術の習得状況」  
[https://www.jstage.jst.go.jp/article/jjahee/57/2/57\\_KJ00009596796/\\_pdf](https://www.jstage.jst.go.jp/article/jjahee/57/2/57_KJ00009596796/_pdf) 2022/12/08

「kajily 家事の大変さをわかってもらおう！大変な家事ランキング」  
<https://www.happy-bears.com/kajily/nayami/3418/> 2022/12/08

「WOMAN PEWSIDENT 日本政府は女性の社会進出より先に男性の家庭進出を勧めたほうが良い納得の理由」  
<https://president.jp/articles/-/46355?page=2> 2022/12/08

# How Do We Run the Sleeper Train Around the World?

~Reduce CO2 by rail~

5310 Kamegaya Kosaku

## Abstract

I like to travel by train and go somewhere every time when I have a long vacation. I often use a sleeper train. As I used sleeper trains many times, I became fascinated by their charms and began researching them. I hope to encourage more people to take them, which are in danger of extinction in Japan. As I continued my research, I found that sleeper trains were being revived one after another in Europe, particularly in France. I researched the reason, and found that countries such as France are taking the lead in promoting this trend because the carbon dioxide emissions of trains are lower than those of other forms of public transportation such as airplanes. Therefore, we thought that we could further promote the revival of this sleeper train boom by operating a train in Europe that incorporates Japanese sleeper train technology. We conducted a survey of sleeper trains in both countries, and came up with a proposal for a sleeper train that takes advantage of the strengths of both.

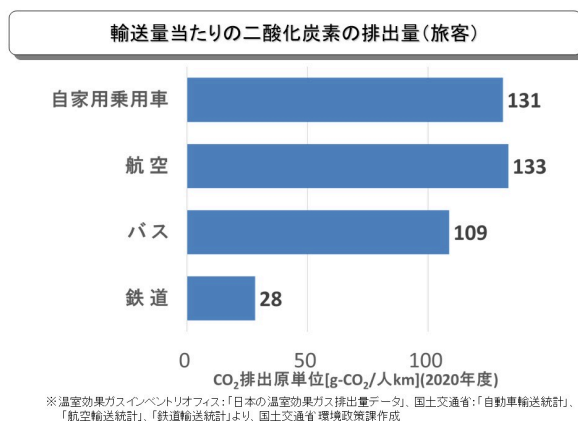
## Background

There were many sleeper trains in operation 10 years ago, such as the "Hokutosei" between Ueno and Sapporo, the "Akebono" between Ueno and Aomori, and the "Express Kitaguni" between Osaka and Niigata, the current sleeper train service is in danger of extinction due to the development of overnight bus routes and the LCCs in Japan. However, the only regularly scheduled train in service today is the "Sunrise Izumo/Seto," which runs between Tokyo and Izumo-shi/Takamatsu. Extra expensive trains "Cassiopeia" and "Transit Shikishima," and the trains are changing from being a means of transportation to a way of enjoying the ride. In addition, the Sunrise Izumo/Seto trains offer guest rooms, beds, yukata (Japanese bathrobes), and shower rooms as services, while the aforementioned extra sleeper trains can be said to offer not only guest rooms, but also dining cars, amenity services, and other services. Is the culture of casual sleeper trains such as the Sunrise seen in other countries as well? A quick search reveals that there are many night trains such as the "EuroNight" connecting European countries, the "City Night Line" connecting Germany and Germany with neighboring countries, the "Orient Express", the "Terror" connecting France and Italy, and the "Russia", a super long-distance train from Moscow to Vladivostok on the Trans-Siberian Railway that runs 9,297 km in Russia. The "Russia," a long-distance train, and others are still in operation around the world. Can we spread the technology of casual sleeper trains, which has faded away in Japan, to other countries around the world?

## Purpose and significance

As we continued to gather information, we learned that in Europe, sleeper trains are being revived one after another, especially in France. Therefore, the research question for this study was "What is the image of sleeper trains required in Europe?" The goal of this study was to propose a sleeper train that would promote the development of sleeper trains in Europe. I researched why sleeper trains are being revived one after another in Europe, and found that countries such as France are taking the lead in promoting this trend because the carbon footprint of trains is lower than that of other forms of public transportation such as airplanes. According to data from the "Ministry of Land, Infrastructure, Transport and Tourism", per capita carbon dioxide emissions from railroads are 1/4 of those airplanes, indicating that there is a large difference in carbon dioxide emissions between railroads and airplanes. (Figure 1) However, the problem now is price competition with low-cost airlines. European countries often use airplanes when traveling between countries because of the long distances involved. The advantage of LCCs is the ease of obtaining tickets and discounts. When we looked into the train fare system, we found that express and sleeping car tickets are charged in addition to the train ticket. Since many tickets are required to board a train, it is difficult to offer discounts only for those trains, and price competition is weak. Therefore, I thought it was necessary to change the service to one that could be operated at a lower price point in order to popularize the sleeper train service. In fact, in Japan, sleeping car trains have been devised to provide seats that can be taken for a reserved seat fee only, and discounts have been offered to compete with night buses and LCCs. Couldn't such innovations be applied to European railroad companies?

(Figure 1) Carbon dioxide emissions in the transportation sector - Ministry of Land, Infrastructure, Transport and Tourism



<https://www.mlit.go.jp/sogoseisaku/environment/content/001489542.jpg>

## Methodology

Since the goal of the study was to promote the development of European sleeper trains. I thought it necessary to first learn about the characteristics of sleeper trains in both Japan and Europe. Also, since the goal of this research is to propose a sleeper train, we thought it was necessary to conduct a survey. The method of this research was to collect information on sleeper trains operated in various countries around the world, to investigate regions and

routes where sleeper trains can be operated, and to collect information on the characteristics of the train car systems and structures of sleeper trains in various countries around the world.

## Results and discussion

As a result of the research, it was found that there is a demand for casual sleeper trains in Europe, as an alternative to other modes of transportation. In order to create a casual sleeper train, a sleeper train that is inexpensive and easy to use, we believe it is important to develop a fare system and interior design. To this end, we first examined the interiors of sleeper trains in Japan. As an example, we cite the "Sunrise Izumo-Seto" (Figure 2), the only sleeper train still in regular operation, which runs from Tokyo to Takamatsu and Izumo City via Osaka, Himeji, and Okayama. The Sunrise Seto/Izumo has 14 cars, and Novinobi seats (28 seats), single private rooms (80 rooms) (Figure 3), solo private rooms (20 rooms), single twin private rooms (8 rooms), sunrise twin private rooms (4 rooms), and single deluxe private rooms (6 rooms) are available. The "Nobi-Nobi" seats allow passengers to board a sleeper train with only a train ticket and an express ticket, whereas originally a sleeper ticket was required in addition to a train ticket and an express ticket. Single private rooms and solo private rooms are structured for comfort and can be used by one person. Single twin private rooms and sunrise twin private rooms are intended for use by two or more people and are designed with leisure demand, such as families in mind. Single-twin private rooms emphasize luxury and compete with other accommodations such as hotels. In other words, it was concluded that the Sunrise Izumo/Seto and other sleeper trains in Japan are designed to meet the demand for single passengers as a means of transportation, the demand for leisure travel by families, and the demand for hotel-like services as a means of transportation.

Next, we examined the interiors of European sleeper trains as a comparison. European sleeper trains are divided into three seating categories: Schlafwagen, Liegewagen, and Sitzwagen. A welcome drink and breakfast are provided, and the fare for single occupancy is 139.90 euros (19,166 JPY). The Liegewagen is a sleeping compartment with a shower room and toilet in the car. Mineral water and a light breakfast are provided, and the price for three adults is 199 euros (27,263 JPY). The Sitzwagen is a seat-only compartment with a shower stall and toilet in the car. The fare for three adults is 99 euros (13,563 JPY).

Therefore, we believe that combining the strengths of Japanese sleeper trains with those of European sleeper trains will promote the further development of sleeper trains in Europe.





(Figure 2) Sunrise Izumo / Seto

(Figure 3) Single Private Room

## Conclusions

In conclusion, the answer to the research question is that the sleeping car trains required in Europe are casual sleeping cars that provide an alternative to other forms of public transportation such as airplanes and buses. Based on the above, we propose a sleeper train that combines the strengths of Japanese sleeper trains, such as the demand for single passengers as a means of transportation, the demand for leisure travel for families, and the demand for hotel-like services, with the strengths of European sleeper trains, such as the use of compartments (small partitioned rooms), which make the trains overwhelmingly inexpensive. Seats are mainly Nobi-Nobi seats or single private rooms as in the Sunrise Izumo/Seto trains, taking advantage of Japanese culture. As a future challenge, we would like to run sleeper trains in China and other Asian countries that are expected to undergo economic development in the future, as well as in Africa.

## References and Bibliography

[Index Navi] List of years when night trains were discontinued or reduced (23/04/17)

<https://nihonkai.exp.jp/hm/index/yako-end.html>

Sunrise Seto/Izumo - JR Odekake Net (23/04/17)

[https://www.jr-odekake.net/train/sunriseseto\\_izumo/](https://www.jr-odekake.net/train/sunriseseto_izumo/)

I want to ride it someday! The 7 most luxurious sleeper trains in the world (23/04/17)

<https://www.businessinsider.jp/post-34276>

Carbon dioxide emissions in the transportation sector - Ministry of Land, Infrastructure, Transport and Tourism (23/4/17)

[https://www.mlit.go.jp/sogoseisaku/environment/sosei\\_environment\\_tk\\_000007.html](https://www.mlit.go.jp/sogoseisaku/environment/sosei_environment_tk_000007.html)

Sleeping car train Let's take a ride on the "Sunrise Izumo/Seto" sleeper express! Explanation of ticket types, how to ride, and sleeping car types. (23/07/09)

[https://www.toretabi.jp/railway\\_info/entry-773.html](https://www.toretabi.jp/railway_info/entry-773.html)

Merkmal: Why are European countries increasing the number of "night trains"? Why European countries continue to increase the number of "night trains" (23/07/09)

<https://merkmal-biz.jp/post/11122>

# Spreading of STEAM Education

## Developing abilities to survive today

5311 Kisaragi Shinsei

### Abstract

Technological innovation demands the ability to find and solve problems and to think. STEAM Education is suggested to adapt to this situation. However, it has not spread now. Therefore, the goal of this research is spreading STEAM Education to develop people who can survive the world of globalization and informatization.

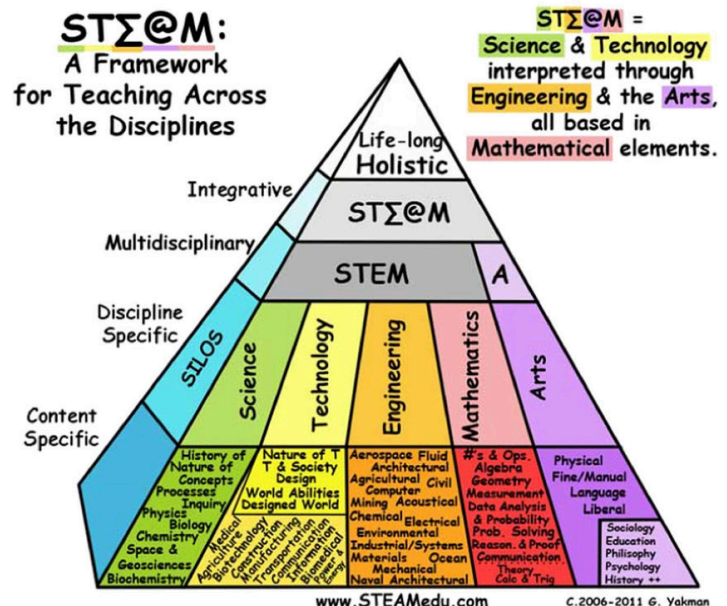
To make searching products easy and reduce educators' burden, accumulating plans of classes, establishing a common market of STEAM products are effective. Supports from STEAM specialists or companies are also important.

### 1 Introduction

The National Science Foundation in America advocated "STEM Education" in the 1990s. STEM Education is multidisciplinary and the name of "STEM" derives from the initials of Science, Technology, Engineering, and Mathematics.

These days, the world is under technological innovation. We are required to have the ability to find and solve problems and to think.

To adapt to this situation, Yakman suggested "STEAM Education" in 2006. The chart on the right shows the definition of STEAM Education by Yakman. This includes Art in addition to STEM. STEAM Education will contribute to cultivating the required abilities and adapting to the new era, but it has not been known yet.



### 2 Discussion and implications

#### ○Distribution of STEAM products and information

Various products and curriculums relating to STEAM Education have been developed recently.

Okayama University has researched a practical example of a STEAM Education class. In the experiment, students measure and analyze how tiny bubbles affect fish. The situation of the



fishery relates to technology and engineering, and the phase of measuring and analyzing relates to science and mathematics.

The examples of integration with arts include cutting out origami to make regular shapes and physically examining spinning tops or stringed instruments.

Segarra(2018) states that the advantages of arts are clarifying scientific concepts and cultures, making science more comprehensive and accessible, and improving works that scientific and artistic parts enhance each other.

I hypothesized that it was difficult for us to search for products which fit our needs.

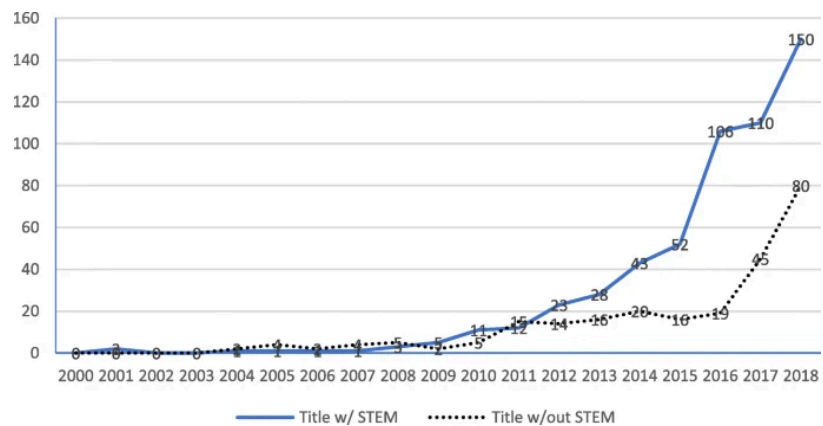
We can improve this situation in these two ways.

- simplifying searching for them

I set the situation that I am searching for STEAM products to practice the example of Okayama University.

After searching in a few languages, I could not find STEAM products which match the condition. The chart on the right shows that one-third of the STEM products do not include the name of it.

To establish an internet shop specialized in STEAM Education can put together markets and it will be a solution.



- utilizing properties

It is possible to practice STEAM classes even if products which are not for STEAM are used.

To include all of the areas of STEAM, the use of past cases is effective.

Past cases practiced as STEAM classes would help educators know requirements.

Thus, it is necessary to set up a system where educators can browse accumulated cases of STEAM classes.

○obstacles to implementation

STEAM Education requires educators to give lessons across the areas of STEAM, whereas most educators cannot. It is difficult to implement STEAM Education, which educators need “activeness” and “knowledge of all areas”.

- eliminating the need of activeness

Qubena, an educational software, provides educators with materials to study about some themes. The materials include past cases, worksheets and movies.

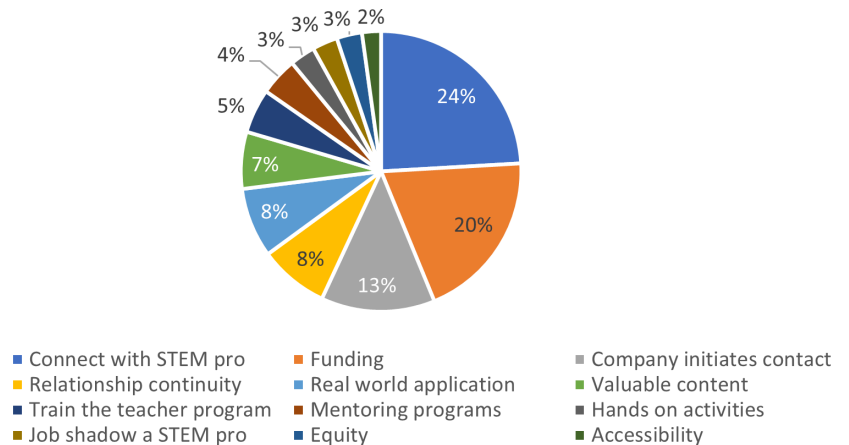
In this way, accumulated past cases can reduce burden in preparing for STEAM classes.

Categorizing and concretizing them are important to make searching them easy.

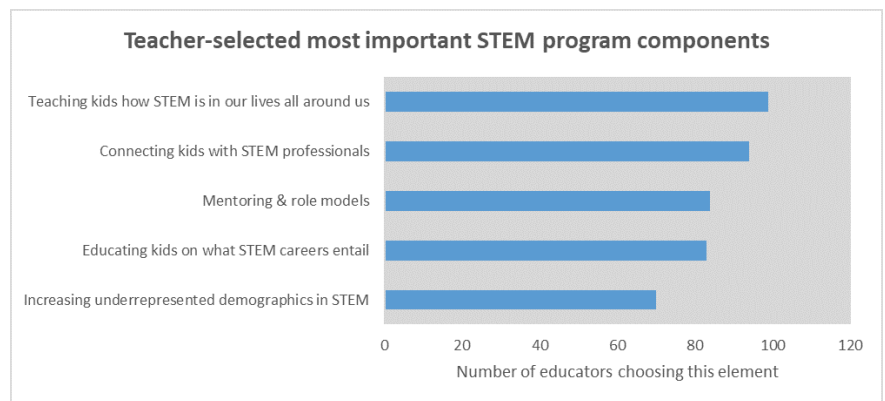
•eliminating the needs of knowledge of all areas

The graph on the right displays the result of the survey of American educators’ suggestions about STEM programs. Many educators need support from STEM professionals or companies. They reduce educators’ labor and promote the implementation of STEM or STEAM Education. The form of STEAM Education in China is similar to this. Over half of STEAM programs are conducted by research institutes and companies. However, this form causes the problem that methods of STEAM Education are not shared well.

Teacher suggestions to improve STEM programs



The graph on the right shows American educators’ view about what the most important element in STEM Education is. The top is “Teaching kids how STEM is in our lives all around us”, followed by “Connecting kids with STEM professionals” and “Mentoring & role models”.



“Let’s talk science”, a charitable institution in Canada, supports programs like these. It has a lot of volunteers and is supported by the government and companies. Main activities are connecting children and professionals, holding science contests, and so on.

### 3 Conclusion

As a solution to the problems mentioned above, I suggest establishing a STEAM Education portal site. This includes accumulated STEAM class plans, a market of STEAM products and information about STEAM professionals or groups. These reduce educators’ labor and promote the spread of STEAM Education. This site should be provided in many languages. We still have room for considering the cross-national disparity in facilities.

### 4 References

「STEAM教育等の教科等横断的な学習」 <https://www.mext.go.jp/studxstyle/index3.html> (2022/5)  
 「What is STEM Education?」 [https://w.nsf.gov/news/news\\_summ.jsp?cntn\\_id=243502](https://w.nsf.gov/news/news_summ.jsp?cntn_id=243502) (2022/5)

「STEAM教育への取り組み」

[https://www.mext.go.jp/content/20200917-mxt\\_kyoiku01-000009959\\_4.pdf](https://www.mext.go.jp/content/20200917-mxt_kyoiku01-000009959_4.pdf) (2022/5)

「STEAM in education: a bibliometric analysis of performance and co-words in Web of Science」

<https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-021-00296-x>

(2022/7)

「An Application Theme Based STEAM Activity Programs and its Educational Effect」

[https://www.jstage.jst.go.jp/article/jsser/29/1/29\\_No\\_1\\_140117/\\_pdf](https://www.jstage.jst.go.jp/article/jsser/29/1/29_No_1_140117/_pdf) (2022/9)

「Creating Successful Partnerships Between Schools and STEM Professionals」

<https://www.aaas.org/programs/center-public-engagement-science-and-technology/reflections/creating-successful> (2022/10)

「Research and trends in STEM education: a systematic review of journal publications」

<https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-020-00207-6>

(2022/11)

「【STEAM教育についてインタビュー】～水産資源の持続可能性を探究するカリキュラム～株式会社COMPASS 未来教育部 部長 木川 俊哉 氏」

<https://www.blog.studyvalley.jp/2021/06/14/%E3%80%90steam%E6%95%99%E8%82%B2%E3%81%AB%E3%81%A4%E3%81%84%E3%81%A6%E3%82%A4%E3%83%B3%E3%82%BF%E3%83%93%E3%83%A5%E3%83%BC%E3%80%91%E3%80%9C%E6%B0%B4%E7%94%A3%E8%B3%87%E6%BA%90%E3%81%AE%E6%8C%81/> (2022/12)

「STEAM: Using the Arts to Train Well-Rounded and Creative Scientists」

<https://journals.asm.org/doi/10.1128/jmbe.v19i1.1360> (2022/12)

「ティーチャーライブラリアン養成におけるルーブリックを活用した評価」

<https://tane.info/knowledge-base/s8/> (2022/12)

「INF506 – The Future of Teacher Librarians」

<https://thinkspace.csu.edu.au/readminder/2020/05/15/inf506-the-future-of-teacher-librarians/>

(2023/1)

「PISA 2018 Insights and Interpretations FINAL PDF」

<https://www.oecd.org/pisa/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf> (2023/1)

「発展途上国の理数科教育開発に関する基礎的研究 –アジア諸国の理数科達成と学校のクオリティに関わる問題点を中心に–」

<https://cice.hiroshima-u.ac.jp/wp-content/uploads/publications/Journal3-1/3-1-5.pdf> (2023/5)

[https://www.jstage.jst.go.jp/article/jssej/45/2/45\\_93/\\_pdf](https://www.jstage.jst.go.jp/article/jssej/45/2/45_93/_pdf) (2023/12/11)

# Improve Soil Quality in Developing Countries

## Soil improvement using microorganisms

5312 Kimura Misaki

### Abstract

The research aimed to propose cost-effective soil improvement methods for developing countries, with a focus on the "Miracle of the Cerrado" in Brazil. The Cerrado, originally unsuitable for agriculture due to its acidic and dry latosol soil, transformed into a large farm through heavy fertilizer use. However, the high cost of chemical fertilizers poses a challenge for similar transformations in other areas. To address this, the study explores the potential of using microorganisms as a low-cost alternative.

Two main types of fertilizers, chemical and microbial, condition the soil differently. Chemical fertilizers directly control soil pH, while microbial fertilizers aim to establish a nutrient cycle in the soil by promoting microorganism activity. The absence of microorganisms in certain soil types hinders the natural nutrient cycle.

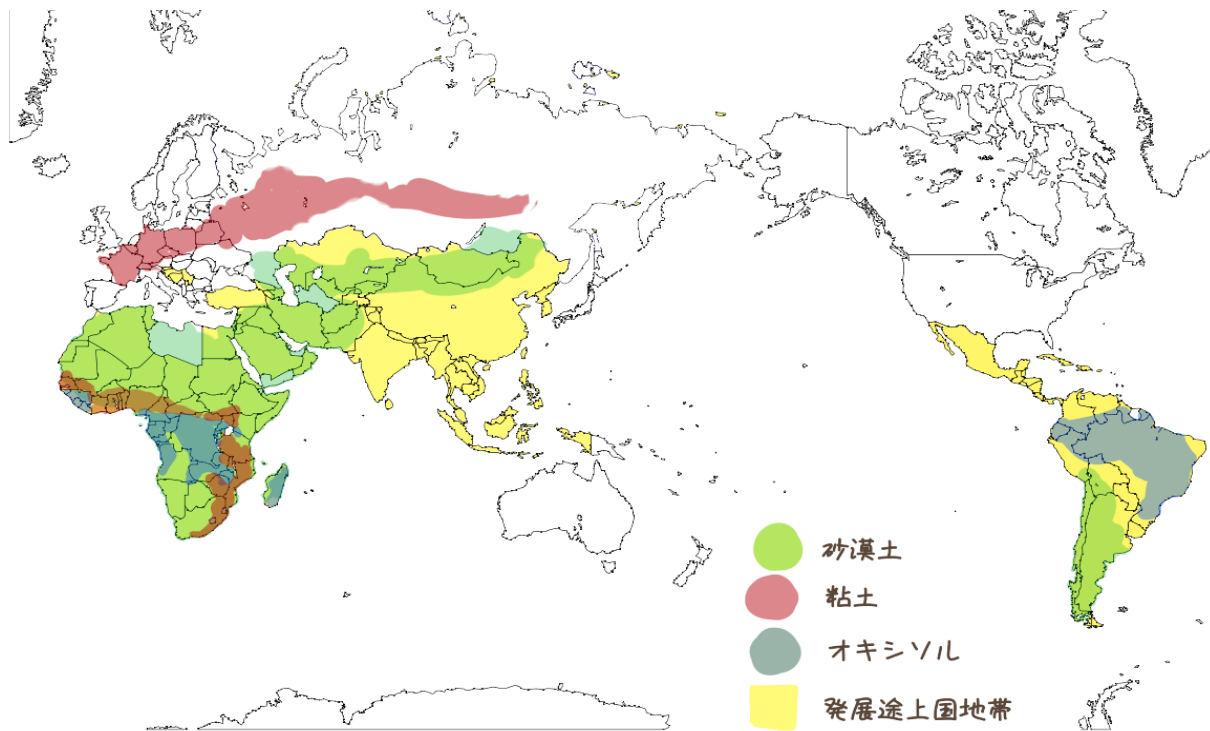
Although comparisons between chemical and microbial fertilizers were inconclusive in existing literature, the study plans to conduct experiments during the winter break. Many individuals have reported success with homemade microbial fertilizers on personal blogs, serving as references for the upcoming experiments.

In conclusion, the research identifies soil quality as a contributing factor to hunger issues in developing countries. However, the effectiveness of microbial fertilizers as a substitute for chemical fertilizers remains uncertain until the experiments are completed. Future research will focus on conducting experiments to address research questions promptly and exploring details such as latosol conditions and the impact of microbial materials on the soil through additional resources.

### 1 Introduction

According to the list of countries that Japan provides support to as ODA, there are more than 140 developing countries now. Developing countries have lots of problems, for example, lack of infrastructure in place and not having a satisfactory education. Hunger problem caused by lack of food is so serious. Then I started to research and focus on agriculture to solve the hunger problem. As a result, it turns out that most developing countries are located in areas of nutrient-poor soil. Developing countries have mainly clay, latosol, and desert soil soils. I decided on latosol as the star of this study because there is a precedent.(details will be described later)

Therefore, I began my study with the goal of improving Latosol soils in developing countries. What is important here, however, is that my suggestions are realistic for developing countries. I must research with it in mind. The goal of this study is to propose a realistic soil improvement plan for developing countries. If this were to be achieved, it may be able to help solve the hunger problem in developing countries.



【Developing Regions and Soil Types】

## 2 Discussion and implications

The research was conducted with the goal of "suggesting soil improvement methods that can be realized by developing countries." For developing countries, the important thing is "low cost. In the beginning, a lot of chemical fertilizers are needed to improve the soil. An example of such soil improvement is the "Miracle of the Cerrado". Cerrado is one of the names of a place in Brazil. This was originally a latosol area, unsuitable for agriculture. This soil called Latosol is highly acidic because of its high iron oxide content. It is also dry. On the other hand, the soil suitable for agriculture is well drained, well-watered, and rich in organic matter such as compost, and is acidic with a pH range of 6.0 to 6.5." However, the heavy use of fertilizers there, has changed the Cerrado into a large farm. Today, Brazil is an agricultural country that exports corn and soybeans. Then let's have a miraculous revolution in the Cerrado in other areas. However, there is an important problem with this. It is very expensive to use large amounts of chemical fertilizers. We need a low-cost way to create a cerrado miracle. Therefore, I came up with the idea of using "microorganism. There are two main types of fertilizers. They are chemical and microbial fertilizers. These are both injected into the soil to condition the soil. What makes these different is the way in which the soil is conditioned. Fertilizers directly control the PH of the soil. For example, if you wanted to make the soil acidic, you would inject acidic chemicals. On the other hand, microbes create a cycle in the soil. Soil originally has cycles. Microorganisms decompose dead animals and plants to produce nutrients. The animals and plants use the nutrients. Many soil types that are unsuitable for agriculture do not have microorganisms in the soil and are not able to create this cycle. There are many definitions, but for now, this is the definition within this study. Here, however, a doubt occurs. Is microorganism really that effective? Comparisons between chemical fertilizers and microorganisms could not be found through internet or book

research. However, there were many people who made their own microorganism fertilizers on their personal blogs, so I will make them and actually experiment with them as a reference. We are still preparing for that experiment. (To be conducted during the winter break)

### 3 Conclusion

From the above, it was found that one of the causes of hunger problems in developing countries lies in the underlying soil of agriculture. However, since the experiment has not yet been done, it is not known at this moment whether microbial can be a substitute for chemical fertilizers.

As for future issues, we would first like to conduct experiments to solve research questions as soon as possible, and we would like to investigate other issues, such as conditions classified as latsol and the effects of microbial materials on soil, using books and other resources, since many details are still vague.

### 4 References

Let's explore! Earth for

All [https://www.mofa.go.jp/mofaj/gaiko/oda/sanka/kyouiku/kaihatsu/chikyu/international\\_society/developing\\_country/developing\\_country\\_02.html](https://www.mofa.go.jp/mofaj/gaiko/oda/sanka/kyouiku/kaihatsu/chikyu/international_society/developing_country/developing_country_02.html)

What is soil?

<https://miraiecossharing1.com/page-4605/>

The Miracle of Tripling Agricultural Production in Brazil: Asahi Shimbun GLOBE+

<https://globe.asahi.com/article/12358808>

The 9th lecture Global Environment from Soil Perspective - Potential of Arid Land  
Satoshi Matsumoto, Graduate School of Agricultural and Life Sciences, The University of Tokyo

<https://www.sanshiro.ne.jp/activity/97/k01/lecture9.htm>

Four ways to increase soil microorganisms | Explanation of their functions and benefits | Mynavi Agriculture

[https://agri.mynavi.jp/2022\\_03\\_25\\_187394/](https://agri.mynavi.jp/2022_03_25_187394/)

List of 15 microorganism material manufacturers (2022 edition) | Metairie

<https://onl.la/954x1Q1>

Spreading yogurt in planters

<https://eco-rich-life.com/gardening/yogurt>

Let's use it for agriculture! Good for pest control. Good for soil. How to make Bacillus subtilis natto solution - Fruit Dome, a fruit picking company in Niigata, Japan

<https://fruitdome.net/196/>

Includes information on microorganisms, lime materials, and lime products! Microbial materials for agriculture and fields | Lisar Kosan

<https://www.resahl.co.jp/column/field-microorganism-material.html>

The case of technical cooperation on improvement of acid soil and cultivation of upland rice in Panama

[https://www.jica.go.jp/jica-ri/IFIC\\_and\\_JBICI-Studies/jica-ri/publication/archives/jica/enkyu/98\\_27/27\\_07.pdf](https://www.jica.go.jp/jica-ri/IFIC_and_JBICI-Studies/jica-ri/publication/archives/jica/enkyu/98_27/27_07.pdf)

How to improve soil and create a well-drained environment? | Columns | Seiko Ecologia Inc.

<https://onl.la/gykgnPJ>

Report on the 21 st World Congress of Soil Science

Grant-in-Aid for Young Scholars: Grant-in-Aid for Young Scholars to Report on Research Abroad

[https://www.jstage.jst.go.jp/article/africa/2020/98/2020\\_39/\\_pdf](https://www.jstage.jst.go.jp/article/africa/2020/98/2020_39/_pdf)

The power of commercially available fermented foods to improve soil fertility! Utilizing the commonly eaten "natto" for agriculture

<https://www.kaku-ichi.co.jp/media/crop/microorganism/natto-used-for-agriculture>

Where is fertile soil? A soil scientist talks about soil from space to balcony gardens (Part 1)

[https://agri.mynavi.jp/2019\\_11\\_22\\_96225/](https://agri.mynavi.jp/2019_11_22_96225/)

The Complex System of Soil Kazuyuki Fuji

[https://www.jstage.jst.go.jp/article/vss/63/4/63\\_20180536/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/vss/63/4/63_20180536/_pdf/-char/ja)

# To Make Sustainable Compact City

## How to support Africa's living

5313 Kohei Koike

### 1. Introduction

#### (1) abstract

Increased urbanization creates a strong economic force due to the fact that there are more places to educate and work, and because of the concentration of industries. The strong economic power thus created also leads to more opportunities for the exchange of information and knowledge. However, there are also disadvantages in this situation. For example, urbanization has reduced rural and regional areas and concentrated many of the latest trends, job options, and conveniences in the cities. Urbanization also makes other environmental problems more likely to occur, such as the "heat island effect", "building winds", and the "waste problem". These are generally referred to as "urbanization problems". Under these circumstances, the purpose of my research is to find out how to turn these disadvantages into advantages and how to solve the urbanization problem.

#### (2) Research background

In recent years, economic growth in developing countries has been remarkable, and many new cities have developed. The development of cities in developing countries has many advantages. For example, the concentration of industry in cities can generate strong economic power and high productivity through the exchange of information, ideas, knowledge, and technology, as well as research, development, and innovation. There is also the expectation of higher incomes in cities compared to rural areas due to the greater opportunities for education and employment. In such a situation, if urban development is rapid and the population inflows are fast, administrative, welfare services and infrastructure development may not be able to keep pace, prices and rents may remain high, and educational and employment opportunities may be limited. As a result, in cities with inadequate urban policies, some residents may be forced to accept a relatively low standard of living by living in slums and working hard for low wages, even though they have moved into the city. In addition, such poverty problems may lead to a deterioration of public safety, and inadequate infrastructure may lead to a regular deterioration of the urban environment through traffic congestion, air pollution, and other problems. We decided to conduct this study in order to break out of this situation.

#### (3) Significance and purpose

The purpose of this study is to solve various problems in Africa through compact cities and agriculture. Over the past two decades, many urban areas have experienced dramatic growth.



As a result of rapid population growth, combined with rapid technological innovation and political change that has transformed the global economy, some 3 billion people, or half of the world's total population, now live in cities. And cities are playing an increasingly important role in the global economy as centers of production and consumption. Cities are growing rapidly throughout the developing world. Over the next 30 years, nearly all of the world's population growth is expected to be concentrated in urban areas in developing countries. Currently, many international organizations are not yet fully aware of either the expected rapid growth of small and medium-sized cities or the worsening living conditions of the urban poor. The challenges of achieving sustainable urban development are particularly critical in Africa.

## 2. Discussion and implications

### (1) Discussion

#### 〈1-1〉 Effect of the compact city

The realization of a compact city could have a variety of effects. On the environmental side, in terms of improved energy efficiency and preservation of green spaces. On the social side, it will lead to improved accessibility of transportation and facilities, diverse modes of transportation, and an improved urban environment. On the economic side, it will revitalize urban centers and reduce transportation costs.

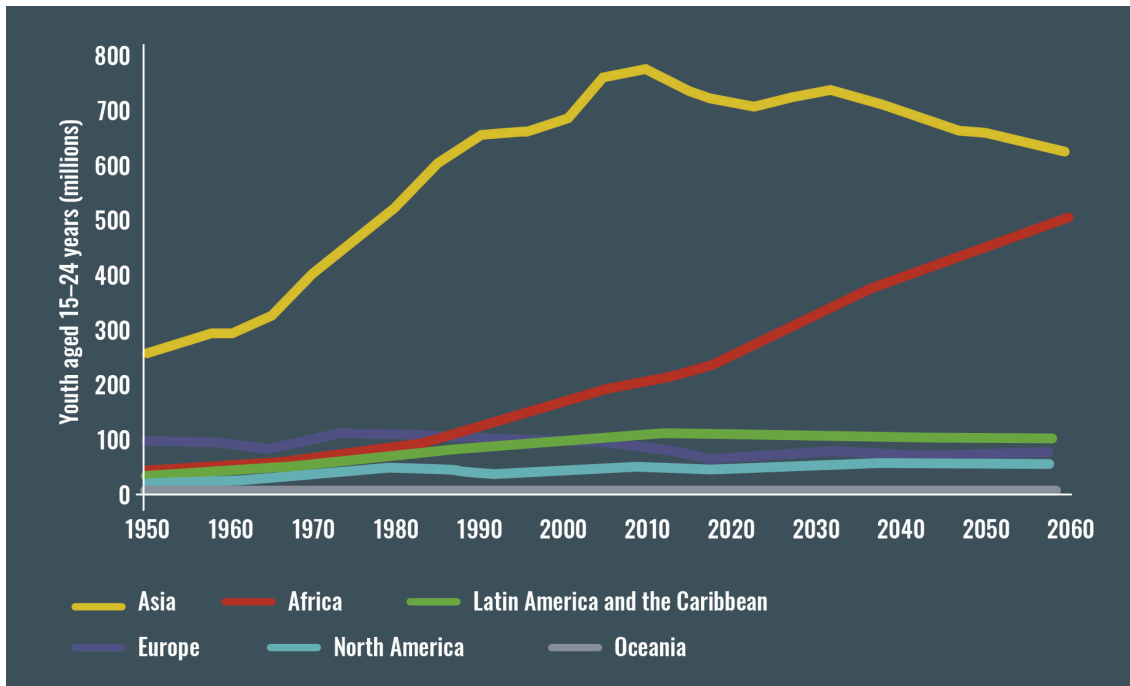
While there are various advantages, there are also disadvantages.

Population movement without regard to financial resources and prices will not easily change and salaries will not increase even if compact city development is implemented.

Those who have been living in the suburbs, where prices are lower, may experience a significant squeeze on their finances.

And the most serious problem is the fear that the lives of people living in the suburbs may not be taken into account. Even if a compact city is realized, the lives of people living in the suburbs should not be ignored.

#### 〈1-2〉 The Importance of Compact Cities in Africa

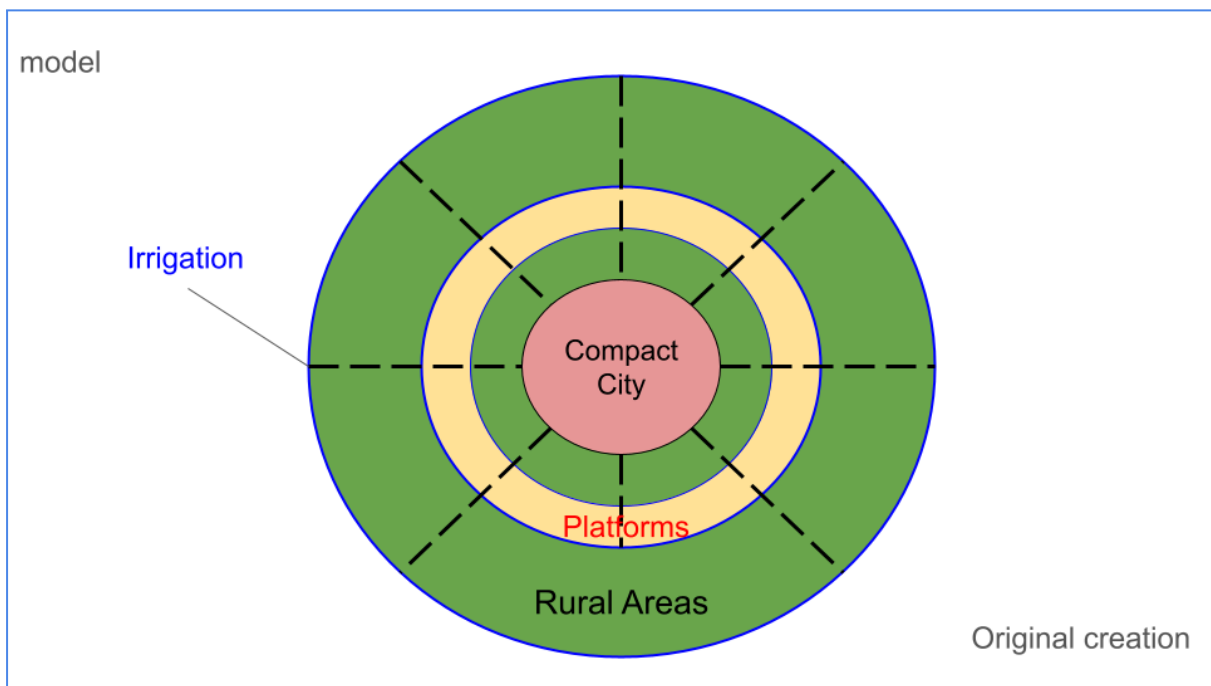


It has the world's fastest population growth rate and is estimated to account for 20% of the world's population by 2050. Therefore, it is expected to become a huge market in the future. Twenty countries on the African continent have shown good economic performance, with an average GDP economic growth rate of over 5% from 2004 to 2006 and an inflation rate that is one-fifth of what it was a decade ago. However, poverty remains a serious problem, with 41.1% of the total population living on \$1 a day as of 2004, and hunger rates exceeding 35% in 18 countries.

However, building a compact city will help attract population to the city and facilitate the establishment of various industries. This will also lead to a diverse supply of goods and services and increase worker productivity.

### 〈1-3〉 Compact City and Agriculture

An important question for Africa in the future's how to secure food supplies.



I suggest forming a compact city like the one above. Developing irrigated agriculture in the suburbs around compact cities will create better markets and solve food insecurity in Africa. In addition, the creation of a railroad connecting compact cities and suburban irrigated areas will allow for more efficient food transportation. The benefits of this plan are that it will solve Africa's food problems and create demand for jobs for people living in the suburbs of the compact city. The point to consider here is how to raise money and create irrigation.

### 3. Conclusion

「Relationship between Compact Cities and Developed Countries in Africa」

I have made various proposals for the formation of compact cities, but the most important issues are cost and time. Here, my strongest suggestion is to build a cycle between developed and developing countries. Currently, developed countries are trying to catch up with the speed of economic growth in developing countries. In addition, while developing countries are rapidly developing, their technological capabilities are not able to keep up with the speed of their economic growth, creating various problems such as the "urbanization problem. Therefore, it is important for developed countries and developing countries to cooperate with each other.

### 4. References

「The steady rise of Africa's youth population against world continents. Image: SESRIC SWOT Outlook 2018 for OIC Countries」

<https://www.weforum.org/agenda/2020/01/the-children-s-continent/>

2023/12/10

<https://www.timeshighereducation.com/>

Times Higher Education

<https://www.mlit.go.jp/pri/houkoku/gaiyou/pdf/kkk166.pdf>

海外のメガシティにおける都市の発展段階とインフラシステムのニーズに関する調査研究

[https://www.mlit.go.jp/pri/kikanshi/pdf/2018/68\\_6.pdf](https://www.mlit.go.jp/pri/kikanshi/pdf/2018/68_6.pdf)

(出典:国土交通省「世界で進行する都市化の傾向と都市開発戦略(その1)」,2018)

[https://www.mlit.go.jp/pri/kikanshi/pdf/2018/69\\_6.pdf](https://www.mlit.go.jp/pri/kikanshi/pdf/2018/69_6.pdf)

世界で進行する都市化の傾向と都市開発戦略(その2)～香港の都市開発戦略～

<https://www.jica.go.jp/publication/mundi/1502/ku57pq00001o9vm7-att/03.pdf>

JICA「データで見るアフリカの経済」

# To prevent youth suicide

## Relation between people and hearts

ID5314 氏名小林兜真

### Abstract

According to a report of WHO in 2012, young people between 15 years old and 25 years old committed suicide the most than any other people. In addition, suicide account for 1.4 percent of the cause of death, but paying attention to young people, suicide comprise about 8.5 percent of that and suicide is the second cause of death for the youth. The aim of this study is that everyone can find the way of saving yourself. I analyzed about the reason why young people think that they want to commit suicide and I researched about the counselors. The way of research was mainly information gathering on the Internet and looking at books in the library. In gathering information on the Internet, it was difficult to collect information on suicide outside of Japan. In addition, some information was unreliable, so I was able to conduct my research by looking at figures from credible WHO reports and other sources to see if they were believable or contradictory. The causes of suicide among young people cannot be summarized in a single cause. This is because suicide is not the result of one specific cause, but a chain of various causes. Examples of reasons include gender issues, economic issues, school issues, health issues, and family issues. Suicide is not caused by just one of these issues, but rather by a chain of various factors that have diverse and multiple causes and backgrounds.

### Introduction

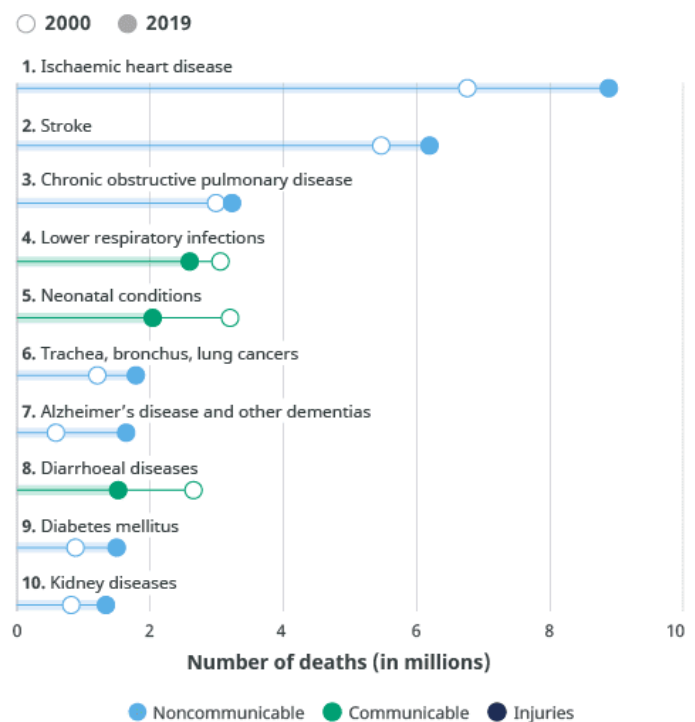
Young people between 15 years old and 25 years old committed suicide the most than any other people. In addition, suicide account for 1.4 percent of the cause of death, but paying attention to young people, suicide comprise about 8.5 percent of that and suicide is the second cause of death for the youth. The aim of this study is that everyone can find the way of saving yourself. I analyzed about the reason why young people think that they want to commit suicide and I researched about the counselors. The causes of suicide among young people cannot be summarized in a single cause. This is because suicide is not the result of one specific cause, but a chain of various causes. Examples of reasons include gender issues, economic issues, school issues, health issues, and family issues. Suicide is not caused by just one of these issues, but rather by a chain of various factors that have diverse and multiple causes and backgrounds.

## Discussion and implications

According to the National Police Agency, the total number of suicides in Japan peaked at 34427 in 2003 and has been decreasing year by year. However, the total number of suicides among teenagers and people in their 20s is increasing year by year. In addition, when looking at suicides worldwide, Greenland is in first place, Lithuania in second place and South Korea in third place. Why does Greenland have the highest number of suicides? Most of Greenland's citizens have high incomes, a world-class standard of living and good social security. However, approximately 20% of the population attempt suicide at least once. There are two reasons for this. The first is alcoholism and the second is depression and insomnia due to lack of sunlight, both of which are social problems in Greenland. Japan was ranked 13th. According to the WHO report, 800 000 people commit suicide annually, and a simple calculation shows that one person dies by suicide every 40 seconds. See Figure 1. This graph shows the causes of death worldwide. It shows that the leading cause of death is ischaemic heart disease, which is a general term for diseases such as myocardial infarction and angina pectoris that occur when there is insufficient blood supply to the heart muscle. Deaths from ischaemic heart disease have increased by more than 2 million over the past 20 years, reaching 8.9 million in 2019; it is estimated that 16% of all deaths in 2019 were due to ischaemic heart disease; in second place is stroke, which kills around 6 million people; in third place is lung cancer, which is the most common cause of death in the world.

Third place goes to lung cancer. Have you noticed anything so far? Yes, suicide is not in the top ten. Some people may think that, based on the results so far, more people could be saved by improving medical care than by trying to reduce the number of suicides. However, if we look at the causes of death among young people around the world, the leading cause of death is road traffic accidents, and the second leading cause is suicide. I think it's great that we are improving health care and saving a lot of people, but I think it's very serious that we are losing young people to suicide, who still have a future. Saving the increasing number of young people committing suicide and creating a brighter future is the reason why I wanted to do this research and why it is so important.

Leading causes of death globally



Source: WHO Global Health Estimates.

## Conclusion

Based on the results so far, some people may think that more people could be saved by improving healthcare than by working to reduce suicides. However, if we look at the causes of death among young people around the world, the number one cause of death is road traffic accidents and the number two is suicide, and suicide, which was not even in the top ten causes of death when looking at the causes of death regardless of age, has risen sharply to number two. I think it's great that we are improving health care and saving a lot of people, but I think it's very serious that we are losing young people to suicide, who still have a future. This research is about saving the increasing number of young people committing suicide and creating a brighter future.

## References

[https://shodo-kanji.com/word/w\\_hogoshi.html](https://shodo-kanji.com/word/w_hogoshi.html)

<https://fk-vintage.com/iranaihanshi/>

[http://shodo-seisen.com/blog\\_old/blog\\_20140217.html](http://shodo-seisen.com/blog_old/blog_20140217.html)

<http://ecoshin.or.jp/sub2.html>

<http://ecoshin.or.jp/sub2.html>

[https://www.google.com/search?q=%E6%8A%98%E3%82%8A%E7%B4%99%E3%80%80%E8%A2%8B&tbn=isch&ved=2ahUKEwix6pawwt\\_0AhUH8ZQKHeKJCCUQ2-cCegQIABAA&oeq=%E6%8A%98%E3%82%8A%E7%B4%99%E3%80%80%E8%A2%8B&gs\\_lcp=CgNpbWcQ](https://www.google.com/search?q=%E6%8A%98%E3%82%8A%E7%B4%99%E3%80%80%E8%A2%8B&tbn=isch&ved=2ahUKEwix6pawwt_0AhUH8ZQKHeKJCCUQ2-cCegQIABAA&oeq=%E6%8A%98%E3%82%8A%E7%B4%99%E3%80%80%E8%A2%8B&gs_lcp=CgNpbWcQ)

<https://www.who.int/data/gho>

# Muscle training and mental health

## Healthy life

5315 Ibuki Saito

### •Abstract

Currently, the increase in the number of depressed patients is a worldwide problem. I decided to solve this problem by utilizing my hobby of muscle training. Brain hormones secreted by exercise promote mental stability and alleviate physical and mental distress. In addition, the change in appearance due to muscle training is expected to improve and encourage improvement of low self-esteem, which is also a cause of depression. Using these results, I am considering proposing the establishment of gyms and opportunities for people to easily engage in muscle training.

### •Background

The World Health Organization (WHO) reported that the total estimated number of depressed people worldwide reached 322 million as of 2015, an increase of more than 18% from 2005. In terms of distribution by region, the Asia-Pacific region accounted for about 48% of the global total, the Americas about 15%, and Europe about 12%. This data indicates that the increase in the number of depressed patients, especially in the Asia-Pacific region, is currently a problem. In Japan, the number of depressed patients attending hospitals is estimated at 960,000 (:Ministry of Health, Labor and Welfare Patient Survey 2011), while the actual number of depressed patients in Japan is estimated to be between 3.6 and 6 million (:WHO).

Depression, unlike a simple injury, is a mental illness that is often unrecognized by the patient themselves as well as by others. This is one of the reasons for the difference between the number of depressed patients visiting hospitals and the actual number of depressed patients in the data above. When I wondered what an effective solution to this situation might be, I remembered that my hobby of strength training is said to be closely related to mental health. This study is an attempt to deeply consider the effects of strength training as a preventive method rather than a cure for depressed patients, and to develop a realistic solution using this method.

The research question for this study is: "What are the measures that need to be taken to prevent and treat depression worldwide, using muscle training as the main tool? The goal is to improve the health of all mankind. Until now, depression has been thought of as a disease of the brain, but recent research has produced a series of results suggesting that it may be a type of lifestyle disease that is deeply related to lifestyle habits. Therefore, I wondered if we could reduce the number of patients suffering from depression by making effective use of muscle training, which has a benign effect on mental health and also leads to lifestyle modification. By conducting

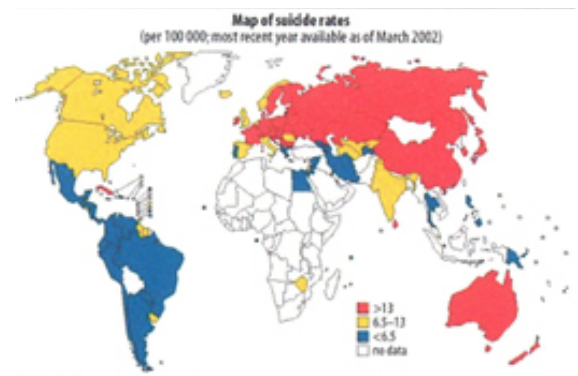


this research, we can expect not only a reduction in the number of depressed patients, but also secondary benefits such as improved physical fitness and obesity.

Gathering information using the Internet (literature, etc.)

#### •Result

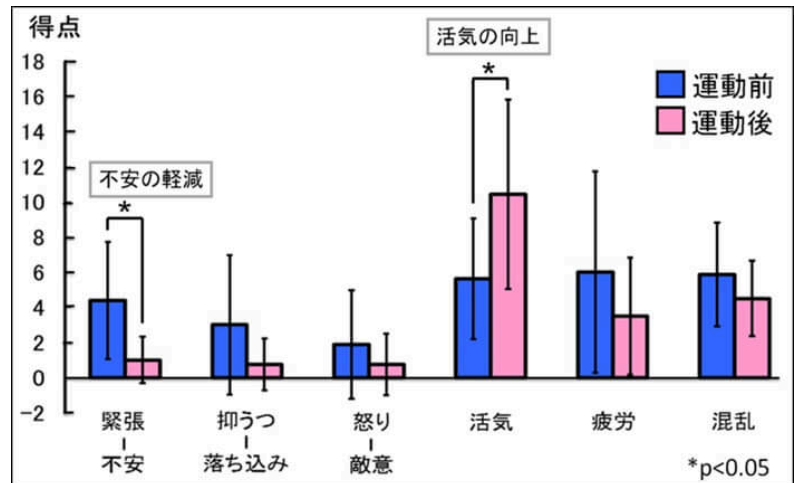
Worldwide, there are about 1 million suicides per year, 10~20 million suicide planners, one person dies by suicide every 40 seconds, and one person attempts suicide every 3 seconds. The graph on the right is a global suicide rate map (:WHO), which shows the ratio of suicides to population in each country by color. The graph shows that suicides, in other words, patients with severe depression, are distributed mainly in the Asian region. As mentioned in the background of the study, the current number of depressed patients is 322 million (2015), and it continues to rise gradually.



The symptoms of depression can be divided into two main categories: psychological and physical symptoms. Psychiatric symptoms are the core symptoms of depression. They include depressed mood, low motivation, anxiety, irritability, difficulty concentrating, and pessimistic thinking. The diagnosis of depression is primarily based on an interview of these mental symptoms and a comprehensive assessment. In addition, the severity of these symptoms is characterized by the fact that they change over time, and it is important to take this into consideration during treatment over the long term. Somatic symptoms refer to physical symptoms caused by an imbalance of the autonomic nervous system due to the strong stress and impaired brain function in depression. The most characteristic symptom is sleep disturbance, which is present in as many as 90% of depressed patients. Other symptoms include decreased appetite, lethargy, diarrhea and constipation. There are three main treatments for depression: rest, psychotropic medication, and psychotherapy.

Depression is not just a disease, but is considered to have many treatment options. The one I would like to focus on in this study is muscle training. Muscle training is literally "strength training," and its main goal is to strengthen muscles through anaerobic exercise. At first glance, there is no relationship between depression and muscle training, but recently I have seen a number of references describing this relationship. First, I would like to discuss the relationship between those two things, which are the basis of this study.

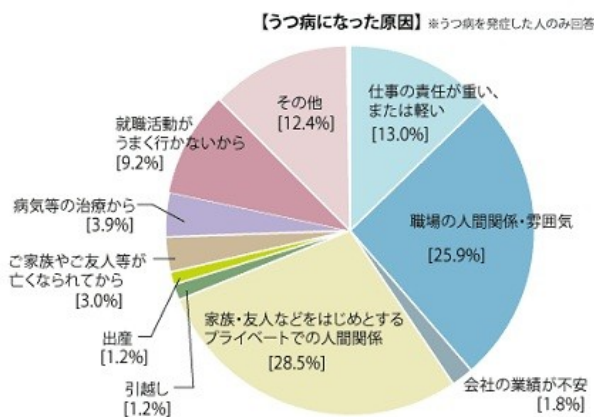
The graph on the right is the "Mood Questionnaire Before and After Exercise" (:Ikuo University 2014). This is not limited to muscle training, but rather to the broad category of exercise (aerobic exercise), but all of the items can be said to promote mental stability and mood elevation. In particular\*, the percentage of serotonin, a neurotransmitter, in urine was found to be higher after exercise. This result reveals the effect that exercise has on mental health. So why the emphasis on muscle training?



As it turns out, there was no significant difference between the effects of aerobic exercise and muscle training on mental health. Both types of exercise produce brain hormones such as serotonin, dopamine, endorphins, and testosterone, which are known to elevate mood and reduce physical and mental distress. However, there is a major difference between strength training and aerobic exercise. The difference is in how one's body looks.

Although we were unable to obtain specific survey results, from the experience of people involved in the medical field of depression, such as Mr. Hisashi Kaneko of Keiseikai Medical Corporation and Mr. Mikiya Takasu of Takasu Clinic, it seems that

depression and self-esteem are closely related. The graph on the left shows the results of the "Causes of Depression" section of the survey on "Job Hunting and Depression" (:Life Improvement Web 2014). As can be seen from the results, about half of the respondents were depressed because of their relationships, and this fact seems to have promoted a decline in their sense of



self-esteem. This is where the effects of muscle training come into play. Muscle training is about strengthening muscles, so of course there will be changes in the appearance of the body due to the building of muscles. Such changes, which are easily noticed by the respondents themselves, lead to an increase in their sense of self-affirmation, as they feel that they have achieved something through their own efforts and that they have the power to change something. These data clearly indicate that muscle training is effective against depression.

## ※Serotonin

Serotonin is known to control mood and emotions by regulating other neurotransmitters such as dopamine and noradrenaline. Depletion of serotonin is known to increase the susceptibility to mood disorders such as depression and other psychiatric disorders.

### ・Conclusion

My conclusion is to establish a gym company where muscle training is readily available. The goal is to take advantage of the positive impact of exercise on mental health and to reduce the number of pre-depression patients. At first glance, this approach may seem a long way off, but it may be an effective measure to combat depression, which is difficult to treat and even more difficult to detect. There are currently several similar companies, but they have many problems. So I would like to create one whose main goal is to address depression while improving those problems.

future issues

- ・What specific exercises should be performed?
- ・How do we attract customers of all ages?

### ・References

[うつ病の人は世界で3億2千万人 WHOが推計 - Science Portal](https://scienceportal.jst.go.jp/newsflash)

<https://scienceportal.jst.go.jp/newsflash>

[あの人が「うつ病」を自覚できない最大の理由 | 健康](https://toyokeizai.net/life/health)

<https://toyokeizai.net/life/health>

[図表1-2-9 こころの病気の患者数の状況 - 厚生労働省](https://www.mhlw.go.jp/hakusyo/kousei/backdata)

<https://www.mhlw.go.jp/hakusyo/kousei/backdata>

[うつ病 | こころの病気を知る | メンタルヘルス - 厚生労働省](https://www.mhlw.go.jp/know/disease/depressive)

<https://www.mhlw.go.jp/know/disease/depressive>

[筋トレはメンタルも強化する！良い影響がある理由と5つの ...](https://www.cospa-wellness.co.jp/cospa/labo)

<https://www.cospa-wellness.co.jp/cospa/labo>

[メンタルが弱い女性こそ筋トレを！不安やイライラを鎮める ...](https://www.karakoto.com/.../心の健康/不安)

<https://www.karakoto.com/.../心の健康/不安>

[筋トレがメンタルヘルスに及ぼす影響 | 医療法人社団 平成医会](https://heisei-ikai.or.jp/column/muscle-training)

<https://heisei-ikai.or.jp/column/muscle-training>

[Testosterone「自信がない人は筋トレしろ。不安・焦燥を取り ...](https://r25.jp/article)

[https://r25.jp > article](https://r25.jp/article)

[筋トレがメンタルに及ぼす5つの効果？心身ともに強くしよう！](https://fukuyamaseitai.com/symptoms/post-3532)

[https://fukuyamaseitai.com > symptoms > post-3532](https://fukuyamaseitai.com/symptoms/post-3532)

[メンタルの強さは筋トレで鍛えられる！筋トレがメンタルを ...](https://findtrainer.jp/training)

[https://findtrainer.jp > トレーニング](https://findtrainer.jp/training)

[筋トレでメンタルは強くなる？筋トレに隠された効果を研究 ...](https://ufit.co.jp/Home/training)

[https://ufit.co.jp > Home > トレーニング](https://ufit.co.jp/Home/training)

[筋トレでメンタルを強化？！鍛えることが心身に与える5つの ...](https://247-workout.jp/article/training)

[https://247-workout.jp > article > training](https://247-workout.jp/article/training)

[就活が原因でうつ病になった人は1割、世代別では現在活動中 ...](https://news.mynavi.jp/work&ライフ/キャリア)

[https://news.mynavi.jp > ワーク&ライフ > キャリア](https://news.mynavi.jp/work&ライフ/キャリア)

[自己肯定感と抑うつ - 新潟市医師会](https://www.niigatashi-ishikai.or.jp/psychiatry-memo)

[https://www.niigatashi-ishikai.or.jp > psychiatry-memo](https://www.niigatashi-ishikai.or.jp/psychiatry-memo)

[なぜ“筋トレをすると自信がつく”と言われるのか？運動時に ...](https://melos.media/健康)

[https://melos.media > 健康](https://melos.media/健康)

[うつ病 - こころの情報サイト](https://kokoro.ncnp.go.jp/disease)



こころの情報サイト

[https://kokoro.ncnp.go.jp > disease](https://kokoro.ncnp.go.jp/disease)

<https://kokoro.ncnp.go.jp/disease.php?@uid=9D2BdBaF8nGgVLbL#:~:text=%E3%80%8C%E3%81%86%E3%81%A4%E7%97%85%E3%80%8D%E3%81%A8%E3%81%AF,%E3%81%AA%E3%81%8F%E3%81%AA%E3%81%A3%E3%81%A6%E3%81%84%E3%82%8B%E7%8A%B6%E6%85%8B%E3%81%A7%E3%81%99%E3%80%82>

<https://kokoro.ncnp.go.jp/disease.php?@uid=9D2BdBaF8nGgVLbL#:~:text=%E3%80%8C%E3%81%86%E3%81%A4%E7%97%85%E3%80%8D%E3%81%A8%E3%81%AF,%E3%81%AA%E3%81%8F%E3%81%AA%E3%81%A3%E3%81%A6%E3%81%84%E3%82%8B%E7%8A%B6%E6%85%8B%E3%81%A7%E3%81%99%E3%80%82>

# Review of the Local Health Care System

- Reviewed in the reform of the way we work -

5316 Shinnosuke Sakamaki

## Abstract

After Covid-19 came to Japan, the medical system had to be reviewed. In some regions, medical care became tight, and in urban areas, the lack of hospital beds became a problem. I came up with the theme of this study to see what could be done to review the medical system and alleviate the uneven distribution of doctors in the region. Through this research, I believed that by finding problems and issues in reforming the way doctors work, it would be possible to make their work easier and increase their motivation.

## 1 Introduction

Covid-19 came from China in 2020. The virus caused the breakdown of the medical system. Japan's medical system is highly technological, and the average life expectancy is getting longer. However, a problem with the medical system has occurred in Japan.

I thought that we could work to alleviate the pressure on health care in the region. Even though the number of doctors is increasing, it may be possible to spread out the number of doctors in the region by reviewing the way doctors work, as there are severe disparities in medical care in the region.

To examine the current state of the medical system, we will look into the reform of the physician workforce. Since there is not much prior research, I will come up with my own conclusions and measures.

## 2 Discussion and implications

### What is Community Healthcare?

Community medicine is a medical activity to watch over and support local residents so that they can live their lives with peace of mind. It pays close attention to their various health concerns and worries and responds appropriately to them, as well as to the lives of the residents at large.

### Problems and Current State of Local Medical Care

Uneven distribution of doctors in urban areas, lack of people working at night, and poor access to hospitals.

### Advantages and Disadvantages of Online Medical Treatment

#### Advantages Disadvantages

Patient's side: Easy access to medical care, no need to go to the hospital, reduction of transportation costs

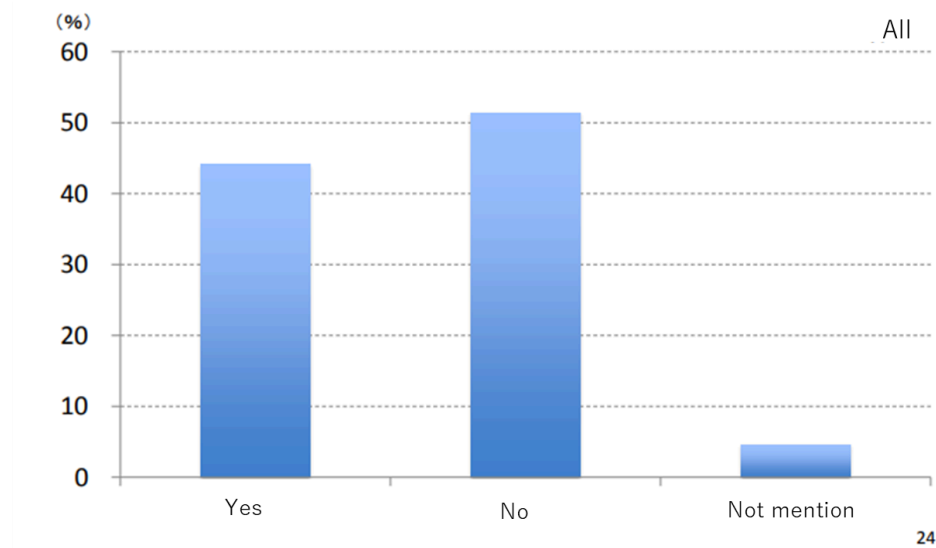
Doctor's side: only need to see the patient at the appointment time.

#### Disadvantages

Patient's side: Sometimes online connection is not available.

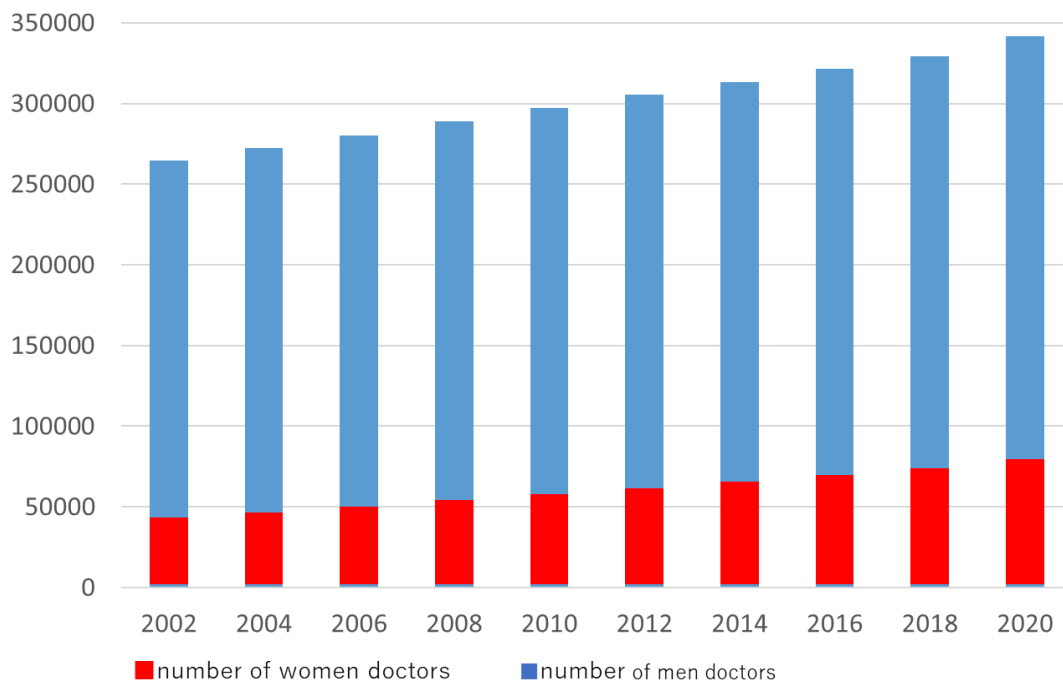
Doctors' side: Difficulty in palpation, etc. Cannot provide medical care

## Willingness to work outside of urban areas

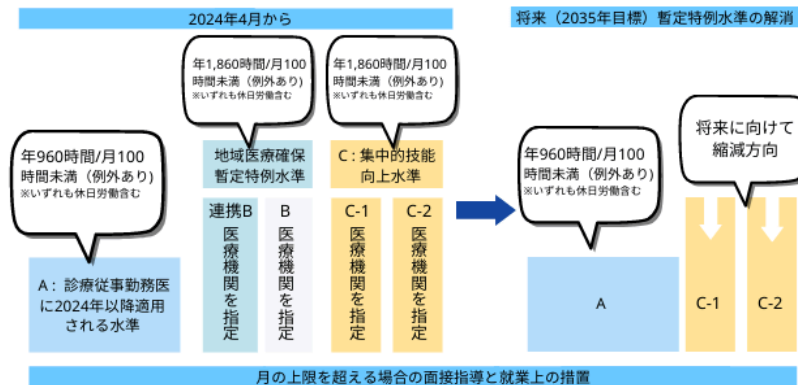


About 40 percent are willing to work outside of urban areas. Many doctors are concerned about the educational and working environment in the countryside compared to the city, which has caused the rural areas to be concentrated in urban areas.

## Number of male and female doctors



## 医師の働き方改革のイメージ



Although the number of physicians is increasing by about 4,000 each year, there is still a small distribution of doctors. The current number of physicians is 339,623. Doctors are concentrated in urban areas, and local medical care is becoming unevenly distributed. This has been accelerated by the fact that residents can now choose the hospitals where they can train. My concern is that the work schedule will reduce doctors' working hours, and that they will have less time to see their patients.

### 3 Conclusion

Innovate initiatives that can improve local health care. It is difficult to make new reforms when we link data from anywhere with vague conclusions. If we can keep what doctors can implement regarding medical care and increase what nurses, laboratory technicians, and others other than doctors can do, the burden on doctors will be eliminated.

### 4 References

[医師の勤務実態及び働き方の意向等に関する調査 \(mhlw.go.jp\)](https://www.mhlw.go.jp)

from ministry of health, labor and welfare 2/12

[地域医療、6つの問題点と今後期待されること | 女性ヘルスケアマーケティングのウーマンズラボ \(womanslabo.com\)](https://womanslabo.com)

about local health care 1/23

<https://www.dtod.ne.jp/dekurasu/kouroushou/>

Measures to prevent uneven distribution of doctors 4/3

<https://www.mhlw.go.jp/content/10800000/000818136.pdf>

Reforming the way doctors work Ministry of Health, Labour and Welfare 5/7

# Reorganization of TSE

## How to bring global investment

5317 Shingai Koya

### 1. Abstract

In April 2022, TSE (Tokyo Stock Exchange) was reorganized into three markets: Prime, Standard, and Growth, replacing the five markets: TSE 1st and 2nd section, JASDAQ (Japan Securities Dealers Association Quotation System), and MOTHERS. (JASDAQ has two markets: Standard and Growth) Therefore, I continue studying about “Listed Goal” relation to the growth market to make it safer for investors to invest.

### 2. Backgrounds

You know 4 markets of Tokyo Stock Exchange have been divided into 3 new markets named Prime, Standard, Growth in April 2022. It is because the market capitalization of JPX (Japan Exchange Group) became lower than other world-wide markets, and declined the market presence. In addition, TSE had a lot of problems; (the profitability of listed companies was low, the criteria of list and keep listing five markets is ambiguous, the number of companies belonged to TSE 1st section was too large, some companies became a company with low prospect of the future and TOPIX (Tokyo Stock Index) has distorted, and so on) and they think that the problem is cause the convenience and reliability of deal. As one of them, “Listed goal” is raised. Listed goal is the word; Indicator that founder, venture capital etc. prioritize profiting from listing rather than sustainable progress of company value. In fact, many venture companies go bankrupt doing that. I believe that if these problems could be eliminated, many investors would feel more comfortable investing in such companies.

### 3. Purpose and importance

TSE is the biggest stock exchange place in Japan, manages the financial market with a license as a financial exchange based on financial instruments and exchange act, and deals with many finance products like domestic and overseas issue stocks, corporate bonds, government bonds etc. Moreover, TSE is called the three major exchanges in the world. Therefore, the TSE is a big exchange. But the market capitalization is low compared to other stock exchanges in the world. One reason this happens is the environment that investors would invest safely isn't easy. In other worlds, the great effect doesn't appear. Therefore, I think that if I can find and spread some idea that makes investors feel more comfortable when they transport, the amount of investment will increase, much money will accumulate in each company, large projects can be undertaken, and finally world-wide economics will boost more and more owing to the TSE.



#### 4. Discussion and implications

TSE has reorganized to improve roughly three points:

The concept of each market classification is ambiguous, the utilization is low for many investors. Next, the role that is expected in terms of the motivation of sustainable improvement of corporate value about the listed companies

Third, the index that functions as an object to invest and market representativeness doesn't exist.

But, this effect doesn't work perfectly due to transitional measures and discrimination.

So, I think they should be focused on these 4 points:

At Prime market, raise the basics of market capitalization about listing maintenance standards by almost hundreds of million yen from 10 years to 20 years.

At Standard market, raise the number of companies which are assessed at this market carrying on the strategy of suitable management.

At Growth market, enhance some systems that start-up-company are given financial tension for institutional investors.

Maintenance of a delisted market like the system of marketmaker.

Actually, it is so difficult that I can't suggest these alternative plans. So I continue studying in particular the Growth market.

Growth market is pointed to the problem of "listed goals". From now on, there were a lot of companies which didn't make an effort to increase market capitalization. So I think market capitalization was not so high because investors felt disappointed and they didn't invest a lot.

So there, I suggest new ideas which is associated with virtual money and crowdfunding (but it doesn't occur profits)

The system and index I want to introduce:

##### ○Provisional investment system

Each investor gains a certain percentage of their own assets as a provisional asset and makes a provisional investment in each company.

##### ○the Index of provisional expectations for start-up companies

This index shows how much each company gathers provisional assets compared to other companies.

Calculate

(the provisional assets of one's company

all companies listed on the Growth market

×-----)×100

total provisional capital

•The criterion is 100.(= Average provisional capital acquired per company is regarded as 100.)

•if the index shows over 100, it is able to say that the company gathered provisional assets a lot.

○provisional capital of the average investor

This shows how much each investor invests provisional money.

Calculate

$$\frac{[(\text{initial provisional assets of each investor} - \text{temporary assets at the time of calculation for each investor}) / \text{the number of day from when an investor starts investing to when he finishes}] + (\dots \text{repeat this operation for each investor})}{\text{total number of investors}}$$

○The positive effect to set the index

The Index of provisional expectations for start-up companies

Provisional corporate value from an investor prospecting shows clearly, so the consignment is able to do with reducing risks naturally. Bui, it is only a provision.

Provisional capital of the average investor

By allowing each investor to know the investment amount of other investors, it is possible to prevent unintended provisional investments. However, there is also a possibility that restrictions are too effective because the value is a rough estimate of all investors.

## 5. Conclusion

These systems and indexes have several advantages and disadvantages.

On the company's side, it is possible to know in terms of investment how much consumers expect what it is that the company wants to develop.

On the investor's side, they can see how much other investors are expecting the same thing from a company, which makes it easier to make the resulting investment.

Thus, low-risk investment becomes possible.

But, Some investors may not participate in such a system because they want high risk/high return. And, product development, especially for technology and innovative ideas, may not like this time-consuming system because ventures may want to get started on product development as soon as possible.

With this in mind, I would like to explore ways to reduce the disadvantages and communicate them to the world in the future.

## 6. Literature

<https://www.homemate-research-stock.com/useful/tokyoshouken/>

<https://www.jpx.co.jp/equities/market-restructure/market-segments/index.html>

<https://www.lvmag.jp/column/yomanai/28315/>

<https://www.jri.co.jp/MediaLibrary/file/report/researchfocus/pdf/13304.pdf>

<https://www.soico.jp/ipo-goal/#:~:text=%E4%B8%8A%E5%A0%B4%E3%82%B4%E3%83%BC%E3%83%AB%E3%81%A8%E3%81%AF%E3%80%81%E7%B6%99%E7%B6%9A,%E8%A1%8C%E3%81%86%E3%81%93%E3%81%A8%20%E3%82%92%E3%81%84%E3%81%84%E3%81%BE%E3%81%99%E3%80%82>

<https://gendai.media/articles/-/69525?imp=0>

<https://hataractive.jp/useful/2658/>

<https://kigyolog.com/article.php?id=396#:~:text=%E6%A0%AA%E5%BC%8F%E6%8A%95%E8%B3%87%E5%9E%8B%E3%82%AF%E3%83%A9%E3%82%A6%E3%83%89%E3%83%95%E3%82%A1%E3%83%B3%E3%83%87%E3%82%A3%E3%83%B3%E3%82%B0%E3%81%A8%E3%81%AF%E3%80%81%E9%9D%9E%E4%B8%8A%E5%A0%B4,%E5%8F%97%E3%81%91%E3%82%8B%E3%81%93%E3%81%A8%E3%82%82%E3%81%A7%E3%81%8D%E3%81%BE%E3%81%99%E3%80%82>

# **Low Birth-weight Infants We Can Save**

A step toward reducing child mortality rates

5318 Sekiguchi Miyu

## **Abstract**

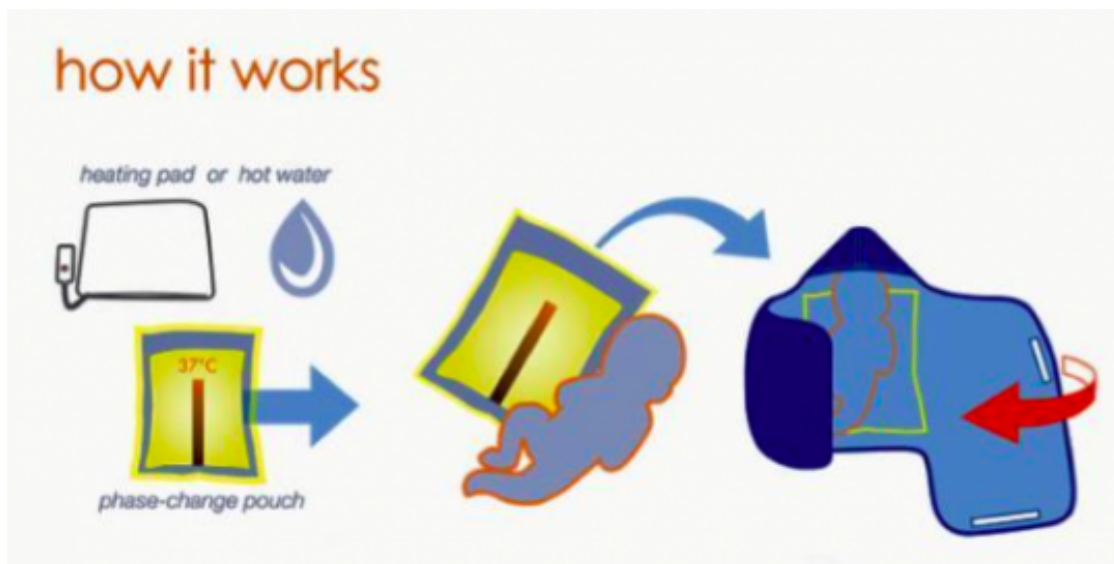
There are children born with a low birth weight which is less than 2500g in the world. They have the risks of death and developmental delay. Therefore the aim of this study is to clarify the cause of low birth-weight infant's death and make them survive better. For that reason, my research questions are "How can we save low birth weight infants? How can we lower the health risks after low birth weight infants are born?" I began to grasp what low birth weight infants are and the problem they face by researching the Internet and reading preceding studies. Then, I visited the Centre for innovation in healthcare in Singapore to deepen my knowledge of medical devices developed by innovation. Through research, I found it difficult to resolve problems rooted in the local area. Thus, I propose to promote the widespread use of portable infant incubators which is called "Embrace". If this study is successful, it may be able to reduce child mortality rates and it will stabilize the population in the world. Women no longer need to give birth to many children and at the same time the population explosion would be controlled.

## **Introduction**

There is terrible data about low birth weight infants. It is that more than 80% of the 2.5 million newborn deaths worldwide each year are due to low birth weight. That is the reason I researched low birth-weight infants. To begin with, what is the definition of low birth weight infants? They are newborns who are born under 2500g. Incidentally, someone who is born under 1500g is called a very low birth-weight infant. Birth weight is an important measure of their mother and themselves health. At the same time, it can be a significant determinant of medical outcomes. Low birth weight infants have a greater risk of both short and long term disadvantages in their health. As a short term risk, because of undeveloped health systems, their bodies tend to get cold and the probability of death is higher than usual. As long term risks, some researchers pointed out that educational disadvantage associated with low birth weight persists into early adulthood. For example, fewer very low birth weight young adults had graduated from high school than normal birth-weight adults. That is because such children have poorer cognitive function and academic performance. Some low birth weight infants also have chronic illness and handicap. During study, I found that there are two main inducements of low birth-weight infants. First, about pregnant women, they are too young or too old and suffer from infectious disease or other illnesses. Second, about the environment, people have bad nutritional conditions and water supply or other infrastructure is lacking. These problems are occurring not only in developing countries but also in developed countries. However, they are difficult to solve because they are rooted in each area.

## Discussion

I visited the Centre for innovation in healthcare in Singapore in autumn 2023. At that time, I learned much but I will introduce the main two points. To begin with, it is necessary to generate innovation to combine some things which exist around you. Now, many convenient products are already created and it is pretty hard to come up with an idea about something completely new. Next, there is a portable device for pregnant women. I was able to learn information about innovative healthcare devices. Most of them were developed by National University of Singapore and some of them were already being used. It was one of them. With this device, pregnant women can examine their unborn children even though there is no hospital near them. I thought this device was very effective but my research question is “How can we save low birth weight infants? How can we lower the health risks after low birth weight infants are born?”. Then I suppose a portable device for infants is best to solve the problem. Here, I will present a similar innovation “Embrace”. It aims to help millions of vulnerable babies through a low cost infant warmer which is safe, portable, easy to use and can work without electricity(diagram 1).



(diagram 1)

## Implications

I would like to create innovation combining two preceding innovation devices. They are portable devices for pregnant women and infants. Actually, Embrace, which was developed by Jane Chen in 2014, was already being used mainly in India. It is less difficult to carry out innovation with products being used than new ones. I think about the system that inspects the risk of low birth weight infants with products for pregnant women and delivering rapidly Embrace to care. The limitation is the cost problem to carry the devices. Then my idea for future research is to try to put it into practice.

## **Conclusion**

I research how to solve the problem of low birth weight infants, which is related to the population problem. I would like to create innovation with two portable devices for pregnant women and infants and save low birth weight infants.

## **References**

Centre for Innovation in Healthcare

[Centre for Innovation in Healthcare - NUHS Centres](#)

2023/6/20

Doherty, T., & Kinney, M. (2019). Low birthweight: will new estimates accelerate progress?

*The Lancet*, 7, E809-E810.

[https://doi.org/10.1016/S2214-109X\(19\)30041-5](https://doi.org/10.1016/S2214-109X(19)30041-5)

2023/10/10

Malleett-Moore, A. Baedaji Maureen Hack, M.B., Ch.B., Daniel J. Flannery, Ph.D., Mark Schluchter, Ph.D., Lydia Cartar, M.A., Elaine Borawski, Ph.D., and Nancy Klein, Ph.D.(2002). Outcomes in Young Adulthood for Very-Low-Birth-Weight Infants

*The New England Journal of Medicine*, 349, 149-157.

<https://www.nejm.org/doi/pdf/10.1056/NEJMoa010856?articleTools=true>

2023/1/15

## Utilization of Cells

Toward the Application of Honeycomb Core to Housing

5319 Aoi Takeuchi

### **Abstract**

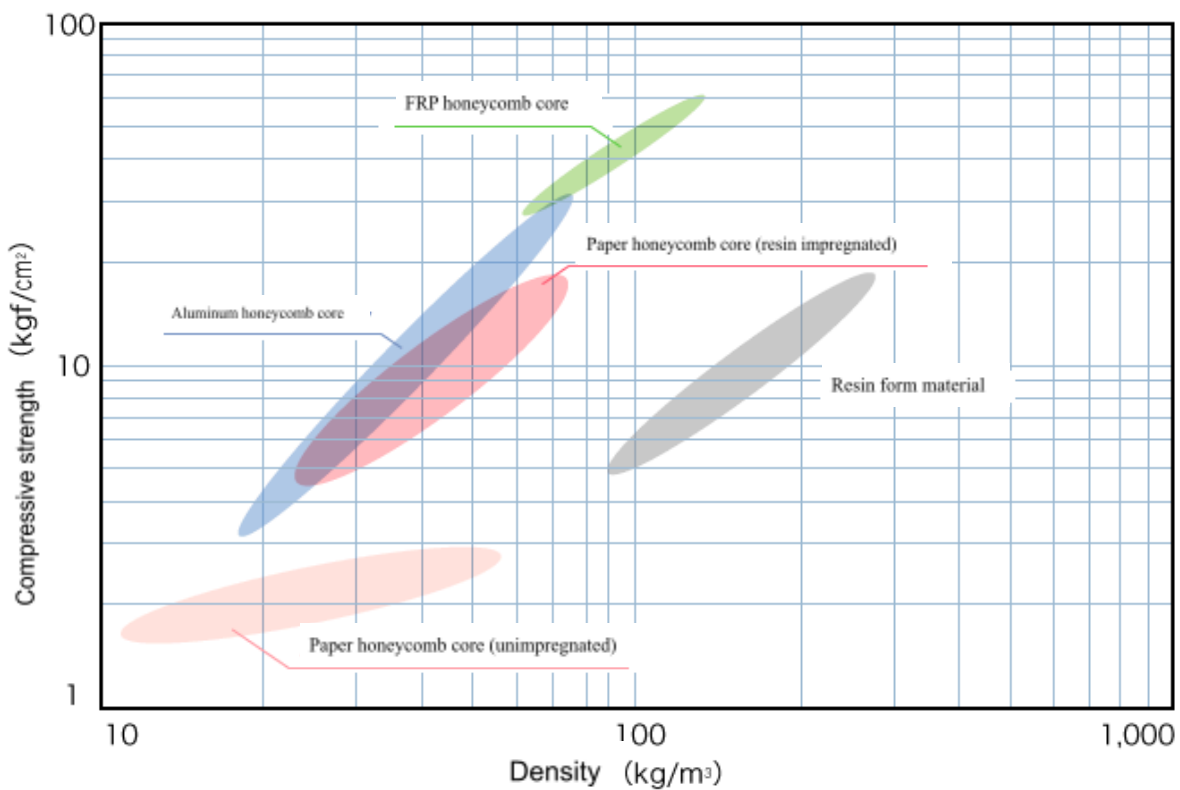
Now the price of foundation work occupies one-tenth of the cost of constructing a house, so I thought of how to lower the price of that. Then, I focus on the honeycomb core. It is a very light, but hard material. The cheapest standard of aluminum honeycomb was found to be able to withstand the weight of a house, but its service life was short at 15 years, making it unsuitable for house foundations. Although CFRP(Carbon-Fiber-Reinforced Polymers) was strong and had a reasonable service life, it was very expensive and did not fulfill its intended purpose. The final choice was steel. Although heavier than aluminum, steel is low-cost, high-strength, and, with hot-dip galvanization, has a very long service life. Future issues include the selection of the type of steel to be used and consideration of seismic resistance.

### Discussion and implications

For the material for the honeycomb core, firstly I chose aluminum from several resources in the chart below. Other materials are too weak or may do bad for the environment.

**Figure 1**

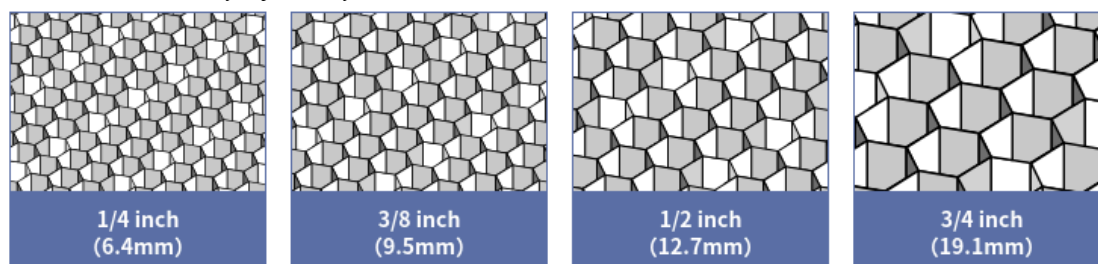
*Comparison of different types of honeycomb core*



*Note.* This chart is edited and cited from Shin Nihon Feather Core.

Also, according to Morishin Kogyo, the durability of the aluminum honeycomb panels is as follows.



**Figure 2***Size and durability of honeycomb core cells*

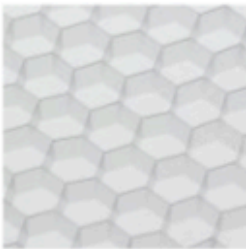
Material	Size	Thickness	Compressive strength (t/m <sup>2</sup> )	Unit weight (t10: kg/m <sup>2</sup> )
A3003 or A5052	1/4inch	25~76μm	280~428	0.74~0.85
A3003 or A5052	3/8inch	25~76μm	143~190	0.49~0.57
A3003 or A5052	1/2inch	25~76μm	98~107	0.39~0.43
A3003 or A5052	3/4inch	25~76μm	48~66	0.27~0.28

Note. This chart is edited and cited from Morishin Kogyo.

The weight of a house is generally around 1.6 tons per square meter, therefore even the largest cell size within the specifications sold by this company can withstand the weight. While there is a custom-made option, I first checked the standard products offered by this company. Here are the details.

**Figure 3***An example of the honeycomb core*

Product number No.16	
<b>Name</b>	Aluminum Honeycomb "Core" (3/4inch) *The photo is an image.
<b>Size</b>	t15×1,000×4,800mm
<b>Specification</b>	A3003
<b>Price</b>	28,000 yen (Excluding tax. Fares are separated.) For example, if you do not need all of the above dimensions, but would like one cut into 500mm squares, the price per piece will be 7,000 yen.
<b>Quantity in stock</b>	8 pieces
<b>Remarks</b>	You can also cut it to your desired size. Please inquire separately for cutting fees.



Note. This chart is edited and cited from Morishin Kogyo.

Certainly, when calculated on a per-square-meter basis, the cost of the panels is not considered, but it amounts to approximately 6,000 yen. However, a new issue arises at this point. First, the question of whether mass production is feasible. Second, is the issue of service life. While the service life of concrete is approximately 50 years, aluminum is only about 15 years. This makes it impractical as a foundation for a house, resulting in a misguided approach. Therefore, I turned my attention to coating the surface of the material. That is hot dip galvanizing. Hot dip galvanizing is a process in which steel is immersed in zinc and melted at high temperatures to form a zinc coating on the surface. The useful life is as shown below. This is based on the calculation of the period until 90% of the plating film is worn away when the zinc deposition is 550 g/m<sup>2</sup>. In addition, for large structures such as bridges, the thickness of the material is 9 to 30 mm and the amount of zinc deposition is considered to be 800 to 2000 g/m<sup>2</sup>. The service life is expected to be semi-permanent. Although steel is heavier than aluminum, aluminum costs about 340 yen per kilogram, whereas steel costs several tens of yen per kilogram. For these reasons, I decided to use steel.

#### Figure 4

##### *Zinc Corrosion Rate by Operating Environment*

Zinc Corrosion Rate by Operating Environment (JIS H 8641 Hot Dip Galvanizing)		
Exposure test area	Average corrosion rate (g/m <sup>2</sup> /year)	Useful life (years)
Urban industrial area	8.0	62
Countryside	4.4	113
Coastal zone	19.6	25

Note. This chart is edited and cited from Ōem Kogyo.

**Conclusion**

After careful consideration of various materials, the ultimate decision led us to utilize iron and implement plating. However, it's important to note that "iron" is a broad category encompassing numerous types, and my next endeavor involves precisely selecting the specific variant to meet our requirements. Given the inherent characteristics of the honeycomb core, its vulnerability to lateral impact necessitates contemplation on how to enhance its resistance, especially in scenarios such as seismic events where lateral forces might pose a threat. Additionally, contemplating the production methodology for manufacturing honeycomb panels of a scale substantial enough to serve as a foundation for a house presents yet another formidable challenge on our construction journey.

## References

「意外と知られていない！戸建住宅の「基礎工事」とは、いったいどんな工事なの？」

<https://www.inos-ie.com/topics/2018/04/20180424000892.php>

「ベタ基礎・布基礎って何？ どっちがいいの？ 家の基礎(土台)の事情」

[https://suumo.jp/article/oyakudachi/oyaku/chumon/c\\_knowhow/ie\\_kiso/](https://suumo.jp/article/oyakudachi/oyaku/chumon/c_knowhow/ie_kiso/)

福島県「応急仮設住宅の建設にかかる対応状況等報告会」

<https://www.mlit.go.jp/common/000170083.pdf>

石田 祥子「折紙工学(2)—ハニカムコアの力学—」

[https://www.jstage.jst.go.jp/article/bjsiam/30/2/30\\_27/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/bjsiam/30/2/30_27/_pdf/-char/ja)

MORISHIN「アルミハニカムパネルの技術データ」

<https://www.morishin.com/about/data.html>

軽金属商品協会「建築用アルミ表面仕上げ材の標準耐用年数指針」

<http://www.apajapan.org/APA2/pfd-files/member/bm-03.pdf>

‘TORAY」CFRPとは？ 特徴や用途から成形方法の選び方まで詳しく解説」

<https://www.carbonmagic.com/cfrp/#anc1>

Lifter「アルミハンドブック」

[https://www.lifter.co.jp/handbook\\_p2/#:~:text=%E3%82%A2%E3%83%AB%E3%83%9F%E3%83%8B%E3%82%A6%E3%83%A0%E3%81%AE%E6%A9%9F%E6%A2%B0%E7%9A%84%E6%80%A7%E8%B3%AA,%E7%82%AD%E7%B4%A0%E9%8B%BC%E3%81%AB%E5%8C%B9%E6%95%B5%E3%81%99%E3%82%8B%E3%80%82](https://www.lifter.co.jp/handbook_p2/#:~:text=%E3%82%A2%E3%83%AB%E3%83%9F%E3%83%8B%E3%82%A6%E3%83%A0%E3%81%AE%E6%A9%9F%E6%A2%B0%E7%9A%84%E6%80%A7%E8%B3%AA,%E7%82%AD%E7%B4%A0%E9%8B%BC%E3%81%AB%E5%8C%B9%E6%95%B5%E3%81%99%E3%82%8B%E3%80%82)

SUPER RESIN「CFRPの物性」

<https://www.super-resin.co.jp/cfrp/properties/#reinforced>

オーエム工業株式会社「溶融亜鉛めっき」

<https://www.om-industry.co.jp/business/hot-dip-galvanizing/feature/feature03/>

佐野重量金属株式会社「アルミの買取単価」

<https://aipo.xsrv.jp/sanometaru/%E8%B2%B7%E5%8F%96%E5%8D%98%E4%BE%A1%E4%B8%80%E8%A6%A7%E3%82%A2%E3%83%AB%E3%83%9F%E7%B3%BB%E3%81%AE%E8%B2%B7%E5%8F%96%E5%8D%98%E4%BE%A1/>

日本鉄リサイクル工業会「価格推移表」

<https://www.jisri.or.jp/kakaku>

日経XTECH「アルミ合金は鉄の1/3の軽さ、たわみは3倍だが設計でカバーできる」

<https://xtech.nikkei.com/atcl/nxt/column/18/01309/00010/>

日本建築学会技術報告集「屋外暴露 33 年目までの CFRP板の劣化状態」(米丸・桑原、2020)

[https://www.jstage.jst.go.jp/article/aijt/26/62/26\\_164/\\_pdf](https://www.jstage.jst.go.jp/article/aijt/26/62/26_164/_pdf)

# How to support new artists the evolution of the way of decide wage

ID5320 氏名Takezawa Kazutoshi

## Abstract

These days, more people are enjoying music through streaming services such as Spotify, Apple Music, Line, Amazon. Compared to the past, the ways of listening to music have become easier with the spread and evolution of the Internet. On the other hand, the number of CD sales is declining, making it more difficult to generate revenue beyond the number of CDs sold. Therefore, I would like to find the problems of the streams preventing new artists from making money and solve them. I suggest changing the way to decide the salary.

## 1 Introduction

First of all, Meanwhile, in 2022, Onkyo, a Japanese audio company, went bankrupt because demand for the company's products was decreasing. That's when I started researching, wondering if there were even bigger problems within the music industry. I also learned that streaming services offer low pay and are a difficult environment for new artists. I began this research wondering if there was anything I could do to support artists. First, We investigated how streaming services' profits are determined. Most streaming services such as Spotify divide the money collected from users based on how much of the total number of views the service accounts for. So even if a new artist gets a few hundred thousand views, it's still so small in the grand scheme of things that they won't be able to make enough money.

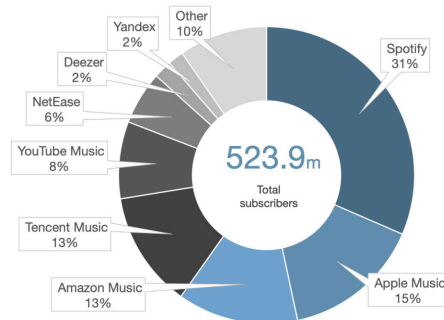
## 2 Discussion And Implications

### Current status and problems of subscription services

The number of users (paid members) of unlimited music listening services (streaming services) is 523.9 million worldwide, of which 30% use Spotify and 15% use Amazon Music. In particular, Spotify, which ranks first, has over 400 million users. Spotify is used by many people, but it is said that the revenue that artists who are listened to can earn is small. And the reason lies in the way Spotify's revenue is distributed. According to an article in Rolling Stone magazine, Spotify collects revenue from services such as monthly usage fees, removes Spotify's share (30%),

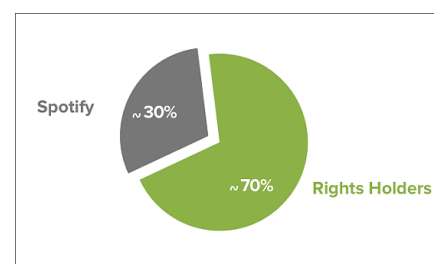
### Global streaming music subscription market, Q2 2021

Global streaming music subscription market, Q2 2021, global

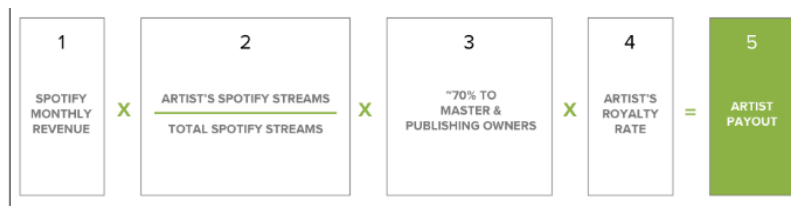


Source: MIDiA Research Music Subscriber Market Share Model 11/21

MIDiA



and distributes the rest to musicians . The distribution method is not based on the number of accounts that have played the game, but rather on the number of plays. With traditional CDs, the income could be received regardless of the sales of other musicians, but with subscriptions, the income is taken from the entire money distributed to the musicians. A bigger share for pop stars means a smaller share for minor musicians. This is a situation where someone else's sales have a deep impact on your own income. Spotify itself is said to be profitable only after reaching 500 million paying users. I found that conventional subscription services are very hard to run.



### 3 Conclusion

Based on these facts, I propose a new revenue distribution method for new subscription services.

We will pay revenue based on the percentage of the artist who was listened to from the total number of views of each individual subscription user.

This method is the easiest way to distribute profits to young artists. By introducing this method, there is a higher possibility of giving more revenue to young artists who have not yet received a lot of revenue due to the low number of plays. On the other hand, the disadvantage is that there is a difference between songs. In Japan's House of Representatives elections, there is a large difference in the number of votes required to become a member of the House of Representatives between Yamaguchi Prefecture, which has a small population, and Tokyo, which has a large population. Something similar could happen with subscription services. In particular, the amount of time spent on streaming differs greatly depending on the person, so it is possible that the amount of money given to an artist will be the same depending on whether someone has listened to a song over 100 times in a month or someone who has only listened to it 10 times.

By adding additional options to streaming, such as becoming a YouTube member, you can support her artists while also distributing exclusive information and sound sources.

By adding this option, users will feel special, more people will subscribe to it, and artists will receive additional revenue in addition to the number of plays. The advantage of this is that compared to method 1, there is no disparity in songs, and additional income can be obtained by the operating company and others, which can be used to improve its services.

On the other hand, the disadvantage of this is that the more additional options you choose, the more you will have to pay. The good thing about streaming services is that you can listen to unlimited music for a fixed monthly fee at a low price.

Therefore, eliminating its appeal would mean losing users who used to use it because they thought it was easy.

We also need to think about ways to increase the operating company's profits in the future.

#### 4 References

[【音楽学】音楽産業の歴史と発展～レコード・CD・MP3・ストリーミング～ | XERA](#)  
[音楽業界の現状・今後の動向について](#)  
[オンキヨー破産「高性能でも勝てない」時代の現実 | IT・電機・半導体・部品 | 東洋経済オンライン](#)  
[OZZY OSBOURNE On Streaming Royalties: "Spotify Is AF\\*cking Joke"](#)  
[Spotifyを痛烈に批判するジーン・シモンズ\(KISS\)「翻訳ミュージシャン」](#)  
[音楽配信を聞かすく上げたスティーブ・ジョブズ—NapsterのつまずきとAppleの理想](#)  
[定量調査からみる若者の音楽生活：コミュニケーションツールとしての音楽](#)  
[細野晴臣 いまの音楽には何か足りない感じがする | 朝日新聞デジタルマガジン&\[and\]](#)  
[世界の音楽市場、2020年は7.4%増の売上216億ドルに到達。IFPIレポート解説](#)



# the Formation of a Sustainable Society

～Recycling-oriented society through the use of resource～

5321 Tajiri Kaito

## Abstract

In recent years, garbage emissions have become a growing problem in the world. The more the population is increasing, the more the amount of garbage produced in the world is increasing. However, according to the OECD, less than 50% of the waste is recycled. In addition, The recycling rate of Germany and Austria is about 60%, while that of New Zealand and Turkey is about 0%. Accordingly, there is a difference between developing countries, where recycling is less advanced, and developed countries, where recycling is more advanced. In addition, the recycling rate for each resource is 77% for paper, while the recycling rate for plastic is low at 42%. So, I thought the problem of plastic waste was especially a problem to solve. The effects of this problem include global warming and its impact on living organisms. Then, we decided to focus on plastics with the goal of reducing the number of discarded plastics. Through this research, we believe we can come closer to solving these problems. Next, we examined the propensity to recycle plastics and found that the propensity to recycle is particularly low in Africa and Asia. Furthermore, we investigated why the amount of plastic waste generated is low. We found that the reason for this is a matter of cost and technical capacity. Therefore, we thought that measures that could be taken in developing countries were necessary. Next, we looked into the measures that are currently being taken, and found that in countries such as Germany, weighing is being used. We believe that this is an effective measure that can be taken in developing countries as well.

## 1 Introduction

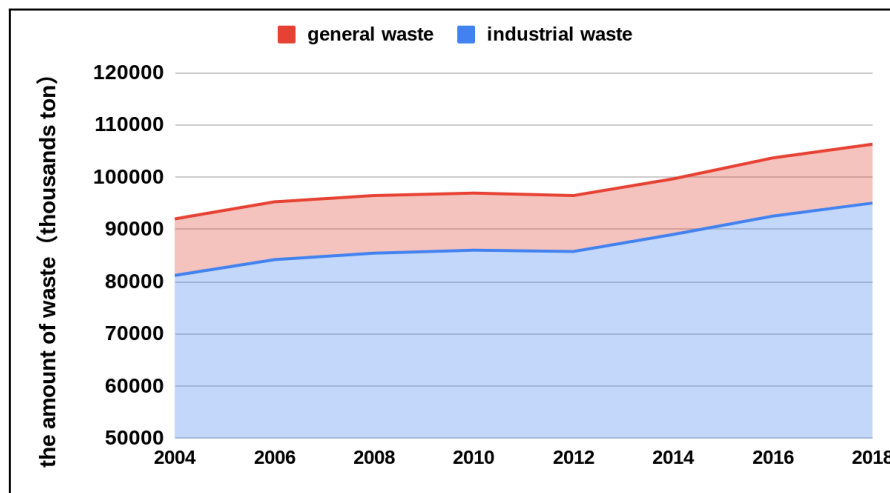
### 1.1 The definition of my study

First is “waste”. In my study, I use this word as “wastes, bulky waste, sludge, waste oil, excreta, and other excrement or something unnecessary, which we can understand objectively from the actual condition of emission excluding gaseous and radioactive waste”. (the Ministry of the Environment, Kanseiren, 16.10.1971) Second is “industrial waste”. I used this word as “among waste, sludge, waste oil, cinders, and so on, which was trashed for the purpose of profit making and public works”. (the Ministry of the Environment, Kanseiren, 16.10.1971) Third is “general waste”. I used this word as “all waste except the industrial waste”. (the Ministry of the Environment, Kanseiren, 16.10.1971) Then, in my study, I defined the amount of waste as the total of the industrial waste and general waste.

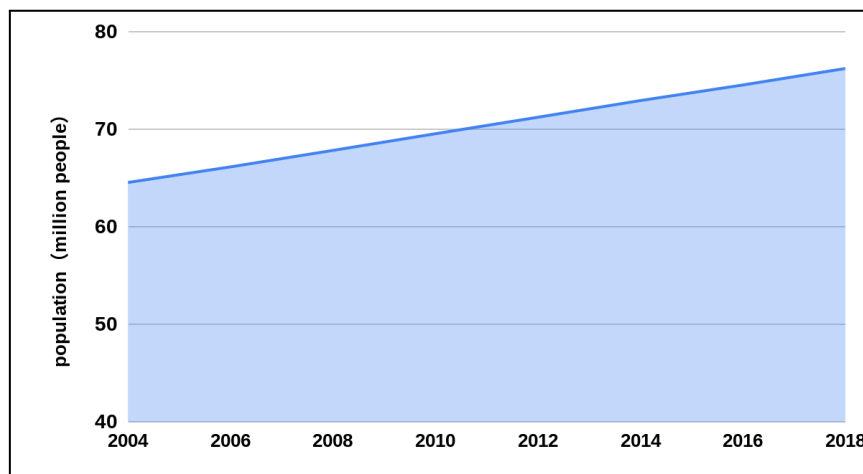
### 1,2 The data

#### 1.2.1 The change of the amount of waste

Graph 1 shows the change of the average of the amount of the waste of each country. I quote this data from *Municipal waste, Generation and Treatment (OECD \*1,15.08.2023)* and *Generation of waste by sector (OECD)*. I made this graph except for the countries which aren't recorded in those data. Graph 2 shows the change of population in the world. I quote this data from *World population by year (Worldometer)*. According to these graphs, the amount of waste and population are on the increase. Accordingly, as the population increases, the amount of waste increases too. Also, we can predict that the amount of waste will continue to increase (*Research Institute of Solid Waste Management Engineering*).



Graph 1 the change of the amount of waste in the world



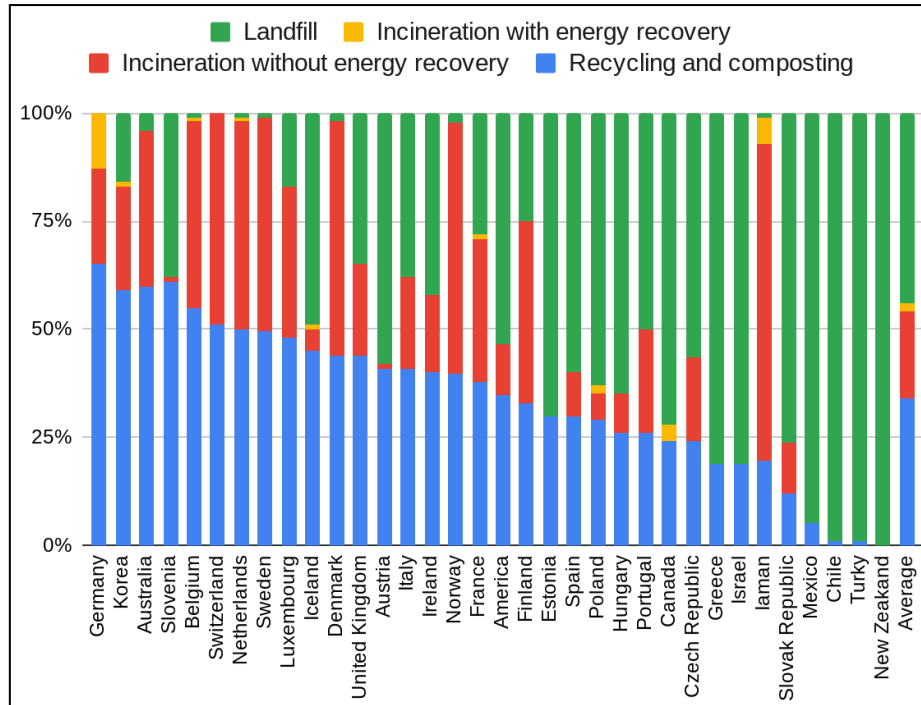
Graph 2 The change of population

\*1OECD : The Organisation for Economic Co-operation and Development (OECD) is an international organization that works to build better policies for better lives. (<https://www.oecd.org/about/>)

### 1.2.2 The recycling rates

Graph 3 shows the recycling rates of the world. I quote this data from *Environment at a Glance 2015 OECD INDICATORS (OECD)*. According to this graph, there are differences among countries such as Germany and Turkey. In addition, the average recycling rate of the world is lower than 50%. Table 1

shows the recycling rates organized by materials. I quote this data from *Municipal waste by waste operations and waste streams (OECD.Eurostat)*. I used the data of Europe that the recycling rates are good compared to others in this graph because I think I can understand the problem of the world. As you can see from this table, the recycling rate of plastics is the worst.



Graph 3 Recycling rates (2013)

Material	Rates of recycling
Plastic	42
Paper	71
Can	75

Table 1 Rates of recycling organized by materials

### 1.3 Impact of Plastic Emissions

The emission of the waste of plastic causes a lot of problems. According to EverGreen, there are three problems. The first problem is global warming. The factor is greenhouse gasses produced when plastics are burned. The second problem is a lack of resources. The material of plastics is petroleum, so there is a lack of resources. The third problem is marine pollution. The factor is a large quantity of plastics which run out to the sea.

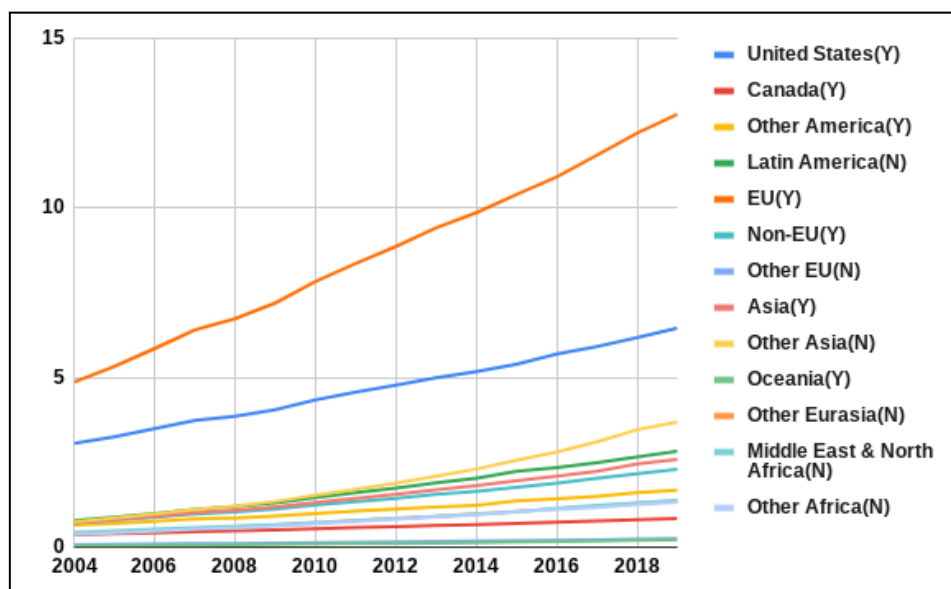
### 1.4 Research Purpose, Research Motivation, and Significance

I had studied the garbage problem before. Then, I became interested in recycling. Therefore, I decided to start this research. In addition, these days, there are problems such as low recycling rates and differences among countries, especially poor recycling rates for plastics.

In addition, a lot of damages to life and global warming have been reported due to these problems. Therefore, in this study, we decided to focus on plastics and conduct research aimed at reducing the number of discarded plastics. We believe that through this research we can come closer to solving these problems.

## 2 Discussion and implications

First, I searched the present circumstances of the recycling of plastics. Graph 4 shows the result. This graph presents trends in plastic waste collected for recycling for the 13 global regions. Also, Y means the countries which join the OECD, N means the countries which don't join the OECD. According to graph 4, regions with many developing countries, such as Africa and Asia, have lower trends in plastic waste collected for recycling compared to other regions, while regions with many developed countries, such as America and Europe, have lower trends in plastic waste collected for recycling compared to other regions. So, I think that I need to make measures which development countries can do.



Graph 4 Plastic waste collected for recycling

Next, I looked at the reasons why plastics are not being recycled. According to the name of the site, there are five reasons: the first reason is cost; the second reason is that the same material must be collected. For example, polypropylene and polystyrene cannot be recycled at the same time. The third reason is composite plastics, which are made of composite resins, making them difficult to recycle. Fourth is contamination, which makes it impossible to recycle dirty plastic. Fifth, additives, which make recycling difficult. From these factors, we thought that it would be difficult to have plastic recycled in developing countries. Therefore, we set a goal to reduce the amount of plastic used.

Next, we looked at what measures are currently being taken in practice. One example is Germany. Various stores in Germany sell by weight. Weighing is a method of determining the

price of an item by its weight using a bottle. This is also used for shampoo, for example, and is thought to reduce the amount of plastic.

### 2.3 Current measures

Next, I searched what measures are being taken now. For example, Germany. At the various shops in Germany, there are different ways of shopping. The ways are selling by weight. Concretely, when we buy items, shoppers decide the fee by weight using jars. This way is also used for shampoo and I think it can lead to reducing the amount of plastic waste. It is easy for developing countries to reduce the amount of plastic waste.

### 3 Conclusion

In response to the question of how plastic waste can be reduced, we thought that weighing would be an effective way to do this. This is because it is easier to do than recycling, and we believe it is as effective as the recycling rate in Germany. I want to do two tasks. First task is examining measures taken in other countries. Second task is considering the merits and demerits of the measures considered.

### 4 References

<https://www.kanseiren.or.jp/>

全国環境整備事業協同組合連合会

<https://www.env.go.jp/>

環境省

<https://www.env.go.jp/hourei/11/000516.html>

廃棄物の処理及び清掃に関する法律の施行について | 法令・告示・通達 | 環境省

<https://www.oecd.org/>

OECD

<https://stats.oecd.org/>

OECD Statistics

<https://www.worldometers.info/world-population/world-population-by-year/>

World Population by Year - Worldometer

[https://www.oecd-ilibrary.org/environment/environment-at-a-glance-indicators\\_ac4b8b89-en](https://www.oecd-ilibrary.org/environment/environment-at-a-glance-indicators_ac4b8b89-en)

Environment at a Glance Indicators | OECD iLibrary

[https://www.oecd-ilibrary.org/sites/ac4b8b89-en/1/3/4/index.html?itemId=/content/publication/ac4b8b89-en&\\_csp\\_=87902827c775ab2e647000889063ed4c&itemIGO=oecd&itemContentType=book#section-d1e715-ea46b079b9](https://www.oecd-ilibrary.org/sites/ac4b8b89-en/1/3/4/index.html?itemId=/content/publication/ac4b8b89-en&_csp_=87902827c775ab2e647000889063ed4c&itemIGO=oecd&itemContentType=book#section-d1e715-ea46b079b9)

<https://blog.goo.ne.jp/wa8823/e/59f70c61f5c90414bba2c001ec7f5582>

OECD加盟34カ国、一般廃棄物の処理とリサイクル率(2013年) - 東京23区のごみ問題を考える

[https://ec.europa.eu/eurostat/databrowser/view/ENV\\_WASMUN/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/ENV_WASMUN/default/table?lang=en)  
Statistics | Eurostat

[https://losszero.jp/blogs/column/news\\_732](https://losszero.jp/blogs/column/news_732)

世界のリサイクル率ランキング！日本のゴミの量は多い？ - ロスゼロ

[https://www.egmkt.co.jp/column/consumer/20210730\\_EG\\_129.html#menu3](https://www.egmkt.co.jp/column/consumer/20210730_EG_129.html#menu3)

プラスチック問題とは？プラスチックごみをもたらす影響や家庭でできる取り組みなどを解説

[https://stats.oecd.org/viewhtml.aspx?datasetcode=PLASTIC\\_WASTE\\_6&lang=en](https://stats.oecd.org/viewhtml.aspx?datasetcode=PLASTIC_WASTE_6&lang=en)

Plastic waste collected for recycling

<https://lessplasticlife.com/plastics/trash-recycle/why-are-plastic-recycling-rates-so-low/>

世界でプラスチックのリサイクル率が低い5つの理由&日本の現状

<https://www.vogue.co.jp/article/sustainable-tips-bulk-shop>

毎年7月は“プラスチック・フリー・ジュライ”——バルクショップマップを活用した、脱プラ買物術【注目のサステナTips】 | Vogue Japan

<https://earthsustainability.jp/economy/9427/#%E9%87%8F%E3%82%8A%E5%A3%B2%E3%82%8A%E3%81%AE%E3%83%A1%E3%83%AA%E3%83%83%E3%83%88%E3%81%A8%E3%81%AF>

ゴミの削減にも繋がる！環境先進国ドイツで人気の「量り売り」とは - あすてな

# Stress-free Obesity Prevention

## new healthy habits

5322 Tei Masami

### Abstract

Today, there are more than 2 billion people who are obese or overweight in the world, and the number of them has been increasing. Obesity is related to various diseases, such as high blood pressure, diabetes, and heart diseases. I felt strange that there are still a large number of obese people in the world despite the fact that there are already many considered solutions. That is why I decided to choose this theme.

I believe that If we can find some drastic solutions to reduce the number of these people, more people can enjoy a healthy life. In my research, I found the common point of many countries with high obesity rates or population was excessive calorie intake and lack of exercise. Diets with much fat, carbohydrate, and sugar, represented by fast food, had much to do with them. Therefore, I came up with a idea to display the nutritious balance of food visually by food labeling in order to increase people's awareness of nutrition.

### Introduction

The state of obesity indicates people whose BMI are above 22. Obesity leads us to various health crises, but the number of obese people has been increasing since the 1900s. The aim of this study is to identify what causes this change and prevail a new lifestyle to reduce illness caused by obesity worldwide. The main evidence comes from the internet. As a result, It was found that the average calorie intake in many countries was gradually increasing. Also, the country with a high obesity rate was especially found in Oceania. The common point of these nations is that they have no choice but eating things with low nutritional value but high calories. This trend was observed in some developed countries, such as the U.S.

### discussion & implications

According to the chart1 below, the state of obese indicates people whose BMI is over 30, and there are two types. One is visceral fat obesity and the other is subcutaneous fat type obesity.

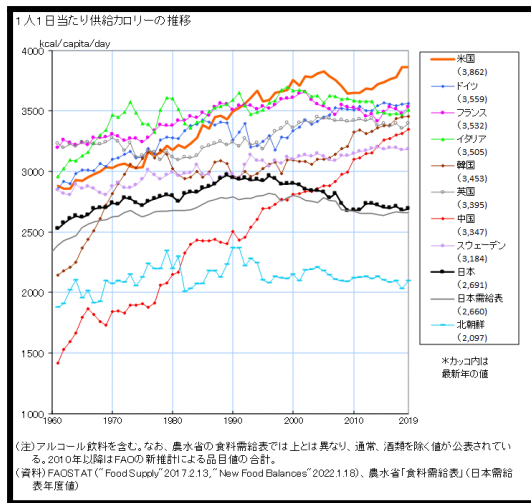
WHO CLASSIFICATION OF WEIGHT STATUS	
WEIGHT STATUS	BODY MASS INDEX (BMI), kg/m <sup>2</sup>
Underweight	<18.5
Normal range	18.5 – 24.9
Overweight	25.0 – 29.9
Obese	≥ 30
Obese class I	30.0 – 34.9
Obese class II	35.0 – 39.9
Obese class III	≥ 40

It is said that the former has a higher risk of lifestyle diseases. I will comply with this definition in this study.

⇐CHART1 (WHO, 1988)

First, I tried to find some common points between different countries with much obesity. I compared both countries with a high obesity rate and one with a large obese population. As a result, the former was especially found in Oceania, while a large part of the

latter was developed countries. It is difficult to identify what caused this tendency because many elements are related to each other. However, there are some remarkable ones for this fact. That is, excessive calorie intake and lack of exercise.



性別	エネルギー	主食	副菜	主菜	牛乳・乳製品	果物
男性 6~9歳 身体活動量 低い	1,400kcal ~2,000kcal	4~5つ	5~6つ	3~4つ	2つ (子どもは2~3つ)	2つ
女性 6~11歳 70歳以上 身体活動量 低い	1,400kcal ~2,000kcal	4~5つ	5~6つ	3~4つ	2つ (子どもは2~3つ)	2つ
男性 10~11歳 身体活動量 低い	2,200kcal ±200kcal (基本形)	5~7つ	5~6つ	3~5つ	2つ (子どもは2~3つ)	2つ
女性 12~17歳 18~69歳 身体活動量 ふつう以上	2,400kcal ~3,000kcal	6~8つ	6~7つ	4~6つ	2~3つ (子どもは2~4つ)	2~3つ

※right:CHART2(社会実情データ実録)  
left: CHART3(MAFF)

about excessive calorie intake

According to these charts, the necessary calories are at most 3,000 kcal per day. However, most countries are above the line of 3,000kcal in the CHART2.

I thought that what played an important role in this change is what is called "fast food". "Fast food" matches the modern lifestyle, which contains people becoming busier. On the other hand, these diets are cheaper compared to more elaborate dishes, therefore more available to those who are in poverty. In this way, fast food is acceptable for a large part of us.

In contrast to its spread, fast food is not very good for our health in general. The main problem which rises when it comes to preventing obesity are 1)low nutrition and 2) a high acceptance for people.

To write about 1), many of the fast foods contain a lot of carbohydrate and fat, but not so much vitamin or Dietary fiber. Especially when you eat them in a invalid combination and frequency. What should be emphasized here is that fast food itself doesn't matter much. According to CARDIA [Coronary Artery Risk Development in Young Adults] in which 3,031 white and African American men and women who are in the range of 18 to 30 years old were the subject, people who eat fast food, such as hamburgers, pizza, fried chicken has a higher risk of obesity and insulin resistance, which would lead them to the onset of type2 diabetes.

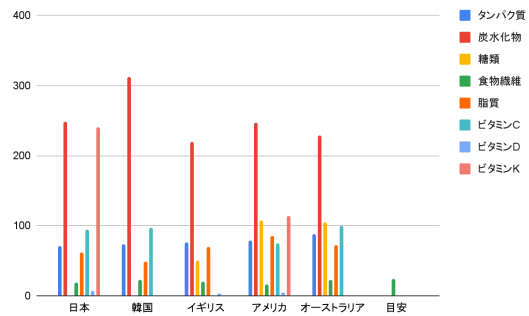
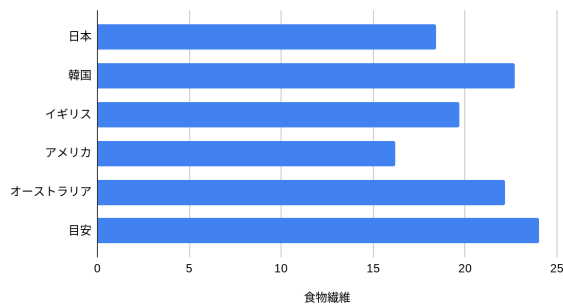
However, I couldn't find a clear relationship between frequency and obesity in other countries but America. For example, according to CHART4, Japan has the second largest number of McDonald's, but the obesity ratio in Japan is not so high. Nevertheless, generally speaking, a biased diet style leads people to more easily growing fat.



CHART4(from <https://gigazine.net/>)



食物繊維



※left:CHART5 right:CHART6

The countries involved in this data are Japan, Korea, the U.K., America, and Australia. From CHART6, it is hard to find common points.

CHART5 is specialized in the amount of dietary fiber. The “criterion” used in the chart is “Ideal value with a view to preventing lifestyle-related diseases”. Though the lowest is that of America, even the country with the highest intake, Korea, didn’t reach the ideal value. Therefore, I think we can incorporate more dietary fiber.

By the way, according to the Dietary Reference Intakes for Japanese (Ministry of Health, Labour and Welfare, 2020), the target amounts are 21g or more per day for men aged 18-64 and 20g or more for those aged 65 and older, and 18g or more per day for women aged 18-64 and 17g or more for those aged 65 and older. This figure is a little lower, so it can be said many countries above but America have already achieved the minimum amount, from this perspective.

Next, I’ll write about ② easy to be accepted by people.

“There is a “reward system” in the brain. This is the name of the mechanism, not the part of the brain.

When we eat a meal and think that the food tastes good, our brain releases a substance called “dopamine,” which is responsible for pleasure. This makes the brain want to eat more. This sequence of events is called the reward system.

Our brains are equipped with a mechanism that makes us want to eat more when we eat something tasty. This is one of the reasons why we want to eat more high-calorie foods!” [Translated with DeepL.com (free version)] (中野, 2019)

As it is said in this paragraph, a system called “reward system” exists in the human brain, so we instinctively seek high-calorie food. Also, in the long term, the environment in which humans have survived was not very related to fat and carbohydrates, so the characteristics to prefer high-calorie food with much fat and carbohydrates can apply to most of us.

Taking these into consideration, I thought keeping people far from fast food or something like that aren’t very good solutions.

〈measures〉

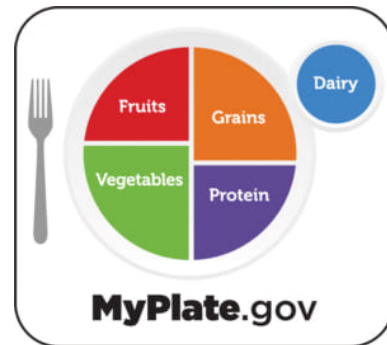
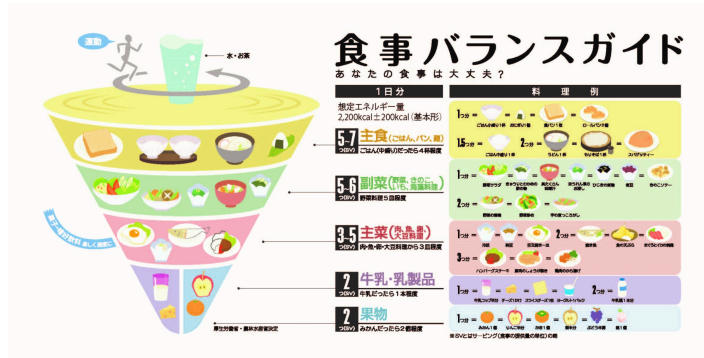
○to obesity

In Mexico, tax on high-calorie foods, such as soft drinks and fast food, came into being. Because of this, consumption of high-calorie food declined by several %

A fast food shop displayed calories on the menu.As a result, customer’s calorie intake was lowered.

○to nutrition

The Japanese ”food balance guide” made by the ministry of agriculture, forestry and fisheries and the ministry of Health, Labour and Welfare and MyPlate.gov made in America are representative examples.



(MAFF)

(U.S. department of agriculture)

After all,the main elements I think will be obstacles to avoid obesity are biased nutritious balance caused by European-American eating habits;eating diet containing much fat, carbohydrate, and sugars, lack of dietary fiber and vegetables, difficulties to alter the preference of biased nutrition, and lack of nutrition knowledge.

I came up with an idea to create a system to coordinate the components of daily food and make it automatically possible to keep the balance of nutritions for the consumers. Here is the brief explanation:

For the first step, sort the food sold in stores into some nutritious groups, like the”food balance guide” made by the Japanese ministry of agriculture, forestry, and fisheries. Next, make some simple marks like MyPlates.gov, such as a blue square, pink circle, and make it correspond to each group, and put it on each commodity. The third step is to consider an ideal combination of the marks and make it understandable for consumers. Finally, consumers choose some marked foods using the criteria in the third step as a reference. Then, the combination of their food is naturally good for their health and well-balanced.

From the fact that showing calories on the menu has a certain effect to prevent people from ordering too much, I thought that by displaying nutritious information visually and more understandable and making it prevail, the effect of making more people, including those with less nutritional comprehension, to be conscious of nutritious balance might be able to be expected.

In addition to that, it’s just an idea, but I thought about adding more dietary fiber to school lunch because many people eat it in common.

## Conclusion

I want to make people prevent obesity by creating a system which shows nutritious information visually.

However, my data is too scarce to refer to the state of nutrition all over the world and the solution is neither universal nor concrete, relatively biased to developed countries. Also, I have no idea how to make my solution accepted. The further challenge is to gather more references about more regions.

## References

<https://www.pen-online.jp/article/008333.html>

「お金がない人ほど肥満が多い!? “お金に縁がない人”の食生活の深刻すぎる「特徴」

<https://tokuteikenshin-hokensidou.jp/news/2022/010869.php>

「世界肥満デー 肥満者の努力だけではコントロールできない 誤解や偏見に"思いやり"で対策」

<https://samoakiblog.com/obesity-reasons/>

<https://ja.wfp.org/stories/feimantojienosheniguanxi>

肥満と飢餓の「深い関係」

CIA「The World Factbook」(2016)

[https://www.nhk.or.jp/kenko/atc\\_866.html](https://www.nhk.or.jp/kenko/atc_866.html)

「肥満の原因とは？肥満の人は「ある腸内細菌」が少ない」

<https://wellmethod.jp/mykinso/#1-3>

<https://www.nibiohn.go.jp/eiken/kenkounippon21/foreign/kijun.html>

国立健康・栄養研究所(2023)「食物摂取基準の概要」

<https://www.waseda.jp/top/news/39021>

<https://sports.yahoo.co.jp/column/detail/201911200011-spnavid0>

中野卓(2019)「なぜ高カロリーなものほど食べたくなる？糖質と脂質がアレを刺激していた」

<https://seikatsusyukanbyo.com/calendar/2017/009383.php>

「一般社団法人 日本生活習慣病予防協会」

[https://www.ssf.or.jp/ssf\\_eyes/international/usa/20170202.html](https://www.ssf.or.jp/ssf_eyes/international/usa/20170202.html)

鎌田 真光(2017)

「身体活動量の地域間格差 ～地方でアクティブ人口を増やす取り組み～」

<https://www.bbc.com/japanese/40578921>

BBC NEWS JAPAN(2017)

「世界で一番運動しない国は.....活動格差がポイント」

<https://mhlab.jp/>

<https://dm-net.co.jp/calendar/2019/029010.php>

「「ファストフード」は健康的になったか？ 糖尿病や肥満にも影響 30年間の調査の結果」(2019)

<https://www.ncbi.nlm.nih.gov/books/NBK551660/figure/article-35266.image.fl/?report=objectonly>

BMI chart with obesity classifications adopted from the WHO 1998 report. Contributed by the World Health Organization - "Report of a WHO consultation on obesity. Obesity Preventing and Managing a Global Epidemic."

<https://www.nibiohn.go.jp/>

「国立研究開発法人 医薬基盤・健康・栄養研究所」

<https://www.tyojyu.or.jp/>

「公益財団法人 長寿科学振興財団」

[https://www.maff.go.jp/j/balance\\_guide/](https://www.maff.go.jp/j/balance_guide/)

農林水産省

[https://column.asken.jp/blue\\_circle/blue\\_circle-15936/](https://column.asken.jp/blue_circle/blue_circle-15936/)

あすけん(2022)「何をどれだけ食べたらいい? アメリカの食事ガイド「マイ・プレート」」

<https://honkawa2.sakura.ne.jp/0200.html>

「社会実情データ実録」

# How Not to Regret ~Keep Japan from missiles~

5323 Aoi Nakamura

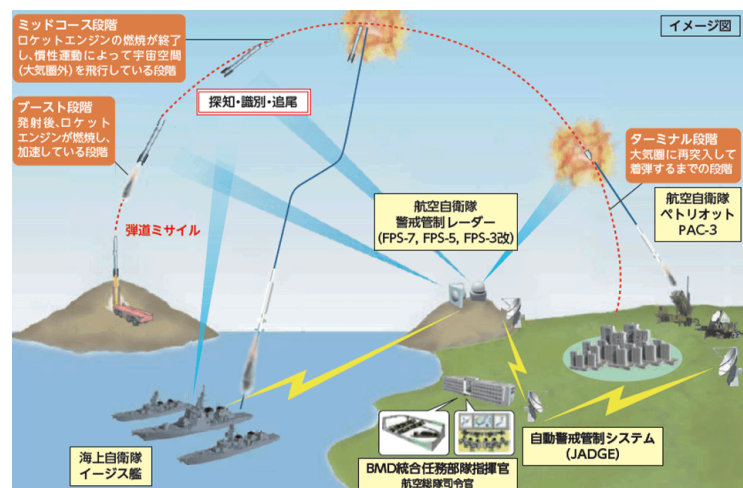
## Abstract

The reason I chose this research theme is that recently there have been many reports on TV news about missiles flying from North Korea, and I thought that this might be a problem that Japan must solve with higher priority than COVID-19. I initially wanted to solve the diplomatic problem to avoid receiving missiles from North Korea, but as I researched, I learned that North Korea's reason for the missile attack on the Japanese side was not a direct intention toward Japan, and from then on, I changed my research objective to "In order for Japan not to be victimized by missiles from North Korea even if it is exposed to them." I gathered information from the Internet and TV news, and conducted research with the aim of spreading the public's knowledge on how to deal with the future missile situation from North Korea in Japan.

This study was based on the research question, "How would we survive if a missile from North Korea fell on Japan?" I believe that the most important issue for Japan to solve today is the missile problem rather than the corona problem. This is because the most serious damage that could be caused by a missile falling on the mainland of Japan. However, although missiles are launched on a daily basis, we have come to feel that it is a matter of course that no damage occurs, and our sense of crisis has only grown weaker. The purpose of this study is to raise awareness of the danger of missiles.

## 1. Introduction

How many times has Japan been hit by missiles by North Korea? Furthermore, what would happen if a missile fell on Japan? There is a great possibility that people will die. No matter how safe Japan is, I think Japan has a soft spot regarding the missile situation from North Korea. I believe that Japan will not reflect on the situation until it is hit by a missile. In fact, Japan has taken various disaster countermeasures against earthquakes since the Great East Japan Earthquake in 2011, but these are also after-the-fact policies. In other words, does Japan reflect on its actions and develop countermeasures after a missile strike? No. Japan should have learned to "reflect" through the Great East Japan Earthquake and other disasters. I was wondering what Japan should do today to prevent the deaths that could have been prevented by the missiles. Japan's current countermeasures against missiles are shown in the figure above. In words, if a missile were to fly toward Japan, it would be destroyed by bombers from Aegis ships over Japanese waters before it fell. Certainly, this is a good



countermeasure because early detection and early response are of utmost importance when a missile flies over, but the fact is that on October 4, 2022, a missile from North Korea passed over Japan and fell into the Pacific Ocean (see figure on the right). While the system shown on the above exists, I believe that it should not have been the most important one. In view of this situation, I suppose that Japan should prioritize policies on how Japanese people can avoid damage from missiles rather than policies on how to prevent missiles from striking Japan. The Ministry of Foreign Affairs and the Ministry of Defense responds to every missile that comes flying (from the Ministry of Foreign Affairs' website, "We once again strongly urge North Korea to immediately and fully implement the relevant UN Security Council resolutions. We also take this opportunity to urge North Korea to take concrete action toward a comprehensive resolution of its abduction, nuclear, missile, and other concerns".) but, this does not mean that the North Korean missiles have stopped flying just because Japan has responded. In other words, the fact is that Japan's response has not been successful. Therefore, I would like the government to first give priority to explaining the contents of evacuation orders and other measures to prevent damage, "the public's response after a J-Alert in the event of a missile flight. Many lawmakers and others have posted on social networking services about what to do in the event of a missile flight, and there are many examples of such posts being spread, but Japan must have learned through the Great East Japan Earthquake that this alone is not enough to prevent damage, so the government must provide correct information through cabinet resolutions. Therefore, we believe it is very important for the government to release correct information to the public through SNS and TV, etc.

## 2. Discussion

First, I posted what a ballistic missile is and an explanation about the flight distance of each type of missile is shown in the figure on the right.

At the beginning of this study, I did a survey of how many missiles North Korea has launched in the past few years and found the results as shown in the figure on the right (according to the information from the Ministry of Defense). This was taken from an article in the Nihon Keizai Shimbun in June of this year, and it can be read that as of June, the most missiles have been launched in the last few years. Next to the

### 弾道ミサイルとは

○ 弾道ミサイルは、放物線を描いて飛翔する、ロケットエンジン推進のミサイルで、離れた目標を攻撃することが可能。核・生物・化学兵器などの大量破壊兵器の運搬手段としても使用される。  
 ○ 有効に対処するには極めて精度の高い迎撃システムが必要。

○ 一般的な弾道ミサイルの構成

○ 弾道ミサイルと巡航ミサイルの違い

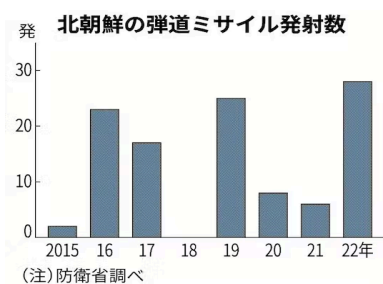
弾道ミサイル	巡航ミサイル
<ul style="list-style-type: none"> <li>放物線を描いて飛翔する、ロケット推進のミサイル。</li> <li>長距離にある目標を攻撃することが可能。</li> <li>速度が速い。</li> </ul>	<ul style="list-style-type: none"> <li>基本的にジェットエンジン推進の、航空機に似た形状の誘導式ミサイル。</li> <li>低空飛行が可能。</li> <li>飛行中に経路の変更が可能で、命中精度が極めて高い。</li> </ul>

○ 様々な飛行経路

○ 弾道ミサイル迎撃における課題

極めて短い時間で、迎撃のための対応を行う必要  
 高高度まで、迎撃ミサイルを精密に誘導・管制し、確実に迎撃するため迎撃させる必要  
 小さく高速な目標を確実に探知・追尾する必要

極めて精度の高い迎撃システムが必要





graph shows how many missiles were launched in 2022 alone (according to the Ministry of Defense). We can see that in November of this year alone, more missiles were launched than the total number of missiles launched in 2019. This indicates that North Korea has conducted more missile tests in the past few months than it has ever done before. But why did North Korea want to conduct so many missile launch tests in the past few months? The following explanation was posted on the BBC News YouTube channel as thinkable information. First of all, the Yoon administration in South Korea has been deepening its military cooperation with the U.S. this year, especially since the summer, which is no doubt a great threat to North Korea, which is in a confrontational relationship with the U.S. It was explained that North Korea has been launching many missiles in recent days to counter what seems to be a provocation by that South Korea against North Korea. In other words, what we can learn from this is that the purpose of North Korea's missile launches is irrelevant to Japan. From this, I came to the conclusion that Japan should have a policy not "how to prevent Japan from launching missiles," but "how to make Japan suffer zero damage even if a missile is launched".

### 3. Conclusion

There are two main issues that I believe need to be addressed. The first is for the government to instruct the public on the correct way to evacuate from missiles. Currently, the Cabinet's website has a Q&A section on how to evacuate from North Korean missiles, but not everyone looks there. Therefore, I believe that the first thing the Cabinet should do is to publicize the correct evacuation method and spread the information on TV and SNS, etc. In addition, schools and other institutions should conduct evacuation drills as part of their evacuation training. Another issue is to make efforts to gather more knowledge about missiles among the public, as there are many posts on SNS saying "J-Alert went off again". I hope that by presenting my research, people will reaffirm their awareness of the missile crisis.

### 4. References

- Image 北朝鮮 なぜこんなにミサイル撃つ？ 思惑は【11月24日改訂版】(2023.4)  
[https://www3.nhk.or.jp/news/special/international\\_news\\_navi/articles/qa/2022/05/25/21100.html](https://www3.nhk.or.jp/news/special/international_news_navi/articles/qa/2022/05/25/21100.html)
- Image 北朝鮮、ミサイル発射に870億円(2023.4)  
<https://www.nikkei.com/article/DGKKZO61643300R10C22A6EA3000/>
- Image 図解 緊迫する北朝鮮の核・ミサイル脅威(2023.6)  
<https://www.nikkei.com/article/DGXMZO20608750R30C17A8000000/>
- Missile Launch on October 4(2023.4)  
<https://www3.nhk.or.jp/news/html/20221004/k10013847211000.html>
- Explanation of missiles from the Ministry of Defense(統合防空ミサイル防衛について)(2023.7)  
<https://www.mod.go.jp/j/approach/defense/bmd/>

# Yokai's Global Expansion

## How to spread "Yokai"

5324 Mai Nakayama

### 1 Abstract

I love yokai. I love yokai. Since I was a child, I have always read books about yokai, and even now I like yokai so much that I buy art books about them. Therefore, I have been doing this research since last year to connect my beloved Yokai with the problems of the world. The purpose of this research is to introduce the wonderful Japanese culture of yokai to the world and to use yokai to solve problems. At first glance, this may sound difficult, but there are many problems in the world. This is why I have focused on "depopulation. Like Japan, the world's population is concentrated in urban areas, and the rural areas are aging and losing population. From my perspective living in the countryside, there are many attractions that are not found in urban areas, but people are moving to places where transportation is convenient and where you are able to buy anything. I think it is a waste because for me the countryside has a lot of attractions. With this in mind, I decided to use yokai as a way to attract people to rural areas. I believe that yokai are a part of Japanese culture that we can be proud of. Therefore, I thought it would be a good idea to solve the problem of depopulation and spread yokai at the same time.

### 2 Introduction

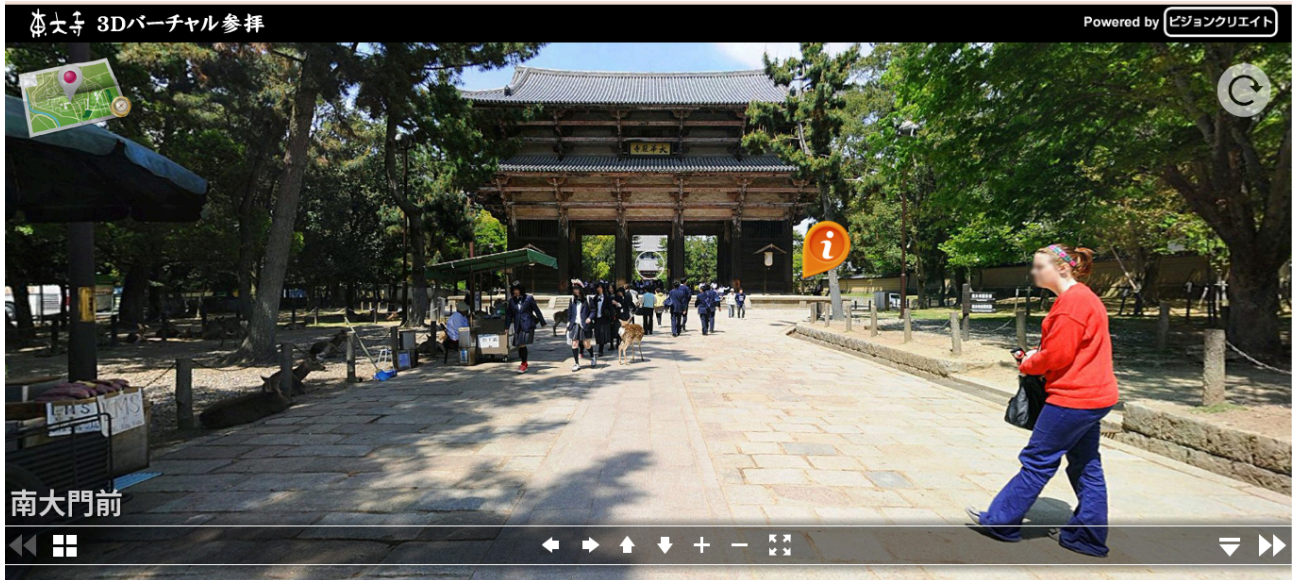
My purpose is "To solve the problem of depopulation area using the area's Yokai". You may think "Is it possible? Are there already some tourist's attractions? I know this is a difficult problem, because I have to change the yokai's image of foreigners. Also, I feel that young people from depopulated areas do not understand the magnificence of their hometowns. I feel that they are leaving for the cities not only because of transportation or what kind of stores are available, but because they do not understand how valuable the traditional arts and activities unique to that area are. To solve this problem, which is not limited to Japan, I changed my original plan to "monsters of the area" instead of "Japanese monsters."

### 3 Discussion and implications

There are many people who can't move their body as they wish. It is very difficult to treat, but we can show them what we usually see. I want them to see something beautiful.







### ⇨3D Virtual Visit to Todaiji Temple, a National Treasure

This is a 3D experience that makes you feel as if you are really walking. As you walk around, orange points appear and you can tap them to read explanations. You can also see the national treasure, the Great Buddha, which makes for a very satisfying experience.

I think the virtual visit to the temple is a really innovative idea. Because it is virtual, you can visit the shrine from anywhere in the world, and because it is free, it is easily accepted by many people. If this technology can be used to create a "virtual yokai tour," people around the world will become interested in yokai and may even want to enliven their own hometowns with a similar project.



### ⇨Illustrations actually drawn by world-renowned VR artist Aimi Sekiguchi

We believe that VR art technology can send yokai into the real world with vivid colors.

## 4 Conclusion

As I went through this research, I realized the horror of depopulation. Looking at the examples of actual efforts in Japan, I realized how difficult and important it is to keep the tradition alive, as it is more difficult for local youth to return than it is to attract new people. Although this research has been ongoing for three years, The idea of using my beloved yokai to enliven the local community was very interesting, and I would like to continue my personal research to connect yokai with the world.

## 5 References

<https://camp-fire.jp/projects/view/465805>

東京北千住の街を妖怪道中で盛り上げるための神輿(ガシヤドクロ)をつくりたい 5/22

[https://www.kyoto-saga.ac.jp/web\\_magazine/saganikki/11836](https://www.kyoto-saga.ac.jp/web_magazine/saganikki/11836)

妖怪藝術団体百妖箱が妖怪仮装行列をプロデュース 5/22

<https://otonoke-enoke.jimdo.com/%E6%AD%B4%E5%8F%B2%E8%A5%BF%E6%B4%8B%E5%A6%96%E6%80%AA%E5%B1%95/>

西洋妖怪展 音ノ怪 絵ノ怪 9/17

<https://www.atago-jinja.com/virtual/>

ヴァーチャル参拝 愛宕神社 9/17

<https://www.todaiji.or.jp/virtual/3dpvr/todaiji.html>

東大寺3Dバーチャル参拝 9/17

<https://www.makesense2020.info/amabie>

アマビエチャレンジ 4/16

[https://www.creativevillage.ne.jp/lp/aimi\\_sekiguchi/](https://www.creativevillage.ne.jp/lp/aimi_sekiguchi/)

[https://www.nhk.or.jp/meicho/famousbook/34\\_toono/index.html](https://www.nhk.or.jp/meicho/famousbook/34_toono/index.html)

NHK 100分で名著 柳田國男11/3

<https://cir.nii.ac.jp/articles?q=Yokai>

CiNii 妖怪論文 3/18

<https://spirits4.muragon.com/entry/235.html>

muragon 妖怪さんに会おう 3/18

# Measures Against Reducing Plastics

## Raising environmental awareness

5325 Nishiyama Yua

### Abstract

The enforcement of the plastic bag fee system worked out in Japan on July 1st, 2020. I researched the distribution amount of plastic and I found that it decreased by half. However, I don't know if plastic waste really decreased, so I want to research the effect of the plastic bag fee system and reduce plastic waste. As a way to do this, I looked into foreign measures and found a deposit system. I thought this was a good way to reduce plastic waste. However, there are several reasons why this system has not been adopted in Japan, and I thought it would be difficult to establish this system. It is difficult to solve this problem, so I think of another measure. It is to label less bottles. Through these measures, I think we can reduce plastic waste, but it is not possible to use only one bottle because of the law. In one case with cardboard, we need not write brand name and recycling mark about each bottle. Research will be conducted into measures to solve these problems and reduce plastic waste.

### 1.Introduction

I want to reveal the effect of the plastic bag fee system and how we can labelless plastic bottles.

According to the Ministry of the Economy trade and industry, the reason for the plastic bag fee system is “to encourage consumers to change their lifestyles, such as bringing their own bags, by charging for plastic shopping bags as a first step toward solving the marine plastic waste problem and global warming ”The study will also examine whether consumers' lifestyles are changing mentioned above.

I researched and collected some information by using the Internet.

### 2.Discussion and implications

There are many advantages to reducing plastic waste.

First, reducing carbon dioxide.

Second, suppressing environmental pollution.

Third, reducing the use of fossil fuels.

Plastics are made from fossil fuels. Compared to plastic bags, eco bags reduce fifty times more carbon dioxide than plastic bags.

However, eco bags have a demerit.

The demand for plastic bags is increasing because they can't receive plastic bags for free when they are shopping. Some people use plastic bags as garbage bags, so they must buy it. Also, Plastic bags can be made in the process of making oil, so garbage bags are not bad for the environment in the manufacturing process.

### 3.Conclusion

The plastic bag fee system led to increasing people's awareness, but looking at it comprehensively, I can't declare that we can reduce it.

In addition, the disadvantages of eco-bags were that they emit a lot of pollutants during production and that they increase the number of plastic bag purchasers.

Therefore, some people think that plastic bags are more eco-friendly than eco-bags. One reason is that plastic bags can be produced when oil is being refined.

Second, it can be used as garbage bags. For this reason, many think that plastic bags are more eco-friendly than eco-bags.

Also, I found a deposit system. This system is that a deposit is charged when buying bottles and PET bottles, and the deposit is returned when the bottles or PET bottles are returned. I think that we should implement this system. However, it is difficult to carry out because to incorporate a deposit system, all bottled PET products would need to be changed to a deposit price, otherwise it is very likely that they will not be bought.

Label less bottles can not use only one bottle. In one case with cardboard, we need not write brand name and recycling mark about each bottle. In the course of my research, I considered measures aimed at "reducing" plastic waste, but I thought that reducing the amount of plastic produced in the first place would be a fundamental solution. That means reusing containers. They are sold in glass bottles rather than plastic bottles, which the purchaser returns after use, and the manufacturer fills the container. In this way, they can be used repeatedly and the amount of waste is reduced. An example is the returnable bottle of Pocari Sweat. I thought that if this system spread, the amount of waste would be significantly reduced, but if we did not create a system whereby containers are always returned, we would only end up manufacturing more bottles. In addition, it is not possible to convert all containers to reusable containers, as is the case in Germany, where the use of reusable containers is required by law.

#### 4. References

- 「プラスチック問題とは？プラスチックごみがもたらす影響や家庭でできる取り組みなどを解説」  
<https://onl.sc/ZYd2CQZ> (2022年5月23日)
- 「海洋プラスチックごみ問題とは？日本や海外の取り組み、私たちができることを解説」  
<https://onl.sc/Ztkp5Tx> (2022年5月23日)
- 「アサヒ飲料、完全ラベルレスペットボトル。レーザーマーキングで直接印字」 <https://onl.sc/EuJNfYS> (2022年5月23日)
- 「【トレたま】ラベル不要のペットボトル」  
<https://onl.sc/eDGaUDg> (2022年5月23日)
- 「ラベルレス飲料が一気に拡大、環境と利便性で支持、店頭展開も本格化へ」 <https://onl.sc/EEeYvsz> (2022年5月30日)
- レジ袋有料化は「エコ」じゃない...?日本人は知らない「不都合な事実」  
<https://gendai.ismedia.jp/articles/-/75287> (2022年6月20日)
- 世界と日本のプラスチックゴミの現状  
<https://www.mymizu.co/blog-ja/eco-with-kanae-state-of-plastic-waste-japan-world> (2022年10月)
- プラスチックごみの7割を占めるのは容器包装 脱・過剰包装でごみ軽減へ  
<https://onl.la/BrNvV87>
- 今、なぜプラスチック問題が注目されているのか  
<https://www.mri.co.jp/knowledge/column/20181221.html> (2022年10月)
- ボトル9割回収へ、欧州の脱プラ指令とは  
<https://www.alterna.co.jp/33709/2/> (2022年10月)
- ラベルレスボトルのメリット・デメリット～知らないとは法律違反？  
<https://manabow.club/rabellessbottle/> (2022年11月)

「紙レジ袋製造会社の本音「ポリ袋、実はエコ」その理由に納得

<https://grapee.jp/842916> (2022年11月)

ペットボトルごみを削減する「デポジット制度」とは？

[https://magazine/oceans/marine\\_pollution/plastic\\_garba](https://magazine/oceans/marine_pollution/plastic_garba) ラベルレスボトルのメリット・デメリット～知らない法律違反？

<https://manabow.club/rabellessbottle/> (2022年11月)

「紙容器」「ペットボトルに直接印字」...展示会で脱プラ提案があふれ始めた

<https://newsswitch.jp/p/21235> (2022年11月)

アルミ缶及びペットボトルの表示に関する資源有効利用促進法の省令一部改正について

[https://www.meti.go.jp/policy/recycle/main/admin\\_info/law/02/steel\\_alumi\\_pet.html](https://www.meti.go.jp/policy/recycle/main/admin_info/law/02/steel_alumi_pet.html)

/(2022年12月)

PETボトルリサイクル推進協議会 広報誌

<https://www.petbottle-rec.gr.jp/ring/vol34/p09.html> (2022年12月5日)

環境と安全

<http://glassbottle.org/ecology/returnable/> (2022年12月9日)

# Implementing the MaaS Model in Japan

## Improving the convenience of transportation and life services

ID 5326 氏名 Hyono Mao

### Abstract

A lot of people use cars in many countries. Cars are very convenient because we can go to destinations easily, but cars emit a lot of carbon dioxide, and they are not good for the environment. Through my research last year, I learned about MaaS and I was interested in it. According to the research on the internet, MaaS can increase the percentage of the use of public transportations and decrease the use of private cars. I think it leads to achieving SDGs number 13 “Take urgent action to combat climate change and its impacts” to advance the MaaS services in the world.

To solve the local problems is included in MaaS services, so I think the MaaS services lead to achieving SDGs number 11 “Make cities and human settlements inclusive, safe, resilient and sustainable”.

I set the research question “What kind of ideas are needed to make the services easy to use for people of various generations?” And I formed a hypothesis for this research question: “Make various planes and systems which take not only transportations services but also life services plants.”

In this research, I collected information from the internet. After collecting information, I thought about the program that we have to do to solve some problems.

I searched about Whim, a MaaS service in Finland. I knew that Whim provided search, reservation, and payment in a single package. It has some kinds of charge plans. I thought it is a good thing to use this system in Japan. And I thought that Japan needs to make a system which is easy to use for elderly people without using the internet to get elderly return their driver license.

I knew that the use of quick commerce had increased. One of the benefits of cars is that cars can carry a lot of things at once. So I thought people can choose not to own a car if they can save the trouble of carrying what they bought. And I hope to create a service that works with quick commerce services and allows MaaS users to use quick commerce at a low price.

As for MaaS pricing, I thought it would be better to prepare three plans: monthly, daily, and pay each time. Next, as a solution to make it easier for the elderly to use, I hope to make a system where people can use cards. As for how to use public transportation after paying with the app, I am thinking of a form that can be used by touching a smartphone or card at the ticket gate or entrance. Suica and others are now available in that way, so I think it is possible.

As for quick commerce, there is not enough information to gather, for example, how far delivery can be done and how much pricing is optimized, so I would like to look into it further in the future research.

There are three problems in the future research. First is how to deal with areas where public transportation is underdeveloped.



Second, we will further collect information and consider the specific structure of MaaS services.

Third, I would like to think about the specific structure of quick commerce and how to integrate it with MaaS.

## 1 Introduction

A large percentage of the use of transportation in Japan is cars. According to the data from the Ministry of Land, Infrastructure and Transport in 2015, use of cars is 45.1% on weekdays and 61.7% on weekends. Cars emit a lot of carbon dioxide, so it becomes the cause of environmental pollution. By using electric cars and eco cars, we can reduce emission of carbon dioxide but the penetration rate of them is low. I thought the best way to decrease the emission of carbon dioxide is to use public transport more often. Last year, I researched about the share cycle, and at a Research institution visit, I learned about MaaS, so I was interested in MaaS. I searched about MaaS on the internet, and I realized that MaaS service was carried out in foreign countries. According to the instance of MaaS, I understood some effect that MaaS causes. It is that the proportion of use of public transportation increased and the percentage of use of private cars decreased. From this information, by progressing the MaaS service in Japan, we can reduce the emission of carbon dioxide and achieve the SDGs number 13 “Take urgent action to combat climate change and its impacts”.

And MaaS service’s purposes are not only to improve convenience of transportation, but also to improve the convenience of life services. So I was going to think of a way to solve the problem in Japan by doing some services to improve the convenience of transportation. And I set the goal to improve the convenience of transportation and life services. In addition, by increasing the convenience of transportation and progressing to solve some local problems, we can achieve SDGs number 11 “Make cities and human settlements inclusive, safe, resilient and sustainable”.

I have three purposes for this research. First is to progress the MaaS services and increase the convenience of movement. In addition, I want to solve the environmental problems by increasing the use of public transportations. Second is to think about the services which elderly people can use easily and to promote to return them driver’s licenses. Third is to improve the life services by putting the MaaS services to practical use.

I set the research question. It is, “What kind of ideas do we need to make a plan that people of various generations can use easily and comfortably.” And I formed a hypothesis for this research question: “Make various planes and systems which take not only transportations services but also life services plants.” MaaS is a service which has two axes: to improve the convenience of transportation and solve local problems. I set two goals: to make public transportation more convenient and to promote returning the elderly driver’s licenses to solve the local problems. By adding the Quick commas services, it can decrease the opportunities that elderly drivers go shopping, and we can promote return licenses. And Quick commas services are also convenient for people who have children.

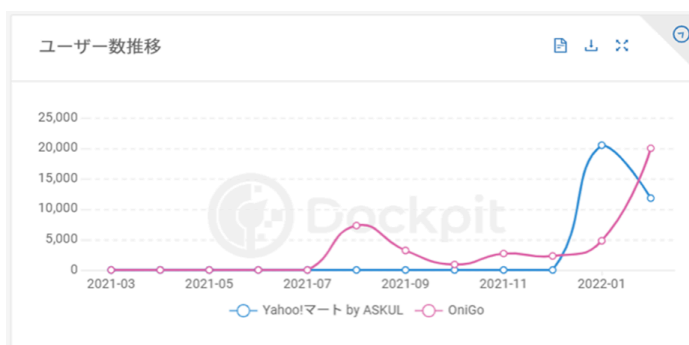
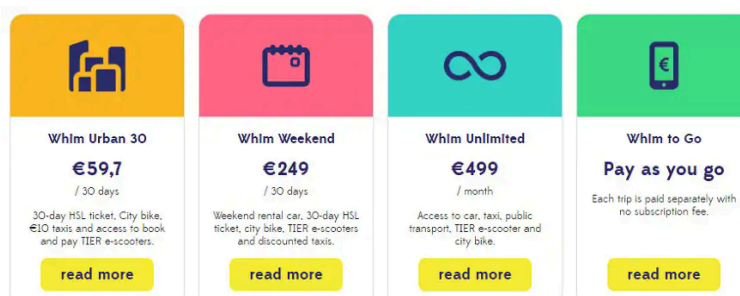
I collect information mainly from the internet. I collect information about the following contents.

Out line	Examination contents	Reference Information
①Overseas examples	What MaaS services are carried out abroad?	Search about the services, mainly about Whim which is held in Helsinki, Finland on the internet.
②Reserch about the present situation	What are the present situations and problems in Japan?	Search for details about public transportation and private cars. And analyze the present problems from the date.
③The ways to solve problems	What solutions can we come up with to solve current problems?	Analyze current problems in Japan and think of some solutions to solve these problems by building on the data collected from the internet.
④ Send to abroad	How solutions can be utilized in the world and how to send solutions to the world?	Search about similar points between Japan and abroad. Spread solutions based on Japan to countries which have similar problems with Japan.

## 2 Discussion and implications

I searched about Whim, a MaaS service in Finland. I knew that Whim provides search, reservation, and payment in a single package. It has some kinds of charge plans. I thought it is a good thing to use this system in Japan. And I thought that Japan needs to make a system which is easy to use for elderly people without using the internet to get elderly return their driver license. But using apps is difficult for elderly people, so I need to make a system that elderly people can use easily without the internet.

About life services, I knew about Quick commerce. It is a service which delivers groceries and daily products which were ordered online. Delivery service's demand increased due to the coronavirus pandemic. One of the characteristics is that it delivers products more quickly than Internet Shopping. One of the merits of cars is that it can carry a lot of baggage, so when we go shopping, using cars is more convenient than using





public transportation. Then, if we can omit labor to carry baggage, we can choose the choice that we don't have a private car. So I think it would be great if MaaS could be combined with Quick commerce service to create a service that allows MaaS users to use Quick commerce service at a low price.

### 3 Conclusion

As for MaaS pricing, I thought it would be better to prepare three plans: monthly, daily, and pay each time. Monthly is good for users who use public transportation every day. Daily is good for users who often use public transportation, for example, only on holidays. As for the specific pricing, I think it would be better if the annual maintenance cost and Aso line cost of the car were set as standard and that the one-year monthly fee would be cheaper if you owned a car. I think that makes it easier to choose not to own a car. Next, as a solution to make it easier for the elderly to use, I hope to make a system where people can use cards. As for how to use public transportation after paying with the app, I am thinking of a form that can be used by touching a smartphone or card at the ticket gate or entrance. Suica and others are now available in that way, so I think it is possible.

Regarding Quick Commerce service, I am planning to create a system in which the distance traveled and the number of times the user uses the app will be rewarded with points. Then, when ordering products using the Quick Commerce service, the points will be used to receive discounts on products. In addition, I would like to offer a returnable service within the Quick Commerce service. Returnable service is an eco-friendly initiative that utilizes returnable containers. A returnable container is a container that is returned or collected after the contents are consumed, cleaned, and used again. Since Quick Commerce is a home delivery service, the containers can be returned simply by leaving them in front of the house for collection.

But there is not enough information to gather, such as how far delivery can be done and how much pricing is optimized, so I would like to look into it further in the future research.

There are three problems in the future research. First is how to deal with areas where public transportation is underdeveloped. MaaS service requires public transportation, so there are some areas that are currently difficult to proceed.

Second, we will further collect information and consider the specific structure of MaaS services. As for the pricing, I think it would be good if we could set the price lower than that annual cost of a private car and make it a little cheaper as the use of public transportation increases.

Third, I would like to think about the specific structure of quick commerce and how to integrate it with MaaS.

### 4 References

「未来シェアとヴァル研究所、MaaS分野で業務提携」

< <https://www.atpress.ne.jp/news/168383> > (5月5日)

「MaaS先進国フィンランドの交通事情とは？Whimの特徴も紹介」

< [https://digital-shift.jp/flash\\_news/s\\_201130\\_22](https://digital-shift.jp/flash_news/s_201130_22) > (5月9日)

「オンデマンドバスとは？」

< <https://maas.osakametro.co.jp/odb/about/> > (5月9日)

「Ubigo |」

< <https://maasification.com/applications/by-application/ubigo/> > (5月31日)

「わが国で MaaS を導入する上での 重要な2つの視点」

< [https://www.mizuho-rt.co.jp/publication/report/2019/pdf/mhir18\\_maas.pdf](https://www.mizuho-rt.co.jp/publication/report/2019/pdf/mhir18_maas.pdf) > (6月20日)

「総務省 | 情報通信統計データベース | 次世代の交通 MaaS」

< [https://www.soumu.go.jp/menu\\_news/s-news/02tsushin02\\_04000045.html](https://www.soumu.go.jp/menu_news/s-news/02tsushin02_04000045.html) > (6月20日)

「MaaS (モビリティ・アズ・ア・サービス) について」

< [https://www.mlit.go.jp/pri/kikanshi/pdf/2018/69\\_1.pdf](https://www.mlit.go.jp/pri/kikanshi/pdf/2018/69_1.pdf) > (9月13日)

公共交通の利用が増えて車の利用が減れば事故が減る？

< <https://car-me.jp/articles/5352?p=2> > (12月19日)

「ヘルシンキの公共交通機関【HSL】を乗りこなそう／トラム・地下鉄・市バス | あおいとりっぷ」

< <https://aoitrip.jp/hsl/> > (12月19日)

「【現地取材】MaaSを世界初導入したフィンランド・ヘルシンキの交通事情 —MaaS最先端都市ヘルシンキ編① | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/14/> > (12月19日)

「【現地取材】スマホ1つで乗り放題。MaaSアプリ「Whim」を使ってみた—MaaS最先端都市ヘルシンキ編② | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/15/> > (12月19日)

「【現地取材】MaaSを生み出したヘルシンキの先進企業「MaaS Global社」

< <https://gazoo.com/mobility/maas/helsinki/20/02/16/> > (12月19日)

「【現地取材】MaaS Global社創業者に聞く！ 日本版MaaS実現に向けた課題—MaaS最先端都市ヘルシンキ編④ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/18/> > (12月19日)

「【現地取材】1年半のスピード法改正！ MaaS関連の法律を一元化したフィンランド—MaaS最先端都市ヘルシンキ編⑤ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/19/> > (12月19日)

「【現地取材】民間の交通事業者や過疎化の進む地域にもメリットをもたらすMaaS—MaaS最先端都市ヘルシンキ編⑥ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/20/> > (12月19日)

「【現地取材】住まいとの連携や交通渋滞、駐車場不足の解決も。移動の効率化にとどまらないMaaSの発展性—MaaS最先端都市ヘルシンキ編⑦ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/21/> > (12月19日)

「【現地取材】ヘルシンキで聞いてみた。「トヨタってどんなイメージ？」—MaaS最先端都市ヘルシンキ編最終回 | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/22/> > (12月19日)

「4-04 日本の部門別二酸化炭素排出量(2020年度)」

< <https://www.jccca.org/download/65477> > (12月19日)

「今さら聞けない「MaaS (Mobility-as-a-Service) って何？」を簡単解説」

< <http://tamaran326.blog.fc2.com/blog-entry-21.html> > (12月20日)

「【現地取材】MaaSを世界初導入したフィンランド・ヘルシンキの交通事情 —MaaS最先端都市ヘルシンキ編① | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/14/> > (12月19日)

「【現地取材】スマホ1つで乗り放題。MaaSアプリ「Whim」を使ってみた—MaaS最先端都市ヘルシンキ編② | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/15/> > (12月19日)

「【現地取材】MaaSを生み出したヘルシンキの先進企業「MaaS Global社」

< <https://gazoo.com/mobility/maas/helsinki/20/02/16/> > (12月19日)

「【現地取材】MaaS Global社創業者に聞く！ 日本版MaaS実現に向けた課題—MaaS最先端都市ヘルシンキ編④ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/18/> > (12月19日)

「【現地取材】1年半のスピード法改正！ MaaS関連の法律を一元化したフィンランド—MaaS最先端都市ヘルシンキ編⑤ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/19/> > (12月19日)

「【現地取材】民間の交通事業者や過疎化が進む地域にもメリットをもたらすMaaS—MaaS最先端都市ヘルシンキ編⑥ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/20/> > (12月19日)

「【現地取材】住まいとの連携や交通渋滞、駐車場不足の解決も。移動の効率化にとどまらないMaaSの発展性—MaaS最先端都市ヘルシンキ編⑦ | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/21/> > (12月19日)

「【現地取材】ヘルシンキで聞いてみた。「トヨタってどんなイメージ？」—MaaS最先端都市ヘルシンキ編最終回 | トヨタ自動車のクルマ情報サイト-GAZOO」

< <https://gazoo.com/mobility/maas/helsinki/20/02/22/> > (12月19日)

# To Decrease The Number of Marine Plastic Garbage

~To increase the rate of recycling by the deposit system~

5327 Ryusei Fukasawa

## Abstract

These days, I often watch some TV shows and news about SDGs. I am especially interested in the problem of marine plastic garbage. So I conducted this research. The method of it was mainly to use the internet and to consider the information from the internet. My research question was “Can we introduce the deposit system in Japan?”. As a result, the deposit system is conducted in Germany where the rate of recycling is high. I think that system can be introduced in Japan. Furthermore, the company in Japan, LOOP, has already conducted the demonstration experiment in the Tokyo Metropolitan Government. For these facts, I consider some solutions for the problems about customers. For example, I suggest the explanation of the deposit system by using movies or applications. From now on, I want to ask the Tokyo metropolitan Government the reason why they do not conduct the deposit system now and find more problems that need to be solved based on some demonstration experiments in Japan or foreign countries.

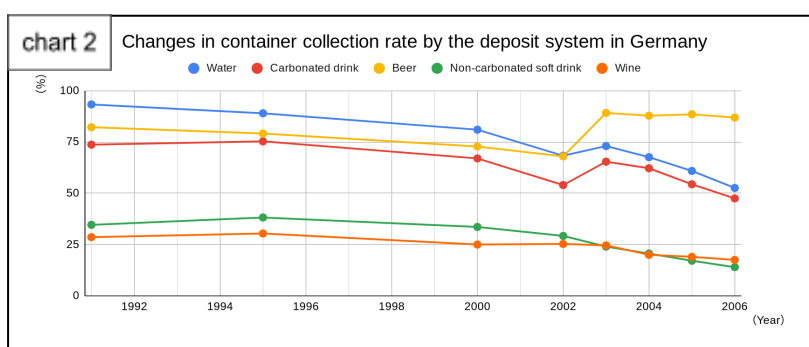
## 1 Introduction

The reason why I set my research theme, “to decrease the number of marine plastic garbage”, is that I was interested in the environmental problem. Recently, I feel that the number of TV shows and news about SDGs is increasing. So I decided to set the theme about “LIFE BELOW WATER” in SDGs.

The reason why I set my research sub theme, “To increase the rate of recycling by the deposit system”, is that I found that the deposit system has a good effect on improvement of the rate of recycling. The deposit system is the system in which is added to the sales price and is returned when some containers of goods are returned. For example, customers must pay an extra 10 yen when they buy one plastic bottle for 100 yen. This is because that 10 yen means deposit. By taking an empty plastic bottle back to the shop where they bought it, they can get that 10 yen.

chart 1 リターナブル飲料容器の比率（容器市場調査社（Gesellschaft für verpackungsmarktforschung mbH）による）

	1991	1995	2000	2002	2003	2004	2005	2006
全飲料	71.7	72.3	65.0	56.2	63.6	60.3	56.0	50.5
水	93.3	89.0	81.0	68.3	<b>73.0</b>	<b>67.6</b>	<b>60.9</b>	<b>52.6</b>
炭酸飲料	73.7	75.3	67.0	54.0	<b>65.4</b>	<b>62.2</b>	<b>54.4</b>	<b>47.5</b>
ビール	82.2	79.1	72.8	68.0	<b>89.2</b>	<b>87.8</b>	<b>88.5</b>	<b>86.9</b>
非炭酸清涼飲料	34.6	38.2	33.6	29.2	24.0	20.6	17.1	<b>14.0</b>
ワイン	28.6	30.4	25.0	25.3	24.6	20.0	19.0	17.5



Germany, whose rate is high, has begun the deposit system since 2003. Then, according to chart 1(made by the Japanese government) and 2( made by myself), it can be seen that the recovery rate of all of the beverage containers in 2003 greatly exceeded that of 2002. Also, that system has already been introduced in Norway whose rate of recycling is about 97%. For these facts, it can

be estimated that the deposit system can promote the improvement of the recovery rate.

Therefore, I think that this system can be spreaded worldwide and the rate of recycling can increase around the world.

## 2 Discussion and implications

At first, I thought about my research question, “Can we introduce the deposit system in Japan?”. Then I investigated the merits and demerits of the deposit system. I found some merits and demerits of it so I summarized them and my ideas. It had two merits.

First, the deposit system was an effective security system. Of course, those who did not return some containers made a loss for deposit money. That system could distinguish between those who cooperated with the deposit system and those who did not.

Second, that system had a good effect on the environment. This was because containers returned by the deposit system were recycled.

It had two demerits.

First, the deposit system was expensive to implement. For example, it had some cost for a place where returned containers were stored and taken to a recycling center.

Second, people went to a place that was not introduced from a place that introduced the deposit system. That is because the deposit system may take much time for customers to return the containers.

Moreover, a demonstration experiment including the deposit system had already been conducted in Hachijo-cho, the Tokyo metropolitan Government for two years. This experiment put 10 yen as deposit in stores in Hachijo-cho. As a result, the recycling rate increased by about 45 %. However, I could not find other experiments like that on the internet.

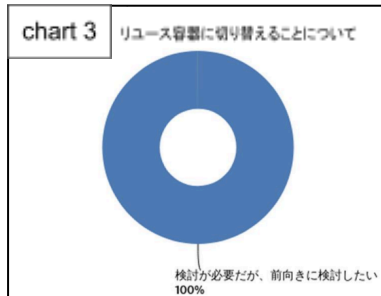
Therefore, I examined not tackles by public organizations in some regions but tackles by private enterprises. Consequently, “LOOP” , a Japanese company, had much to do with initiatives about introducing the deposit system.

“LOOP” is a company that promotes the introduction of the new shopping system. The new shopping system is about three steps. First, containers are replaced with strong materials that can be used repeatedly. Second, those containers are collected from customers by using the deposit system. Third, the shopping mall or store washes those containers to reuse. A lot of Japanese companies including EON, Suntory, and Kirin participate in that initiative. the Tokyo metropolitan Government takes part in, too. That shopping system has about three features compared to the deposit system. The first is that the deposit is more than 100 yen. The second is that customers can use the deposit as electric money when they use the LOOP exclusive app. Third is that there are some differences in sales formats, deposits, and return methods depending on the company.

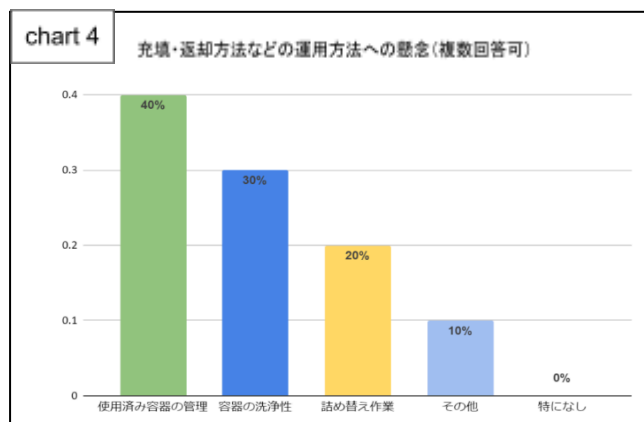
It has some good points and challenges for companies and their customers to promote that initiative. First of all, I will introduce two good points to companies. The first point is that it will benefit the company in the long run. As I mentioned above, LOOP thinks that a lot of companies make new strong containers that can be used many times so that plastic containers will decrease. It costs them to make those containers. However, in the long run, it is cheaper to repeatedly use new strong containers than to continue producing plastic containers. The second is that the initiatives to promote that shopping system finally leads to

environmental improvement so that they will play a big role in the corporate social contribution.

Next, I will introduce three challenges based on the questionnaire to companies held by the Tokyo metropolitan Government. That questionnaire had been conducted to a lot of companies for four months.



According to chart 3 (made by the Tokyo metropolitan Government), all companies answer to consider changing to reusable containers positively. However, I think there are three challenges for companies. First, chart 4 (made by the Tokyo metropolitan Government) says that 40% of respondents are worried about controlling no longer used containers. Also, 30% of respondents are worried about the quality of washing containers. The second is, in developing new containers,



companies are concerned about whether they can carry on the good qualities of plastic containers. Third is that the production cost will increase due to putting washing machines and developing new containers. The Tokyo metropolitan Government says that they will consider solutions to these three problems. Moreover, the Tokyo metropolitan Government suggests concrete solutions about production

cost and washing problems. Therefore, I think that companies should solve problems of developing new containers.

Next, I consider some good points and challenges for customers. Good points include the elimination of waste disposal and the ease of use of new containers.

I consulted about some challenges that remain solved for customers. Then, I found that the demonstration experiment about the deposit system was conducted by the Tokyo metropolitan Government and LOOP. This experiment, LOOP Takeout Bento, was conducted at two restaurants in the office building in the Tokyo metropolitan Government from December 7, 2020 to February 3, 2021. Those two restaurants sold takeout bento using reusable containers. I consider the problems that need to be solved for customers based on its report. At first, as a result of that experiment, their customers said about 4 things. They wanted to pay 300 yen as a deposit. Also, they wanted sealed containers. They wanted companies to explain the methods of washing and returning processes clearly and their sanitary management. Therefore, I think that understanding (clarity and ease of understanding) of the deposit system to customers would be an important issue.

Given the above, I think that there are some problems for each company and customers in the introduction of the deposit system. I think that the development of containers would be a challenge for companies. Also, I think that understanding of the deposit system would be for customers. However, in the aforementioned demonstration experiment (“LOOP Takeout Bento”), the Tokyo metropolitan Government proposed many



solutions for companies problems, such as the development of containers and cost increase. So, I decided to give priority to the customer's problems.

If those problems are solved, Japan will be able to make a big profit. First, the Japanese recycling rate will be increased by the introduction of the deposit system. Moreover, Japan will decrease the marine plastic garbage and make progress toward solving the problem of marine plastic trash.

### 3 Conclusion

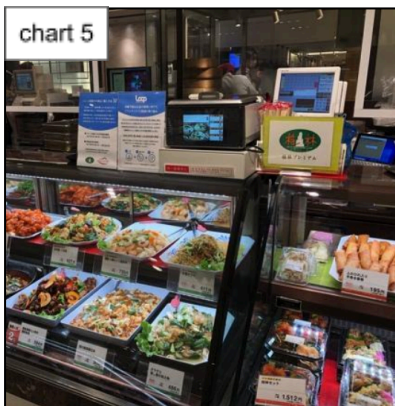
My research question was "Can we introduce the deposit system in Japan?". In conclusion, I think that it is possible to introduce the system of deposit in Japan. In order to do so, it needs to cooperate LOOP with administrative organizations. However, there are some significant problems for both companies and customers.

A main issue on the corporate side, as I mentioned above, is about costs including the development of containers and washing them. Yet, this problem may be solved in the near future, because the Tokyo metropolitan Government suggests some solutions to it.

A main issue on the customer side, according to "LOOP Takeout Bento", is an explicit statement about hygiene and methods of washing and returning containers. Therefore, I decided to solve it by prioritizing understanding (clarity and ease of understanding) for the consumer.

The information customers need before purchasing is about the deposit system and sanitation. Moreover, in the demonstration experiment ("LOOP Takeout Bento"), there were no consumers who said that it was difficult for them to comprehend the deposit system. Therefore, I thought that the explanation of the deposit system should be the same as in the demonstration experiment. In order to understand it more deeply, stores that sell the products covered by the deposit system should post advertisements, explain with movies, and put QR of the LOOP application. Furthermore, about hygiene, they should explain what criteria are being sold because commodities meet concretely and are understandable through some movies and advertisements.

The information that customers need is about the methods of washing and returning containers. In the demonstration experiment, shops put movies to explain (chart5) and convey them. However, the explicit statement of washing methods is lacking. I considered that there was a possibility that consumers forgot the methods when they went back home. Stores should give a piece of paper with details on how to wash and return to customers at the time of purchase. Also, considering the environment, they should describe the explanation understandable on the LOOP application.



In the future, I would like to ask the Tokyo metropolitan Government the reason why they do not conduct the deposit system now and find more problems, on the consumer side, that need to be solved based on some demonstration experiments in Japan or foreign countries. I think that these tackles can spread to countries that have the same problems.

#### 4 References

「Environmental observatory」

< <https://tenbou.nies.go.jp/news/fnews/detail.php?i=30601> > (2022 5/9)

「Why is the waste recycling rate in Japan lower than in Europe?, Kosuke Kawai」

< <https://www-cycle.nies.go.jp/magazine/kenkyu/202008.html> > (2022 6/23)

「Germany Inspection Report, Ministry of the Environment」

< <https://www.env.go.jp/council/36pet-junkan/y360-05/mat02.pdf> > (2022 7/14)

「Positive and Negative Impacts of the Deposit System - Economic Research Surveys - ,  
Daisuke Numata」

< [https://www.jstage.jst.go.jp/article/jswme/19/6/19\\_6\\_353/\\_pdf](https://www.jstage.jst.go.jp/article/jswme/19/6/19_6_353/_pdf) > (2022 9/15)

「White Paper on the Environment, Ministry of the Environment」

< <https://www.env.go.jp/policy/hakusyo/h12/12104.html> > (2022 10/18)

「What is “LOOP” - Recycling-Oriented Shopping? Initiatives by Japanese companies,  
Industrial waste media」

< <https://sanpai-media.com/column/3267> > (2022 11/22)

「Container Reuse Platform “LOOP” Expands Rapidly Worldwide New Business Model  
Aimed at Sustainable Society, Japan Food Journal」

< <https://news.nissyoku.co.jp/news/original2020012403> > (2022 12/8)

「LOOP」

< <https://loopstore.jp/> > (2023 1/23)

「LOOP implementation report, The Tokyo metropolitan government」

<[https://www.kankyo.metro.tokyo.lg.jp/resource/recycle/single\\_use\\_plastics/circular\\_innovation.files/LoopProfessional\\_report.pdf](https://www.kankyo.metro.tokyo.lg.jp/resource/recycle/single_use_plastics/circular_innovation.files/LoopProfessional_report.pdf)> (2023 2/13)

「Verification of a business model using reusable containers for takeout bento, etc. at  
restaurants in office buildings implementation report, The Tokyo metropolitan government」

<[https://www.kankyo.metro.tokyo.lg.jp/resource/recycle/single\\_use\\_plastics/r2\\_pla\\_report.files/loop\\_houkokusyo\\_r2.pdf](https://www.kankyo.metro.tokyo.lg.jp/resource/recycle/single_use_plastics/r2_pla_report.files/loop_houkokusyo_r2.pdf)> (2023 3/16)



# ReSchool Project to Save Relative Poverty and Food Waste

5328 Yuno Fujizuka

## 1. Abstract

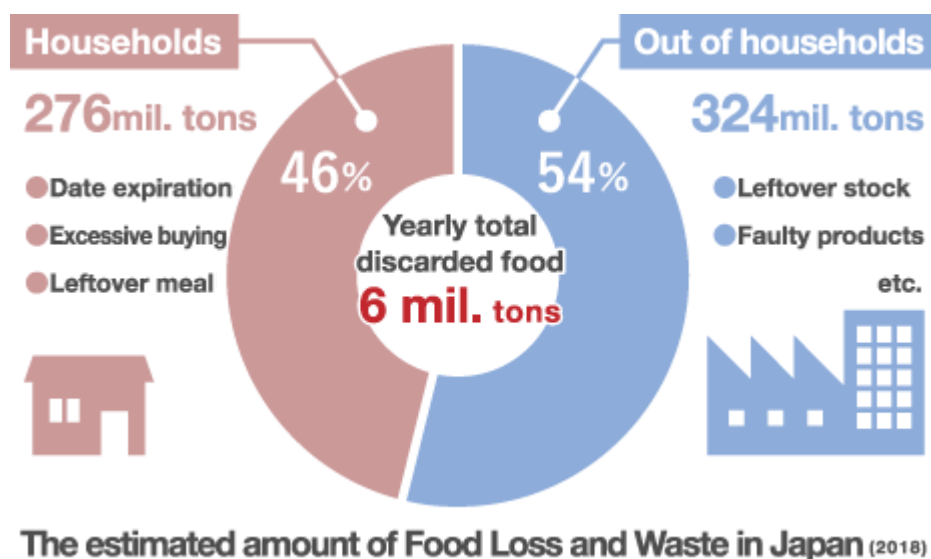
One in seven. This number is the number of children who are in relative poverty in Japan. This is about 2,550,000 children. Also, one third of the food that we produce every year is thrown away in the world. We often call it food waste. There are no benefits for every perspective when we waste food. To solve the problem of relative poverty, for example in Japan, “Kodomo shokudo” are spreading these days. However, there are some crucial tasks and it is not sustainable to continue the activity.

To solve the problem of the children who are in relative poverty and about food waste, I suggest holding the project which I named “ReSchool Project”. “ReSchool” is a combination of “Rescue” and “School”. Rescuing children and their parents at school by giving the foods that are leftover at lunch which can still be eaten. Children are free to come every day, however, adults need to pay 200 yen every lunch. After we collect the 200 yen up to 1,000,000-5,000,000 yen. The reason is to purchase “Commercial garbage disposal machine SINKPIA bacteria method extinction type” in each school to make sustainable reduction of food waste. By implementing the project, we can commit to No.1, No.11, No.12 of SDGs.

My research question is “How can we contribute to rescue food waste & relative poverty ?”

## 2. Introduction

<backgrounds>



One in seven. This is the number of children who are in relative poverty in Japan. This is about 2,550,000 children. If we think about it in the world, there are one in five children who can't eat full or healthy foods.

However, in the same country; Japan, there are over 6 million tons that people are wasting

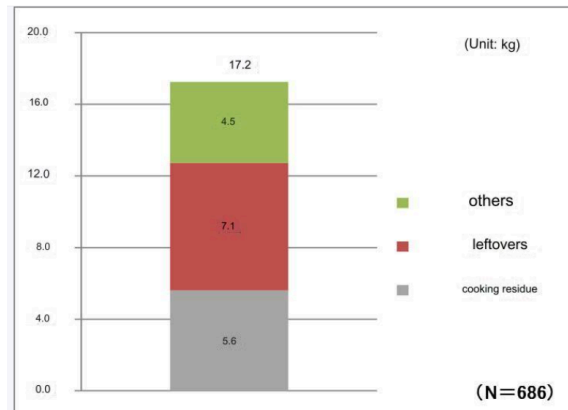
every year. According to 2018 by SYSTEM SQUAIR (<https://www.system-square.com/en/redu>)

[ce-food-loss-and-waste/](#))” For detail, about 324 million tons are discarded from business and 276 million tons are discarded from domestic. And we call those wasted food; “food waste”. For my research, I focused on the 324 million tons discarded from business.

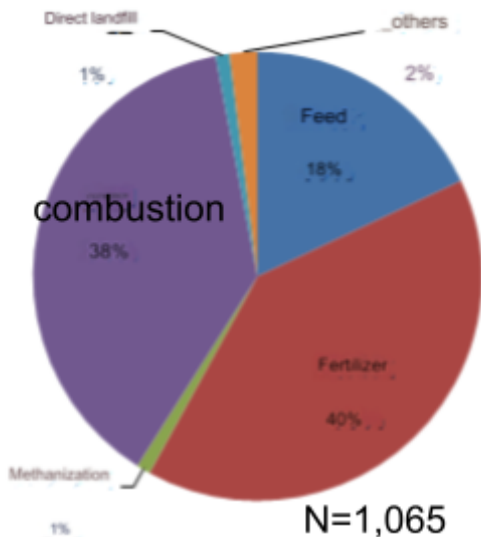
For food waste, there are several bad impacts. For example, it will be a waste of time, money and energy to ship. Also, by filling up the food would need some land. Conclusionary, we can easily say that increasing food waste can lead to Global Warming.

According to the graph from H25 by DANONE INSTITUTE

(<https://www.danone-institute.or.jp/mailmagazines/backyear/1124.html>)” above, the annual food waste per student is 17.2kg. This is the same amount as a 5 year old baby. This data is from the Ministry of the Environment. And the whereabouts of the food waste is shown in the graph below. It is made by the Ministry of the Environment.



It can be seen that 38% of food that children waste is still being burned. Combustion causes



deadly effects to the environment and the earth.

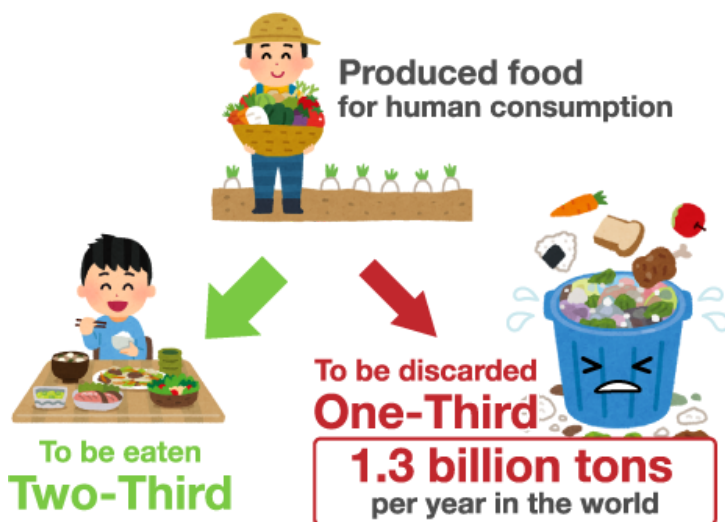
I would like to explain about food waste more deeply. According to the FAO of the UN, food waste is, “food appropriate for human consumption being discarded, whether or not after it is kept beyond its expiry date or left to spoil.”

Also, according to the picture by SYSTEM SQUARE (<https://www.system-square.com>)

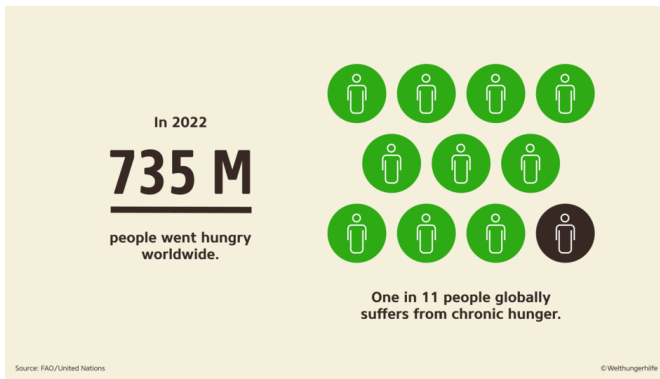
[/en/reduce-food-loss-and-waste/](#)) left below, nowadays, in this world there are 1/3 of the foods that people have produced are wasted. It means that 1.3 billion tons per year in the world are wasted even though the farmers produced food for human consumption.

It is likely to assume that all humans are well enough distributed to eat foods.

However, the reality is not. In this world in 2022, one in eleven people are suffering from chronic hunger. Reported in 2022 by WELT



HUNGER HILFE (<https://www.welthungerhilfe.org/hunger>)



About 735 million people went hungry worldwide. People aren't having the correct distribution of food.

However, developed countries like Japan are facing the problem of relative poverty. According to the WORLD

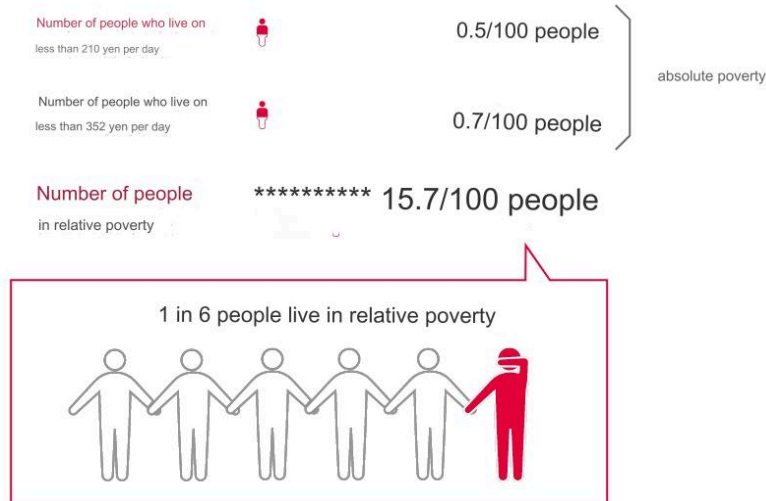
Table 1 Poverty estimates for reference year 2019, changes between September 2022 and March 2023 vintage by region and poverty lines

Region	Survey Coverage (%)	\$2.15 (2017 PPP)					\$3.65 (2017 PPP)				\$6.85 (2017 PPP)			
		Headcount ratio (%)		Number of poor (mill)			Headcount ratio (%)		Number of poor (mill)		Headcount ratio (%)		Number of poor (mill)	
		Mar 2023	Sep 2022	Mar 2023	Sep 2022	Mar 2023	Sep 2022	Mar 2023	Sep 2022	Mar 2023	Sep 2022	Mar 2023	Sep 2022	Mar 2023
East Asia & Pacific	97.4	1.1	1.2	24	25	7.6	7.6	160	161	32.1	32.1	675	676	
Europe & Central Asia	87.4	2.4	2.3	12	11	6.2	6.1	31	30	15	15	74	74	
Latin America & Caribbean	86.7	4.3	4.3	28	28	10.6	10.6	68	68	28	28	180	179	
Middle East & North Africa	48.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Other High Income	82.3	0.6	0.6	7	7	0.8	0.8	9	9	1.4	1.3	15	15	
South Asia	96.4	8.5	8.6	156	161	42	42.3	772	788	82.2	82.3	1508	1532	
Sub-Saharan Africa	54.3	35.1	34.9	389	391	62.4	62.3	691	698	86.5	86.4	958	969	
Eastern & Southern Africa	29.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Western & Central Africa	90.5	27.2	27.3	122	124	57.1	57.2	255	260	85.1	85.1	380	387	
World	84.6	8.4	8.5	648	659	23.5	23.6	1803	1831	46.7	46.8	3590	3634	

Note: Poverty estimates are not reported for Eastern and Southern Africa and Middle East and North Africa due to a limited survey data coverage of less than 50% of the regional population; however, the available data are incorporated into the poverty estimates for Sub-

BANKORG(<https://blogs.worldbank.org/opendata/march-2023-global-poverty-update-world-bank-challenge-estimating-poverty-pandemic> in 2017) there are 44 million people that are in

relative poverty. Also according to GRAMIN, in Japan one in six people live in relative poverty. It means that more than 20 million people are suffering from lack of money. To be more specific, Gunma has 630,000 people in relative poverty. About 3% applicable to them.



Actually, according to the Ministry of Health, Labour and Welfare relative poverty means the number of people whose household income is less than half of the

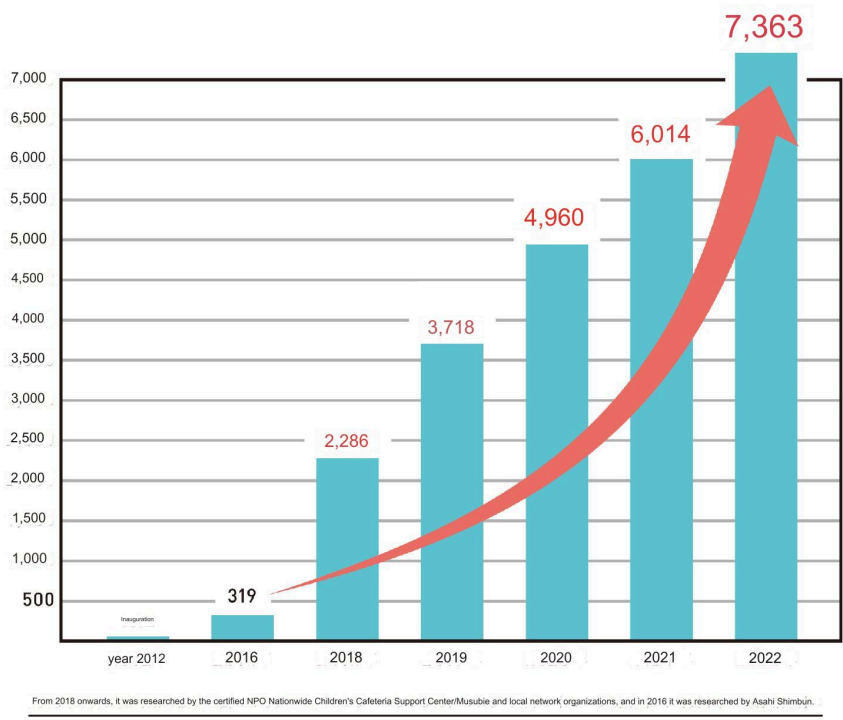
country's median (poverty line) of the country's equivalent disposable income (adjusted take-home income divided by the square root of the number of people in the household.)

Relative poverty has several differences between hunger. They get over their lunch by cheap foods or unhealthy foods. They may not eat satisfied.

For people in relative poverty Japan and the world has provided several programs like the Children cafeteria. According to Musubie, In Japan the number of Children's cafeterias

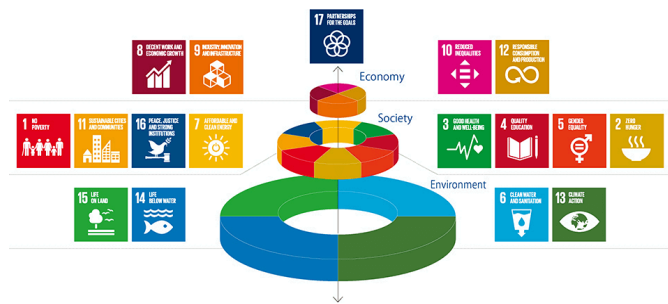
are increasing rapidly. We can assume that society demands this system. This system is applauded by the world.

However, there are tasks that are about the deficit because of the costs of food and the cost to hire the staff. In Gunma, the prefecture is supporting money to accompany the Children cafeteria. However, it costs more than supporting money so most of the Cafeteria volunteers are paying the costs. To break down, the expense of food is costly. Also, hosts need to select and book some place to host the event every time and that leads to the staffs' burden. Therefore, it is clearly known that a children's



cafeteria is not the most perfect sustainable way to solve those problems.

### 3. Discussion and implications



By considering and solving the problems that I mentioned above, we can contribute to reducing relative poverty and food waste.

By reducing the number of relative poverty, we can make our economy more active and can make people more healthy and reduce extremely fat or extremely slim which are not good for their body.

By reducing the number of food waste, there are 6 benefits for everyone and the earth

that I can mention. First, we can reduce the gas emissions that we used to carry extra to the garbage station. Gas emissions cause global warming. Second, we can cut off the costs of carrying garbage. Third, If we hand over those food waste to developing countries, they might save their lives and not die of hunger. We should think about those people. Fourth, we can save the land of wildlife

unless we use the land to throw food waste. Fifth, we can save energy. Saving energy is good for the environment.

By committing to these problems, we can contribute to Number 2, Number 11, and Number 12. According to “The SDGs wedding cake from Stockholm Resilience Center(<https://www.stockholmresilience.org/research/research-news/2016-06-14-the-sdgs-wedding-cake.html>)” when we achieve goal number 2, we can build the base of the second bottom of the SDGs wedding cake. We could make society better.



#### 4. Conclusion

To make my research true, I suggest holding a “ReSchool Project”. I am planning to hold this project at the elementary school. “ReSchool ” is the word combination of "RESCUE" and "SCHOOL". I would like to explain the main six details of this project.

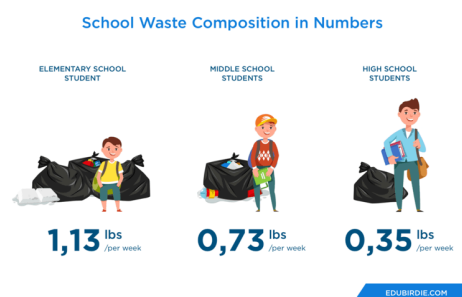
First, the project will be held at elementary school. The reason for the place is that according to EduBridge (<https://edubirdie.com/blog/school-waste-statistics>) compared to the middle school students or the high school students, the elementary school students waste 1.13Lbs per week and this is the most large amount of wastes than others. This means that elementary schools could waste more food and we have to overcome those problems.

Second, we are planning to give out the untouched school lunch to the participants. For example, there are breads or fish that the number had left. Food might be wasted if some students that day were absent and others did not want to have them. Also, thinking about the freshness, it is difficult to keep the food that we touched or wasted so we will throw them away in a Garbage disposal machine (Compost) that we will purchase later. I will talk about them later.

Third is about the time. The time of after-school facilities are usually open until 18:00. Furthermore, I will do this project from 16:00-19:00. By setting the time above, I made parents and their children have dinner together and also with their siblings for example after school club.

Fourth is about the takeaway. Families who could eat dinner at home could take away the foods that school handed out. School or volunteer members will pass “Doggie bag” to them. According to the Ministry of the Environment (<https://www.env.go.jp/recycle/food/motteco.html>), they started to call them “MottECO” as a doggie bag from April of 2022. Also, several new doggie bags had been designed and people could consider the type flexibly. ([https://www.env.go.jp/recycle/foodloss/pdf/wd\\_05.pdf](https://www.env.go.jp/recycle/foodloss/pdf/wd_05.pdf))

Fifth is the way of advertising. In Japan, elementary school students receive a tablet one by one.



Volunteers will make the flier or the website and send them into their tablets and make the children and their parents easy to view. Also, we will make the participant reservation and make no one have less dinner at school. Every day the lunch cooker will post the upper limit of participants at 1:00 pm. Children could book the joining easily to participate or not. Moreover, about volunteering, we will take an application from local people. There is no limit to being a volunteer. They can apply through the school website.

Sixth, the cost of having school lunch is equal to 200 yen. We are going to use it to reduce food waste more. To explain it in detail, I am planning to

purchase “Commercial garbage disposal machine SINKPIA bacteria method extinguishing type” which costs one million to five million yen. According to the number of clients which go to Children Cafeteria is about 10 people a day. Therefore, by saving money for 2 to 6 years at school. The disposal machine that we are going to purchase, microorganisms, could decompose and release water and carbon dioxide. The disposal machine is automatic so it is easy to save time and staff.

The above explanation is the overview of the ReSchool project to encounter the problem from Discussion and Implication.

Why don't we use the crisis of relative poverty and food waste as an opportunity to rescue relative poverty and bring more smiles through the ReSchool project?

## 5.Reference

Food and Agriculture Organization

Food wastage footprint Impacts on natural resources 2023/11/13

<https://www.fao.org/3/i3347e/i3347e.pdf>

Grammin

POVERTY 2023/12/09

<https://grameen.jp/about/poverty/>

The Japan time

Cafeterias offering low cost children's meals in Japan rose by 1,300, survey says

<https://www.japantimes.co.jp/news/2022/12/19/national/low-cost-children-cafeteria-rise/>

# Preventing Lifestyle Diseases

## Ways to prevent bad effects on health due to sedentary behavior

ID 5330 Fujimoto Shintaro

### **1.Abstract**

Over-sitting is a growing health problem around the world today. The aim of this study is contributing to the health of the international community by preventing sedentary behavior. I searched about the risk of over-sitting and the measures mainly on the Internet. Also, I received some advice and information from the Centre for Innovation in Healthcare, a national institution of Singapore. It has been revealed that sedentary behavior has harmful effects on both physical and mental aspects. The physical effect is the higher risk of getting lifestyle diseases like cancer and diabetes. Also, the mental effect is being more likely to suffer from worse mental health. There are several individual actions to prevent over-sitting, such as decreasing sedentary time, and standing up once in thirty minutes. Also, many institutions in the world are taking steps against sedentary behavior, like introducing height adjustable desks. I have three parts of suggestions based on the result of the study. First, companies and schools can introduce standing desks or balance balls. By doing so, we can decrease the sedentary time. It is possible to improve worker's health and productivity. Second, government or international institutions can set the numeric goal of sitting time and exercise time. People can know what they should do in detail so as to improve their health. Third, public health institutions can let people know the health risk of oversitting. Most people do not realize the risk of this lifestyle, so this initiative will be effective.

### **2.Introduction**

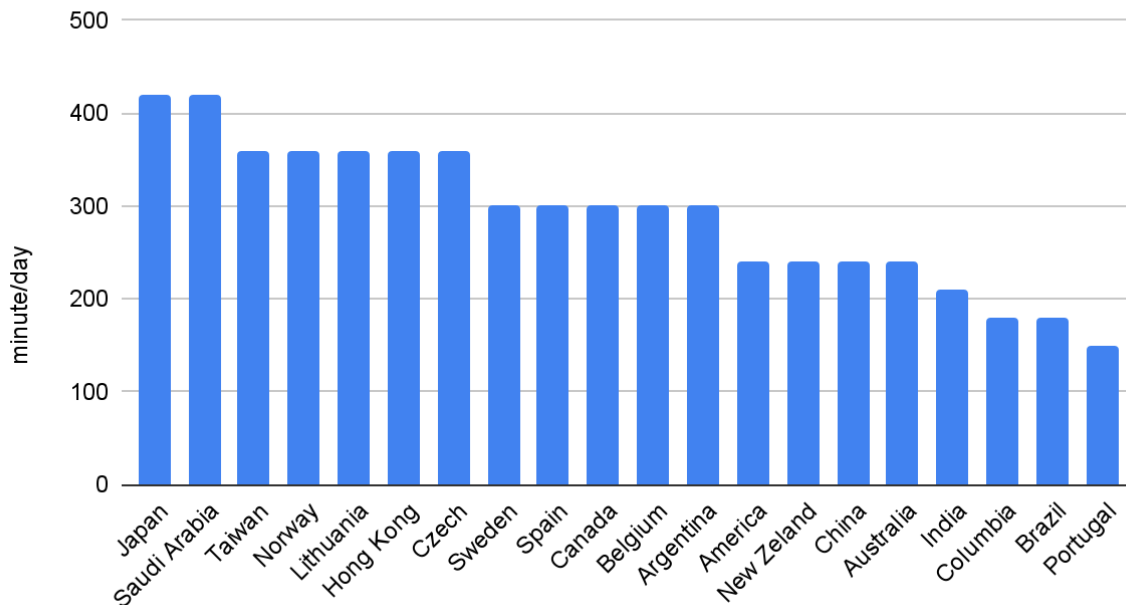
People can enjoy their lives even if they keep sitting all day long in modern society because the technology has been becoming sophisticated. It is a little old data, but participants of the study in the United States spent about 55% of their waking time in sedentary behavior in 2003 (Charles E. Matthews, Kong Y. Chen, Patty S. Freedson, Maciej S. Buchowski, Bettina M. Beech, Russell R. Pate, Richard P. Troiano, 2008). However, this lifestyle can be a vital risk. The paper of Faculty of Sport Sciences of Waseda University (2018) says that sitting for a long time causes the leg muscles, which support the metabolic functions of the entire body, to become inactive, and reduces the body's metabolic functions and blood flow. The risk of lifestyle becomes higher in this situation. In addition, too much sitting has a bad effect on mental health. Therefore, I believe that it is necessary to decrease sitting time to solve the health problem in the world. The aim of this study is to decrease sitting time and lower the risk of getting lifestyle diseases. I searched about the current situation, risk of sedentary behavior, and initiatives to solve the problem on the Internet, considered the solution, received some advice from staff of CIH (Centre for Healthcare in Innovation) in Singapore, and then improved my conclusion.

### **3,Discussion&Implications**

According to the survey of Sydney University (2011), the average sitting time per day in 20 countries is 300 minutes (5 hours). As the graph in the next page shows, the sitting time is longer in Asian countries, such as Japan, Saudi Arabia, and so on. It is said that business people are sitting 70% of their working time, so the sitting time might be longer than the data in the survey.



## The sitting time in 20 countries (median of weekdays)



Graphing from

<https://www.nli-research.co.jp/report/detail/id=61220?site=nli#:~:text=%E8%B1%AA%E3%82%B7%E3%83%89%E3%83%8B%E3%83%BC%E5%A4%A7%E5%AD%A6%E3%81%AEBauman,%E5%B9%B3%E5%9D%87%E3%81%AF300%E5%88%86%2F%E6%97%A5%E3%80%82>

People in the US have a sedentary lifestyle, too. They spend about 55% of their waking time in sedentary behavior, and only 5% in high intensity exercise (Charles E. Matthews et al 2008). Also, an inquiry done in 20 countries showed that the sitting time other than working time in 2006 was about 806 minutes, up slightly from 794 minutes in 1997. An increasing trend in sedentary time in the areas of transportation and education was shown in this survey. There are two main reasons why the time people sit has become longer in the world. It is the increase of desk workers and the increase of screen time caused by digital devices like smartphones or tablets. Actually, in the case of elementary school students, 726 minutes, or about 65.1% of weekday sitting time is considered screen time. (Isi, 2017). For this reason, foreign governments are encouraging children to decrease their screen time to less than two hours per day. The aim of this initiative is to shorten the screen time in leisure time. However, children who meet this criteria is about 30~50% and it is not a large number. Also, children spend most of their time in class sitting, so sitting for a long time is a big problem not only for adults but also for children. They are likely to keep the sedentary behavior in their future, and it will be a health risk for them.

Sedentary behavior has adverse effects in both physical and mental aspects. The behavior has a risk of degrading our health as much as drinking and smoking. However, this fact is unknown among people in the society. In physical aspect, it has been revealed that sedentary behavior increases the risk of getting lifestyle disease. The report of Waseda University (Araki, Oka 2018) refers the mechanism of that. If we sit, muscle of under limbs which support the metabolism of whole body doesn't work and the secretion amount of lipoprotein lipase decreases. Then, our whole body metabolism and blood circulation get worse, like Hyperglycemia, hyperinsulinemia, and dyslipidemia. After that, people suffer from lifestyle disease, such as obesity, diabetes, metabolic syndrome, cardiovascular disease, cancer, and so on. Provided that you stop sedentary behavior and just stand for a moment, the muscle of leg works



and the metabolism get better. Therefore, the possibility of becoming lifestyle disease is lower when we stand up more often even if the sitting time is the same. Also, the research of Kyoto Prefectural University of Medicine (Oyama, 2019) revealed that each additional two hours of sitting time per day increases the risk of death by 15%. That figure to people who suffer from dyslipidemia, to those who suffer from high blood pressure, and to those who suffer from diabetes is each 18%, 20%, and 27%. We can say that the increasing rate of diabetes patients is high [Chart 1]. I considered the reason why people suffering from lifestyle disease caused by sedentary behavior is likely to increase is that their death risk is higher. Also, the study found that the more of the three major lifestyle diseases (dyslipidemia, high blood pressure, and diabetes) we have, the more likely we are to have a higher risk of death due to increased sedentary time. [Chart 2] I considered the reason why the risk of death of those who suffer from three kinds of disease is much higher than those who have two is if they suffer from diabetes or not. Other data, the study done by Sydney University (2012) revealed that the possibility of death of those who sit more than 11 hours per day is 40% higher than those who sit less than four hours. Moreover, according to the research of American Cancer Society/Behavioral Epidemiology Research Group (2018), the death risk of people who sit more than 6 hours is 19% higher than those who sit less than 3 hours, and the risk of death by circulatory disease, cancer, and diabetes become higher. Those risks do not decline by exercising only on the weekend.

### Increased risk of mortality for each additional 2 hours of sitting time during the day

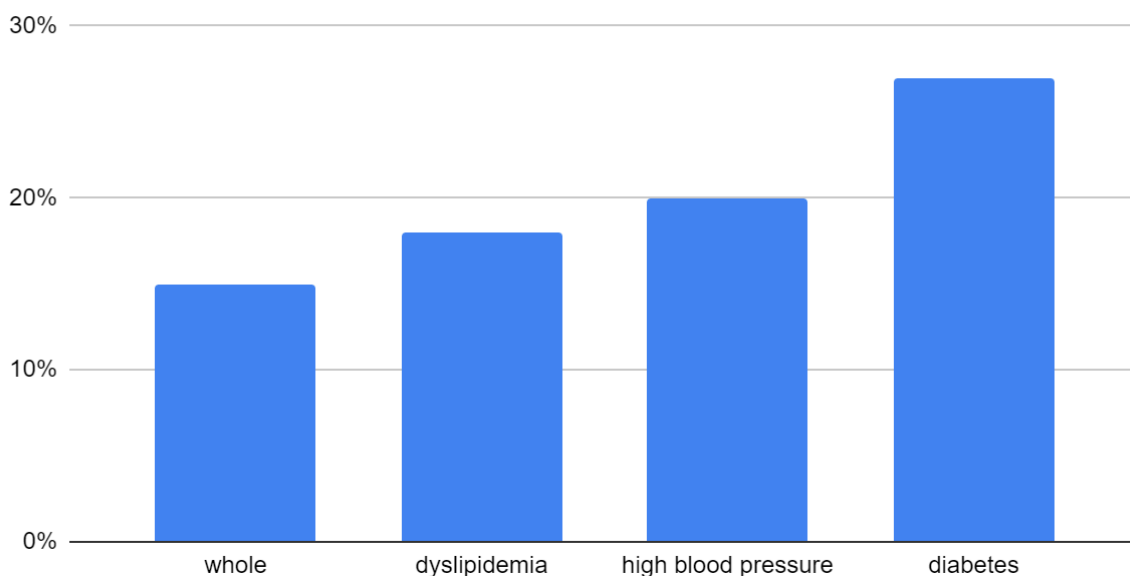


Chart 1

## Increased risk of death for each 2-hour increase in sitting time during the day by holding number of lifestyle disease

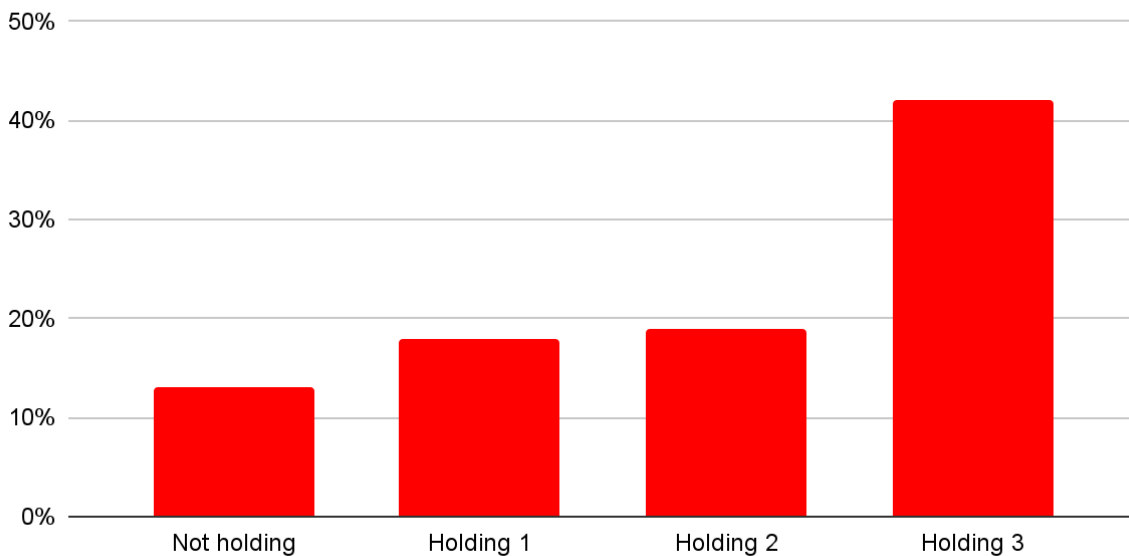
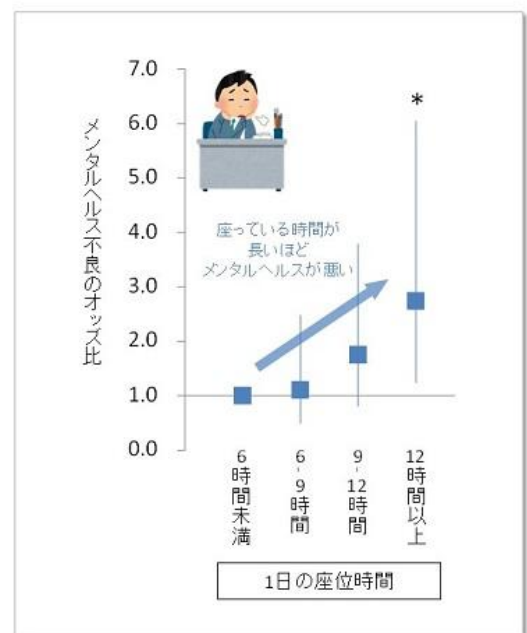


Chart 2

Graphing from <https://www.kpu-m.ac.jp/doc/news/2021/files/27489.pdf>

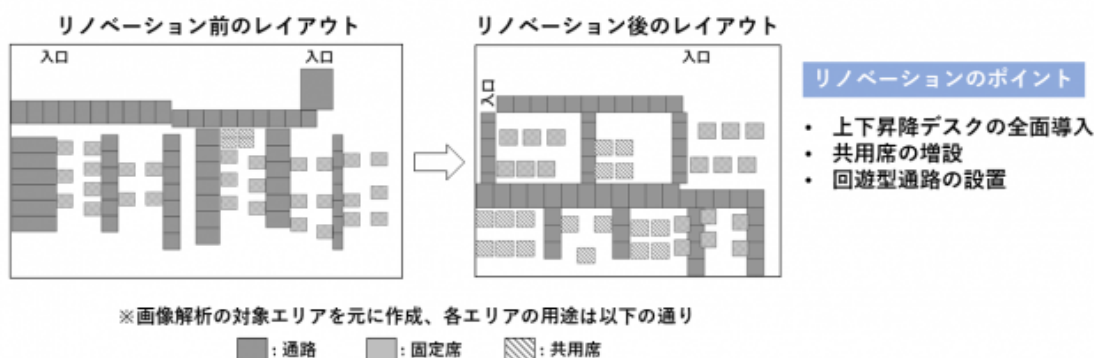
To add it, sedentary behavior degrades our mental health. The graph on the right shows that mental health is not quite different if the sedentary time per day is less than 9 hours. However, the possibility of bad mental health of those who sit more than 12 hours a day is 3 times higher than those who sit less than 6 hours per day. (Meiji Yasuda Health and Welfare Organization Force Medical Research Institute, 2017) That humans have been active for a long time and keep sitting is a stress is may be the reason for that result.

Moreover, the research of Waseda University done to Japanese students (2017, Ishi) revealed three things. First, sitting time is related to bad mental health. Second, changes in physical activity and holiday sedentary behavior over a 2-year period affect mental health 2 years later. Third, we tend to feel depressed if we use more than two types of media device, such as TV, game, PC, and so on, for more than one hour a day. quote from <https://onl.tw/ghcwApm>



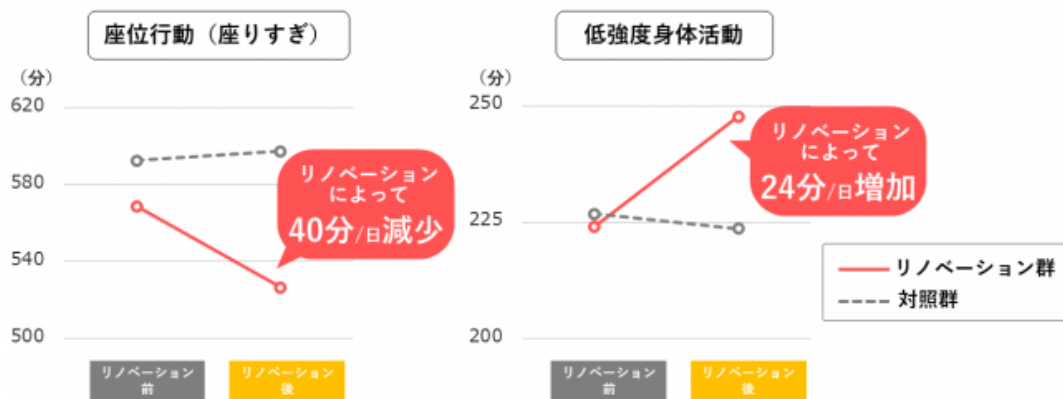
There are several ways to prevent these side effects of sedentary behavior. Decreasing sitting time, standing up once in thirty minutes, and exercising every day is effective to stimulate metabolism, and prevent lifestyle diseases. Increasing the sleeping time instead of sitting time is effective to be healthy mentally.

In order to prevent these adverse effects, companies and schools all over the world are taking steps. Efforts in global companies like Google and Facebook are well known. In this thesis, I will introduce the experiment on office environment improvement that Okamura Corporation, and Dentsu International Information Services (ISID), Inc. jointly implemented at Okamura Corporation from October 2018. This experiment is based on the ABW (=Active Based Working = the idea that staff can select the place or seat suitable for each business situation). Installation of elevated desks for standing work, more shared seating for free choice, and circular pathways to various destinations was conducted.



quote from <https://prtimes.jp/main/html/rd/p/000000012.000043138.html>

In order to confirm the outcome of the experiment, the researcher compared the renovation group (13 participants) with two other sites (29 participants) as the control group. And then, it became clear that the renovation group had 40 minutes less sedentary time per day, and 24 minutes more time of low intensity activity, like walking, than the control group.



quote from <https://prtimes.jp/main/html/rd/p/000000012.000043138.html>

It is considered that the reason for this decrease in sitting time was the more use of the circular aisles and the shared seating near the entrances and the windows. If workers use circular aisles they can know the progress of other's work. If employee use shared seating they can consult on the work. I considered those things are why many workers in the renovation group used circular aisles and shared sitting space.

It was found that the introduction in countries in Europe and America is more progressive. Particularly in Europe, the EU has set a goal for less sedentary time, and has cited the introduction of standing desks to achieve the goal. In the global companies, such as Google, Facebook, Volvo, it is normal to work standing. This act enhances not only the health of workers but also the creativity of

them. According to the study of Stanford University(2014), 81 % of subjects were more creative with walking movements than with sitting,and their creativity increased by 60% on average. (2019,Nissay Research Institute)

Also, Japanese companies,schools,and government administration offices are working to introduce balance balls instead of seats. Although it was rare for Japanese government administration offices, Tanabe City Office in Wakayama Prefecture adopted the balance ball on a trial basis in 2021,and approved all of the officers of the use of the ball in 2022. The effect of the balance ball differs from each worker,but many of them said that their backache became milder, and their posture was better. In addition,more than 90% of schools in Finland introduced the balance ball. It is not clear if there is a correlation, but Finland has a steady achievement in many fields ,and the score is better than other countries in PISA. PISA is a test that OECD conducts once in three years for 15-year-old students.

Moreover, an experiment that handed down play goods on class basis for school which can be used freely in break time was done in Japan from April to July, 2013. The play goods were many kinds of balls which are easy to get, like volleyball and ellipsoid balls. The number of the balls provided,one available for two people. In this experiment, the difference of sitting time in between period (break time between 2nd and 3rd period) and lunch break between schools that received the ball and school that were not was compared.According to the survey,the school that received the ball have less sitting time for about 5 minutes in between period,and almost 9 minutes in lunch break. From the results, it was clarified that giving play goods have effect on living more active even though it is a little.(2015,Ishi)

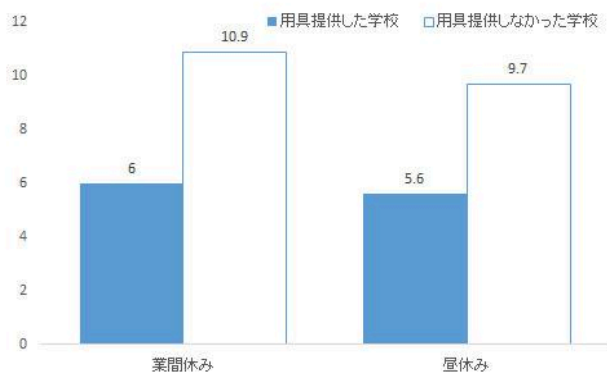


図 用具を提供した学校としなかった学校での座位行動実施時間(分/日)の差  
出典:文献10

quote from [https://yab.yomiuri.co.jp/adv/wol/opinion/sports\\_171225.html](https://yab.yomiuri.co.jp/adv/wol/opinion/sports_171225.html)

#### **4.Conclusion**

It is indispensable to take steps to decrease the sedentary time in both schools and companies. That is because the sitting time in schools or companies account for most of the sedentary time in a day for many people.The decline of sitting time in those times is related to the notable decrease of sitting time. Firstly,it is necessary to introduce standing desks in both companies and schools. As I mentioned, the installation of the desks resulted in the decrease of sitting time in the experiment of Okamura Corporation. Also, it is revealed that the productivity of workers is better if we introduce standing desks to the office. However,if we keep standing for a long time.I would like to realize the use of standing desks that the height can be changed so that we can repeat sitting and standing if possible. If it is impossible to make use of that type of desk, it might be good to create a place where

we can sit except normal desk. The barrier to introduce standing desks may be a financial problem(particularly for schools), so it is necessary to support the companies and schools financially to install them. Public institutions in each country can help implement the desk. I was advised that adopting balance balls instead of standing desks might be easier in the presentation time in school, so considering the way to introduce and use the ball is one of the challenges of this study.

Also, it is effective to advertise the adverse effects of over-sitting and the way to prevent that in various languages in SNS. The bad effects of sedentary behavior is not known for many people and SNS is a kind of media that people in the world use. Therefore, texting in SNS can lead to individual initiatives such as reducing sitting time and increasing the number of interruptions of sitting behavior. It may be good that reliable international institutions like the researcher group and WHO give information in SNS.

Finally, each government can set a numeral and national goal of sedentary time similar to the EU. I consider that 5 hours in developed countries, and 4 hours in developing countries is a goal that we can realize and also save our health. Numerical targets will help determine the direction of each country's efforts and enable more effective measures to be taken. For example, as I was advised in CIH(Centre for Innovation in Healthcare) in Singapore, Singapore sets the goal of people's sugar intake per day and sets the numeric limit of sugar amount in refreshing drinks in order to prevent diabetes. The goal makes it easier to assess how the initiatives are going well. Also, it is easy for the private sector to take measures.

The most major challenge of this study is to think of ways to make my suggestion more effective. Also, it will be necessary to change the custom to sit for a long time in order to make my suggestion more effective.

## **5. References**

「座りすぎ」ていませんか

<https://www.city.kita.tokyo.jp/k-suishin/kenko/kenko/kenko-yobo/documents/standup.pdf> 5/23,6/20

WHO身体活動・座位行動ガイドライン

<https://apps.who.int/iris/bitstream/handle/10665/337001/9789240014886-jpn.pdf?sequence=151&isAllowed=y> 5/20,6/20

「座り過ぎ」はカラダにもココロにも悪い？ | 健康づくりウォッチー一覧

<https://onl.tw/ghcwApm> 6/20

座り過ぎは子どもにとっても危険 日常生活から意識することで、体力や学力の向上に期待

[https://yab.yomiuri.co.jp/adv/wol/opinion/sports\\_171225.html](https://yab.yomiuri.co.jp/adv/wol/opinion/sports_171225.html) 9/26

座位行動の科学 ー行動疫学の枠組みの応用ー 2013

[https://www.jstage.jst.go.jp/article/kenkokyoiku/21/2/21\\_142/\\_pdf](https://www.jstage.jst.go.jp/article/kenkokyoiku/21/2/21_142/_pdf) 9/30

国内初！オフィス環境改善による座り過ぎ解消効果を確認

<https://prtimes.jp/main/html/rd/p/000000012.000043138.html> 10/21

株式会社オカムラ | 「働き方改革」の効果をAIで可視化する実験を開始

[https://www.okamura.co.jp/company/topics/other/2018/workstyle\\_ai.html](https://www.okamura.co.jp/company/topics/other/2018/workstyle_ai.html) 10/21

座っている時間が長いほど死亡リスクが増加する

<https://www.kpu-m.ac.jp/doc/news/2021/files/27489.pdf> 11/4

意識したい『座り過ぎ』の問題ー健康リスクを下げて、生産性を上げる

<https://www.nli-research.co.jp/report/detail/id=61220?site=nli#:~:text=%E8%B1%AA%E3%82%B7%E3%83%89%E3%83%8B%E3%83%BC%E5%A4%A7%E5%AD%A6%E3%81%AEBauman,%E5%B9%B3%E5%9D%87%E3%81%AF300%E5%88%86%2F%E6%97%A5%E3%80%82> 12/9

休み時間の用具提供による小学校児童の身体活動推進の効果

[https://www.jstage.jst.go.jp/article/kenkokyoiku/23/4/23\\_299/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/kenkokyoiku/23/4/23_299/_pdf/-char/ja) 12/16,18

役所の椅子はバランスボール 本格導入、思わぬ効能

<https://www.sankei.com/article/20220328-BWXQ5BVFZ5PA3JJDEV2HLKL74/> 2/13

フィンランド大使館ーEmbassy of Finland in Tokyo

<https://www.facebook.com/FinnishEmbassyTokyo/posts/3990519374295992/> 2/13

フィンランド教育の特徴とは？世界一といわれる理由からデメリットまで解説

<https://for-teachers.manalink.jp/think-edu/overseas-case/dqzauud9xfr> 2/13

The Impact and Feasibility of Introducing Height-Adjustable Desks on Adolescents' Sitting in a Secondary School Classroom

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5690354/> 4/24

Amount of Time Spent in Sedentary Behaviors in the United States, 2003–2004 11/20

<https://academic.oup.com/aje/article/167/7/875/84501> 11/20

# To Improve Literacy

To help all people in the world become literate.

5331 Hoshino Tamaki

## Abstract

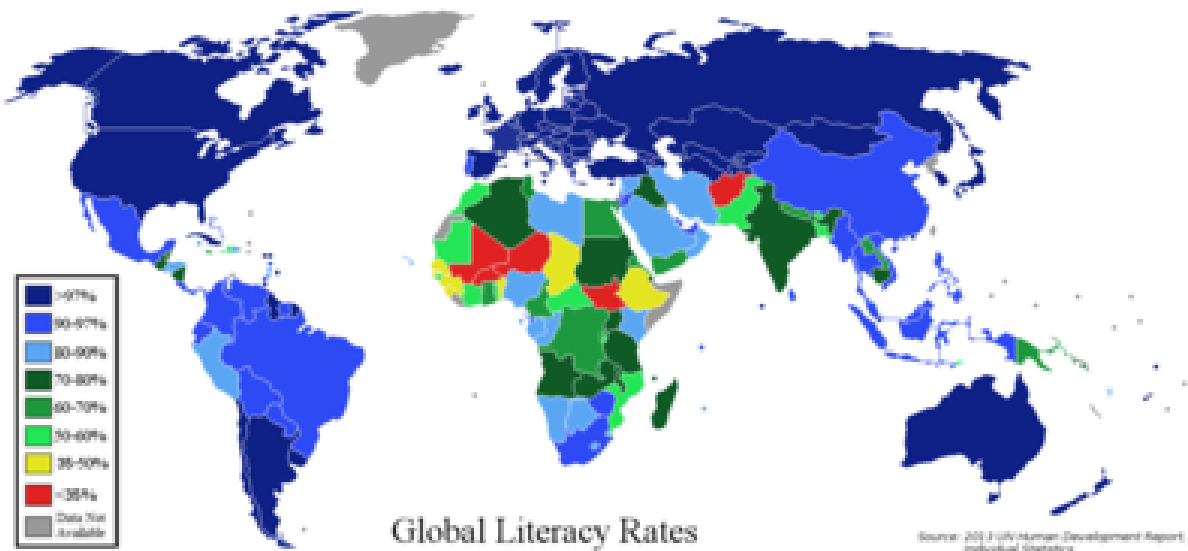
The average of world literacy is 92% on the male, 88% on the female. These figures are high. However, some developing countries' figures are lower than 50%.

Low literacy percentage means the number of people who can read and write something is seldom. The ability to read is so important. There are three main reasons. First, it enables us to read dangerous sentences. Second, it enables us to get services. Third, it enables us to work for a good salary company. Next it is about the cause of low literacy. The big cause is the number of schools in developing countries is rare. Therefore, my first suggestion is for JICA to use a Moving School.

A definition of Moving School is that the teacher moves a certain range with a car and some tools. The advantages of Moving School is that the teacher comes near the student's house. The cause of low literacy is the number of students is high, because the cost is too high to pay for them and it is very far from the school, so this Moving School can solve the problems. The Moving School can reduce the time of going to school and it restrain students for about three hours. I think that Moving Schools should teach only math and literacy. It is Ok for a short time. It enables students who have not gone to school to help their family. Second, the quantity of teachers in developing countries is low is one of the biggest problems. Low quality teachers are not efficient. That's because teachers in developing countries can not receive a fair salary, and most of them would not be taught when they were children. The number of teachers in developing countries is low, so we have to improve their skills. Therefore I have a second suggestion. It is for us to rely on JICA (Japan international cooperation agency). JICA has a program to improve teacher's skills. From these things, My finally suggestion is I will suggest these proposals (Moving Schools and improving teacher's quality) to JICA.

## 1 Introduction

According to UNESCO, literacy means ability of writing and reading, also literacy means the percentage 15 over the age 15 who can read and write about simple things in our daily life. Look at this graph. It indicates the percentage of literacy by country. We can see that developed countries have a high rate but developing countries are much lower than developing countries.



It is said that the number of people who can not literate is 773 million. Most of those people could not receive education because discrimination, war, and the situation of their house. In developing countries , the rate of literacy is lower than any other country,because the number of children who can not go to school is about 121 million. They can not read and write because they are not taught. I know that it became a vicious circle. From my point of view , I think we need to increase literacy rates around the world.

The purpose of this research is for children in developing countries to improve their literacy skills.

My research point is children in developing countries. I will tell you about the significance of my study. Inability to be literate has a lot of difficulties. I believe that the ability to be literate can change their life.

Let's show the previous study.

Mr. Kitajima is Japanese and he built a school in Cambodia. He bilt school and gave it to the government. In the strike zone , he talked about his action to build a school in Cambodia. First, matching a lot of people's intuition makes one project. Second, he needs about 4 million yen to build the school. Third, we have to take care of the school after we build the school. It is not final, we should be associated with my project eternally.

From his study, I understand reducing cost and spreading the range of schools are problems for us to solve.

I use the internet and previous research to make my suggestion. After that, I will prepare to make a presentation of my proposal to JICA.

## 2 Discussion and Implication

### 1. Present situation

The average of world literacy is 92% on the male, 88% on the female. However, some developing countries' figures are lower than 50%. It is much lower than the world average. One of the reasons is most children do not go to school. According to JICA, the Total Primary Education Attendance Rate of developing countries is lower than any other countries. There are mainly two reasons for the low rate. Firstly, in developing countries , most families recognize children as an important workforce, so many parents do not let their



children go to school. Secondly, most poor families can not pay high tuition fees if they want children to go to school. Second reason for the low rate is the number of teachers is much less than needed. The number of students per teacher in the Central African Republic is by far the highest compared to Japan and China, indicating a heavy burden on one teacher. From these things we have to make a new school style to improve literacy.

### 3 Conclusion

I have two suggestions to improve the present situation. My first suggestion is Moving School . I define Moving School in my own way as a school that is mobile, that is, it does not define the place where it educates, but develops education within a certain area from point to point. The reason I make this statement is that Moving School can reduce cost and can teach to many children by one teacher. I know we need a cost, time and human resources to build and manage a normal school, so I propose unnormal suggestion. This Moving School has two good points than normal school. One is that it is cheaper. In building schools need not only the cost of construction, but also utilities, water, land, etc. However, Moving Schools do not need them. Therefore, I think we can build a school more than a normal school with the same money. Second is the parents who think children are an important workforce are likely to permit children to go to school. That's because the Moving School comes near their house, so they can have a shorter time going to school. I think the parents can understand this way. I think Moving School has 100 minutes a day. It will teach literacy and mathematics, because most children need a lot of time to help their family. I plan to set up a curriculum that can be taught in one year. We need some car or bike to move.

I want to propose an EV-tuktuk. ( The picture is EV-tuktuk.) It does not need gasoline, it uses electricity, so it is good for the environment. It can be ridden simply by charging it from a 100 V household power source. Also, it is large enough to carry some things such as markers, whiteboard, and so on.



It is more reasonable than any other car.  
In Tokyo, you can buy it for about  
770,000 yen. It contains necessary  
insurance.



My second suggestion is to ask JICA. As I said in the Introduction, teachers in developing countries do not have enough quality and quantity, but it is impossible to increase the number of teachers because it prevents people from getting other jobs. Then, I want to ask JICA to send Japanese teachers to improve their skills by suggesting Moving School. Now, JICA is doing a project named 'Overseas Youth Cooperation Team'. I want them to teach not only children but also teachers in developing countries.

The future of my proposal is to prepare suggestions for JICA. There are a lot of thinking points, so I continue to think about how to improve literacy in developing countries. Also, I want to research about JICA more.

#### 4 Reference

•COCOCOLEREARTH / Yoshida Koki /「What is Literacy Rate? Explains the current situation around the world and efforts to improve it!」

<https://cococolor-earth.com/shikijiritu/#:~:text=%E6%97%A5%E6%9C%AC%E3%81%AE%E8%AD%98%E5%AD%97%E7%8E%87%E3%81%AF,%E3%81%99%E3%82%8B%E3%81%93%E3%81%A8%E3%81%8C%E5%BF%85%E8%A6%81%E3%81%A7%E3%81%99%E3%80%82>

•GraphToChart. /「Number of elementary school (primary education) students per teacher in the Central African Republic (transition and comparison graph)」/2021.03.20.

<https://graphtochart.com/education/central-african-republic-pupil-teacher-ratio-primary.php>

•Strike Zone / Kitagawa Yusuke /「Crowdfunding was used to pay for the construction of an elementary school in Cambodia.」/2016.09.08/

<https://yusukekitagawa.com/crowdfunding/>

- READY FOR / 「If you're looking to make a donation READY FOR」/ 2011  
<https://readyfor.jp/proposals/intro/?topbutton>
  
- Oshieru.work/ Manabuterasu/ 「Advantage of face-to-face class and Online class」/2022  
<https://www.oshieru.work/online-advantage-disadvantage/>
  
- gooddo /gooddo magazine editorial department/ 「The present situation of education in Africa」 / 2018  
[https://gooddo.jp/magazine/education/education\\_africa/4102/](https://gooddo.jp/magazine/education/education_africa/4102/)
  
- YAHOO NEWS/ Mutuji shoji/ The International Political Economy of the African Boom 4. A continent where growth and poverty coexist (1)/ 2014.10.19  
<https://news.yahoo.co.jp/expert/articles/98dc52b60bf25da6cc2ac5d0ed15ae1beb21afdc>
  
- JICA/ JICA Initiatives/  
<https://www.jica.go.jp/activities/issues/education/approach.html>
  
- UNESCO/ Teacher policy development/  
<https://teachertaskforce.org/what-we-do/national-and-regional-policy-learning/teacher-policy-development>
  
- Blog about politics, economy, culture, IT, international cooperation, Malawi/  
<https://marxtomusk.com/%E3%82%A2%E3%83%95%E3%83%AA%E3%82%AB%E3%80%81%E3%83%9E%E3%83%A9%E3%82%A6%E3%82%A4%E3%81%AE%E5%85%88%E7%94%9F%E3%81%AE%E7%B5%A6%E4%B8%8E%E3%81%AF%E3%81%84%E3%81%8F%E3%82%89%EF%BC%9F/>
  
- Impress Watch / Kiyomiya Shinji / 「I rode in an "EV Tuk Tuk" available at Yodobashi.」 / 2022. 04.1/  
<https://www.watch.impress.co.jp/docs/topic/1398217.html>

# Global Healthcare Disparities

~Improving the Healthcare Environment in developing countries~

5332 Kazuki Manabe

## Abstract

I decided to research global healthcare disparities because I would like to work in healthcare in the future. I have learned that the healthcare disparities between developed and developing countries have a major problem. In developing countries, the medical environment is not so well developed. Therefore, I have been conducting research with the research question, "How can we ensure that medical care is available to people in developing countries?" My research was mainly based on gathering information on the Internet. In my research, I found that there are problems such as a shortage of medical personnel, medical facilities are far or few, and medical expenses cannot be financed. Therefore, I wanted to utilize AI and robots. Specifically, I wanted to use diagnostic assistance systems and telemedicine systems to reduce human costs while introducing systems that can diagnose and treat patients. I would also like to combine this with the airlift of medical supplies by drone. In terms of future prospects, I would like to propose that local people learn medical care and increase the number of medical personnel. Also, it would also be good if we can take measures to address the increasing number of patients who require surgery due to severe conditions that cannot be cured by medicines, as this will cause a noticeable shortage of manpower.

## 1. Introduction

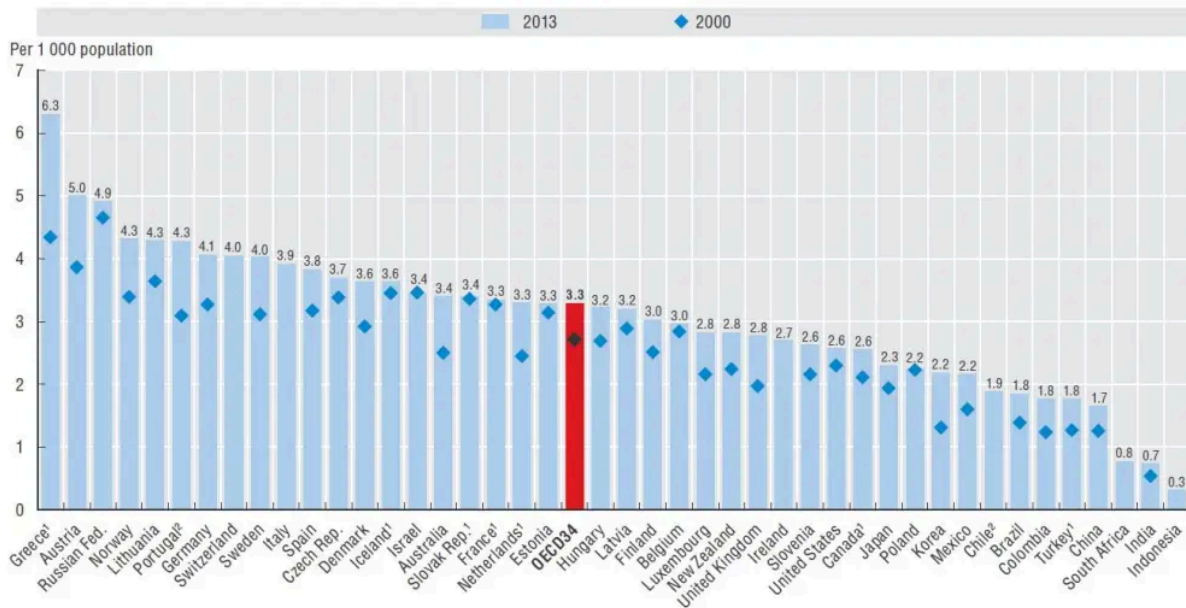
Global medical disparities are now a serious problem in the world. The disparities between developed and developing countries are particularly severe. I found in my research that there are some problems especially in Africa. In Africa, there are few hospitals, so it is difficult to get medical care. Also, people in Africa do not have enough money to access medical care. In addition, a shortage of medical personnel is a serious problem. I wanted to solve these problems, so I think it is useful to use AI or robots. In developed countries, a lot of AI is currently used in some ways, so it is believed that many jobs will be replaced by AI in the future. Therefore, I thought that replacing doctors in developing countries with AI would solve the problem, so I researched about what AI is useful in Africa.

## 2. Discussion and implications

There are several medical problems in Africa. The first problem that has been identified as a healthcare problem in Africa is the extremely high hurdles that patients face in accessing healthcare. This high hurdle has led to a vicious cycle of patients being further deterred from accessing medical care.

The most important problem in African healthcare is the shortage of doctors and medical personnel. There are overwhelmingly not enough doctors and health care workers for the number of people in Africa. Many African countries have less than 0.1 doctors per 1,000

people. Japan has a high level of 2.3 as of 2018, and European countries in the world have more than 4.0.



In countries where the number of doctors is low relative to the population, many lives are lost due to lack of proper medical care. The high number of patients per doctor means that the time available to see each patient is far too short, causing unnecessary suffering for the sickest patients. Although the crisis caused by this shortage of human resources is widely recognized, few concrete measures have been taken locally.

Another problem is the inability to raise funds for medical expenses. Africa has one of the highest poverty rates in the world.

Therefore, there are many people who want to receive medical services but are unable to raise

## Global poverty estimates

People living at the international poverty line of US \$ 1.90/day (in 2011 PPP).

Region	Headcount ratio (%)		Number poor (millions)	
	2013	2015	2013	2015
East Asia and Pacific	3.6	2.3	73.1	47.2
Europe and Central Asia	1.6	1.5	7.7	7.1
Latin America and the Caribbean	4.6	4.1	28.0	25.9
Middle East and North Africa	2.6	5.0	9.5	18.6
South Asia	16.2	12.4	274.5	216.4
Sub-Saharan Africa	42.5	41.1	405.1	413.3
World Total	11.2	10.0	804.2	735.9

money from their household budgets to pay for them.

Even if they are able to provide for their medical expenses, they often have to sell off their household goods or borrow money to provide for their medical needs. As a result, their lives become even more difficult and they remain in poverty.

Patients who cannot afford to pay will not go to the hospital even if they are infected. As a result, the ability to monitor the spread of infection is weakened and adequate measures cannot be taken, which can result in a pandemic.

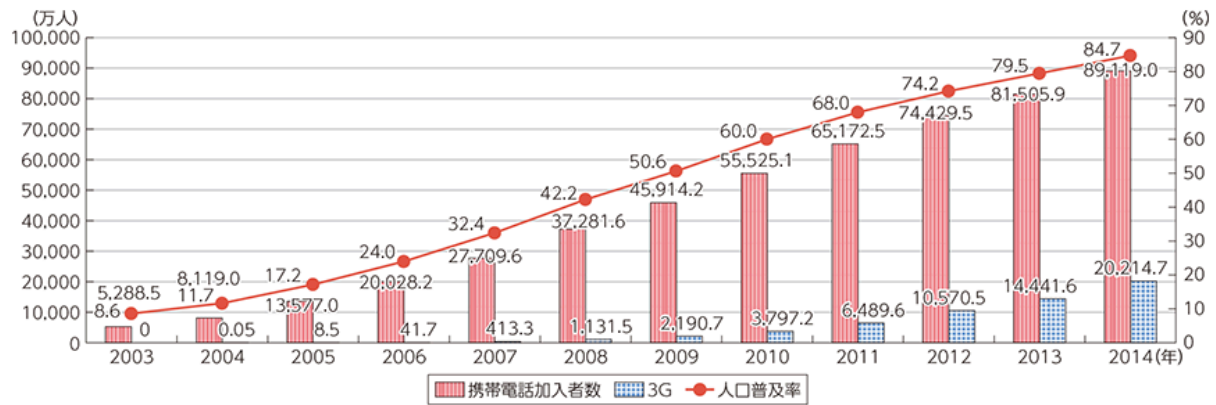
Another factor is the distance to hospitals. In Africa, there are limited hospitals available within a patient's living area. Few hospitals can provide emergency care, even in urgent cases. The further away from urban centers, the fewer hospitals are available, and in some areas, hospitals and other medical facilities do not exist at all. Roads and other transportation infrastructure, such as ambulances, are not well developed. This situation makes it difficult for people living outside of urban areas to access medical services in the first place. Currently, hospitals with adequate medical facilities in Africa are only located in urban areas, making it difficult for people who wish to receive treatment to access adequate medical services.

In addition, the quality of medical care is low. The reality is that in Africa, the quality of medical care is basically not high.

The level of medical care in urban areas in Africa may be considered high for Africa, but it still does not provide the same level of medical care as in Japan or Western countries. Many of the poor and middle class people living in Africa can only receive treatment at public hospitals that lack medical resources, and even if they know they will not receive satisfactory treatment, they have no choice but to receive treatment at those hospitals. If they want to receive quality medical care, they must go to private hospitals in urban areas, but private hospitals are mostly for the wealthy because of the high cost of treatment.

I would like to solve these problems. I especially wanted to utilize robots. I thought that if we could use robots, we could reduce human costs and make access to medical care easier. I would first like to use the diagnostic assistance system and telemedicine system that is being developed by a company called miup, which is assisting Bangladesh. In rural Bangladesh, there is only one doctor for every 15,000 residents. By utilizing these systems, diagnosis and treatment can be carried out while reducing human resource costs. Diagnostic assistance systems and telemedicine systems are systems that perform statistical processing based on symptoms and vital values to suggest diseases and prescriptions that are likely to affect the patient. Now, we are further developing these systems, and with the support of the SDG Business Grant Program of the Japan International Cooperation Agency (JICA), we have entered the field of "prediction" using machine learning, and are proceeding with demonstration experiments. The prediction system is a system that analyzes a large amount of detailed vital data and the results of medical interviews of patients, applies machine learning to correlate the data, calculates future health risks, and provides advice on how to improve health. I wanted to introduce these systems to developing countries in Africa and elsewhere. I also wanted to introduce the UNICEF-led airlift of medicines by drone. I thought that by using drones to transport and deliver blood transfusions and medicines, it would be easier for medical assistance to reach people in areas where hospitals are scarce or far away. I also wanted to utilize smart phones. By utilizing smart phones, medical examinations,





appointments, medicine orders, and payments can be made smoothly. In Africa, people tend to think that smartphones are not very popular, but the current cell phone penetration rate is increasing. This is due to lower prices resulting from the appearance of low-end terminals and the fact that Chinese manufacturers and others have provided smartphones to Africa. As you can see from the graph, the penetration rate is increasing every year, so I believe that when the penetration rate increases more in the future, the use of smartphones will lead to improvements in the quality of healthcare.

### 3. Conclusion

In order to enhance the medical environment for people in developing countries, we have come to the conclusion to use diagnostic assistance systems and telemedicine systems to reduce human costs, to enable many people in developing countries to receive diagnosis and treatment, to use drones to make medicines available to people living far from medical facilities, and to use smartphones. The company has also come to the conclusion that smartphones can be used to smoothly diagnose, make appointments, and provide medicines. As for future issues, I think there is a limit to how much support we can provide all the time, so I think we also need to make efforts to have local people learn medical skills and increase the number of medical personnel. So I would like to be able to make suggestions for that. I would also like to be able to take measures to address the shortage of manpower and inadequacy of the medical environment, since some patients may not be cured by pharmaceuticals even after their symptoms are diagnosed and may require surgery, which would then be conspicuous.

### 4. References

- [https://gooddo.jp/magazine/health/africa\\_health/4033/](https://gooddo.jp/magazine/health/africa_health/4033/)  
2022/05/31 アフリカの医療問題
- <https://gooddo.jp/magazine/health/3340/>  
2022/05/31 世界の医療事情を比較しよう
- [https://uhcday.jp/about/about\\_uhc/](https://uhcday.jp/about/about_uhc/)  
2022/11/15 UHCとは
- [https://wired.jp/waia/2019/06\\_mari-sakoh/](https://wired.jp/waia/2019/06_mari-sakoh/)  
2022/05/31 医療とAIで途上国に医療革命を

<https://monoist.itmedia.co.jp/mn/articles/1607/19/news127.html>

2022/11/15 ドローンがアフリカの地でインフラを目指す

<https://alj.com/ja/perspective/improving-healthcare-access-in-developing-markets/>

2023/01/15 発展途上市場における医療アクセスの改善

<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/h27/html/nc123120.html>

2023/01/15 総務省



# **New way to deal with Parkinson's disease**

## **By the use of various games**

ID 5333 氏名 Ichino Motegi

### **Abstract**

In today's world, there are said to be 306 designated intractable diseases. Out of these diseases, I chose "Parkinson's disease"(PD) as the theme of my study. Currently, more than 10 million people worldwide are living with Parkinson's disease. This disease is caused by the lack of a substance called dopamine. Right now, the treatment we have for this disease is mainly with medication or therapeutic surgery. Both cost a lot of money and some side effects so I wanted to come up with step-by-step treatment without any side effects and cost less money. The aim for the study is to come up with a treatment for PD that is very exciting and cheaper. I referred to the game that was originally invented by the company called Mindmaze, which uses the patient's actual movement to move the character in the game. I want to suggest an improved version of this game and collaborate it with many famous games so that it is more available and familiar to us. Also I want to make a suggestion to make a facility that is associated with hospitals and specializes with the gaming treatment not only for PD but also for many other neurological diseases. I am going to use the Internet to gather information related to PD .

### **Introduction**

This study aim is to come up with a new type of PD treatment. The reason why I put my eye on that theme is that, when I first started to do some research about PD, it showed that there are few treatments for this disease right now. Those are medication and therapeutic surgery (which I will mention later again). When I saw these treatments, I wanted to come up with a more enjoyable disease that the patients could have fun while living along with the symptom for the rest of their lives. The thought of using games as the treatment for PD is not out of the blue. University in Brazil has successfully used goalkeeper games as a way to predict the possibility of PD. I thought that this example can be the cornerstone of my study. Also a company in Switzerland has come up with a game called "Toap run", which uses physical movement of the PD patients to practice rehabilitation. I am considering using and developing this game and including it in my suggestion.

The research was conducted mainly through the Internet.

(1) Find out how prevalent games are in the world and in the gaming population.

We will examine this from various perspectives to find out the state of the current game industry.

(2) Investigate the relationship between games and dopamine secretion.

We will also examine in detail the relationship between time and dopamine secretion. (We want to ask specialists in the future.)

(3) Find out how much money is needed and where is the best place to use this therapy when it is actually utilized.

(4) Consider the harmful effects.

For example, there is a problem that if dopamine is continuously secreted for a long period of time, it may become tolerated and lose its effectiveness. In addition, we will focus on the type of work that seems to be tolerating dopamine secretion at the moment. In this case, we will focus on professional gamers, who are likely to be tolerant of dopamine secretion at this point in their careers.

In the last part of the survey, we would like to ask gamers/streamers who are familiar with games how they think the use of games in medicine will be received by the public, so we would like to conduct a survey of the general public (people in their grades) as a comparison target, We would also like to consider the differences in perception.

In parallel with this, we will also collect information on Parkinson's disease itself as appropriate.

Since research on how to treat Parkinson's disease using games is actually being conducted worldwide, we would like to investigate institutions that are pioneering such research and make contact with them if possible.

## Discussion and implications

### About PD

PD is one of the intractable diseases. It is caused by the lack of dopamine. Dopamine is one of the neurotransmitters and hormones which play an important role in many body functions including movement and memory, mood, attention etc.

<About the symptoms>

Main 4 motor symptoms

1. Involuntary shaking of particular parts of the body

The most noticeable symptoms, and often appear in the earlier stage of PD.

2. Stiff and inflexible muscle

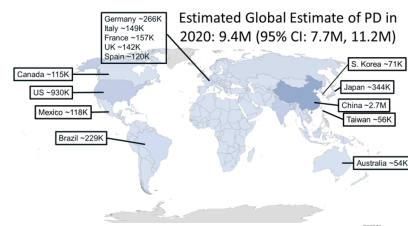
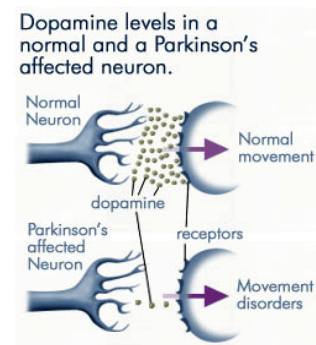
The muscle will become stiff and less flexible. Smooth movement will be difficult. Patients will not be able to relax even if they try to do so. Overall the movement will be unnatural.

3. Postural reflexes

It will become more difficult to balance their body, so the reflex when they try to change their posture will become dull. Also, their walking speed might get faster and changing the direction of their body will get troublesome. Sometimes their walking steps will become smaller so that they will not fall down, and their walking speed will get faster.

4. Akinesia

Even though motor paralysis and loss in muscle strength do not appear, movement related to daily lives will become slower. Spontaneous movement will decrease and that causes the amount of the exercise time of the patient to decrease even more. In the initial stage, the patients are still able to do their stuff alone, but as the symptoms get worse and worse, they will not be able to do those kinds of stuff by themselves. Eventually they are going to need some nursing.



< Other non-exercise symptoms >

Autonomic nervous symptom

The autonomic nervous system is responsible for unconsciously controlling body functions in response to external stimuli, but when a person suffers from Parkinson's disease, this autonomic nervous system is disturbed, causing "constipation," "urination disorders," and "abnormal sweating."

Mental illness

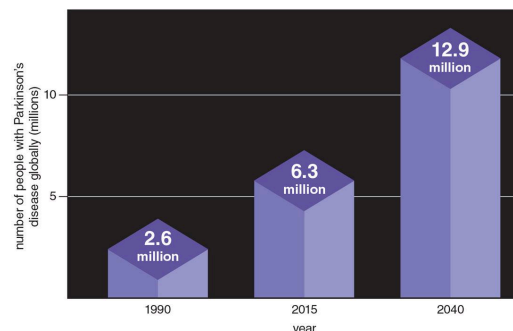
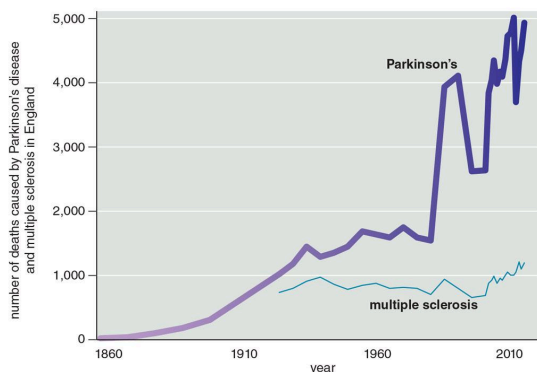
Shock from the fact that the patient themselves got PD or from the PD symptom itself, patients might suffer from depression or they might experience Hallucinations and auditory hallucinations. These mental symptoms might appear as a side effect of the PD medication.

Sleeping disorder

When PD progresses, the secretion of neurotransmitters such as serotonin, which provides peace of mind and mental stability, may be affected, resulting in insomnia.

<Current situation of PD patients>

The estimated number of PD patients all around the world is about 9.4 million in 2020. According to American Scientist, by 2040, the number of PD patients are estimated to increase up to at least 12.9 million. It also showed that this increment is peculiar to PD compared to other sclerosis, as the graph below shows.



Not only the number of patients but also the number of people who die because of PD is increasing. The reason for this increment is yet uncovered. American Scientist assumed that air pollution and metal production and many other things are thought to be linked to PD.

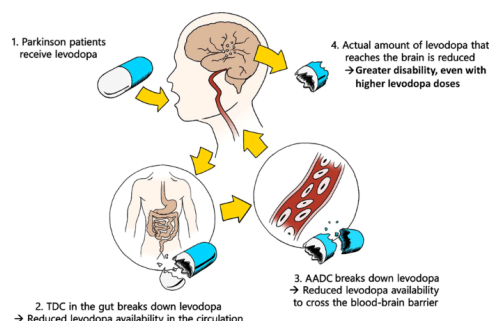
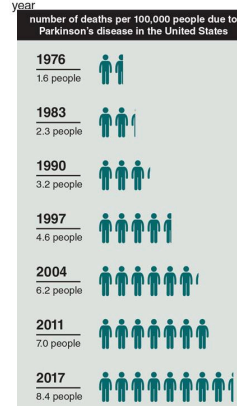
<Current treatment>

There are two ways to treat PD currently. These are medication and surgery.

1. Medication

Levodopa and Carbidopa (Mainly used)

Levodopa (also called L-dopa) is the most commonly prescribed medicine for Parkinson's. It's also the best at controlling the symptoms of the condition, particularly slow movements and stiff,



rigid body parts. Carbidopa makes the levodopa work better, so you can take less of it. This prevents many common side effects of levodopa, such as nausea, vomiting, and irregular heart rhythms.

< Main side effects >

### 1. Sudden Somnolence

It does not occur so often but sometimes, unexpected sleepiness occurs without omen. While taking the medicine, you need to refrain from activities that are risky. (ex. driving)

### 2. Digestive Organ Symptoms

Nausea, anorexia, dry mouth and constipation might appear

### 3. Psychoneurotic symptoms

Symptoms such as insomnia, anxiety, weakness, depression, hallucinations, and involuntary movements may occur.

### 4. Caution regarding the phenomenon of wearing off

This phenomenon is more likely to occur as Parkinson's disease treatment with levodopa becomes more prolonged.

The duration of levodopa's effect becomes shorter and shorter, and once a dose of levodopa is taken, symptoms may appear before the next dose is scheduled to be taken.

### 5. Cautions on on-off phenomenon

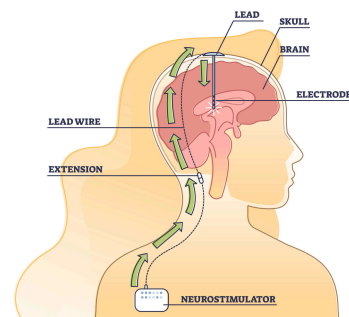
It may occur after long-term treatment of Parkinson's disease with levodopa.

Symptoms fluctuate rapidly, like turning a switch on and off, regardless of when levodopa is taken.

## 2. Surgery

### ① Deep Brain Stimulation (DBS)

Deep brain stimulation known as DBS, is a surgical therapy used to treat certain aspects of PD. This powerful therapy most addresses the movement symptoms of Parkinson's and certain side effects caused by medications. DBS may also improve some non-motor symptoms, including sleep, pain, and urinary urgency. It is important to keep in mind that DBS can only help relieve symptoms, not cure or stop disease progression.



In DBS surgery, electrodes are inserted into a targeted area of the brain, using MRI (magnetic resonance imaging) and, at times, recordings of brain cell activity during the procedure. A second procedure is performed to implant an impulse generator battery (called an IPG), which is similar to a heart pacemaker and approximately the size of a stopwatch.

Treatment with ongoing research

### 1. Utilization of iPS cells

iPS cells are a type of pluripotent cells that can be directly generated from somatic cells. For the treatment of PD, it is considered to make a nerve cell that produces dopamine from iPS cells and transplant it to the patient's brain. Now the research is conducted and the goal for it is to get approved by Pharmaceutical and Medical Device Law in a few years. The drawback of this way is that iPS has a high proliferation ability and it is concerned that it has the risk of

degenerating to tumors or other tissues. Also, it is considered that the transplanted cell might be producing dopamine too much and that might cause another problem other than PD. This treatment might be the highly expected and effective treatment that will be developed in the near future.

## 2. Gene Therapy

Injecting specific genes to the brain and curing PD is also considered these days. For this treatment, we will give patients' brains a gene that changes a Levodopa called "Dopa decarboxylase" into dopamine. and improve the production of dopamine. If you take Levodopa for a very long time, the effect of that medicine will gradually decrease, this is because the decrease of "Dopa decarboxylase" will also decrease the amount of dopamine that will be made from Levodopa. This gene related treatment is not carried out a lot and it is just a kind of experiment at this point. It is not considered to be used positively yet.

### <Cost of the treatment>

A research conducted in April 2022 showed that the annual incremental cost of Parkinson disease (PD) ranges from \$8,000 to \$10,000 per patient. It does not exceed the average americans' annual income, which is about \$31,000, but it is still a big number.

For surgery, it costs about \$40,000 and this is a big number. Although, in some countries, it is possible to use the insurance for an expensive medical treatment, which will decrease the financial burden a little bit.

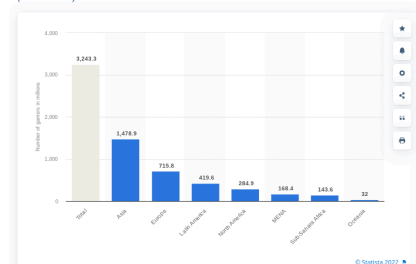
Other studies and graphs show a different number but what can be said common in those data is that the price of the treatment is a financial burden.



## About game

I could grasp a lot of information related to the population of the game industry worldwide from the graph that Statista presented in 2021. First of all, the number of game players worldwide is more than 3 billion and the number is about 40% of the world population which is huge. By the way, the number of game players by region shows that Asia has the largest population and the number is about 1.4 billion, a little less than half of the population worldwide.

Number of video gamers worldwide in 2021, by region (in millions)



Newzoo made an estimation on the number of the gamer population that is going to grow from 2015 to 2023. The information showed that the number of people would reach 3 billion by 2023, but it turned out that the increase was actually much steeper. One reason for the steep increment is the influence of Covid-19. Because of this furious pandemic, people had to stay home a lot compared to before. That caused the increase in the needs of indoor activity and the game industry developed a lot. The growing needs also affected the company of the game makers to improve their game contents and graphic skills to gain more players and not to lose the fierce competition. I

thought this spread of the game culture around the world will make it easier for people to accept games as the treatment in the medical area.

Also, I researched about how game addiction occurs and this infographic came out. This shows the mechanism of game addiction and it can be seen that in the “Anticipation” phase, dopamine will be secreted.

When the secretion of dopamine continues for a very long time, resistance against dopamine that humans had innately will disappear. The repetition of those sequences will lead us to game addiction. Shinjuku Perikan Kokoro Clinic's article

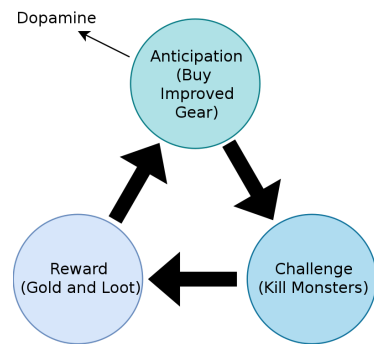
showed a lot more specific information about this. Dopamine is a substance that gives us satisfaction and happiness. But if the amount of dopamine made is too high, the receiver's sensitivity will decrease. As a result, they won't be able to gain the feelings that they used to feel.

In this situation, people will want to earn more strong stimulation, and again, this process will be done again. This is the same mechanism that occurs in drinking, and drugs.

In the case of "game", people who got stuck in this vicious cycle are likely to play games a lot more than before, or will be choosing more stimulating games. This is called "Reward Deficiency Disorder" and when one gets to this level, they will no longer be able to feel pleasure from anything.

There was also a statement that explained why the effect of Dopamine will decline.

It is similar to the mechanism of diabetes, and there are two patterns. First is the simple, the decrease of the secretion of Dopamine itself, and the second is the decrease of the dopamine receptor (Downregulation). The true reason why the downregulation happens is yet unclear but there are many studies going on about this right now. There are some hypotheses that say that this reaction happens because against the excessive stimulation, the adjustment function that human beings inherently have will work.



By utilizing the fact that playing games will produce dopamine, a company called Mindmaze in Switzerland is doing various kinds of research and effort. Mind maze came up with three different games called “Mind pod”, “Intento”, and “Toap run” and uses them as

rehabilitation for various neurological disorders. Particularly a game called “Toap run” (the game that the picture shows above) is specialized to PD. This game uses the technology to connect the game characters’ movement and the actual movement of the patient, to avoid obstacles on the screen by jumping to the side or upwards. I want to advance this game and make it my conclusion.





< about toap run > “ FAST and BIG movement”

• Player(patient) will take a posture that is usually difficult for the PD patients to perform, like movement to the side, dashing movement, twist of the upper body or stretching for example. These movements will help the patients’ movement to improve without the patient noticing it. To make the patient keep on doing this treatment, this game will combine visual, sound and cognitive solicitation and encourage them to improve their score as they play a lot. Actually, toap run was invented as one of the REHAB e-NOVATION projects, and won the Inv Avlogo2030 WOrld Innovation Competition and being supported by the future investment program and the development is in progress. In 2016, it gained the new European Call for project, Eurostars(Hoerizon 2020) and it is now possible to conduct research all over in the European area.

Other two games “mind pod” and “intento PRO” are being used as the rehabilitation for patients with various neurological diseases. I am going to introduce those two games briefly.

[mind pod]

MindPod Dolphin is designed to encourage motor skills and cognitive function. By using the anti gravity vest, it will decrease the weight of the arm and, by encouraging the continuous exploration of an immersive marine environment by game, it helps to train the control of the upper limbs.

[Intento]

Intento PRO is designed to treat the patient with a serious disability because of stroke. By using this, the patient will be able to control their arms. It is completely programmed and it will provide the electrical stimulation at the right time so that it can create the movement of the upper limbs. Because of the personalized design. patients can control the stimulation given to them and they can complete the task with the movement created by electricity.

All three of the above have been proven to be more effective than conventional rehabilitation and treatment, so I would like to actively incorporate them into the final proposal of this study.

Using games as the treatment, not only improves the PD’s physical symptoms but it might also improve its mental illnesses. A study called “Establishment of e-Sports to enhance therapy for depression treatment and elucidation of its biological mechanism”, which was conducted by a professor at Hirosaki University, showed the result that e-sports(In a broad sense, the term refers to entertainment, competitions, and sports in general that use electronic devices, and includes sports competitions using computer games and video games.) might contribute to the improvement of depression.

**【Implications】**

As of December 18th,I had not considered the way of the treatment that includes patients to actually move their bodies to complete the game, but considering this method would broaden

the scope of our research and allow us to incorporate immediacy into our proposals. I would like to build a treatment facility for Parkinson's disease into a complex facility where treatments can be performed using games in a variety of ways. I thought that I can meet the needs of various patients by expanding the range of applications rather than limiting the number of applications.

I considered the location for constructing this facility based on the information I earned. In addition to collaborating with local hospitals, I believe it is important to create global collaboration in order to further develop research into intractable neurological diseases, so I want to establish several bases in major countries and cities.

## **Conclusion**

As a conclusion of the study, I propose the worldwide dissemination of facilities that can treat Parkinson's disease using games, as well as the development of an application that uses games to predict Parkinson's disease, similar to the goals presented in the introduction. In terms of the dissemination of facilities that can treat Parkinson's disease, I believe that by having these facilities not exist on their own, but in partnership with regional and national hospitals, it will be possible to contribute to society by providing research information on Parkinson's disease itself at the same time. We have not yet decided on the specifics of how to do this, but we thought it would be best if we could gain the understanding of local hospitals and hospitals specializing in neurological diseases by holding explanatory meetings with them.

[About the facility]

We would like to set up a treatment facility with private rooms like a regular hospital, an area where patients can live, and a place that is similar to a rehabilitation facility, even for day patients. The system will analyze each patient to determine what kind of symptoms require immediate treatment, such as improving physical symptoms and mental symptoms, and will incorporate AI to create a treatment menu specifically for each patient.

Future tasks

(1) Resolving questions

In the course of this research, many questions arose. (see below).

We would like to resolve them not only through Internet-based research but also by interviewing experts and other people involved in the field.

Questions to Consider

If this solution is realized, will it be accepted by the public?

What kind of games would actually work?

If a professional gamer has Parkinson's disease, will this method really work?

Do pro-gamers actually take care of their health?

If they are taking energy drinks on a daily basis, will this also affect their daily dopamine secretion, since energy drinks also have the function of secreting dopamine?

How much game playing (time) is related to dopamine secretion?



If we continue to play games every day for a long period of time, even for a short period of time, will we develop a tolerance to dopamine?

Is gaming a behavioral addiction?

Do you think there is a difference between being addicted to games and playing games as a job?

Do you think there is a parallel between being addicted to games and playing games as a job (e.g. professional gamer)? Can they happen at the same time?

## (2) Be specific

Nothing concrete has been decided on in realizing the proposal. If the goal of creating a treatment facility for Parkinson's disease using games is actually going to be carried out, I would like to decide on the best place to build it and which organizations, such as local government and government agencies, would support this. I think we can begin to think about some of these points once the questions in (1) are resolved.

I will also consider concrete ways to promote cooperation between treatment facilities and local hospitals, which was one of my proposals at the National High School Student Forum held on 12/18, rather than vague suggestions.

## References

### Demographics

<https://www.parkinson.org/advancing-research/our-research/parkinsons-outcomes-project/demographics> (10/30)

### The Rise Of Parkinson's Disease

<https://www.americanscientist.org/article/the-rise-of-parkinsons-disease> (10/30)

### Estimation of the 2020 Global Population of PD

<https://www.mdabstracts.org/abstract/estimation-of-the-2020-global-population-of-parkinsons-disease-pd/> (2022/11/04)

### Medication for PD (11/04)

<https://www.webmd.com/parkinsons-disease/drug-treatments>

### Surgical treatment options (11/04)

<https://www.parkinson.org/living-with-parkinsons/treatment/surgical-treatment-options>

### Understanding Deep Brain Stimulation (DBS)

<https://www.ohsu.edu/brain-institute/understanding-deep-brain-stimulation-dbs>

### About Parkinson's 5/9

<https://www.irs.jp/article/?p=374>

### パーキンソン病、新たな治療法の可能性 5/9

<https://parkinson-smile.net/treatment/p5.html>

### About Parkinson's symptoms

<https://kobe-shinkyu-pd.jp/parkinson-yokuutsu-naosu-tameni>

### 第3回:パーキンソン病～高齢化社会のCommon Disease～ | かしわばブログ

### パーキンソンの予防方法

<https://kobe-shinkyu-pd.jp/parkinson-yobou-houhou>

### パーキンソン病の年齢別患者

<https://kawamuraika.jp/blog/nousinkei/5091>

### 手術療法に関して

## 外科治療 | パーキンソン病の治療

- Number of gamers worldwide by region 2021 | Statista

[Number of gamers worldwide by region 2021 | Statista](#)

Genz

<https://newzoo.com/insights/infographics/gen-z-gamers-key-insights>

Millenials

<https://newzoo.com/insights/infographics/millennial-gamers-how-millennials-engage-with-video-games/>

GenerationX

<https://newzoo.com/insights/infographics/gen-x-gamers-how-gen-x-engage-with-video-games/>

Babyboomer

<https://newzoo.com/insights/infographics/gen-x-gamers-how-gen-x-engage-with-video-games/>

about global gaming industry

<https://www.gamesindustry.biz/global-gaming-market-to-hit-usd222-billion-this-year-data-ai>

神経疾患の回復を促すゲームに開発

<https://project.nikkeibp.co.jp/behealth/atcl/news/world/00054/>

Article introducing Mind maze

<https://www.prnewswire.com/news-releases/mindmaze-defines-the-future-of-brain-health-with-digital-neurotherapeutics-portfolio-301269857.html>

Mind maze

<https://www.mindmaze.com/gaming-fun-and-functional/>

toap runについて

<https://www.curapy.com/jeux/toap-run/>

The economic burden of PD among Medicare beneficiaries

<https://www.jmcp.org/doi/pdf/10.18553/jmcp.2022.28.4.405>

Medical in development for PD

<https://phrma.org/resource-center/Topics/Medicines-in-Development/Medicines-in-Development-for-Parkinsons-Disease-2014-Report>



# Improvement of Medical System

～Medical Staff Share their Task by Task Shifting System～

5401 Ando Yuki

## Abstract

I researched the medical system in Japan. I found some problems. One of them is the problem of overwork. These days, the Japanese government has come to grips with how to work in all jobs and most of the job's work system has been improved. However, the medical system was not a major improvement. There are several reasons. First, the lack of physicians. However, the number of doctors has been reduced greatly. Then, why has the lack of physicians occurred? That is because there are a lot of hospitals and uneven distribution of physicians. Also, it also has to do with the low number of female physicians.

I think that task shifting is effective for these and other problems.

## 1 Introduction

Nowadays the Japanese government reviews working hours such as work-system reform. It is defined as reforms to realize a society in which workers can choose a variety of work styles according to their circumstances. It mainly has four points.

First, limited overtime work is prescribed forty-five hours per month and three hundred sixty hours a year in principle. Even though there are crucial reasons, it must be within one hundred hours per month and seven hundred hours a year. If it is exceeded, the person must pay a fine.

Second, Introduction of the work hour interval system. They are required to take an amount of time off at least between the end of one workday and the start of the next day's work. Third, the obligation to take five days of paid leave per year. For workers who have ten or more days of paid leave per year, such as a full-time 5-day work week, companies are required to provide five days per year and violations of this requirement are subject to fines to companies.

Fourth, the expansion of flexibility to the Flextime system. It is that workers decide the total number of working hours in advance and they can decide their own daily start and end times and working hours as they wish. It only could be applied up to one month before. However, it can be applied in increments of two or three months.

In this, we can consider the system of physicians.

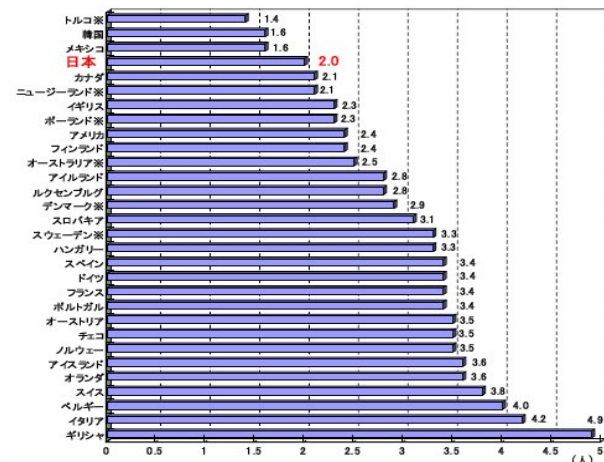
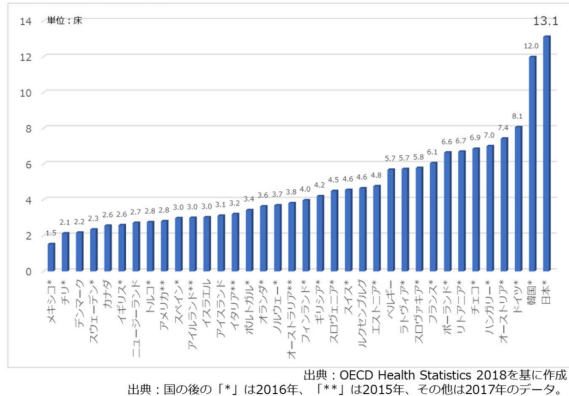
## 2 Discussion and implications

While the issue of doctors' working hours has been raised, the government has also begun to take action to address this issue. The government has also begun to take action to address this issue. The reforms are divided into three levels: Level A, Level B, and Level C. The first level, Level A, applies to all physicians. The first, Level A, applies to all physicians and includes restrictions on overtime work. The first, level A, is for all physicians and includes a limit on overtime work of 960 hours or less per year. This makes no sense at all, as it means that doctors are allowed to work the same number of overtime hours as the overwork line mentioned earlier. On the contrary, level B is for those who work at medical institutions that provide emergency medical care and other urgent medical services, and the upper limit is less than 1860 hours per year, a figure that far exceeds the overwork line. Level C is also for physicians who need to accumulate case experience intensively in a short period of time, such as initial clinical interns, medical specialists in the new medical specialty system,

and physicians aiming to acquire advanced skills, and the limit is less than 1860 hours. In addition to this, they are allowed to exceed overtime hours under special circumstances. The situation in the medical field is thus dire.

Then, I 'll talk about two main courses.

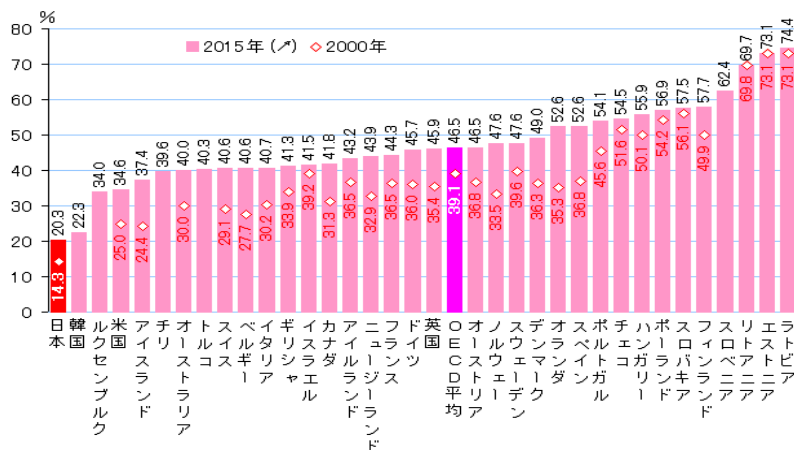
図：病床数の国際比較



The graph on the left shows an international comparison of the number of hospital beds. The leftmost graph shows that Japan has significantly more beds than other countries. The graph on the right shows an international comparison of the number of physicians. It shows that Japan does not have so many doctors compared to the rest of the world. These two graphs show that the number of physicians in Japan is insufficient for the number of hospital beds, and that the burden on a single physician is high. This may be one of the reasons for the increase in doctors' working hours.

Another characteristic of Japanese physicians is the small number of women. The figure below shows that the percentage of female doctors is very low compared to the rest of the world. I think the reason for this is the problem of Japanese doctors. The stereotype that "I don't want female doctors to operate on me" is held by many Japanese. If there were more female doctors, it would lead to a decrease in working hours.

女医比率の国際比較 (OECD諸国)



(注) OECD Health Statistics 2017による。OECD平均は各年次の単純平均。2000年のデータ：リトアニアは2001年、ラトヴィア、ノルウェーは2002年、アイスランドは2015年。2015年のデータ：チェコは2013年、デンマーク、日本、スウェーデン、米国は2014年

(資料) OECD(2017) The Pursuit of Gender Equality: An Uphill Battle, p265

### 3 Conclusion

To solve these problems, I would like to propose the promotion of task shifting. Task shifting is an attempt to alleviate the concentration of physician work and improve labor shortages and working conditions by transferring and sharing physician work to pharmacists, nurses, and other co-medical staff in the hospital. For example, when an accident such as "adverse drug reactions" occurs during hospitalization, the patient must wait for the doctor's consultation and instructions to change prescriptions, etc. However, if task shifting expands the work of each area of the co-medical staff, the co-medical staff will be able to respond more quickly at their own discretion.

#### **4 References**

<https://honkawa2.sakura.ne.jp/1930a.html> 「女医比率の国際比較」

<https://www.nli-research.co.jp/report/detail/id=58024?pno=2&site=nli>

「病床を減らそうとしているらしいけど、なぜ？」

[https://www.tis.amano.co.jp/gyomu\\_kaizen/](https://www.tis.amano.co.jp/gyomu_kaizen/)

「2024年開始予定の「医師の働き方改革」とは？」

<https://gemmed.ghc-j.com/?p=44190>

「2019年度国民医療費」

[https://www.watakyu.jp/wp-content/uploads/2020/09/20200915\\_2.pdf](https://www.watakyu.jp/wp-content/uploads/2020/09/20200915_2.pdf)

「医師勤務実態調査」

# Education for All People

## — Using digital education tools—

5402 Iida Mima

### 1. Summary

I believe that education is fundamentally needed as a means of solving many of the issues that are occurring in the world. Many people in developing countries do not have access to adequate education. There are many causes, but I have focused on online education as a solution to these problems. I have made recommendations to change the online educational materials used according to the age of the children, to reform online education to incorporate more forms of human interaction, and to provide tablet terminals that do not require Wi-Fi.

### 2. Introduction

#### Background and purpose of this research

Although many of the world's problems have been solved in the last few decades, there are still many people in the world who are poor and do not have access to adequate education. I believe that education is a major step toward people's affluent lives and a better nation. For example, education may help people learn to accept different values or diversity, and reduce wars. Also, thanks to education, people may be able to farm more rationally, which may reduce hunger. In other words, I believe that solving the education problem will solve other problems.

The purpose of this research is to provide such education to more people and of better quality. In this context, I turned my attention to digital education. I believe that this can solve the factors that hinder access to education in developing countries. In this study, I would like to consider how digital education should be used.

#### Research Method

- (1) Research with the Internet.
- (2) Based on the research, make proposals that will enable us to achieve the objectives of the research.

### 3. Main discussion

#### (1) Current Situation of education in developing countries

It is estimated that there are 61 million children worldwide who do not have access to education, and more than half of them live in areas south of the Sahara Desert in Africa. The number of children enrolled in school and attending school alone has increased by an estimated 160 million compared to 10 years ago, but many challenges remain.

The net enrollment rate in least developed countries, including South Sudan, Uganda, and Bangladesh, is 80%, with one out of every five children out of school. Meanwhile, the net attendance rate is 75%, with one in four children out of school.

Looking at the country-by-country data, we can see a bias that is not represented in the averages. In South Sudan, the overall net enrollment rate for primary education is 31%, and for girls only 27%. And although they are enrolled, only 20% of these children actually attend school. In Uganda, enrollment in primary education is over 90% for both boys and girls, but the percentage of children who remain in the final grade has dropped to 20%. The problem is not only low enrollment rates.

The average literacy rate in least developed countries is 63%, and in South Sudan, the literacy rate among young people (15-24 years old) is only 44% for males and 30% for females. The country with the lowest literacy rate is Niger, with only 35% for males and 15% for females. The data also shows a significant disparity in education for women.

So why do some children fail to get an education? Let us consider the causes. First, there is the cause of the lack of an environment which is to receive an education in the first place. Specifically, schools are not located nearby, the number of teachers is small, and the quality of teachers is low. Secondly, many children are not able to attend school until their final year of school due to family reasons which means they have to work to support their families even after starting school. In other cases, parents lack understanding and interest in education and do not allow them to go to school. Furthermore, cases of children being unable to attend school due to civil war or conflict have become a problem in recent years. For example, in South Sudan, there are many children who are unable to receive an adequate education because they have become refugees due to civil war. The problem of "child soldiers," or children who are sent out as soldiers, is also a major factor.

Based on these causes, I thought that online education could solve this educational problem. With online education, children in developing countries don't need a school to take classes, and they can take classes from high quality teachers. Online education allows students to study while working from home and does not cost much money. Even during war, they may be able to study when they have time.

Before I discuss the various online education options, I would like to review the current status of online education. and is projected to register a CAGR, Compound Annual Growth Rate of around 12.68% over 2020-2027. The global online education market is expected to grow 2.8 times during the assessment period 2020-2027.

## (2) MOOCs, Massive Open Online Courses

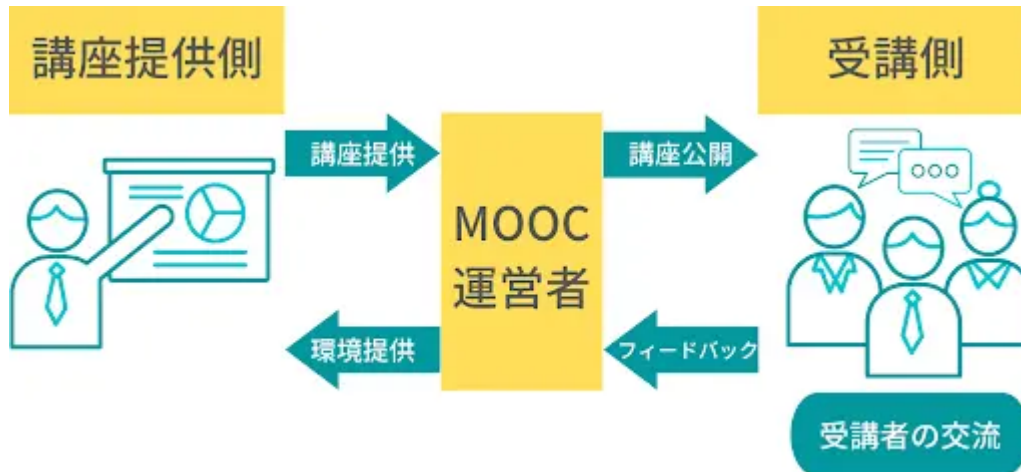
MOOCs is a kind of digital education, and its formal name is Massive Open Online Courses. Here I would like to introduce MOOCs, which have become increasingly popular in recent years.

MOOCs refer to large-scale online courses that use the Internet. In many cases, universities use a platform for video distribution to make lecture videos available to the public. Students can view the videos by registering to use the platform and



registering for courses of their choice. Figure1 is an easy-to-understand summary of this mechanism. The "MOOC operator" is the "platform that distributes the videos." This system started in the United States around 2008.

Figure1:How MOOCs work



Basically all classes can be viewed for free, but there is a fee for the certificate of completion. Let me give you an example of Coursera which serves a lot of classes for free, one of the many MOOCs, which offers free classes . It costs about US\$49 for a one-month course. The certificate can be used as proof of what you have learned, but it seems to be of less value than what you would get from actually studying at a university. Therefore, the certificate is not of high value, but only a proof of learning.

I mentioned Coursera a little above, but there are many other MOOC platforms out there. The most representative ones are Coursera, edX, Swayam, and FutureLearn. Figure2 shows you the current situation of various platforms.

Figure2: current situation of various platforms.

name of platform	number of users(ten thousands)	number of courses
Cousera	9,700	6,00
edX	4,200	3,550
Future Learn	2,200	1,400

Thus, "Coursera" is far ahead of other services. This indicates the high quality and diversity of courses offered by "Coursera". While the examples given above are global platforms, I would like to introduce the Japanese version of MOOC, which was established in 2013 as the Japan Open Online Education Council (JMOOC) to promote and expand MOOCs that started in the United States. JMOOC basically

handles courses at Japanese universities, and most of them are in Japanese. As of March 2023, JMOOC had 617 courses and over 1.39 million registered users.

MOOCs allow students to take lectures in a variety of systems. Higher education at the university level is available through online lectures. Here are some examples. University lectures are directly converted into videos of classes for their own students, and you can take various types of highly specialized lectures, such as lectures in the humanities, lectures related to art and design, lectures in science and engineering, and so on. There are also those for business people to learn business knowledge. Students can take leadership training, project management training, and other management-related knowledge. In addition, Udacity's services include a wide variety of lectures related to IT, such as mathematics, web development, programming, and deep learning.

The MOOCs introduced so far are free to use and are online lectures, which may provide an opportunity for people around the world who would otherwise have difficulty accessing education. However, MOOCs are best suited for educating college students and adults, but do not achieve a fuller education for children, as many of the lectures are highly specialized. Therefore, next, I would like to consider online education suitable for primary and secondary education.

### (3) e-Education

e-Education is a non-profit organization that provides video education to children in rural areas of developing countries who are disadvantaged in educational opportunities. So far, we have delivered education to more than 30,000 junior high and high school students in 14 countries.

At the beginning of their activities, they produced DVD-based video lessons inspired by the model of the preparatory school they attended for university entrance exams, and offered them to people in developing countries. Later, in 2015, when smartphones began to spread even to rural areas in developing countries, they switched to education using tablet devices. Furthermore, in 2017, they jointly developed a tablet specialized for video education. In 2019, they developed an online learning application. Currently, there are approximately 2,000 lessons and 10,000 digital questions for both arts and sciences. In addition, students can even receive a correction service for written questions and essays. The system not only delivers lessons and question papers, but also records the results of the lessons and tests online. In addition, an online tutoring business connecting urban university students with rural students preparing for entrance exams is also in the works for 2020.

So far, I have introduced MOOCs and e-Education specifically, but there are many online education systems in this world that have provided education to people in developing countries. e-Education is a group that serves secondary school students with many classes, but similar organizations for elementary school students also exist. I would like to describe some examples.

#### (4) Online Education Case Studies

In Cambodia, when classes were canceled at schools due to COVID19, online classes were delivered on the Ministry of Education's website. Think! Think!" is an application created by WonderLab (Tokyo, Japan) for kindergarten through early elementary school students to help them acquire spatial awareness, plane figures, and other elements that form the basis of thinking skills while having fun. Think! In Cambodia, where the improvement of the educational environment and academic ability is a national issue, WonderLab has been promoting the use of "Think! The Cambodian government asked us if we could use "Think!Think!" for interactive learning at home, and we decided to provide it free of charge," says Hiroki Watanabe of WonderLab.

Next, I will introduce a case study in Uzbekistan. When all educational institutions across the country were closed in mid-March, we received a strong request from the Ministry of National Education of Uzbekistan to distribute Japanese learning materials. In response, we began to deliver a mathematics video course for junior high school students using the remote learning support system we have been building in Uzbekistan," said a staff member of Digital Knowledge (Tokyo). Digital Knowledge was commissioned by JICA to conduct a demonstration project in Uzbekistan from August 2019, including e-learning training, academic achievement tests, and after-school classes. The project had produced results in teacher training, as well as math, English, and mental arithmetic classes using the know-how of Japanese educational companies.

This time, since all schools in Uzbekistan have been closed, we are providing a free math video course, "Basic Math," using the e-learning system that has already been established.

#### 4. Conclusion

Digital education such as e-Education should be promoted for children who are not satisfied with primary and secondary education. In doing so, consultation and coordination should be made among countries so that people in developing countries can receive services easily and inexpensively. In addition, taking into consideration the fact that network infrastructure is underdeveloped in some areas, if necessary, tablets that can be used without Wi-Fi, etc., should be provided. In cases where this is difficult, we considered creating a system where online terminals could be consolidated in a single location, where students could take classes there. This would solve problems such as the number and poor quality of teachers.

Furthermore, especially in elementary education, skills that can only be developed face-to-face, such as cooperation, are important, so it is necessary to design a system in which students can receive digital education at school on certain days of the week and at home on other days. In this case, tools such as Google Classroom should be used to support smooth communication between teachers and students. Next, let's look at higher education. In higher education, MOOCs should be effectively utilized, and reforms should be promoted such as creating a system that

allows students to obtain degrees through MOOCs and increasing time for discussion among students. In education in any era, it is important not to rely solely on digital technology. In developing countries, a mix of face-to-face and digital education should be provided.

## 5.References

<https://column.savechildren.or.jp/what-is-conflict-causes-and-effects-on-children>

紛争とは？その影響や子どもたちへの影響

[https://www.worldvision.jp/children/poverty\\_13.html#d0e9d87eb78fa54e47cd213ca7606442](https://www.worldvision.jp/children/poverty_13.html#d0e9d87eb78fa54e47cd213ca7606442)

飢餓の解決策は？飢餓の現状と原因を知ろう

<https://career-ed-lab.mynavi.jp/career-column/1150/>

MOOCとは？無料で世界中の講義が受けられる?!進むオンライン教育改革

<https://school.jp/biz/column/1251>

MOOCとは？日本におけるMOOCの現状やメリット・デメリットについて解説

<https://www.internetacademy.jp/it/programming/programming-basic/what-is-mooc.html>

MOOC(ムーク)とは？世界で注目されている学習方法でスキルアッ

<https://manatoku.com/coursera-intro/>

Cousera入門ガイド

<https://manatoku.com/coursera-plus/>

Cousera Plusとは、料金

<https://school.curious-world.co.jp/archives/993>

JMOOCって何？

<https://qeee.jp/magazine/articles/5314>

EdTecで注目を集めるMOOCsとは

<https://reseed.resemom.jp/article/2020/11/18/855.html>

世界のオンライン教育市場、2027年には2.8倍に急増

[https://www.jica.go.jp/Resource/topics/2020/20200519\\_01.html](https://www.jica.go.jp/Resource/topics/2020/20200519_01.html)

子どもたちの学びを守ろう

# Ideal Working Style

-Labor innovations corresponding to the country-

5403 Iwazaki Sumire

## Abstract

Working hours around the world vary greatly from country to country. The country with the longest hours is Mexico and the country with the shortest is Germany(OECD, in 2021). Then, why does Germany have the shortest working hours? This is because of the high labor productivity resulting from the introduction of IT tools. On the contrary, Mexico's long working hours are due to low labor productivity. Therefore, I propose the introduction of IT tools. I propose a system called ERP and RPA. These systems can manage various business systems and they can consolidate. If we use it, we can reduce the personnel expenses and working hours.

Therefore, I predict that the introduction of these systems will reduce working hours around the world. However, they have some disadvantages, so I would like to make other solutions.

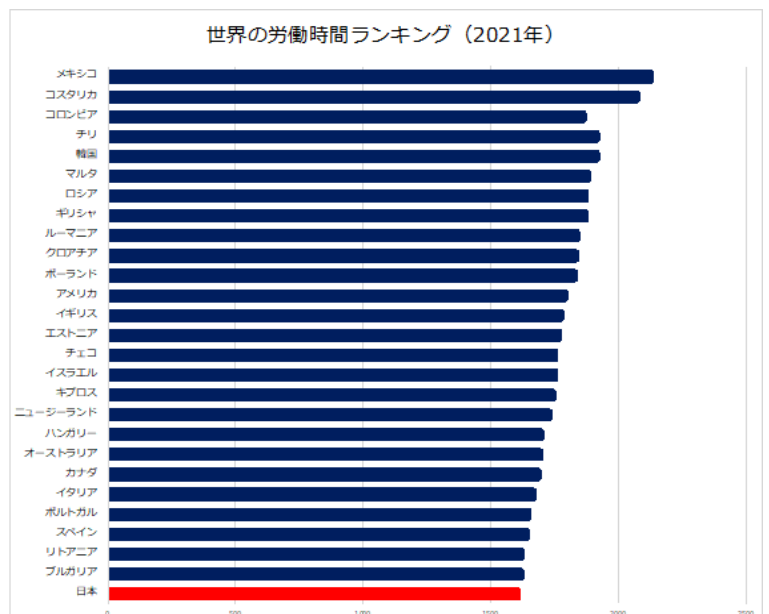
## 1 Introduction

Labor is an essential part of life. And it is something that will be a major part of ours in the years. However, we often hear words like "long hours", "overwork" and "overtime" in daily life. And there is a big difference among countries. One thing we often hear is that working hours in Europe are shorter than in Japan. However, we do not know why this is so. Specifically, we hope to eliminate long working hours by finding out the reasons why some countries have long working hours and others have short working hours. Ultimately, we want to create a kind of "labor" that allows all people to work without burdening their health.

## 2 Discussion and implications

〈 Graph①〉

A ranking of the working hours of the world's OECD member countries show the current average working hours in 2021.(Graph①) The world's average is 1725 hours per year, and the average in Japan is 1716 hours. The country with the longest working hours is Mexico (2128 hours per year), and the country with the shortest working hours is Germany (1349 hours). Comparing these two countries, we can see that there is a difference of about 750 hours. Looking at the ranking of other countries, it can be seen that the countries with the longest working hours



are dominated by Asian countries, such as Costa Rica, Colombia, Chile, and South Korea. On the other hand, the countries with short working hours are Germany, Norway, Denmark, and France. It almost indicates European countries which have short working hours.

〈 Graph②〉



Many people suffer health problems as a result of work. In 2017, Graph② shows that the high number of overwork deaths and overwork suicides in Japan. There are a lot of health hazards. In addition, it also shows that while the number of overwork deaths is decreasing, but the number of overwork suicides is increasing. Long working hours are one of Japan's leading social problems, and the term "overwork

death" is also used in English. In these years, overwork deaths have become a big problem in the world. And in May 2021, the WHO announced that "long working hours kill 745,000 people a year. The causes of overwork death and overwork suicide are the accumulation of fatigue due to lack of sleep and terrible stress. This shows that long working hours and overwork death is a problem that we need to solve.

I researched Germany, which has the shortest working hours at 1349 hours. Germany uses the system called "the Working Time Savings System". The working time savings system is a system that grants leave rather than extra pay for overtime work. The benefits of this system include an improved work-life balance for employees. However, it would be difficult to introduce this system in Japan, because it would violate laws. So why is Mexico's working time so long? This is because of the low labor productivity. In Mexico, there are a lot of companies that say Saturday isn't a holiday.

How can we reduce the number of working hours in the world? We need to increase labor productivity. To do so, we need to use IT tools. I recommend using both ERP and RPA. ERP is the system that manages various business systems. It can consolidate, so we don't have to manage a lot of information. RPA is the system that

do the work automatically. If we use it, we can reduce the personnel expenses and working hours. Therefore, to introduce at the same time, ERP and RPA become more effective. As a result, we can reduce the work that people do. However they are very expensive. Both ERP and RPA cost from 1 to 10 million yen each.

Therefore, the cost of both are very expensive to introduce. This makes it difficult to introduce the system in small and medium-sized companies. I think we must create a subsidy program. In addition, they are difficult to use, so I think support is necessary. For example, making a subsidy system and doing EPA and RPA courses. They are very good things, but they have some disadvantages (Who teaches where and how?), so I want to make more useful solutions. And we want to make it possible for any company to introduce them.

Finally I would like to recommend using these systems in companies around the world.

### 3 Conclusion

My purpose is to reduce working time, and make sure all people can work healthy. To that end, I suggest implementing both ERP and RPA. If we use these systems, we can work more quickly, and we can finish working early. I hope to make use of these in various jobs. I also want to take these systems to developing countries, small and medium-sized companies. However, they have some disadvantages, so I would like to make solutions. Finally, I want to create a kind of "labor" that allows all people to work without burdening their health.

#### **4 References**

World Working Hours Rankings and Trends by Country (OECD) 2023.06.21

<https://www.globalnote.jp/post-14269.html>

Actual working hours in Mexico 2019.03.25

[https://kuno-cpa.co.jp/mexico\\_blog/labor-time-3/](https://kuno-cpa.co.jp/mexico_blog/labor-time-3/)

Can a Working Time Savings System be Introduced in Japan? Feasibility and Benefits

2021.07.09

<https://ak4.jp/column/working-time-savings-system/>

What is「ERP」

[https://www.obic.co.jp/knowledge/erp\\_foundation/](https://www.obic.co.jp/knowledge/erp_foundation/)

Also explains case studies! - | RPA Business Automation Solution

<https://www.hitachi-solutions.co.jp/rpa/sp/about/>

ERP and RPA with different functions and features. 2022.04.13

[https://www.noc-net.co.jp/blog/2021/03/column\\_432/](https://www.noc-net.co.jp/blog/2021/03/column_432/)

What are the penalties for violations of the Labor Standards Law? What happens to a company that is found to be in violation?

<https://corporate.vbest.jp/columns/4315/>

What is overwork? Definition and Measures to Be Taken by the Company 2021.12.17

<https://www.r-agent.com/business/knowhow/article/10826/>

WHO says long working hours are killing 745,000 people a year 2021.06.05

<https://gigazine.net/news/20210605-who-long-working-kill-745000-people/>

How much does it cost to implement RPA? Introducing cost quotes and estimates.

2022.11.19

<https://robotango.biz/knowledge/knowhow/1733/>

How much does ERP cost to implement? Explaining the Price Difference between Cloud and On-Premise 2023.11.28

<https://it-trend.jp/erp/article/price>



# Eating Rice

To solve the problem of Japanese people's breakfast

5404 Ryuto Umezawa

## Abstract

I think Japanese people have a problem with meals. That is some people do not eat breakfast. According to a survey results from "nosh" which is the meals home delivery service company, about thirty percent of Japanese people do not eat breakfast every day. According to the survey, the causes of a lot of people don't eat breakfast are no time to eat breakfast, not being hungry in the morning, and eating is troublesome in the morning. I think this problem is bad for us. Eating breakfast is connected to our health. If we don't have breakfast, we won't be fine from morning. I think eating rice balls in the morning can solve the problem. If we make a rice ball for breakfast, we can change the deal. And last year, I researched about rice and I learned that rice is not allergen, rice is more filling than bread. So, I think the food made for rice can solve the causes of the problem and rice balls will become our hero for breakfast. But, in my research, I realized that when we eat only rice balls, we can't get enough nutrients. So, If we want to get enough nutrients in the morning, we have to eat a rice ball and more than one meal. For example, salad, fruits, miso soup and so on. But the situations which we eat more than two foods in the morning promote the problem because the situation can't solve the problem "no time to eat breakfast" "not being hungry in the morning". So, I researched about rice ball sandwiches and I want to suggest eating them. Rice ball sandwiches become hero for our breakfast.

## 1 Introduction

I researched about rice for two years and I wanted to make the most of the knowledge I learned by my research. So, I thought about what is a problem rice can solve. I think the problem is some Japanese people do not eat breakfast. A lot of research told us breakfast is important for us. So, I think this is the problem we should solve. And, I thought I should use a lot of information, so I researched about the culture of breakfast in foreign countries. After that, I found some cultural breakfast's good points.

## 2 Discussion and implications

First, I researched the good points of rice. The dominant nutrition of rice is carbohydrates but rice has a lot of nutrients such as protein, vitamins, minerals and dietary fiber. So we can understand that rice is a healthy food.

Second, I researched rice's better points than bread. The better points are "rice is more filling than bread", "rice doesn't have allergen". The first better point is affected by chewing. The data of chewing by "Kamigotae Hayamiyou" shows this fact. The data shows rice has 5 chewing scores but bread has 3 chewing scores. If we eat the foods which have high scores, we need a lot of chewing. So we can get satisfaction from eating. In order to feel full, the satiety center is activated, and factors that activate the satiety center include elevated blood glucose levels. The increase in blood glucose level due to eating has a great deal to do with

the speed at which starch is digested and absorbed. Chewing food well causes the secretion of more saliva, which is quickly broken down into starch sugars in the food. The satiety center takes about 15 to 20 minutes to detect that blood glucose levels have risen with a meal, so it is easier to feel full when eating rice, which can be eaten more slowly due to chewing.

Second better point is rice does not have an allergen. The material of bread wheat has an allergen. This is the big difference between rice and bread. The data of number of people with allergies by「平成30年度食物アレルギーに関連する食品表示に関する調査研究事業報告」 published by the Consumer Affairs Agency in 2018 shows the fact that wheat occupies for 10.6% of allergy-causing foods.

Next, I researched about the problem of Japanese people's breakfasts. Frozen home-delivery meal service company "nosh" in Osaka did a research. The name of research is "朝食に関する意識調査" and the research result shows us the fact that 63.7% of people eat breakfast every morning. So we can find that 36.3% of the people do not get breakfast every day. And the homepage of the Ministry of Agriculture, Forestry and Fisheries said "The percentage of people who do not eat breakfast is increasing every year, especially about 30% of men in their 20s and 30s do not eat breakfast." Like this, about the situation of some people do not eat breakfasts, there are some factors. For example, "not having much time", "not hungry" "the reason for money" "the reason for health, for example dieting" "eating breakfast is a chore." My primary goal was to resolve these factors that prevented me from eating breakfast. I also researched the benefits of eating breakfast, the homepage of the Ministry of Agriculture, Forestry and Fisheries said "If you do not eat breakfast, you tend to feel idly in the morning, even though your body is moving. Breakfast should provide glucose, a source of energy for the brain, and wake up the brain and body. Staple foods such as rice contain a lot of glucose, which is a source of energy for the brain, so you can concentrate on your studies or work in the morning."

Based on these things, I thought eating a rice ball was the best idea. We can make rice balls very easily so I think it can solve "eating breakfast is a chore." And, we can eat rice balls very quickly by only one hand and we can preparation its deal so rice balls also solve "not having much time", "not hungry"

But, the research results of "Otsuka Seiyaku" shows us the fact that the important thing is to eat breakfast which contains a lot of nutrients, so if we eat breakfast such as only rice balls, breads, we cannot get many benefits by eating breakfast. We should eat some foods such as salad, soup, fish and meat. So, I search for the special food which contains the benefits of rice balls and the culture of breakfasts in foreign countries.

I researched a lot of breakfast culture in foreign countries such as America, the United Kingdom, Vietnam, Italy and so on. And I think the breakfast of America and Vietnam is so good. First, American people often eat cereal. If we eat cereal, we can get short breakfast time and we can eat a lot of nutritions. Cereal has a lot of nutrition such as milk, grains, fruits and vegetables. But, wheat, milk and soybean are allergen. Second, I think the culture in which Vietnamese people eat "banh mi" like a sandwich is so good, because it has a lot of nutritions. So, these foods' benefits can support rice balls' demerits "less nutritious". I found a special food which has both of benefits. That is a rice ball sandwich.

Sandwich rice is similar to a sandwich but the part of bread is rice. For example, you can get all the nutrients of protein, carbohydrates, and vitamins by sandwich rice balls with lettuce, meat, or eggs sandwiched between the rice.

Therefore, I think that by promoting sandwich rice balls to the public, we can help solve the breakfast problem in Japan, and I propose to promote sandwich rice balls.

### 3 Conclusion and Future Issues

Based on this research, I can understand that Japan has a serious problem and the key to solve this problem is rice ball sandwich.

After that, I want to promote the rice ball sandwich and I want to remove its problem. For example, sandwich rice balls take longer to make than onigiri. I want to make the recipe for myself and connect to solve the problem.

### 4 Reference

<https://www.lieugaksquare.com/us/info/foodculture.php>

Is fast food common in American food culture?

[https://www.maff.go.jp/j/syokuiku/kodomo\\_navi/oneday/morning1.html](https://www.maff.go.jp/j/syokuiku/kodomo_navi/oneday/morning1.html)

The reason that breakfast is important

<https://www.itmedia.co.jp/business/articles/2206/25/news034.html>

The reason that Japanese people don't eat breakfast

<https://www.otsuka.co.jp/health-and-illness/balance/breakfast/>

The importance of breakfast

<https://sekai-musubi.com/>

Sekaimusubi

<https://midorifoods.com/gyomuyomai-kaigo/rice-vs-wheat/>

Rice vs. Bread" for a Healthy Body: A Comparison of the Differences and Nutritional Value of Rice and Wheat

[https://www.ibasikai.or.jp/wp-content/uploads/2012/08/49\\_pdf05.pdf](https://www.ibasikai.or.jp/wp-content/uploads/2012/08/49_pdf05.pdf)

chewability chart

[https://www.mapple.net/global/column/c\\_world/world-breakfast/](https://www.mapple.net/global/column/c_world/world-breakfast/)

Ten Breakfasts of the World

# Change Your Sleep

To help all people get a good night sleep

ID 5405 氏名 Yu Orita

## Abstract

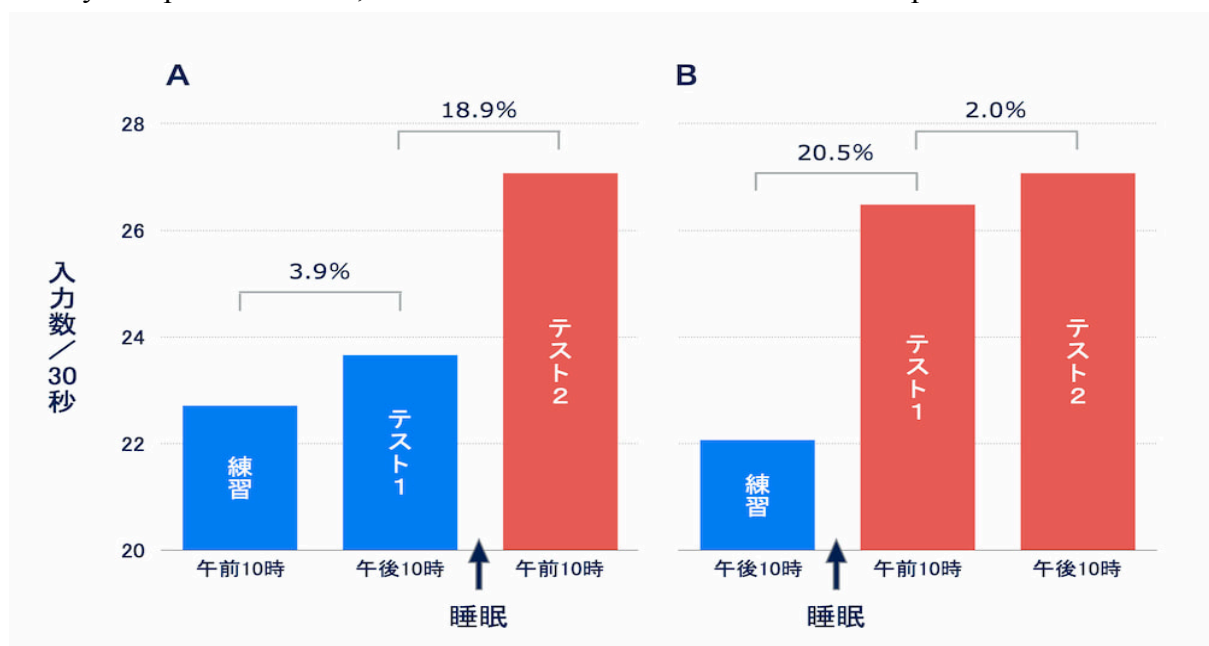
Many people in today's society are dissatisfied with their sleep. It is a well-known fact that longer sleep increases performance levels, but because there are only so many hours in a day, many people are unable to devote long periods of time to sleep. The first time that is likely to be cut back when time is in short supply would be sleep time. Although this is the case, it is one of the most important things for humans, and we believe that simply improving our sleep can dramatically improve our quality of life. However, sleep research and the study of the brain as it relates to sleep is still a sector in which there are still many unknowns, and even in the United States, where research is at the forefront, and even in Europe, there are still many things that have not been clarified. Furthermore, sleep is a sector that varies widely from person to person, and no specific remedy has yet been discovered that applies to all people, making it difficult to improve.

### 1.Introduction

Therefore, this study focused on the placebo effect, which is beginning to be adopted in overseas medical care, and promoted research to utilize it to obtain better sleep.

### 2.Discussion and implications

Harvard University has revealed that the brain independently acquires skills during sleep, when the body is not moving. It was also found that the retention of unspoken words also takes place during sleep. This was tested in what is called the serial tapping test. Sequence tapping is a test in which the non-dominant finger is assigned a number (1 for the index finger, 2 for the middle finger, 3 for the ring finger, and 4 for the little finger), and when five numbers appear on the display, such as "2-4-1-3-1," the corresponding finger is used to tap the key to input the number, and the test measures how much can be input within 30 seconds.



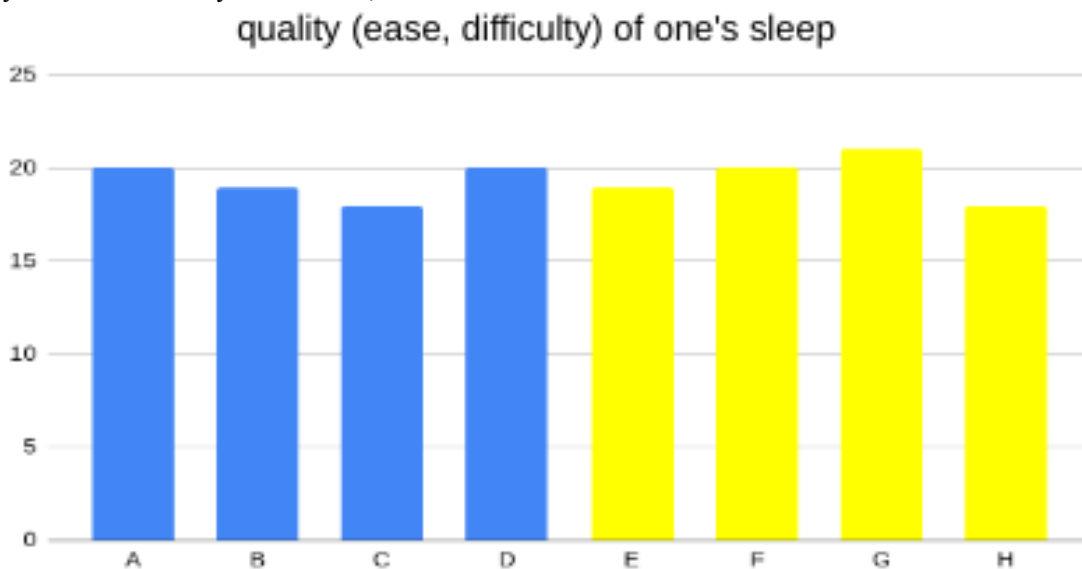
Furthermore, reflexes and cognitive ability were also found to be related to sleep duration. Eleven subjects from the Harvard University basketball team, with an average age of 19.4 years, were given 2~4 weeks of life as usual, followed by 5~7 weeks of life in which they were required to sleep at least 10 hours every night. The results showed that when they increased their sleep time, there was a significant improvement in performance. These results show that sleep is essential for improving human performance.

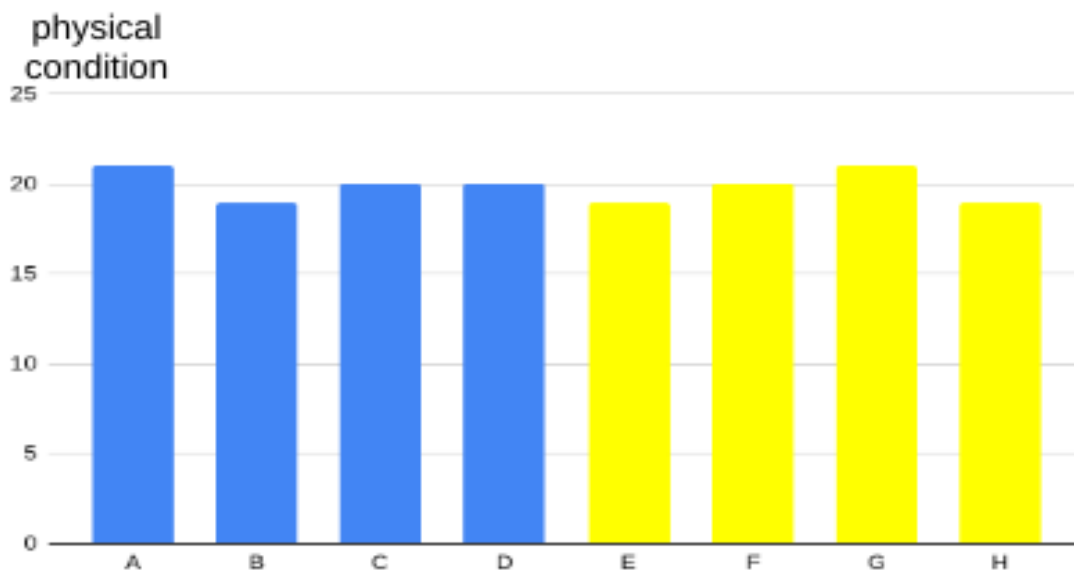
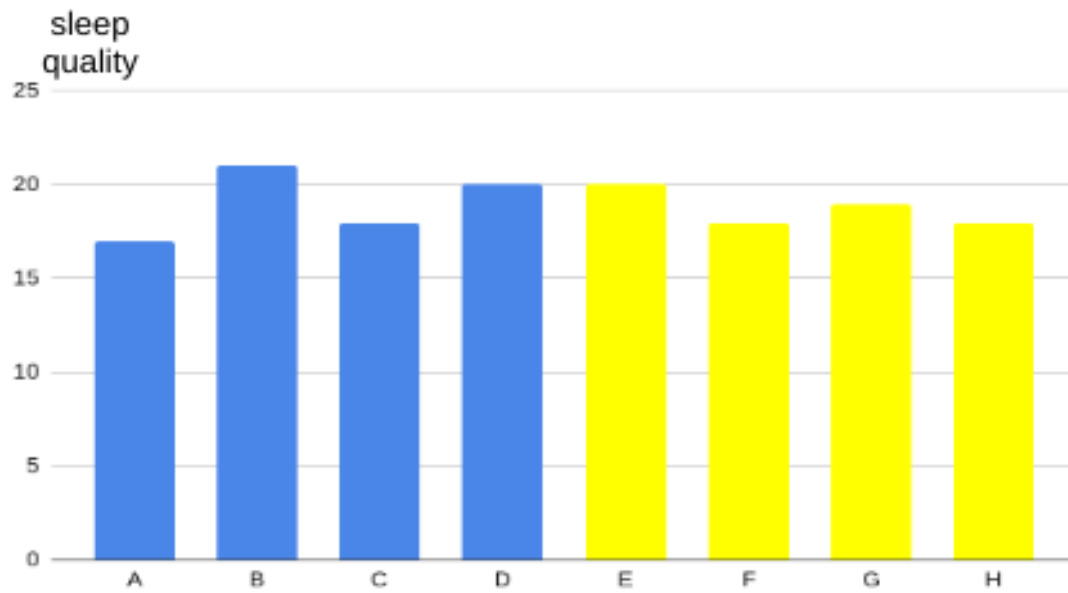
According to data from Philips, a company that conducts global sleep surveys, not many people worldwide are satisfied with their sleep. Therefore, the purpose of this study is to improve the quality of sleep so that those who are in an environment that does not allow them to extend their sleep time can compensate for the small amount of sleep they get by getting good quality sleep.

Currently well-known solutions for improving sleep quality include ingesting bananas and milk, smelling aromas, and bathing time. Since all of these have been shown to have large individual differences and not very significant results, we focused on the placebo effect, which has been used as a solution for several diseases. The significance of this study is to prove that the placebo effect can be applied to sleep to improve sleep quality, thereby creating a method of sleep improvement that applies to many people.

Research methods are primarily experimental. With the help of my own schoolmates, I conducted an experiment to show that the placebo effect is related to sleep.

The experimental method involves having two groups of four people each, one group eating a banana before bedtime and the other group eating a lemon. When they woke up in the morning, they were asked to express their scores in terms of how well they slept, how well they felt, and the quality of their sleep. Both groups were told in advance that the fruit contained an ingredient that had a positive effect on sleep, but only the lemon actually contained it, not the banana.





### 3. Conclusion

The results of all experiments show that the placebo effect is effective for sleep. For these reasons, the placebo effect should be utilized in sleep as well.

### 4. References

- PRESIDENT Online (2019). <https://president.jp/articles/-/27220?page=1> 2022.10.14
- TECHBLITZ (2019). <https://techblitz.com/aging-stanford-nishino/> 2022.6.14
- TORCH (2020). <https://torch-sports.jp/article/sleep-performance-Improvement-1st> 2022.6.17
- PRESIDENT Online (2020). <https://president.jp/articles/-/40356?page=2> 2022.6.17.
- National Library of Medicine (2014). Chronic lack of sleep is associated with increased sports injuries in adolescent athletes <https://pubmed.ncbi.nlm.nih.gov/25028798/> 2022.10.18
- TECHBLITZ (2019). <https://techblitz.com/stanford-nishino-suimin-1/> 2022.11.11

TECHBLITZ (2019).

<https://techblitz.com/stanford-nishino-suimin-2/> 2022.11.11

TECHBLITZ (2019). <https://techblitz.com/stanford-nishino-suimin-3/> 2022.11.11

National Library of Medicine (2002). Practice with sleep makes perfect: sleep-dependent motor skill learning

<https://pubmed.ncbi.nlm.nih.gov/12123620/> 2022.12.9

# New Medical Treatment Ran by AI

~Preventing lifestyle disease~

5406 Yusei Orihara

## Abstract

Recent years, the number of people who have lifestyle diseases and die from it is increasing. What is shown here is that many people who are not elderly are dying or in bad condition. However, we can prevent lifestyle diseases. And, the power of AI has progressed in the last few years. Therefore, in this study, I considered how to prevent lifestyle diseases and explored specific approaches by using AI.

In conclusion, I propose the running of applications that provide suggestions to improve lifestyle by using AI. And I think it should be run by some countries. The reason is the spread of smartphones in these years and the property of AI. Thanks to the spread of smartphones, applications can affect many people. And we can collect a lot of information for AI learning by running in some countries.

As a challenge, this method does not have binding force. Therefore, it is necessary to explore how to enhance its effectiveness while respecting individual freedoms. Additionally, the ease with which malicious entities can input false values, interrupting the learning process, is a concern. To make solutions to these challenges is the perspective of this research.

## 1 Introduction

### Leading causes of death globally

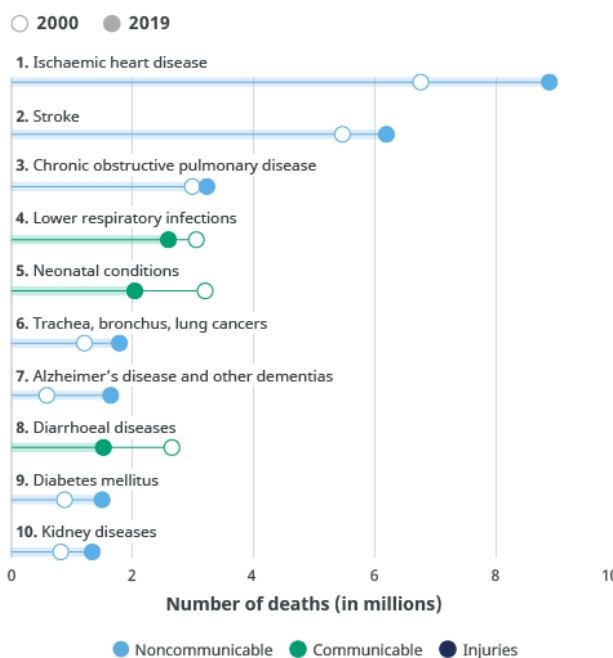


Figure 1. The global top 10 cause of death and the change from 2000 to 2019 surveyed by WHO.

Figure 1 is statistics of the reason for deaths in 2000 and 2019. A glance at Figure 1 will reveal that ischaemic heart disease is the biggest reason for death, and stroke follows it. These diseases are called “Lifestyle Diseases” and the lifestyle of patients affects the incidences.

Besides, Artificial Intelligence(AI) these days made progress dramatically by a new way of learning called “Deep Learning”. As a result, AI has become able to win the top player of table games, generate illustrations by some words of picture, and talk with people.

So, the purpose of this study is to examine the way to control lifestyle diseases by using AI.

## 2 Discussion and implications



•Current challenges

Figure 1 ranks global causes of death. It reveals that the promotion of non-communicable diseases (shown with light blue) significantly increased from the statistics in 2000. These lifestyle diseases, excluding Alzheimer's disease, are considered that lifestyle has much to do with these onset. In this way, this figure indicates that the number of patients with lifestyle diseases are increasing globally.

Lifestyle diseases sometimes kill younger people. It connects to decreasing workers, so it is essential for us to make a countermeasure of lifestyle diseases.

•Difinition

For the purpose of this study, I specifically use cancer, heart diseases, hypertension, diabetes, and cerebrovascular diseases as lifestyle diseases. These diseases are mentioned by WHO in Figure 1, and hypertension is included due to its high prevalence.

•Suggestion

I propose the creation of an application that uses AI to automatically provide suggestions for improving lifestyle habits. There are two reasons why I suggest using AI applications.

First, the widespread use of smartphones is one of the reasons for the suggestion. According to figure 2, in affluent countries, over 90% of the population owns smartphones, while even in less affluent nations, around 25% of individuals have smartphones. Moreover, since we use smartphones while keeping near places where we can reach and use smartphones easily, I think that applications have a lot of opportunities for use.

Second, the improvement of machine and AI ability is also one of the reasons for this suggestion. The advent of deep learning in 2006 and the practical application of machine learning have enabled AI to achieve complex and advanced information processing.

•Details

Figure 3 shows us a rough outline of the application. Users contribute their own act and health information, while the service provider, referring to past data, offers improvement suggestions to the users. Therefore, I consider it crucial for service providers to gather information from users. Analyzing information before and after the presentation of improvement suggestions allows the system to improve analysis.

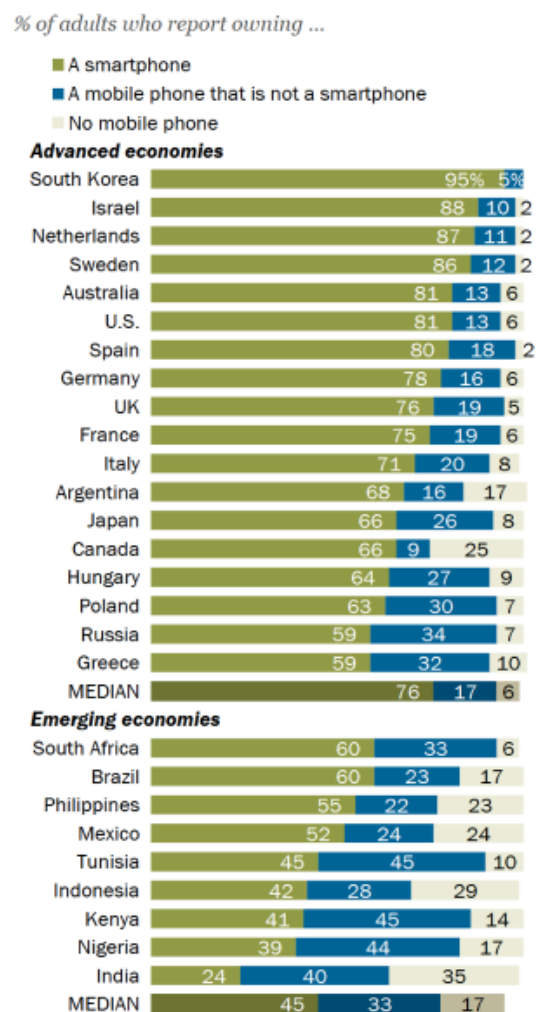


Figure 2. Mobile phone penetration rates in various countries. Pew Research Center

Moreover, I think they should be carried out as a public initiative. For example, in Japan, more than 15% of citizens have lifestyle diseases. Approximately 16% of the healthcare expenses covered by the Japanese government are allocated to lifestyle-related diseases. This expense isn't small, so the importance of acting in order to reduce patients of lifestyle diseases is critical. And, this proposal requires initial costs.

Specifically, expenses for application development and the maintenance of servers are anticipated. Additionally, given the broad scope of lifestyle improvements and the preventive lifestyle diseases inherent in using the application, it is necessary to realize lower burden for users. In order to minimize the burden on users and address the challenge of monetization for sustainable operation, especially considering potential funding shortages, it is suitable to undertake this initiative as a public project rather than relying on private entities such as businesses.

In order to make this AI, we have to collect a lot of information about past diagnoses. Considering the mechanism of AI, collected data must be closely related to the quality of the AI. The increase of the number of patients of lifestyle diseases is worldwide, so the effectiveness of my approach is expected to improve through its action worldwide.

### 3 Conclusion

This study suggests the development of an application that provides suggestions for improving lifestyle habits by using AI. Additionally, I suggest that the system I proposed should be carried out collaboratively as a public initiative across some countries.

There are some challenges in my study. First, my suggestion is only to provide information to users. In other words, whether users actually implement the suggested behaviors and improve their lifestyle completely depends on the users. Moreover, since this method relies on data provided from uses for learning, so there is a potential risk of wrong results due to malicious users inputting abnormal values. Addressing these issues will be necessary, and seeking solutions to these challenges is a key aspect of future prospects.

### 4 References

The top 10 causes of death - WHO

<https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>

Ischemic heart disease - Tokyo Teishin Hospital

<https://www.hospital.japanpost.jp/tokyo/shinryo/jyunnai/kyoketsu.html>

To All Patients: Ischemic Heart Disease - National Cerebral and Cardiovascular Center

<https://www.ncvc.go.jp/hospital/pub/knowledge/disease/ischemic-heart-disease/>

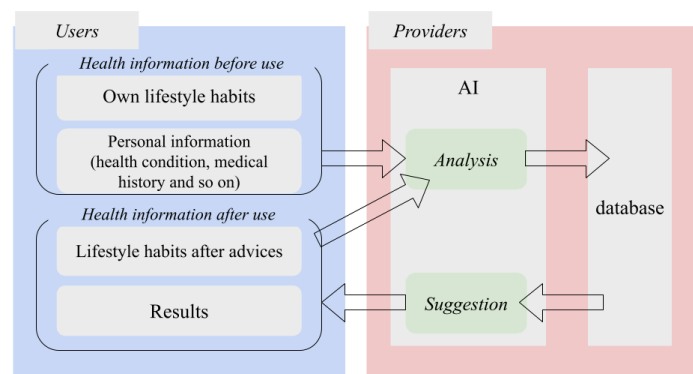


Figure 3. rough outlines of application

Symptoms and Prevention of Stroke - Chiba Nounkeigeka Byoin

<https://ssl.chiba-nougeka.or.jp/brain/>

Respiratory Diseases: Chronic Obstructive Pulmonary Disease -The Japanese Respiratory Society

<https://www.jrs.or.jp/citizen/disease/b/b-01.html>

Lung Cancer Prevention and Screening - National Cancer Center

[https://ganjoho.jp/public/cancer/lung/prevention\\_screening.html](https://ganjoho.jp/public/cancer/lung/prevention_screening.html)

What is diabetes? - Center Hospital of the National Center for Global Health and Medicine

<https://dmic.ncgm.go.jp/general/about-dm/010/010/01.html>

Chronic kidney disease - Hyogo Medical University Hospital

[https://www.hosp.hyo-med.ac.jp/disease\\_guide/detail/21](https://www.hosp.hyo-med.ac.jp/disease_guide/detail/21)

Smartphone Ownership Is Growing Rapidly Around the World, but Not Always Equally - Pew Research Center

<https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/>

Summary of Patient Survey for the Year 2017 (Heisei 29) - Ministry of Health, Labour and Welfare

<https://www.mhlw.go.jp/toukei/saikin/hw/kanja/17/dl/01.pdf>

Population Estimates (June 2022 Final, November 2022 Preliminary) Released on November 21, 2022-Ministry of Internal Affairs and Communications, Statistics Bureau

<https://www.stat.go.jp/data/jinsui/new.html>

# Save The Shopping Refugees

## Suggestions for Each Situation.

5407 Kataoka Hijiri

### Abstract

The final goal of my search is to save shopping refugees. I am interested in mobile vending machines. The population of Japanese shopping refugees is increasing, so I think it is a serious problem now. To solve this problem I searched on the Internet. As for my suggestion, I suggest 3 types to carry food. First practical use of a sharing delivery service. The sharing delivery service is a general team of Uber Eats, Demaekan. Today, many people, mainly young people use this service, but there is a problem. To order through these services, we must use mechanical devices, which is difficult for elderly people. Second is the mobile vending machine. I recommend it, because almost everyone can use it, but 42% of the management of mobile vending machine is in the red. I think collecting money through crowdfunding is essential. I think many people will sympathize with this idea. Third, the use of cutting edge. Many companies carried out such an experiment. However I am thinking about cooperation with Japan Post. Japan Post carried it not only with a drone, but also the machine. I think it will be possible to deliver it to our house more safely and faster.

### 1 Introduction

The background of this research is what interested me in mobile vending machines two years ago. When I was watching TV, I was surprised that mysterious cars appeared. I found it was a vending machine. I searched what kind of social problems can be solved with the machines. I came to know about shopping refugees. I worked on this problem, so my final goal in this research is to suggest how to buy foods not only for shopping refugees but also for people. The previous research which was done by Mr. Kidati from Chuo university said store assortment is bad, which is the most serious problem, but I thought improving the qualities of assortments is difficult only with my research because it is associated with the company's problems.

I have three questions. First I thought: What tools are available to sell foods? Second What kinds of things are shopping refugees having trouble with? Finally what suggestions are the best in each situations?

### 2 Discussion and implications

I stipulate the definition of shopping refugees as [People, especially the elderly, who experience inconvenience and difficulty in purchasing food and eating and drinking.] according to the Ministry of Internal Affairs and Communications.

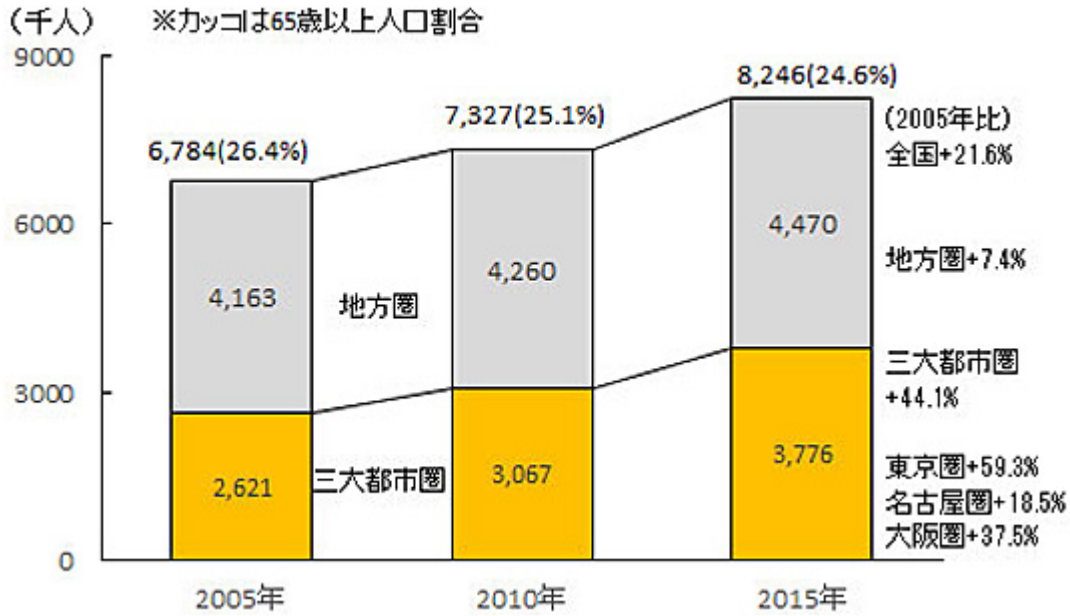


figure 1

Please look at the figure1. The graph shows the figures of shopping refugees ,and the rate of shopping refugees of the elderly. I can affirm there are so many shopping refugees, one-fourth of elderly are shopping refugees ,and the figures of shopping refugees are so many not only in rural areas but also in urban areas.

I searched the situation of foreign shopping refugees. I searched 4 countries, but there is little information about the problem. I searched America, China, Korea, and Britain.

In the U.S. shopping refugees are a problem, although it varies from state to state, and measures are being taken to address this problem, such as purchase substitution and the use of otsukai cabs. In China The problem of shopping for refugees is not a big problem .According to Takashi Nakagawa, he believes this is because there are stores that can be quickly accessed inside apartment complexes such as the "Nana Ichiba" (vegetable market).

Korea is similar to Japan, because the percentage of mountains in the land area, and the climate are similar. Korea also uses mobile vending machines which is called “Donraku” store (figure2).



figure2

In Britain: Not only Britain but also Canada and America establish specific shopping hours only for elderly people.

Compared with those above solutions, Japan is a rare case.

The significance of my research is that eating foods is essential to our society.  
To solve crying foods for people in need of shopping.

### 3 Conclusion

As for my suggestion, I suggest 3 types to carry food.

First practical use of a sharing delivery service. The sharing delivery service is a general team of Uber Eats ,Demaekan. Today, many people, mainly young people use this service, but there is a problem. To order through these services, we must use mechanical devices, which is difficult for elderly people, so I recommend a new plan especially for elderly people.

Second mobile vending machine. I recommend it, because almost everyone can use it ,but 42 % of the management of mobile vending machine is in the red (figure3). I think collecting money through crowdfunding is essential. I think many people will sympathize with this idea.

図 4-1 事業承継後の収支状況 (122 事例)

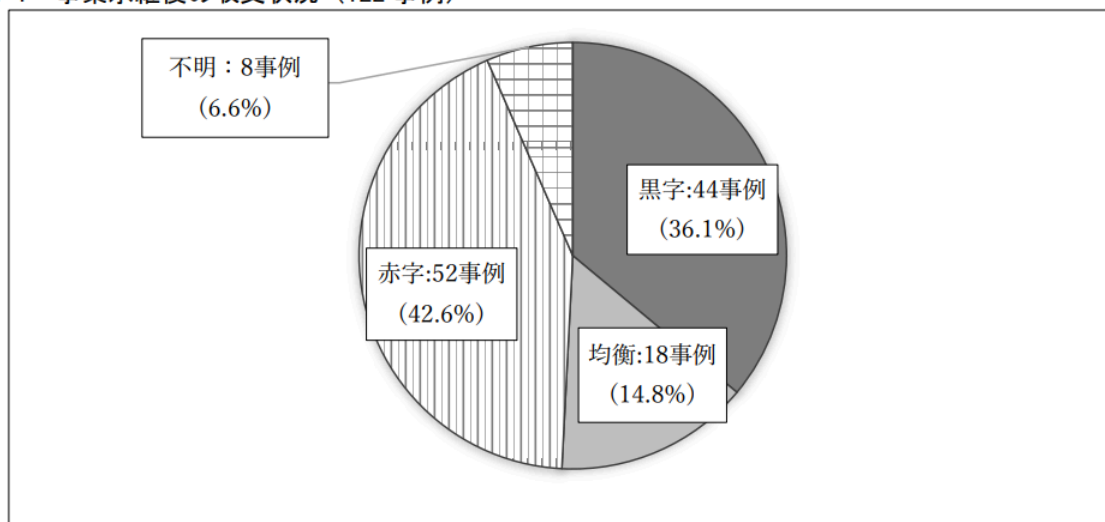


figure3

Third, the use of cutting edge. Look at the figure 4





figure 4

Figure 4 is a picture of practical use of drones. Many companies carried out such an experiment. However I am thinking about cooperation with Japan Post. Japan Post not only carried it with a drone, but also the machine which looked like figure 4 & 5..I think it will be possible to deliver it to our house more safely and faster.



figure 5

The point of assignment is a cooperation with Japan Post. I cannot make a proposal just by thinking in my head, so I can make a proposal while thinking about corporate profits.

#### 4 References

- 「Food Access Issues in a Super-Aging Society: Shopping Refugees,

Toward Solutions for Shopping Refugees, Vulnerable Shoppers, and Food Desert Problems」〈  
" [https://www.jstage.jst.go.jp/article/jfsr/22/3/22\\_377/\\_pdf](https://www.jstage.jst.go.jp/article/jfsr/22/3/22_377/_pdf) 〉 (2023/10/23)

・「Ministry of Internal Affairs and Communications」

〈[https://www.soumu.go.jp/main\\_content/000496972.pdf](https://www.soumu.go.jp/main_content/000496972.pdf)〉 (2022/01/19)

・「Transformation of Small Goods Distribution in China」

〈<https://nakamura-u.repo.nii.ac.jp/record/2790/files/01-005-13-10%20%E4%B8%AD%E5%9B%BD%E3%81%AB%E3%81%8A%E3%81%91...%E4%B8%AD%E5%B7%9D.pdf>  
〉 (2023/11/22)

・「Shopping Refugees: The Case of the U.S.」

〈

[https://www.webl.io.jp/wkpja/content/%E8%B2%B7%E3%81%84%E7%89%A9%E9%9B%A3%E6%B0%91\\_%E7%B1%B3%E5%9B%BD%E3%81%AE%E4%BA%8B%E4%BE%8B](https://www.webl.io.jp/wkpja/content/%E8%B2%B7%E3%81%84%E7%89%A9%E9%9B%A3%E6%B0%91_%E7%B1%B3%E5%9B%BD%E3%81%AE%E4%BA%8B%E4%BE%8B)  
B 〉

(2022/08/30)

・「The Case of South Korea's Social Economy 」

〈

<http://sapenet.net/faq/%E9%9F%93%E5%9B%BD%E3%81%AE%E7%A4%BE%E4%BC%9A%E7%9A%84%E7%B5%8C%E6%B8%88%E3%81%AE%E4%BA%8B%E4%BE%8B%EF%BC%88%EF%BC%91%EF%BC%97%EF%BC%89%E4%B8%8E%E6%B0%91%E5%90%8C%E6%A5%BD%EF%BC%88%E3%83%A8%E3%83%9F?ckattempt=1> 〉

(2023/11/22)

・「Setting shopping hours exclusively for the elderly Supermarkets in Europe and the U.S.  
New virus」

〈<https://www3.nhk.or.jp/news/html/20200319/k10012338861000.html> 〉

(2023/11/22)

・「Shopping time "exclusively for the elderly" spreading 」

〈<https://ideasforgood.jp/2020/03/25/golden-time-for-the-elderly/> 〉

(2023/11/22)

・「Income and Expenses after Business Succession」

〈[https://www.soumu.go.jp/main\\_content/000738993.pdf](https://www.soumu.go.jp/main_content/000738993.pdf) 〉 (2023/12/03)

・「Practical use of mobile vending machines」

〈<http://kyodoshi.com/article/12642> 〉 (2023/12/03)

・「Japan Post」

〈<https://drone-journal.impress.co.jp/docs/special/1183993.html> 〉 (2023/12/03)



# Support the Elderly by Using ICT

~Reduce the burden on young people~

5408 Kawakami Rina

## Abstract

In recent years, aging is becoming a big problem in the world, especially in developed countries. I studied to improve the life of elderly by using ICT, and reduce the burden on young people. Mainly study developed countries with particularly aging populations. Using ICT by the elderly has a lot of advantages for the elderly, their family, and society. However, many elderly can't use ICT because they do not know how to use the internet and have facilities to use the internet. I suggest providing a place where the elderly can learn about the internet, such as internet literacy and how to use it. Also, I suggest hiring someone who can teach them. In addition, there are various problems in introducing and using ICT equipment in care now. For example, it requires a high cost of introduction and it is difficult to use. To solve these problems, I propose to develop new devices that are easy to introduce and use, and someone teach caregivers how to introduce and use them.

## 1 Introduction

In recent years, aging is becoming a big problem in the world, especially in developed countries. Therefore, it is more important to improve the elderly support. Also, we must reduce the burden on the younger generation, which is increasing due to the declining birthrate and aging population. I research the cause and solution of these problems. Finally I suggest solutions.

## 2 Discussion and implications

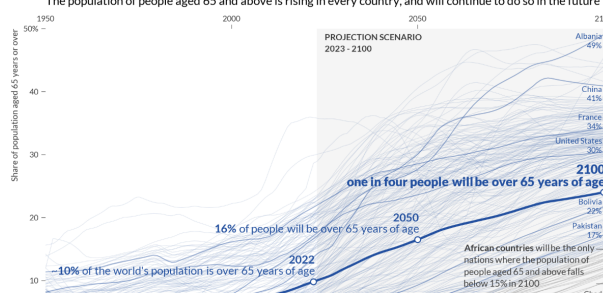
In 2022, the Japanese population 65 years old and over is 36.24 million people. The aging population is at 29.0%. It is estimated that the aging rate will continue to rise.

There are two main causes of the aging of the population. First is age-adjusted death rate (a death rate that controls for the effects of differences in population age distributions) decline and population 65 years old and over increase. Second is the declining birthrate and the young population decrease. After World War II, the age-adjusted death rate in Japan declined significantly because of improved living conditions, dietary and nutritional status, and advances in medical technology, from 23.6 for men and 18.3 for women in 1947 to 13.3 for men and 7.2 for women in 2020.

Comparing the aging rates of developed countries, Japan was in the lower rank until the 1980s, and almost in the middle rank in the 1990s. However, Japan's rank became highest in 2005. It is expected to continue to get high rank.

### The world's population is aging

The population of people aged 65 and above is rising in every country, and will continue to do so in the future



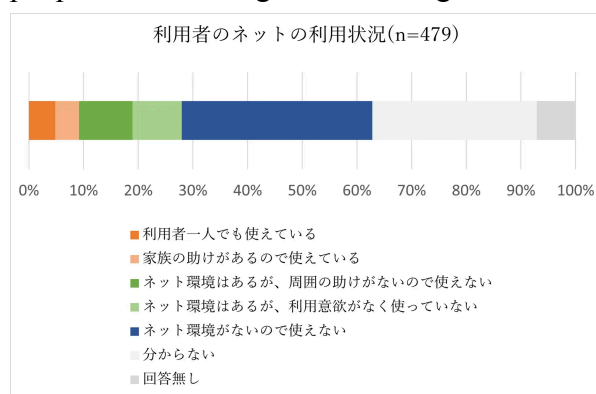
In addition, aging is now not only a problem in Japan, but it is becoming a global social

issue. The global aging rate rose from 5.1% in 1950 to 9.3% in 2020. It is expected to rise to 17.8% by 2060. Aging will develop quickly over the next 40 years. Furthermore, the aging population is rising quickly in developing countries. According to the graph, in 2022, the world aging rate is only 10%, however, it is expected to increase to 16% in 2050, and 25% in 2100.

There are many good effects on elderly people using ICT(Information and Computer Technology: the use of computers and other electronic equipment and systems to collect, store, use, and send data electronically) equipment. First, it increases their activity, friendships, and range of activities. Through the Internet, they make friends not only of their own generation, have more opportunities to keep in touch with their families, and have more topics in common. Second, it provides fun, pleasure, stimulation, and peace of mind. Many people gain stimulation and enjoyment in their daily lives through access to a variety of information. These effects were also present among the elderly who had difficulty using ICTs; the use of ICTs provides enjoyable stimulation. It has a relaxation effect and a sense of accomplishment and security. Third, it improves health. Using ICT equipment activates the brains of elderly people. Fourth, it makes their roles. Fifth, it improves the motivation and life satisfaction of the elderly.

For people close to the elderly, such as family members, relatives, close friends, and caregivers and welfare workers who are involved with the elderly, there are various benefits to using ICT for the elderly. The first is to increase and facilitate communication with family members and others. The use of computers and the Internet by the elderly makes it easier for them to communicate with their children and grandchildren, as they can share common topics of conversation. In addition, if they have children or grandchildren in remote areas, they can exchange emails and photos with them. In addition, if they have children or grandchildren in remote areas in Japan or abroad, they can communicate with them by exchanging emails and photos without having to visit each other. This will increase the frequency of communication and help both parties to feel secure by being able to contact each other when necessary. This will also lead to a sense of security for both parties. As the elderly become involved in various activities, they will have more topics of conversation and consultation with their families, which will further promote communication. This will further promote communication. Besides, these communications improve the elderly person's motivation in life and increase the family's sense of security and reduce their psychological burden. Second, it reduces the burden on family members in caregiving and rehabilitation.

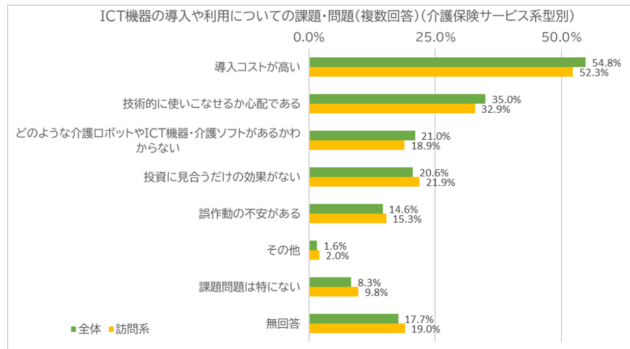
The use of ICT by the elderly affects the community. First, it improves the efficiency of community activities. Second, it creates a role for the elderly in the community and increases community activities. Third, it solves community problems by communicating with people of different generations together.



However, almost all the elderly can't use the Internet. According to the right graph, the elderly who have the internet environment are about 30%, and people who can use the internet are about 10%. In addition, people who can use the internet alone are only about 5%.

### 3 Conclusion

There are a lot of advantages to using ICT. However, the elderly must be able to use ICT, so I suggest providing a place where the elderly can learn about the internet, such as internet literacy and how to use it. Also, I suggest hiring someone who can teach them.



In addition, there are various problems in introducing and using ICT equipment in care now. For example, it needs a high cost of introduction and it is difficult to use. Also, many countries develop service which use ICT and technology to support nursing and lives of elderly, but they didn't support introduction into nursing home. To solve these problems, I propose

developing new devices that are easy to introduce and use, and someone teach caregivers how to introduce and use them.

### 4 References

第5章 高齢者のICT利活用がもたらす効果

[https://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/b\\_free/pdf/b\\_free03\\_3\\_07.pdf](https://www.soumu.go.jp/main_sosiki/joho_tsusin/b_free/pdf/b_free03_3_07.pdf)(2023/6/2)

令和5年版高齢社会白書(全体版)(PDF版) - 内閣府

[https://www8.cao.go.jp/kourei/whitepaper/w-2023/zenbun/05pdf\\_index.html](https://www8.cao.go.jp/kourei/whitepaper/w-2023/zenbun/05pdf_index.html)(2023/6/2)

福祉・介護人材確保対策について

<https://www.mhlw.go.jp/content/12000000/000549665.pdf>(2023/6/2)

第1回:介護分野のICT化における日本の動向・世界の動向

<https://www.wam.go.jp/content/wamnet/pcpub/top/fukushiiryokeiei/ictkaigo/>(2023/11/30)

「ネット利用は要介護高齢者の活性化になる」ケアマネの8割以上

<https://prtimes.jp/main/html/rd/p/000000135.000012000.html>(2023/11/30)

3.2 高齢者のICT利活用に関する調査

[https://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/b\\_free/pdf/usability\\_2\\_03-2.pdf](https://www.soumu.go.jp/main_sosiki/joho_tsusin/b_free/pdf/usability_2_03-2.pdf)(2023/11/30)

介護分野をめぐる状況について

<https://www.mhlw.go.jp/content/12300000/000608284.pdf> (2023/10/2)

高齢者介護(高齢者支援)におけるICT利用などによる生産性向上及び人材確保の取組に関する国際比較調査研究

[https://www.nttdata-strategy.com/services/lifevalue/docs/r02\\_136jigyohokokusho.pdf](https://www.nttdata-strategy.com/services/lifevalue/docs/r02_136jigyohokokusho.pdf)(2023/10/2)

Charted: The World's Aging Population from 1950-2100

<https://www.visualcapitalist.com/cp/charted-the-worlds-aging-population-1950-to-2100/>(2024/1/15)

# Myopia control with daily efforts

## Reformation of people's mindset

5409 Kobayashi Mirai

### Abstract

Today, the number of people with myopia is increasing. Myopia has a lot of risks including serious complications. Therefore, the problem should be improved. The purpose of my study is suggesting actions to decrease the number of people with myopia. The cause of myopia is not clearly known yet, but outdoor activity has been recognized as effective through many experiments since a long time ago. I suggest measures based on mainly two points, people's awareness and outdoor activities. Spreading an accurate understanding of myopia is necessary in order to encourage people to take measures. To do this, I suggest that students learn about myopia in health education classes at school and that some companies or the local government hold an event for their parents. To spread outdoor activities I suggest schools promote them, for example, adopting a rule that requires children to play in the ground during noon recess and opening schoolyards to children. Controlling the use of digital devices is also needed to save time for outdoor activities. Limiting the use in each family or government regulating the use is necessary.

### 1. Introduction

The purpose of this study is proposing actions to decrease the number of people with myopia. Myopia is becoming a problem around the world. A recent study estimated that on average, 30% of the world is currently myopic and some researchers predict there will be 4758 million people with myopia by 2050 (Holden, 2016). It is also known that many people are nearsighted, especially in Asia. Myopia raises the risk of many other diseases in the eye such as retinal detachment, cataract and glaucoma (Figure1). In addition, some jobs like motorboat racers and jockeys require specific vision without correction. For these reasons, decreasing the number of people with myopia has a meaning. The cause of myopia is not clearly known because many factors are involved. However, some researchers discovered that outdoor activity can control myopia (Rose, 2008). This research is based on the data in the books or on the internet.

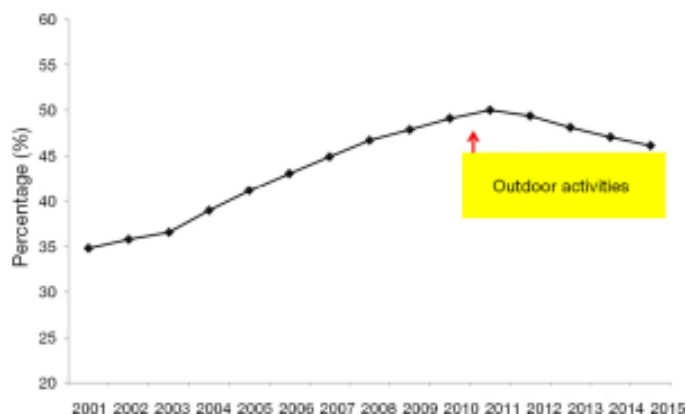
LEVEL OF MYOPIA	CATARACTS	GLAUCOMA	RETINAL DETACHMENT	MYOPIC MACULAR DEGENERATION
-1.00 to -3.00 D	2x	4x	3x	2x
-3.00 to -6.00 D	3x	4x	9x	10x
Over -6.00 D	5x	14x	22x	41x

(Figure1)(O'Connor Optometrists)

## 2. Discussion and implications

Myopia is defined as “A refractive error in which rays of light entering the eye parallel to the optic axis are brought to a focus in front of the retina when ocular accommodation is relaxed. This usually results from the eyeball being too long from front to back, but can be caused by an overly curved cornea and/or a lens with increased optical power. It also is called nearsightedness.” (International myopia institute). Myopia is thought to have two factors, environmental and genetic. Scientists owe the striking increase of myopia in Asia to the genetic factor. However, it is difficult to propose a definite solution to myopia because the cause is not clearly known yet. These days, some information about myopia has been discovered. The younger children are, the easier myopia gets worse (Sankaridurg and Holden, 2014). So it is important to start actions when they are young.

Scientists also know outdoor activity is effective to control myopia. The reason why outdoor activities prevent myopia have been discovered recently. It is said “violet light” is a key in the process. Violet light is light with specific wavelengths, between ultraviolet and blue. When you take the light through the eye, it stimulates a specific gene related to the control of myopia. This process is being discussed now, so I want to reflect the fact that outdoor activity can prevent myopia in my research. In Taiwan, the government has conducted some activities since the 1980s. They promoted 120 minutes of outdoor activities every day, regardless of the type of the activity. After the promotion, the vision impairment rate of primary school children in Taiwan dramatically decreased (Figure2)(Pei-Chang, Li-Chun, Yu-Zhen, Min-Li, Li-Ling, and Chueh-Tan, 2018). This suggests that outdoor activities are worth introducing. Not only Taiwan but also China and Singapore take action to decrease the number of people with myopia.



(Figure2)

On the other hand, the time children spend outside is decreasing. According to a 2016 survey of Japanese children in the upper grades of elementary school on outdoor activity time, the amount of time children spend playing outside has decreased by more than 30% in 35 years, from 2 hours and 11 minutes in 1981 to 1 hour and 47 minutes in 2001 and 1 hour and 12 minutes in 2016. The causes are thought to be an increase in time spent at cram schools and lessons, excessive use of games and digital devices, and a decrease in playgrounds (Citizen, 2016). Promotion of outside playing is actually being implemented in Chiyoda and Setagaya wards in Tokyo, Sanjo City in Niigata Prefecture, and other cities.

Parks, privately owned land, and abandoned schools are provided as places where children can play freely during set times with cooperation with local volunteer groups, and the number of users is increasing.

Myopia increases the risks of complications such as cataract, glaucoma and retinal detachment. If myopia gets serious it is called high myopia followed by pathologic myopia and it can finally cause loss of sight. However, the risk is not widely known. According to a survey conducted with people with myopia in Japan, more than 90% did not know that high myopia leads to blindness. The rate of people who generally see a doctor because of myopia was 21.5%, but of the people who know the risk of high myopia, the rate increased to 41.8% (Bayer pharma japan and Santen pharmaceutical, 2014). This indicates that most people need to understand the risk of myopia and people who know the risk take action more frequently.

Therefore, conducting measures while they are young, promoting outdoor activities, and spreading awareness of the risk of myopia are keys to answering my research question.

### 3. Conclusion

In improving the problem of myopia, schools will play an important role because we should start taking action while we are young and schools can give accurate and reliable knowledge to all students. Understanding the risk of myopia is the first step, so I suggest to schools that they teach about how myopia can be dangerous in health education. Companies holding events to learn about myopia can be effective to tell the risks to not only children but also to the parents. Outdoor activities are one of the most supported things to prevent myopia. To spread outdoor activities, I suggest promoting outdoor activities at school, for example, adopting a rule that requires children to play in the ground during noon recess and opening schoolyards to children. Controlling the use of digital devices is also needed. The direct effect of digital devices on myopia is not clearly understood, but it leads to decreased outdoor activities. Limiting the use in each family or government regulating the use are necessary.

I'd like to make these proposals more concretely and easy to realize. In the future, I expect that the cause of myopia is understood better, and we can take more effective measures. When it is discovered, I want to study again for a better proposal.

### 4. References

「Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050」<<https://pubmed.ncbi.nlm.nih.gov/26875007/>>(2023/11/07)

「Outdoor activity reduces the prevalence of myopia in children」  
<<https://pubmed.ncbi.nlm.nih.gov/18294691/>>(2023/11/07)

「Myopia Prevention in Taiwan」  
<<https://aes.amegroups.org/article/view/4010/html>>(2023/12/06)

「『子どもの時間感覚』35年の推移」  
<<https://www.citizen.co.jp/research/time/20160610/01.html>>(2023/12/06)

「“近視がもつリスク” 認知低く、定期受診している近視の人はわずか」  
<[https://www.santen.co.jp/ja/news/20141125\\_2.pdf](https://www.santen.co.jp/ja/news/20141125_2.pdf)>(2023/12/06)

「MYOPIA」  
<<https://myopiainstitute.org/myopia/>>(2023/12/20)

「John O'Connor OPTOMETRISTS」  
<<https://www.johnoconnor.co.nz/what-is-myopia/>>(2023/12/20)



# Childcare Support in Developing Countries

## Necessity of the nursery school

5410 Saito Yui

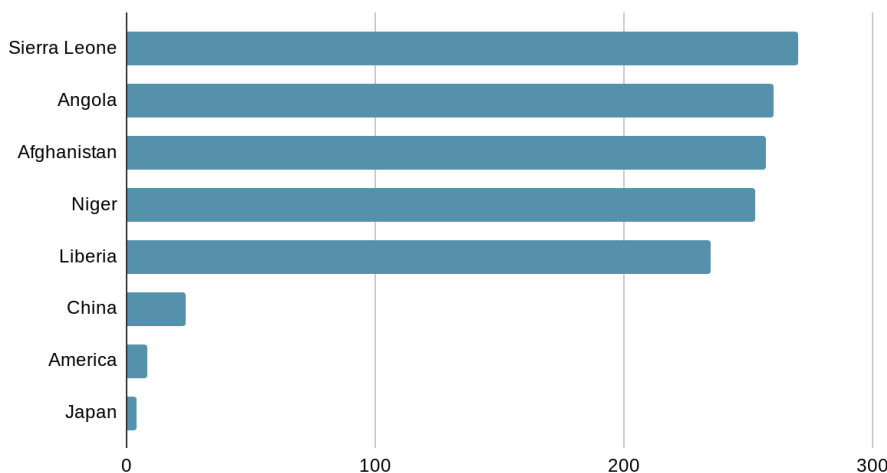
### Abstract

As some children can not live until they become adults and most of them die before the age of five and the mortality rate after that would be low, I thought that since the human immune system is said to be almost complete by the age of five, if we could save children by the age of five, children could live after that. So I considered a way to save children until the age of five. My suggestion is to set up a nursery school. Nursery schools not only protect children's health, but also have many other advantages. However, there are also drawbacks, and I would like to think of ways to improve them.

### 1 Introduction

I like children and at one time I wanted to be a childcare worker. It was around that time that I learned about the shortage of nursery schools in Japan. In the first place, when I tried to think about it in comparison with the rest of the world, I learned that some children never live until they are adults. I considered child care around the world. Mortality rates for children under five are declining around the world. However, it is higher in areas such as Africa than ones in the developed countries. The graph below shows the ranking of mortality rates for children under 5 years old. It shows the number of deaths per 1,000 live births. In the country with the highest rate, the rate is about 70 times higher than in Japan.

Under 5 mortality rate ranks



### 2 Discussion and implication

I thought about why children at that age would die. The first is the cause of infant mortality. What I thought was the lack of doctors, the health condition of the mother, and the sanitary



environment of the hospital. I think there is a serious shortage of doctors in places like Africa. It is a difficult problem because we cannot send many doctors from developed countries. In fact, the UK imports doctors because of a shortage of doctors. They rely on imported doctors because they do not have enough medical care system. However, importing doctors is not possible without funding because the profession is highly paid. This problem can be solved because the UK is a developed country and it is difficult to import doctors in countries that do not have the affording financial resources to do so. Next is the cause of death in childhood. I think it is malnutrition, disease, hunger due to poverty, and infectious diseases. Poor hygiene and disease are major problems in poor areas.

Let me explain about immunity. Babies are born with antibodies from their mother. Between the ages of six months and one and a half years old, the immune system gradually declines. After that, the child's own immunity develops and stabilizes around the age of 2 to 3. By the age of 6, they become the same as adults.

From these things, I suggest setting up a nursery school. First of all, there are five advantages of nursery schools. First, there is always someone who takes care of them. Second, meals are provided everyday. This is a great advantage because enough food is important for children to grow up healthy. Third, they can expand the relationship between children of the same age. More connections with people their own age will help them solve their worries. Fourth, they will improve their communication skills with non-relatives. The more people are involved in a community, the better abilities they can acquire, so the group environment will give them good influence. Finally, there are comfortable environments for children. It is safer for a child with a weak immune system to be in a comfortable environment than to go to a dirty workplace with a parent.

### 3 Conclusion

Therefore, I suggest setting up a nursery school. On the other hand, there are 3 weak points. First, if the nursery schools are insanity, children face diseases and mass infection. As with the coronavirus, infectious diseases are more likely to occur in group situations. Second, the chance of injury increases. When they run or play with their friends, accidents can occur. Finally, time separating from their parents becomes long. For small children, it is important to spend time with their parents. I have to consider these things more. These drawbacks should be solved.

There are two future challenges. The first is a concrete construction plan. I am going to think about where and what size to build will bring the best effect. The second is the financial burden. Who will pay the money? Is there a way to keep costs down? These are the points to consider.

### 4 References

Japan committee for Unisef “Why? Children who do not live to be five years old”  
[https://www.unicef.or.jp/special/10sum/5th\\_birth.html](https://www.unicef.or.jp/special/10sum/5th_birth.html) (5/20)

What is a child welfare facility?

<https://jidoufukushi.jp/jidoufukushi/> (6/13)

Under 5 mortality rate ranks

[https://www.unicef.or.jp/library/pdf/haku08\\_11.pdf](https://www.unicef.or.jp/library/pdf/haku08_11.pdf) (6/18)

Raising children around the world

<https://www.caretheworld.com/worldchildcareaf.html> (7/27)

Britain importing doctors

<https://www.jmari.med.or.jp/download/RE019.pdf> (8/12)

# Reform and Inheritance of Tradition

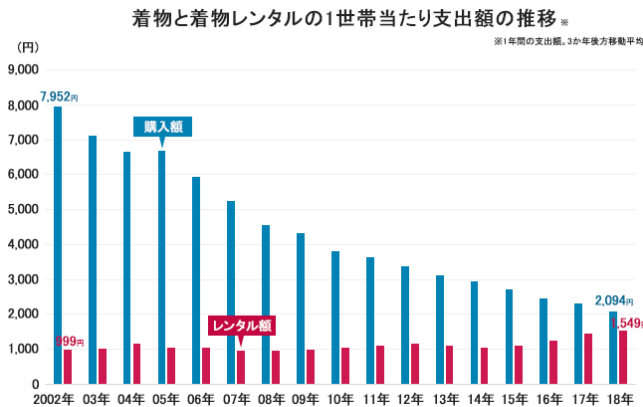
~Kimono as Casual Clothing~

5411 Sawa Akari

## Abstract

The purpose of this study is to find ways of changing kimono for people who want to wear kimono as casual clothing. We do not wear kimonos in our daily lives because kimonos were replaced with western clothes. I thought it is important to inherit the kimono, one of Japanese traditional culture, to the next generation. It is also important to spread kimono to the world. I thought of two methods to wear kimonos in our daily lives. First one is to wear a kimono in the natural form. I think we do not have enough opportunities to wear kimonos, so I thought of some solutions to increase opportunities. Second method is to remake kimono into western clothes. In this method, we change the traditional form of kimono so that we can wear them as casual clothes. I mainly considered the latter, because it enables people to remake kimonos themselves. As for the first one, I need cooperation from public organizations, which is difficult to achieve. I am also thinking of spreading kimono to the world. There are already some people who wear kimonos with western clothing in their daily lives, and also there are some companies which sell kimonos as casual clothes. Referring to these examples, I studied this theme. I will think about the way to wear kimono as casual clothes and how to spread it to many people including foreigners.

## 1 Introduction

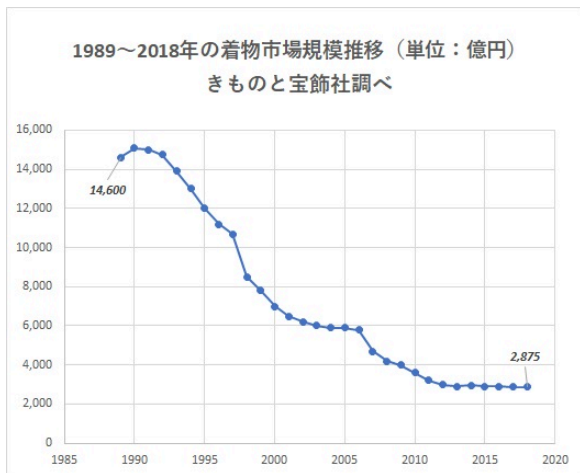


↑FIG1

2002(FIG1), and the size of the kimono industry became one fifth in 2018 compared to 1989(FIG2).

The reason I started this study is that I like kimonos. However, I do not wear them in my daily life, so I wanted to find ways to enjoy kimonos as casual clothing. Looking at SNS and talking with other people, I found many people felt kimonos are cute, and wanted to wear them. Then, I started to think of ways to wear kimonos as casual clothing.

These days, the kimono industry is declining. The purchase of kimonos became one fourth in 2018 compared to

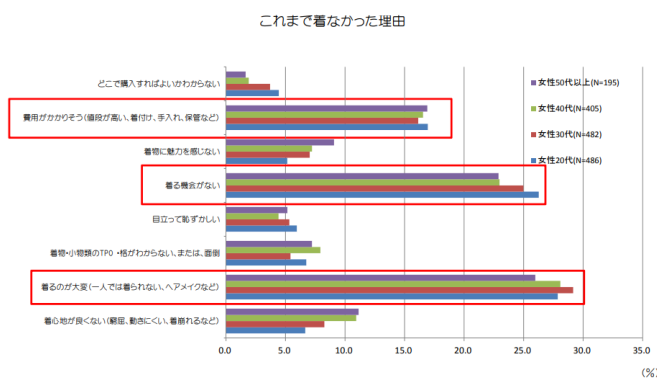


←FIG2

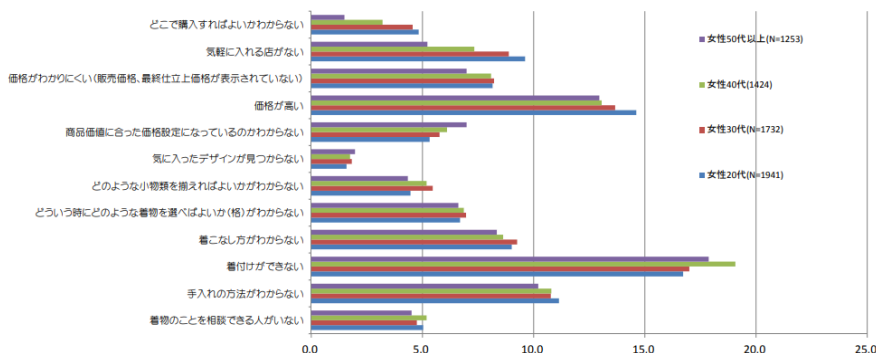
Wearing kimonos in daily lives helps recover the kimono industry. It is important to inherit and spread Japanese traditional culture. This is the significance of this study.

I quoted an attitude survey on kimonos from the Ministry of Economy, Trade and Industry conducted, “The attitude survey of university students toward Japanese clothing”(Ishikawa,2019),and “Interests in kimonos among foreign tourists and response of the kimono industry”(Oshino,2017). Referring to these surveys and people who wear kimonos in their daily life and considering what ideas are important to make kimonos more comfortable, I will devise the way to wear kimono as casual clothes and how to spread it to many people including foreigners.

## 2 Discussion and Implications



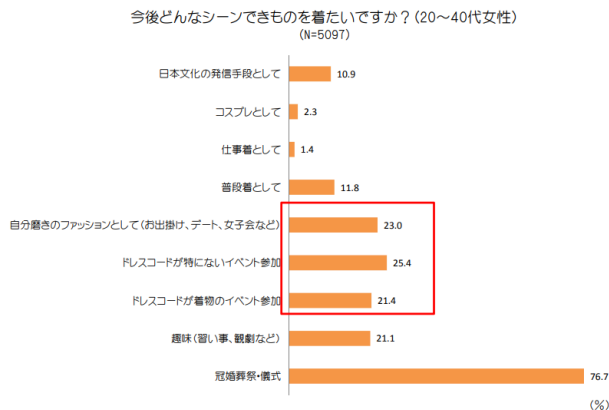
これからきものを着るにあたり分からないこと、困っていることは？



←FIG4

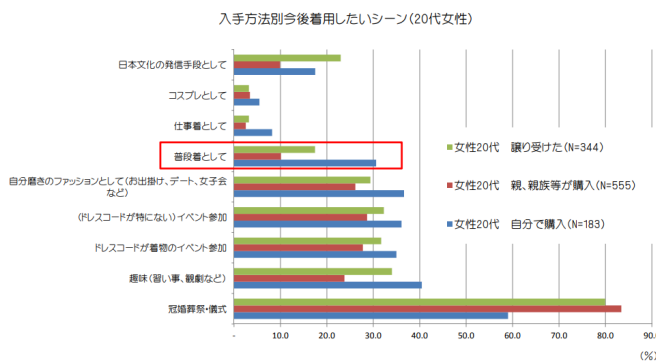
The problems when people wear kimonos are that they cannot put on kimonos

themselves, the prices are high, and they do not know how to treat them. (FIG4)



People were asked when they wanted to wear kimonos, and the rate of ceremonial occasions was the highest of all. Other than that, the rate of as a fashion, and for events were high. (FIG5)

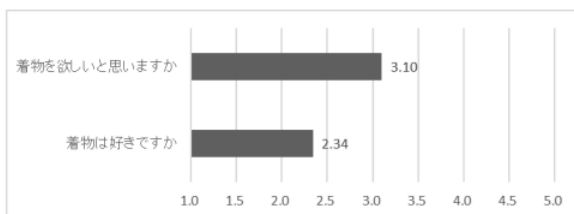
←FIG5



Many of the people who wear kimonos as casual clothes for events other than ceremonial occasions, buy their kimonos themselves, not receive or have their parents buy them. (FIG6)

←FIG6

図表 24 「着物を欲しいと思うか」と「着物が好きか」の平均値



I quoted “The attitude survey of university students toward Japanese clothing” (Ishikawa,2019). This survey targets 170 university students. Students like kimonos, but they do not want kimonos.(FIG7)

←FIG7

図表 30 「着物をモチーフにした洋服を着てみたいか」

	度数	%
着てみたい・興味がある	89	52.4%
着たくない・興味がない	81	47.7%
合計	170	100.0%

We do not have enough opportunities to wear kimonos, and kimonos are expensive and it is difficult to wear them. Moreover, it is difficult to wear them. To solve these problems, there is a way to make clothes like kimonos. The result of the question “Do you want to wear western clothes with kimono motifs?” was that 52.4% of the students answered “Yes”. This question is related

↑FIG8

to my study a lot and this result that as much as a half of respondents want to wear western clothes like kimonos has a good influence on my study.(FIG8)

図表 31 「どんな着物をモチーフにした服を着たいか」

	度数	%
スーツ	44	29.0%
ドレス	36	23.7%
ワンピース	29	19.1%
ジャケット	24	15.8%
シャツ	13	8.6%
サマーカーディガン	5	3.3%
その他	1	0.7%
合計	152	100.0%

However, for the question “What western clothes with kimono motifs do you want to wear?”, the rate of suits and dresses were higher than casual clothes. From this result I can find that the number of people who want to wear western clothes like kimonos in daily life is few. (FIG9)

←FIG9

Viewing these statistics, I can find that there are some people who like kimonos and buy kimonos to wear them in daily life, but they have various problems with wearing kimonos. As for wearing kimonos as western clothes, I thought some people would accept it because about 50% of people want to wear clothes like kimonos.

Moreover, I cited studies of Ms. Oshino from Mejiro University College. I used data about the kimono industry to foreigners. The chart shows what foreign tourists in Kyoto did as an experience of traditional Japanese culture. The number of people who experienced kimono and yukata was the highest, so it shows kimonos are popular among foreigners.

(FIG10)

↓FIG10

表 3 平成26年度 伝統文化体験（複数回答）

項目	全体	北米	オセアニア	欧州	中国	台湾	韓国	東南アジア	その他
着物・浴衣	27.7%	23.2%	18.1%	19.7%	51.0%	40.4%	23.0%	19.7%	28.1%
茶道	24.6%	19.0%	27.2%	25.6%	25.0%	21.4%	18.9%	27.4%	26.4%
日本食づくり	14.5%	12.0%	11.9%	14.7%	26.3%	13.6%	9.0%	6.4%	11.8%
伝統工芸（焼物など）	13.4%	6.8%	14.8%	11.1%	16.0%	12.2%	9.8%	12.7%	15.2%
町家見学	12.2%	10.6%	4.5%	9.0%	15.3%	25.5%	16.4%	5.7%	12.9%
お茶屋体験	8.3%	5.5%	11.9%	9.2%	6.3%	6.8%	3.3%	10.8%	4.5%
座禅	6.2%	3.5%	5.3%	8.6%	5.3%	2.4%	1.6%	10.2%	9.6%
書道	5.8%	2.4%	8.6%	6.5%	4.0%	8.3%	1.6%	3.2%	4.5%
華道	5.4%	3.9%	9.9%	5.9%	5.7%	4.7%	0.8%	6.4%	4.5%
変身体験（舞妓・侍）	4.5%	12.6%	5.8%	4.0%	3.7%	3.3%	0.8%	10.2%	2.2%
武道	2.9%	1.3%	2.1%	5.3%	2.3%	1.8%	1.6%	1.9%	3.4%
香道	2.0%	1.5%	2.1%	4.0%	1.0%	0.9%	0.8%	1.3%	2.8%
その他	2.7%	2.6%	3.3%	2.3%	1.3%	2.7%	4.1%	3.8%	1.1%

※複数回答のため、合計が100%とならない

Foreign tourists answered what they bought, and the following chart shows the ratio of people who bought kimonos. The rate is relatively high and stable, so it is found that foreigners have interest in kimonos. (FIG11)

表2 和服（着物）民芸品購入率

年度	全体	韓国	台湾	香港	中国	タイ	シンガポール	マレーシア	インドネシア	フィリピン	ベトナム	インド
2010	12.7	3.7	10.0	13.8	11.6	9.7	12.3	26.0				15.3
2011	14.1	4.2	11.7	11.9	14.1	18.2	18.2	21.6				16.4
2012	15.5	6.2	12.8	15.4	15.6	11.1	12.1	14.2				17.3
2013	14.3	6.0	12.1	13.0	13.0	10.7	13.3	19.9				18.1
2014	14.0	6.0	10.8	12.2	11.5	12.6	14.3	19.3	24.6	14.9	14.7	17.2
2015	11.9	5.4	8.3	12.2	9.5	11.3	12.5	17.3	21.5	14.6	10.6	15.4

↑FIG11

表4 着物体験または着物レンタルサービスを実施している企業の店舗設置地域及びホームページの言語数

地域	店舗合計	ホームページの言語数の集計	1店舗あたりの平均言語数
全国	2	3	1.5
東京	17	28	1.6
神奈川	1	2	2.0
長野	1	1	1.0
京都	26	171	6.6
奈良	2	7	3.5
名古屋	1	1	1.0
富山	1	1	1.0
石川	1	4	4.0
島根	1	1	1.0
栃木	1	2	2.0
福岡	1	3	3.0
計	55	224	4.1

※「1店舗あたりの平均言語数」は、その地域における「ホームページの言語数の集計」を「店舗合計」で割った値  
 ※全国：全国各地に25店舗以上展開しており、主となる販売店が多く点在している

In Kyoto and Tokyo, where traditional streetscapes remain, the number of rental kimonos' stores is big, and their homepages respond to more language than other cities. In these cities foreign travelers can easily experience kimonos. (FIG12)

←FIG12

Many foreigners are interested in kimonos and Japanese kimono industry also prepare for foreign tourists, so I thought it would not difficult to spread kimonos to the world.



↑FIG13

There are already some people who wear kimonos as casual clothing and companies which remake kimonos into casual clothes and sell them.

These pictures (FIG13) are examples of remaking kimonos into western clothes. She combines kimonos with western clothes and enjoys kimonos in her daily life.





In addition, “Ay”, the company which up-cycle Meisen into western clothes and other products try to make kimonos more familiar to us. (FIG14)

←FIG14

From these examples, many people are making efforts to adopt kimonos into casual clothing.

I visited a company named “Syne Studio” in Singapore. They remake kimonos into jackets, bags, wallets, and so on. Their products are made from different kimonos, each of them is one-of-a-kind. They also said that they made uniforms for one company’s employees, and they attended the Singapore Design Week. In addition to that, they have worked with many other companies. They told us that they started their business because they love kimonos. They import a lot of kimonos from Japan and repair them one by one. They create their products based on slow fashion, which aims to make people buy a few pieces of clothing at relatively high prices, and wear them for a long time. They expand their business by using SNS like Instagram or TikTok. They said they came up with using ASMR with the sound of a sewing machine. I asked them about the popularity of kimonos in Singapore because I’m thinking of spreading kimonos to the world. They answered that Singaporeans know kimonos but only few people have actually seen or worn them. However, I think it is not impossible to spread kimonos to the world, because they sell their products for foreigners, and continue their business outside Japan.

When I devise the method to wear kimonos as casual clothing, it is necessary to consider some points to match the present daily lives. The following are the examples.

- protecting bodies from the environment
- adjustment of body temperature
- the ability to absorb sweat
- ventilation
- size
- easy to move
- easy to put on
- material
- design
- match with the person and occasion

### 3 conclusion

To remake kimonos into casual clothing, I devised two methods.

The first method is to wear a kimono in the natural form. I think we do not have enough opportunities to wear kimonos, so I thought of some solutions to increase opportunities. These days, mainly among young people and foreign tourists, wearing kimonos



in old towns such as Kyoto or Asakusa is becoming a popular event. This is good for the kimono's revival. To make it easier for tourists to experience kimono in such places, reinforcement of the connection between local government and kimono rental companies is important. At the same time, rental companies' effort to use multiple languages is essential to respond foreign tourists. Another way to increase opportunities to wear kimonos is to propose people to wear kimonos in ceremonial occasions. This is the easiest way because people think kimonos are worn in formal situations. However, this method has several problems. Many people cannot wear kimonos themselves, kimonos are expensive, and maintenance is difficult. To solve these problems and adapt to current life styles, I devised another method.

The second method is to remake kimonos into western clothes. In this method, we change the traditional form of kimono so that we can wear them as casual clothes. For example, we can make new western clothing using kimonos, and we can wear kimonos with western clothes such as skirts, boots, blouses. I mainly want to develop the latter, because it enables people to remake kimonos themselves. As for the first one, I need cooperation from public organizations, which is difficult to achieve. Moreover, people can enjoy various coordinates with each personality, and it is easy for foreigners to wear kimonos in their countries. I want to consider how to spread this method to people who want to wear kimonos in their daily lives and also foreigners.

#### **4 References**

Research trends, current situations, and rankings of the kimono industry (2022/10/31)

<https://gyokai-search.com/3-kimono.html>

The changes in kimono's demand: decrease of "nakoudo" and the philosophy of "eco" | kimono hoshokusha | marketing magazine for the kimono industry (2022/12/05)

<https://status-marketing.com/20211026-4230.html>

Japanese clothing promotion and study society The report from the secretariat (The result of the survey) (2022/12/07)

[https://warp.da.ndl.go.jp/info:ndljp/pid/10217941/www.meti.go.jp/committee/kenkyukai/seizou/wasou\\_shinkou/pdf/004\\_03\\_00.pdf](https://warp.da.ndl.go.jp/info:ndljp/pid/10217941/www.meti.go.jp/committee/kenkyukai/seizou/wasou_shinkou/pdf/004_03_00.pdf)

The attitude survey of university students toward japanese clothing (2022/12/12)

<https://open.shonan.bunkyo.ac.jp/hiyoshi/class/survey3/2019/7.pdf>

Interests in kimonos among foreign tourists and response of the kimono industry (2022/10/31)

[https://mejiro.repo.nii.ac.jp/?action=repository\\_action\\_common\\_download&item\\_id=1195&item\\_no=1&attribute\\_id=22&file\\_no=1](https://mejiro.repo.nii.ac.jp/?action=repository_action_common_download&item_id=1195&item_no=1&attribute_id=22&file_no=1)

"Kimono without juban is OK" "Add to everyday clothes" "Belt in place of obi" free style kimono coordinates book by Misamaru (2023/12/06)

<https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.kadokawa.co.jp%2Fproduct%2F322110000949%2F&psig=AOvVaw3fdW5KpvJ4URvIijZn0Hn3&ust=1702793461907000&source=images&cd=vfe&opi=89978449&ved=0CBMQjhxqFwoTCIDWipGmk4MDFQAAAAAdAAAAABAI>

Ay (2022/12/19)

<https://www.ay.style/>

The role of clothing | Tokyo cleaning life hygiene trade association (2022/12/01)

<https://www.tokyo929.or.jp/column/ware/2.php>

# Economics for Education

Create the optimal solution for each person

ID: 5412 Name: Shigeta Kazuto

## Abstract

Shocked by the rather low performance of elementary school students on tests administered by a national agency, I decided to research what the optimal educational approach would be. In order to narrow my target audience, I decided to research mathematics in secondary education. In the process, I discovered the study of educational economics, which links data and education, and decided to apply this to my research. There are several cases in which this study has led to better education, especially in elementary education, and I looked into how this could be put into practice in secondary education as well. However, it is very difficult to obtain data for individual research, so I am currently looking for ways to obtain data.

## 1.Introduction

First of all, please look at this image. This is from the National Survey of School Achievement and Learning, an academic achievement test carried out by the National Institute for Educational Policy Research (NIER) on primary and junior high school students all over the country. In this survey, questions like the one in the image above were asked, and the percentage of correct answers was 55.4%. I was very shocked by this and wondered why this result was achieved. So, I chose this theme because I wanted to research education. I wanted to do research related to the field of economics, which is my chosen career path. I found a study called 'Educational Economics', which links data and education, and decided to research it. I mainly focus on mathematics, which is my favorite subject, and on middle and high school students, or secondary education, which is currently less researched on primary school students and young children.

2021年度全国学力テスト小6算数「三角形の面積を求める問題」

図1のような直角三角形があります。

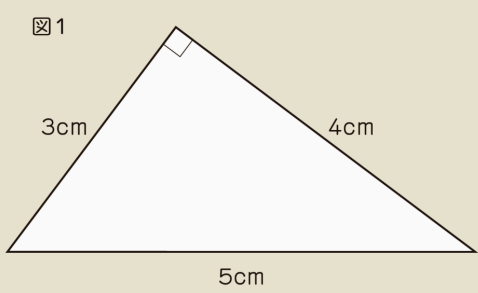


図1

3cm

4cm

5cm

(1) 図1の直角三角形の面積は何 $\text{cm}^2$ ですか。  
求める式と答えを書きましょう。

正答率が  
**55.4%**

(<https://www.nier.go.jp/21chousakekkahouoku/>)

## **2. Discussions and implications**

There is a book named "Geniuses' Predictions of the Future". One of the authors, Yusuke Narita, says that "In the United States, if you look at the subsequent education of people who managed to get into an high level school and a person who have a similar ability who unfortunately failed to pass, we will find that the level of university they go finally is almost the same. The data show that the level of university they go to afterwards is almost always the same. The reality is that it is not that going to a preparatory school makes you smarter, but that the smartest people go there", and although this is an example from another country, it is thought that the situation is similar in Japan when looking at the success results of Japanese preparatory schools. In the same book, he also says that "the average annual income of the parents of children who enter America's top universities, such as Harvard, Yale and Stanford, is more than 20 million yen. The reason for this is that American university entrance examinations are like Japan's AO entrance examinations, in which students pay for a tour of 'experience' such as entrepreneurship in order to appeal to themselves, and are then admitted." He also said, The reality is that with this kind of education, only those who can study and who have invested a lot of money to become able to study are able to hold important positions in society and move it. Therefore, it is significant that changing the education system and reflecting various voices will lead to the realization of a better society. Also, if we find ways to improve students' abilities through this research, I think we can apply it to other subjects as well, so we can create a more efficient education system. The purpose of this research is to reform the education system as described in these Significance and to improve our own academic performance more.

There is one practical example of the economics of education. "Which of two different types of elementary school students, one with gain ¥2,000 for scoring 80 or higher on a test and the other with gain ¥2,000 for completing a book of work, performed better?" The results of the study showed that the children who received the work improved their grades more. This is thought to be because elementary school students had not yet established their own study methods, and their grades improved more when they learned how to use the input method. What about middle and high school students? We would like to find out if the results change depending on the deviation level of the students, such as in mock exams, and if so, how to deal with each level.

Because this study has a very specific target, the number of previous studies and studies with similar content is very limited, and this is making it very difficult to gather information from the Internet or other sources. It needs a strong effort to make it practical.

## **3. Conclusion**

Though there are some issues to make the research practical, Economics for Education has a strong power to change the current situation of Japanese education. It is

difficult to collect data, but if we can get some data and analyze it, we can have a great result.  
I want to think about how to get data and improve my research.

#### **4.References**

高橋弘樹編著(2022)「天才たちの未来予想図」マガジンハウス新書  
「令和3年度 全国学力・学習状況調査 報告書・調査結果資料」  
<<https://www.nier.go.jp/21chousakekkahoukoku/>>(アクセス日:2023/5/30)  
編集長江口悦弘(2022)「日経パソコン 教育とICT No.20」日経BP社  
中室牧子著(2015)『「教育」の経済学』ディスカヴァー・トゥエンティワン

# Improve Working Environment

~Reduce black owned businesses~

5414 Jingu Yuto

## Abstract

I have continued to research improving working conditions. Specifically , to reduce black owned businesses and to make a worker friendly society. Japan has more black owned businesses than any other countries.What is based on black owned businesses and the fact that national character and few government support? For these things, I suggested that the Japanese government impose a fine for people and the money given to people who are unemployed.

## 1 Introduction

There was an investigation to check whether or not black owned businesses by the labor standards inspection office 10 years ago and more than 65% company are caught by the investigation.It is very high figure.Compared to the world , Japan has the largest number of black owned businesses in Organization for Economic Development.Low labor productivity is the reason why Japan has more black companies than other countries.For these things, I want to reduce black owned businesses and to make worker friendly society.

## 2 Discussion and implications

Japan has a lot of black owned businesses in the world. More than 60% of the companies in Japan are considered to be black owned businesses.

	労働時間（時間/年）	労働生産性（USドル/時）
日本	1,680	46.8
ドイツ	1,363	72.9

This table compares the working hours and labor productivity between Japan and Germany. The reason for comparing Japan and Germany is that Japan is ranked 3rd and Germany is 4th in the world GDP ranking conducted in FY2021, and the difference in GDP figures is small,

and the two countries are closer to Japan's national strength than China. Japan averages 1,680 hours of work per year, but Germany averages 1,363 hours. Nevertheless, Japan has lower labor productivity than Germany. Labor productivity is defined as GDP per capita divided by working hours, and we can also be called labor efficiency. This is the reason why there is a difference in labor hours but not in GDP. Japan's labor productivity is very low, ranking last among the major industrialized countries and 23rd out of 38 countries in the Organization for Economic Cooperation and Development . There are three reasons why German labor productivity is so high. German workers are generally not overworked and only choose jobs that they can complete within their capabilities. For example, if your boss assigns you a task that is a little too much for you to handle, you would not be able to complete it during business hours if you were in Japan, but German would have to receive themselves to complete it, and it would be difficult to refuse, and even if one could refuse, someone else would take over the job. In Germany, however, this is not the case. They firmly refuse work that is not up to their abilities. Since those around them also firmly refuse the work, no one can do the job. Second is the national character. Germans are not very interested in improvement. In other words, they are satisfied with the status quo. This is why they do not push themselves too hard, which leads to the first reason.

The third reason is that they are strict against black-owned companies. What is strict is an institution like the Labor Standards Inspection Office in Japan. Even if a company violates the standards and they are found to be a black company, it can only be advised in Japan. Germany, however, imposes fines of up to 2 million yen on black-owned enterprises. This forces companies to become more protective of their workers. I believe these three factors are the reasons why Germany has short working hours and high labor productivity.

Denmark is known as the happiest country in the world, ranking first in Europe with 94% in a survey of workers' working conditions. It is also known as the country with the second highest income per hour. Denmark is unusual in Europe in that it is easy to be fired from a job, and unemployment benefits are given by the government when a person resigns. This makes it easy to leave companies that pay poor wages and are not very responsive, and in the end, only the good companies remain.

My proposal is that the government fines black companies and gives the fines as unemployment benefits when workers leave the country. First, the Labor Standards Inspection Office would issue fines to companies that it determines to be black-owned during its regular inspections. Labor Standards Inspection Offices are birth agencies of the Ministry of Health, Labor and Welfare, and exist throughout Japan. There, they impose fines on companies that are caught in periodic inspections conducted at regular intervals. The amount of money is not set in concrete terms, but the amount is set according to the number of items and by item, and the Labor Standards Inspection Offices collect the money for violations as the government. The money is then used to fund unemployment benefits. Unemployment benefits guarantee workers 70 to 80% of their average salary for the last three months of the month in which they left the company, for up to one year. This would move companies in the direction of improving their companies so that inspections do not result in violations, since money would be collected if a violation occurs during an inspection, and it would also make it easier for workers to leave the company as unemployment benefits would be implemented. I think this will lead to mental relaxation and help solve the problem before stress and other factors lead to depression.

### **3. Conclusion**

In conclusion, Japan is positioned as a country with long working hours and low labor productivity in the world. Although the figures alone suggest that working hours are not as long as other countries in the world, this is due to the influence of short-time workers, who account for about 25% of the workforce in Japan, and their figures create the illusion that working hours are not as long as they are. I propose that the government fine black-owned companies and give the fines as unemployment benefits when workers leave their jobs. First, the Labor Standards Inspection Office would issue fines to companies that it determines to be black-owned businesses during its regular inspections. Labor Standards Inspection Offices belong to the Ministry of Health. They impose fines on companies that are caught in inspection. The amount of money is not set perfectly, but the amount is set according to the number of items and by item, and the Labor Standards Inspection Offices collect the money for violations as the government. The money is then used to fund unemployment benefits. Unemployment benefits guarantee workers 70 to 80% of their average salary for the last three months of the month in which they left the company, for up to one year. This would move companies in the direction of improving their companies so that inspections do not result in violations, since money would be collected if a violation occurs during an inspection, and it would also make it easier for workers to leave the company as unemployment benefits would be implemented. This will lead to a more relaxed mentality, which will allow workers to solve problems before they become depressed due to stress and other factors.

As a future task, I would like to research companies that are hiring mid-career workers. In Japan, we see many advertisements and commercials for job changes, but I think it is necessary to find out if such companies are really white companies or not.

#### **4 References**

<https://saleszine.jp/news/detail/2709>

Survey on workplace being a black company 9/2

<https://honyuki39c.com/black-companytttytytyty/>

Black Company Percentage Definition 9/5

<https://www.enworld.com/burogu/2020/05/EU-working-environment?source=google.com>

Overseas Labor Standards 9/5

<https://president.jp/articles/-/30283?page=3>

German Approach 10/5

<https://workstyle.ricoh.co.jp/article/workingtime.html>

Labor Time in Japan and the World 10/5

<https://www.hrbrain.jp/media/labor-management/labor-productivity1>

Reasons for Japan's low labor quality 10/12

<https://drive.media/posts/11638>

Why Denmark is considered a happy country 10/13





# **To Remove National Borders with Technology**

~To make the world that everyone can serve fair medical care~

5415 Suda Yurina

## **Abstract**

While various medical technologies are developed, the healthcare disparities between developed countries and developing countries are growing, so I thought, why not connect those technologies to eliminating these healthcare disparities. I think telemedicine robots such as Da Vinci are the most effective tool because doctors in developed countries do not have to go to developing countries to treat patients in developing countries by using telemedicine robots. And I think it will become easier to get cooperation from doctors in developed countries. However, most developing countries have inadequate infrastructures, so this project will need huge amounts of funds. Poverty is one of the reasons for these healthcare disparities, so I want to make a place to provide free medical care to the poor, and then more funds are needed. I am hoping to receive assistance, including working with several large corporations to fund these funds. However, this still does not cover all the costs of creating free treatment centers in developing countries, so the question for the future is where to calculate these enormous costs.

## **1. Introduction**

The gap between developing countries and developed countries is how the latest technologies develop. . One of the gaps is healthcare disparities. Non-life-threatening illness in developed countries killed people in developing countries. Currently, some supporters such as Doctors Without Borders are going there to provide medical care, but that number is too small to support enough. So I think if we can introduce telemedicine robots to these countries, doctors in developed countries need not to go to developing countries and more doctors will cooperate with us to save more lives in developing countries. So I focused on Telemedicine robots that have become increasingly competitive recently.. Now that the patent for the telemedicine robot named Da Vinci has expired, competition in the development of telemedicine robots has intensified, and telemedicine robots have been developed that, while not inexpensive, are much more affordable than previous telemedicine robots. For these reasons, I thought if doctors in developed countries can treat patients in developing countries still the doctors in developing countries by using telemedicine robots, we can save more lives and provide more fair medical care to more people.

## **2. Purpose and Significance of the Research**

The purpose of this research is to make a fair medical place in countries where there is no adequate medical care available like developing countries and save more lives. By promoting this research, of course, we can save more lives and it can also make new opportunities for the use of cutting-edge technologies such as AI, which is now being developed one after another. If we can save more lives, more human resources will be created and more people will contribute to the development of the world. In addition, if safe medical

care can be delivered to people in developing countries, it will lead to the development of those countries because it will help spread health and hygiene ideas to the people in those countries. The creation of new venues for the use of cutting-edge technology will promote the diffusion of them and further the development of them. For these reasons, this research has the significance of saving more lives, thereby providing more human resources to contribute to world development, and promoting the diffusion and development of cutting-edge technology as a new venue for its use.

### 3. Research Methods

- ①The extent of global healthcare gap and their current status
  - ②Telemedicine technology
  - ③Telemedicine robot
  - ④Examples of cross-country remote surgery
  - ⑤Infrastructure development in developing countries
  - ⑥Number of death per year in developing and developed countries and breakdown of main causes of death
  - ⑨The safety of medical robots
  - ⑩The cost of telemedicine robots
- I went through the above in that order.

### 4. Reseach Results

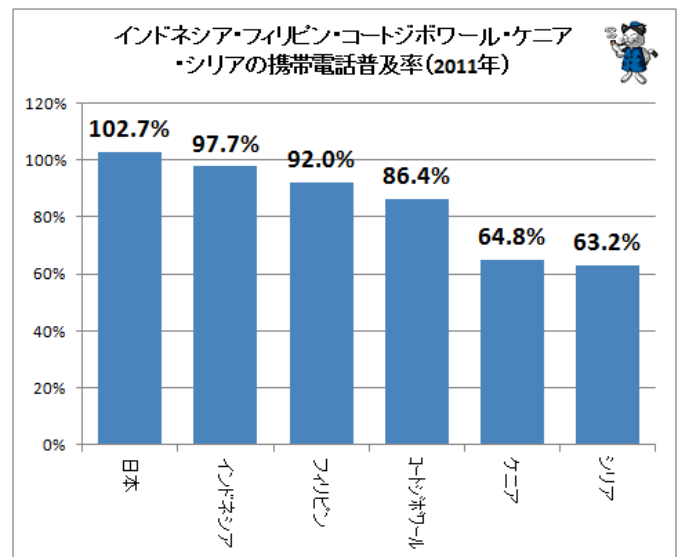
#### Healthcare Disparities Ranking in 2013

順位	トップ 10	順位	ワースト 10
1	フランス	138	コートディボワール
2	デンマーク	139	カメルーン
3	ノルウェー	140	アフガニスタン
4	ルクセンブルグ	141	コンゴ民主共和国
5	フィンランド	142	ニジェール
6	ドイツ	143	赤道ギニア共和国
7	スウェーデン	144	マリ
8	スロベニア	145	ギニア
9	キューバ	146	シエラレオネ
10	スイス	147	チャド

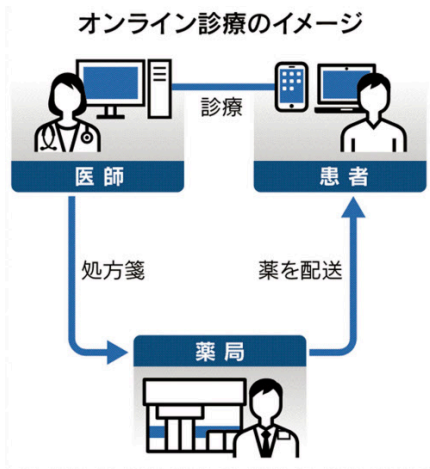
The table on the left shows the top 10 and worst 10 countries ranked in terms of health inequalities in 2013. From here, I'll consider a trial in the Ivory Coast, one of the 10 worst countries in that ranking. To reduce the gap, I have come up with a solution in three separate cases.

- ①Physical examinations referrals for exercise and diet therapy, and prescriptions for medications when surgery is not necessary.

The graph on the right shows cell phone penetration. In the Ivory Coast, the penetration rate is 86.4%. From this, cell phones are widely used in the Ivory Coast. In addition, the infrastructure in the Ivory Coast is



well-developed enough to make online calls from Japan, so it is possible to provide online medical care.

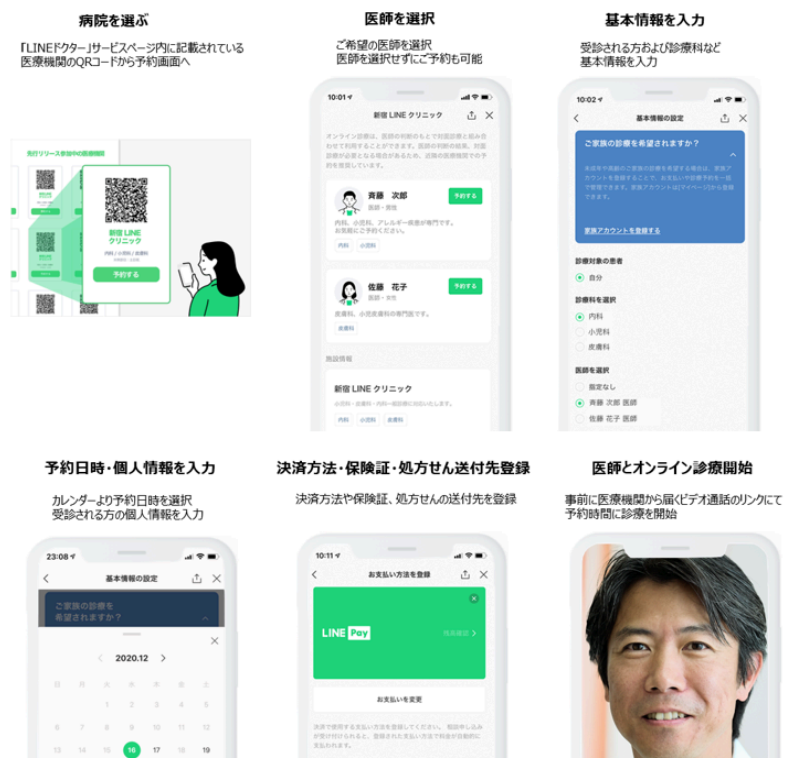


The picture on the left is the image of online medical care. Through cell phones such as smartphones, doctors treat patients and send prescriptions to pharmacies. The pharmacy then delivers the medication to the patient based on the prescription from the doctor. I want to make this system in the Ivory Coast.

This is the system of LINE doctor. I want to make an online system like this because we can freely choose our doctor, set our own appointment date and time, and have a face to face consultation.

The main challenge in online medical care is language differences. Since the goal of this study is to create a system that allows physicians in developed countries to see patients in developing countries, language differences must be arised.

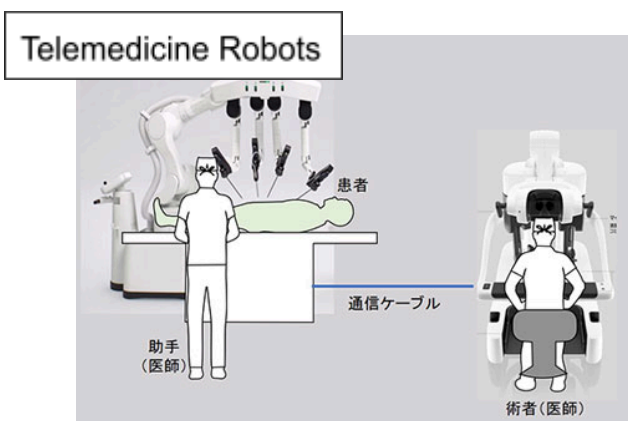
However, there are a lot of translation machines, so I am sure we can work something out.



②When surgery is scheduled and performed in advance.

I suggest using telemedicine robots to reduce the medical gap between developed and

developing countries. Telemedicine robots such as Da Vinci and Hinoroti are medical robots which are used in Japan. The main body of the robots that perform the surgery is located in developing countries and the machine that operates the main body is located in developed countries. By doing so, doctors with advanced skills can operate on



patients in developed countries. In fact, there have been some cases where surgery was performed without delay even when there was a distance between the patient and the doctor.

One example is Operation LINDBERGH in 2001. According to Wikipedia (en.wikipedia.org/wiki/Lindbergh\_operation 25 November 2022, at 07:14 (UTC).), “The operation involved minimally invasive surgery: The 45-minute procedure consisted of a cholecystectomy on a 68-year-old female patient in surgical ward A in Strasbourg Civil Hospital, in Eastern France. From New York, the surgeon controlled the arms of the ZEUS Robotic Surgical System, designed by Computer Motion, to operate on the patient. The link between the robotic system and the surgeon was provided by a high-speed fiber optic service deployed thanks to the combined efforts of several France Telecom group entities.” This operation was a success. This case study shows that cross-border surgery using telemedicine robots is not impossible. From this, when surgery is scheduled and performed in advance, I want to use these telemedicine robots and treat patients in developing countries.



③For urgent surgical procedures that cannot be scheduled.

This case is the most difficult. By gathering physicians from developed countries around the world, we will be able to take advantage of time differences to provide 24-hour surgical services. The surgical procedure is the same as ②, using telemedicine robots.

### 5. Conclusion and future issues

The first is the issue of finding sources. Although the price of the telemedicine robots has been getting cheaper due to the expiration of the da Vinci patent, even Hinotori, which is considered relatively inexpensive, is priced at 150 million yen for Xi and about 100 million yen for X in the U.S. The da Vinci is priced at about 300 million yen, and the cheaper version, X, is priced at about 200 million yen. The Da Vinci is priced at about 300 million yen, and the low-priced X is priced at about 200 million yen. Both da Vinci and Hinotori cost about 10 to 20 million yen to maintain after purchase.

The graph on the left shows the budget of the Ivory Coast for 2020. This also shows that it is financially difficult to purchase new telemedicine robots or develop infrastructure for telemedicine

表 2020年予算の主な内訳 (単位:10億CFAフラン、%)

項目	2019年	2020年	前年比	構成比
歳出総額	7,334.3	8,061.0	9.9	100.0
経常支出	2,877.7	3,063.9	6.5	38.0
人件費	1,720.8	1,770.1	2.9	22.0
その他	1,156.9	1,293.8	11.8	16.1
投資支出	2,095.2	2,281.7	8.9	28.3
国内財源	1,154.9	1,113.5	△ 3.6	13.8
外国資金	940.3	1,168.2	24.2	14.5
債務返済	1,821.4	2,137.1	17.3	26.5
対外債務	759.1	869.4	14.5	10.8
国内債務	1,062.4	1,267.7	19.3	15.7
国庫特別勘定支出	727.5	759.7	4.4	9.4
歳入総額	7,334.3	8,061.0	9.9	100.0
国内財源	6,014.4	6,401.7	6.4	79.4
税金	3,669.1	3,940.8	7.4	48.9
内国税	2,095.4	2,238.3	6.8	27.8
関税	1,573.7	1,702.4	8.2	21.1
税外収入	188.8	206.8	9.5	2.6
民営化	102.0	126.3	23.8	1.6
その他	86.8	80.5	△ 7.3	1.0
国債	1,429.0	1,494.4	4.6	18.5
国庫特別勘定収入	727.5	759.7	4.4	9.4
対外財源	1,319.9	1,659.3	25.7	20.6
開発プロジェクト無償	159.8	190.4	19.1	2.4
開発プロジェクト融資	780.4	977.8	25.3	12.1
財政援助	379.7	491.1	29.3	6.1

(注)2019年は当初予算ベース。  
(出所)コートジボワール 経済財政省

robots, as the country relies on financial aid and development project funds to promote domestic development.

One option is to use crowdfunding, which has become popular recently, but it is difficult to support this system in the long term.

Second, there is a shortage of human resources to work in this healthcare system. We would like this system to be made possible by volunteer activities on the part of medical professionals, i.e., we would like medical professionals to provide medical services free of charge. If this were to happen, the number of medical professionals who would participate in this system would decrease drastically. In addition, since this medical system is a cross-national one, there is a very high possibility that the language used by patients and the language used by doctors and other medical professionals will differ. However, the number of medical professionals who can use the language used by the patients will inevitably be small. Therefore, we would like to recruit interpreters to connect communication between patients and medical professionals. We would also like interpreters to provide interpretation services free of charge. The idealistic vision of achieving all of these things is too high and would be impossible for a small country like Cote d'Ivoire to realize.

For these two reasons, it is not feasible to realize this medical system in one small country, both financially and in terms of human resources. Therefore, we would like to consider the realization of this medical system in West Africa, the region to which Cote d'Ivoire belongs. This is because the financial resources will increase by considering this in the region of West Africa. In terms of human resources, we can handle medical treatment to some extent even if doctors change every day, but we cannot perform surgeries that are planned in advance if the doctor changes. Therefore, we would like to create a network in which the doctor who treated the patient provides information on the patient's physical condition and pre-existing conditions to the doctor in charge of the surgery on the day the patient wants the surgery, so that the surgery can be performed. However, because diseases can be detected through repeated medical care, if the doctors change, there will always be things that cannot be communicated through information exchange between doctors, making surgery in this situation dangerous.

## **7.References**

Japan Surgical Society, "Online Surgery (Remote Surgery)"

<https://www.mhlw.go.jp/content/10803000/000495289.pdf> 2022.6.1.

Tokyo Medical University Hospital, "Thorough Dissection of the Surgical Robot "da Vinci"".

<https://hospinfo.tokyo-med.ac.jp/davinci/charm/index.html> 2022.4.25.

Council for the Promotion of Team Medicine "Learn more about Team Medicine - What is a Doctor?"

<https://www.team-med.jp/archives/specialist/doctor#:~:text=%E5%8C%BB%E5%B8%AB%E3%81%A8%E3%81%AF%E5%8C%BB%E8%A1%93> May 5, 2022

All Japan Hospital Association, "Report on the State of Hospitals."

<https://www.ajha.or.jp/voice/arikata/2011/07.html> May 5, 2022

Ministry of Health, Labour and Welfare, "On Policy - Health and Medical Care"  
[https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/kenkou\\_iryuu/iryuu/index.html](https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/kenkou_iryuu/iryuu/index.html) May 5, 2022

MEDICAL DX "How are hospitals around the world adopting AI and artificial intelligence? Case Studies from the U.S., Germany, and China" <https://medicaldx-jp.com/news/15> May 9, 2022

Biomedical Engineering "Surgical Support System for Telemedicine"  
[https://www.jstage.jst.go.jp/article/jsmbe/49/5/49\\_5\\_673/\\_pdf](https://www.jstage.jst.go.jp/article/jsmbe/49/5/49_5_673/_pdf) June 1, 2022

Enago Academic English Academy "AI Medicine in Japan: Future Challenges and Latest Case Studies" [https://www.enago.jp/academy/medical-ai\\_2021/](https://www.enago.jp/academy/medical-ai_2021/) May 9, 2022

Shinyurigaoka General Hospital, "What is da Vinci da Vinci | Robotic Surgery (da Vinci) Center" [https://www.shinyuri-hospital.com/advanced\\_medical\\_technology/davinci.html](https://www.shinyuri-hospital.com/advanced_medical_technology/davinci.html) April 25, 2022

Expectations for Industrial Robots Grow Even Higher - METI Journal, Ministry of Economy, Trade and Industry  
<https://www.nikkan.co.jp/articles/view/452025> December 14, 2022

Cost of robotic-assisted surgery; expansion of insurance coverage in 2018 will significantly reduce the cost burden of treatment.  
<https://www.ganchiryohi.com/treatment/494> December 14, 2022

2020 budget, 9.9% larger than the previous year (Côte d'Ivoire).  
<https://www.jetro.go.jp/biznews/2019/12/24cfab50dca43a9e.html> December 12, 2022

How many yen from 1 franc  
<https://www.oanda.com/currency-converter/ja/?from=USD&to=JPY&amount=1> December 12, 2022

Can the domestically produced surgical-assist robot "hinotori" surpass the giant "da Vinci"?

Kawasaki Heavy Industries' domestically produced surgical support robot "hinotori" half the price of da Vinci.  
<https://www.watch.impress.co.jp/docs/news/1396350.html> October 24, 2022

Republic of Cote d'Ivoire Basic Data  
[https://www.mofa.go.jp/mofaj/area/cote\\_d/data.html](https://www.mofa.go.jp/mofaj/area/cote_d/data.html) October 24, 2022



Remote Robotic Surgical Solutions Using 5G - Industry-Academia-Government  
Collaboration to Accelerate Innovation

<https://smartiot-forum.jp/iot-val-team/iot-case/case-robotic-surgery> October 24, 2022

How to maintain the quality and safety of robotic-assisted surgery, which is increasingly  
being applied

<https://www.medsafe.net/recent/174robot.html> October 19, 2022

Online Medical Treatment "LINE Doctor" Nationwide Delivery of Prescription Drugs

<https://www.watch.impress.co.jp/docs/news/1460259.html> October 19, 2022

Democratization of Medicine Accomplished by Scanning

<https://alj.com/ja/perspective/> October 19, 2022



# Measures against the Negative Effects of Games

~ To enjoy the game ~

5416 Sumiya Wataru

## Abstract

In 2018, the WHO added the name "gaming disorders" to the International Classification of Diseases (ICD). With it, gaming addiction is now defined and counted as one of the diseases. The ultimate goal of this study is to dispel the image of gaming as a bad thing, and to this end, the goal is to develop countermeasures against gaming addiction. Proposals for solving the problem of "game disorder," which is considered a worldwide problem, will be discussed from the perspective of high school students who play games on a daily basis. Herein lies the significance of this study. We propose that the problem in real life is connected to the addiction to video games, and we propose that the parents provide the students with entertainment other than video games, and that the parents provide the students with the opportunity to do the same. In the future, we would like to continue our study in order to make this proposal more concrete.

## 1 Introduction

In 2018 WHO added "gaming disorder" to International Classification of Diseases (ICD). As a result, game addiction was defined and counted as one of the diseases. Because of my great interest in video games, I became interested in "gaming disorder", which led me to begin this research. I have heard many times from adults telling me to quit playing games. It is true that games have an effect on the body and mind, but I feel that many adults are telling children to quit playing games without considering why games have an effect on the body and mind. I believe that this is due to the underlying image of games as something bad. I would like to dispel this image, and this is the ultimate goal of this research.

I believe that deepening the understanding of "game disorder" among many people through this research is the first step toward solving the problem of "game disorder," which is considered to be a global problem. In addition, I myself am only a game player. Therefore, I believe that I can reflect my opinion as a high school student who plays games, rather than as an adult who does not play games, in my research. Herein lies the significance of this study. Here is the significance of this study.

## 2 Discussion and implications

So, how can we dispel the bad image of this game? To answer this research question, I first considered why games are regarded as worse than other entertainment and hobbies. I hypothesized that it is because games have more negative effects on the body and mind than other entertainment and hobbies. The main negative effects of games are: (1) The possibility of dependence, which interferes with daily life, (2) The tendency to focus too close to the screen and to look at a single point for too long can lead to vision loss. (3) The possibility of lifestyle-related illnesses and impaired communication skills due to not being able to play outside. etc. can be mentioned. I think that these negative effects of video games have

created an image of video games as a bad thing. Therefore, I think that if we can reduce these negative effects of games, we can dispel the bad image of games, and my research will focus on how we can reduce gaming disorders.

In conducting this research, I first want to clearly define the term “game disorder”.

According to the WHO, game disorder is defined as a condition that lasts more than 12 months and seriously interferes with a person's social life, such as (1) inability to control the time and frequency of game playing, (2) giving top priority to game playing, and (3) continuing to play game despite the fact that problems are occurring. When gaming disorder occurs, some problems, such as not being able to wake up in the morning and hitting objects or people appear. I would like to clarify the difference between "game disorder" and "game dependence". First of all, game dependence is a dependence on games, but the negative effects of this dependence are not taken into account. It is not the dependence on games itself that is bad, but the fact that extended game-playing time interferes with other aspects of daily life, such as poor eyesight and lack of exercise, which is considered a "game disorder. This is because no direct adverse physical or mental effects have been reported from playing games. I will mention this later.

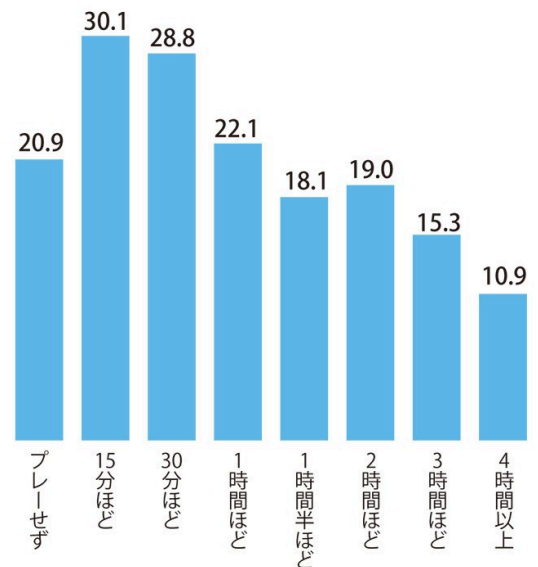
Another thing that needs to be clearly indicated is the negative impact of the games. If this point is not clearly defined, it will hinder this study. Therefore, I would like to define the negative effects of games as follows.

- (1) The possibility of dependence on games and the resulting problems in daily life.
- (2) Decrease in eyesight
- (3) Lifestyle-related diseases due to decreased physical activity.
- (4) Communication problems due to reduced opportunities to participate in society.

Other commonly heard negative effects of games include "game brain," but this definition does not include game brain or its equivalent, because the gaming brain itself has not been clearly defined and it has no scientific basis.

Next, please see the graph on the right. From this graph, we can read that the rate of students who play games for more than one hour decreases as the playing time increases, and conversely, the rate of students who play games for less than one hour have a higher rate of higher education than those who do not play games for less than one hour. The reason for the decrease in the rate of students going on to higher education may be that the increase in game playing time was accompanied by a decrease in the amount of time spent studying. The reason for the higher rate of higher education among those who played games for an hour or less than those who did not play games improved their ability in some way, and or they have enough self-discipline to finish games within an hour. The reasons may include the following.

▼中学時代の平日のゲームプレイ時間別に見た偏差値60以上の高校への進学率(%)



<https://www.asahi.com/edu/article/14382712>

From these results, it is easy to infer that playing games is not a problem in itself, but that playing games too much is a problem.

Therefore, based on the above, the ultimate goal of this study is to limit the amount of time in which the game is played to no more than one hour, which is the amount of time in which the game has a detrimental effect on the body and mind. First, I divided into different target age groups and considered each age group accordingly.

(1)Elementary school students and younger → Have parents set limits

(2)Working adults and college students → self-management

Since I consider it difficult for elementary school students and younger to limit their own game playing time, I recommend that they have their parents or guardians limit their game playing time by utilizing functions such as Nintendo Switch's Mimamori setting. Working adults and university students are considered to be capable of self-management and are therefore excluded from this study. On the contrary, we will focus on developing self-management skills before they reach working adults and university students. It is the age group of junior high and high school students that must be considered here. I think that this age group is not perfectly capable of self-management. However, if they continue to be restricted by their parents or guardians, it will become difficult for them to develop self-management skills by the time they reach adulthood or college age. Therefore, in this study, we will focus on junior high and high school students and proceed with the research. However, I do not consider it to be all about reducing game time. First of all, as shown in the graph above, playing games for one hour or less is considered to have little impact on daily life. And, there is a considerable difference in the amount of time spent playing games among individuals. Taking these factors into account, I would like to let the individual manage his or her game playing time. So, what can we do to achieve this? I would like to take two directions. The first is for the individual and the second is for the parents. The first is essential, but the second is also necessary because if parents impose restrictions, it will hinder the development of self-management skills, and because I believe that it is difficult to improve self-management skills for games alone, so the cooperation of parents is essential. I think that the cooperation of parents and guardians is indispensable.

### **3 Conclusion**

#### **1, For the individual**

First, we considered the factors that lead to game addiction, and it was thought that problems in real life lead to game addiction. For example, they are not good at communicating with others in real life, they have family problems, and they are in an environment where they can play games at any time. These real-life problems cause them to become immersed in the game, and as a result, they become dependent on the pleasure they derive from the game. However, problems in reality vary greatly from person to person, and it is impossible to solve all of them. In light of the above, my suggestion is to "give them something other than games to look forward to. By providing an escape route other than games when problems occur in real life, it is thought that dependence on games can be prevented. However, there are some points to consider here. First, what kind of enjoyment should be provided? Even if they find a new hobby, they will not be able to enjoy it if they

become dependent on it. This point has not yet been researched or considered, and is an issue for the future.

## 2, For Parents and Guardians

When it comes to giving the child something to do other than playing games, the person who can help the most is the person who is nearby, such as a parent or guardian. We also believe that it is sometimes necessary to encourage them to start something new. Therefore, we would like to suggest that parents/guardians "encourage their children to have fun outside of games. However, there may be times when this is not possible due to family circumstances. What to do in such cases is another issue to be considered in the future.

## 4 References

Nikkei Newspaper / Gaming addiction is a disease WHO, new standard for international disease

<https://www.nikkei.com/article/DGXMZO45280950V20C19A5MM8000/>

Positive and negative effects of games on children & time of game use ....

<https://miranobi.asahi.com>

Is There a Threshold for Academic Achievement Reduction Due to Gaming: A Large-Scale Study Using Recall...

<https://www.glocom.ac.jp/wp-content/uploads/2020/02/>

Asahi Shimbun / Does gaming lower academic achievement? Large-scale survey finds that "one hour a day or less ...

<https://www.asahi.com/edua/article/14382712>

# How to Create a Hydrogen Society With Power Generation Technology

5417 Ryota Tajiri

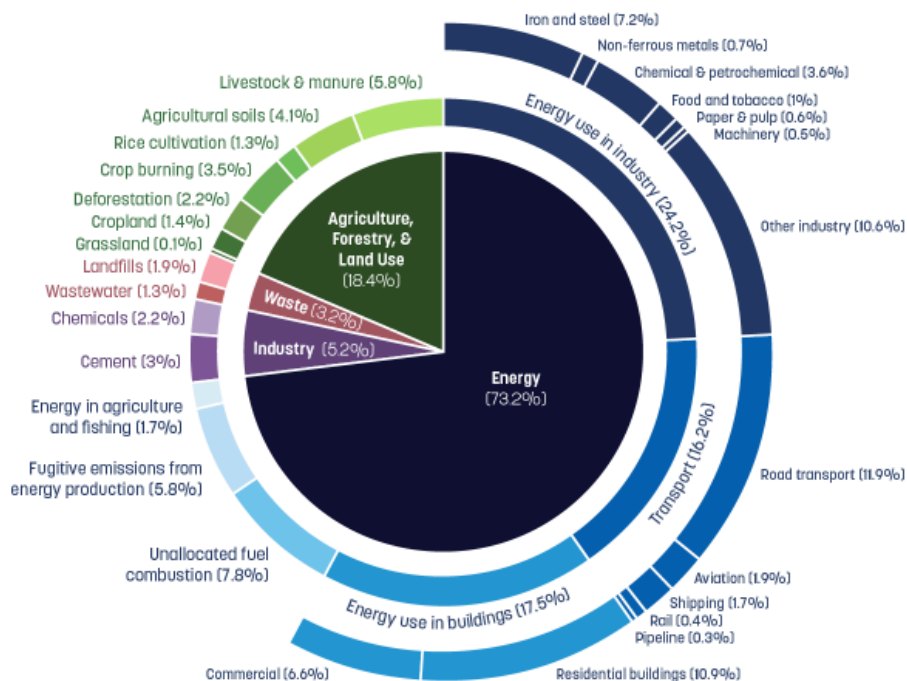
## Abstract

I think we can create a hydrogen society. By the way, the amount of carbon dioxide emissions is increasing every year. We can decrease the amount of carbon dioxide emissions with hydrogen. Also, we can increase efficiency. From now on, I will introduce the way to create a hydrogen society. We should build hydrogen power plants near city and town areas, because we can carry hydrogen without loss. In short, we will create hydrogen in each way in each area such as fossil fuels, by-products of the factory process, biomass, electrolysis of water. And we should carry hydrogen with how to liquefy, because it can carry more hydrogen at a time.

## 1 . Introduction

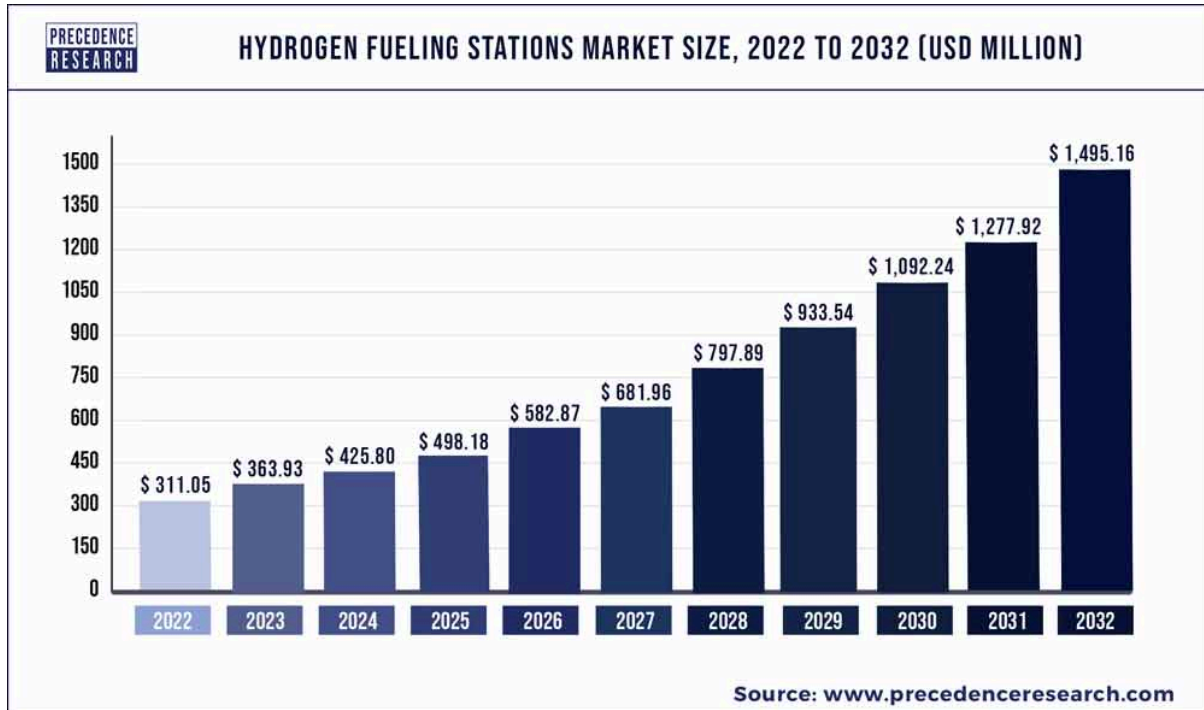
First, the amount of carbon dioxide emissions is increasing every year. Global carbon dioxide emissions from fossil fuels reached 37.12 billion tons in 2022. In addition, when you look at the below chart, global greenhouse gas emissions by sector in 2016, the energy sector accounted for 73.2%. From these, we have to solve the problem of carbon dioxide emissions from the energy sector. In short, hydrogen introduced after this is one of the important ways.

So, I want you to know a little about a hydrogen society now. It is fulfilling little by little.



According to the below chart, the global hydrogen fueling station market size is going to increase, so we should ride the tide. By the way, you may wonder why I chose hydrogen. However, using hydrogen has great importance. First, it can save energy and decrease a load

on the environment by extending its use in many kinds of areas such as transportation and consumption of energy. Second, it can promote industry. Especially, its field is said to have significant growth over the next 10 to 35 years. For example, the hydrogen and fuel cell related market is estimated to grow to about 100 million yen in 2030 and 800 million yen in 2050 in Japan.



Currently, Researchers are conducting various studies to create a hydrogen society. Especially the studies about fuel cells making progress.

## 2 . Discussion and implications

I searched for a lot of information. I will introduce them one by one. The first point is what is hydrogen. For example, it is the most abundant element in the universe. Specifically, It accounts for about 70% of the total mass of the universe. Also, it rarely exists in nature on its own, but exists as a compound on earth, is a colorless, tasteless, odorless gas, is the lightest gas and diffuses quickly, is difficult to see flames and reacts with oxygen to form water when it burns, and liquefies at  $-252.6^{\circ}\text{C}$ . I will use these characteristics.

The second point is the current problems for hydrogen society. We mainly have to consider four points, techniques such as durability and reliability of fuel cells, cost, system such as institutional development" based on the use of hydrogen as an energy source in daily life and industrial activities, infrastructure such as hydrogen supply system including the development of hydrogen stations.

The third point is how to create hydrogen. There are mainly four ways, fossil fuels, by-products of the factory process, biomass, electrolysis of water.

The fourth point is how to carry hydrogen. There are ways such as high pressure gas, liquefaction, organic hydrides, pipelines

The fifth point is how to generate electricity with hydrogen. There are mainly two ways. They are the way with fuel cells and the way with other fuels.

### 3 . Conclusion

I think we should build hydrogen power plants near city and town areas, because we can carry hydrogen without loss. In short, we will create hydrogen in each way in each area. And we should carry hydrogen with how to liquefy, because it can carry more hydrogen at a time. In the future, I want to consider the technology of hydrogen in other countries and the way to tell this research around the world.

### 4 . Reference

- [Our World in Date] <https://ourworldindata.org/>
- [ieo] <https://www.iea.org/>
- [THE WORLD BANK] <https://www.worldbank.org/en/home>
- [PRECEDENCE RESEARCH] <https://www.precedenceresearch.com/>
- [NEDO] <https://www.nedo.go.jp/>

# The World's Public Transportation To Activate by Using MaaS

ID 5418 Name Kyo Tanaka

## Abstract

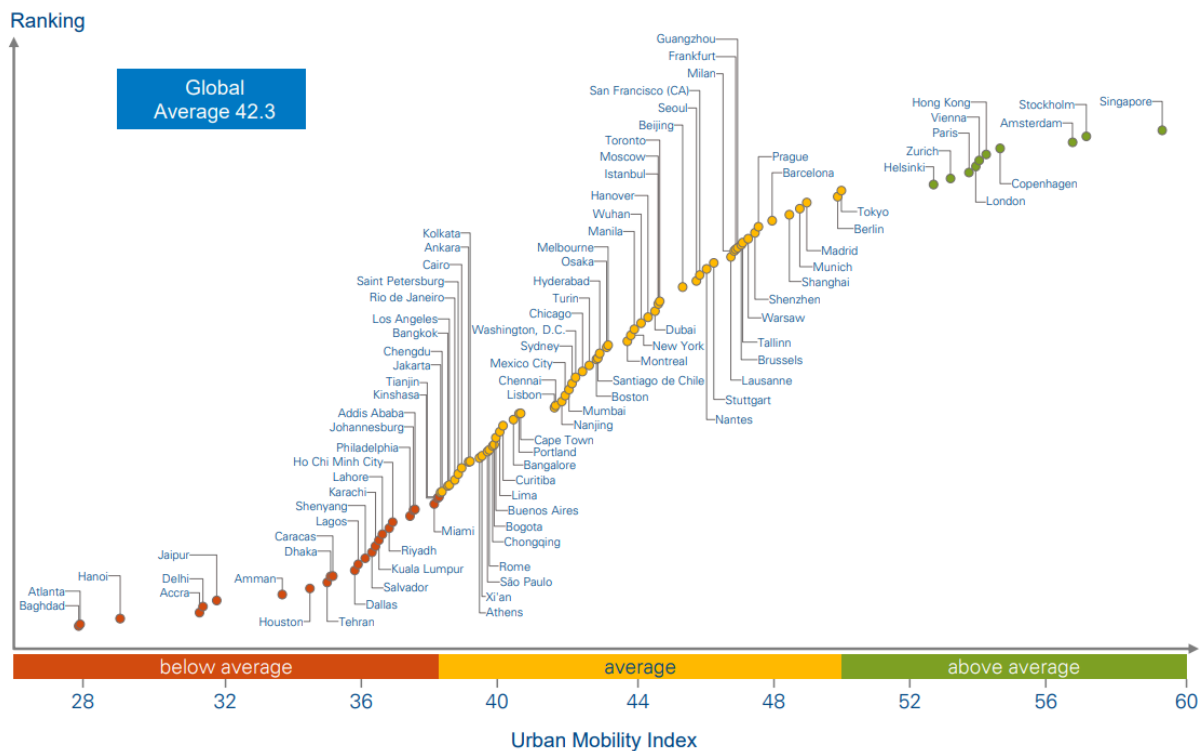
It is said that most cities are on a low level about the public transportation. To activate it, I suggest using MaaS, which is expected to be useful.

The concept of MaaS was first presented in Finland, which achieved great success. MaaS has some benefits such as contribution to the environment, avoiding heavy traffics, and so on. Once the business of MaaS succeeds, it will be a good chance to activate public transportation.

## 1. Introduction

According to the data of Arthur.D.Little, Many cities have low levels of using public transportation. In this study, Arthur.D.Little regarded 50 percent as the standard public transportation level. There are 10 cities which are above that standard, but the others, as many as 90 cities, are below it. The Global Average is 42.3, so it is also low(\*1). To improve this, I suggest the new style of public transportation, called MaaS.

MaaS (Mobility as a Service) is an integrated system that enables commuters to plan, book, and pay for trips through a single online interface. It is expected that MaaS becomes useful for the area whose public transportation is not developed. In this paper, I discuss how to make use of MaaS.



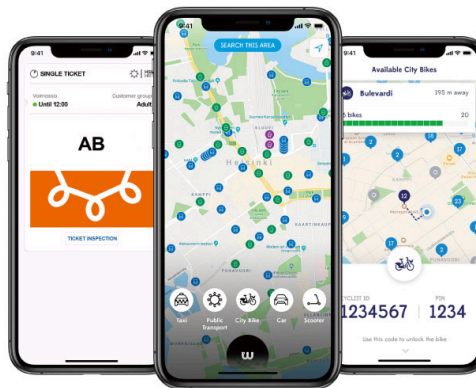
\*1 the graph of City Ranking



## 2. Discussion and implications

### 2.1 MaaS in Finland

It is said that the concept of MaaS was first presented by Mr. Sampo Hietanen in ITS Europe held in Helsinki, Finland, in June 2014. It is called Whim(\*2). According to his presentation, People in Finland spent 300 Euros per month for transportation. It was expensive, so he advocated changing the way how to spend money. He suggested that people spent less money for transportation, and much for technology such as ICT, IoT, and so on. He believed that the fare in the future would be lower than that of that time.

The logo for Whim, featuring the word "whim" in a lowercase, blue, sans-serif font. The letter 'i' has a red dot, and the letter 'm' has a blue dot. A registered trademark symbol (®) is located to the right of the 'm'.

\*2 MaaS service in Finland, called “whim”

### 2.2 The Pros of using MaaS

There are some advantages of using MaaS. If there are MaaS services, the utilization of cars will decrease. For example, in Finland, the government introduced MaaS services, and due to this, the utilization of cars decreased from 40 percents to 20 percents. This custom contributes to the environment. It also allows us to avoid heavy traffic which is caused by a lot of cars.

### 2.3 The way to put MaaS in practice

To make public transportation become more useful, it is important to promote people to use public transportation instead of using their own cars. If we do so, the company which controls public transportation can make more profit, and the level of services will increase. If there are “convenient” MaaS services, many people may think that they do not need to have their own cars. However, there are some problems. Most cities, mainly which is developing, may not be able to afford to introduce MaaS. To solve this problem, it is necessary to give or lend money for the cities in developing countries. Once it succeed, the government in that country will be able to earn money. After that, they can develop public transportation and it will become more convenient.

## 3. Conclusion

In conclusion, MaaS has not only advantages but also disadvantages. To activate public transportation by using MaaS, it is important to introduce MaaS first.

#### 4. References

「The Future of Mobility 3.0」(November 22nd)

<https://www.adlittle.com/sites/default/files/viewpoints/adl UITP Future of Mobility 3.0 1.pdf>

「MaaS trends and policy-level initiatives in the EU」(October 18th)

<https://www.sciencedirect.com/science/article/pii/S0386111219301499>

「Barriers and risks of Mobility-as-a-Service (MaaS) adoption in cities: A systematic review of the literature」(November 8th)

<https://www.sciencedirect.com/science/article/abs/pii/S0264275120313846>

「What is MaaS?」(November 8th)

<https://maas-alliance.eu/homepage/what-is-maas/>

# Improvement of Environmental Issues with Stationery

~ Creating the world where people can live more comfortably ~

5419 Tahara Mie

## Abstract

I started this study because I am interested in stationery. Also, I researched this study last year. Moreover, environmental problems have proceeded these days, and their problems have become more popular. Therefore, I want to research stationery and environmental problems.

First of all, I knew that stationery involved environmental problems. I know that stationery is produced a lot and most stationery is made of plastic and wood. I think stationery has bad effects on the environment, especially ocean plastic trash problems and deforestation. Therefore, I am interested in eco-stationery. Eco-stationery is kind to the globe to protect the environment. In addition, I focus on stationery materials. Broadly divided, there are two kinds of materials. First, it is materials that would be trash are reused, second it is materials that things are made new. If we make eco-stationery, we need to focus on materials. Thus, I want to continue to improve the environment to spread eco-stationery popularity and usage rate. When I knew that, I came up with an idea that is to put an eco-stationary at public places such as schools because I thought many people want to use eco-stationery. Furthermore, I want to do exhibition and trial sessions at stationery shops. I want to do these projects to get more people interested in eco-stationery. Other than that, I thought of ways to solve education disparity. I think we can solve this problem by sending stationery that we cannot finish to use for children who cannot study. Additionally, it is good for decreasing garbage as well.

As you can see, I want to solve environmental problems to spread eco-stationery and help children who cannot study. I want to solve environmental problems and education disparity by using stationery.

## Introduction

Besides, we often hear about environmental problems in many places such as TV, Internet, and magazines because environmental problems have become more serious all over the world these days.

Therefore, when I tried to improve environmental problems, I decided to link stationery and environmental problems in my research and chose the theme of improving environmental problems through stationery. In fact, stationery is made of many kinds of materials. Since mechanical pencils and ballpoint pens are made of plastic, and pencils are made of wood, this could lead to some environmental damage. In particular, I have researched focusing on the ocean plastic waste problem caused by plastics which are often used in the production of stationery, and the deforestation problem caused by wood. Furthermore, we have continued this research with the aim of improving education for children who cannot study with stationery.

In this way, I have conducted this research with the desire to use stationery as an opportunity to improve the environment, and also to improve problems around the world.

## Discussion and implications

As a result of the research, it was thought that stationery is involved in environmental destruction, and we can improve some problems around the world by using stationery. Stationery is mainly made from materials that are associated with environmental destruction. However, after researching eco-friendly stationery, I learned that there are many types of stationery that can reduce environmental destruction as much as possible.

The definition of eco-stationery refers to stationery that protects the environment and is kind to the earth. In addition, they are starting to attract attention as an item that incorporates sustainability into your daily life by using it.

An example of eco-friendly stationery is notebook covers made from upcycled materials. Upcycled materials are things that are made from materials that would be rubbish, but they are turned into something of new value. In this case, the notebook cover is made from upcycled material from unused cloth. There are also campus notebooks made from milk cartons. This is sold at Starbucks and other places, and it is actually made from leftover milk cartons after receiving an order. I thought it would be easier to spread eco-stationery if large companies used stationery for environmental conservation.

Moreover, what I paid most attention to making eco-friendly stationery was the materials. The most interesting item was a ballpoint pen made using a new material called LIMEX which is a hard plastic-like material made from limestone.

Japan is basically a country lacking in natural resources, but limestone is a resource that is abundant in reserves. It has a 100% self-sufficiency rate. Therefore, the material LIMEX is particularly effective for environmental conservation in Japan. I thought it might be a good material. There are also ballpoint pens made using ocean plastic, so, by using and reusing the garbage which we have created, we can conserve resources. The amount of garbage that is generated is one of the major causes of negative effects on the environment, so reusing waste materials not only prevents negative effects on the environment but also reduces the amount of garbage which has a large impact on the environment. In other words, these methods include making good materials from existing resources, making stationery from new materials, using daily waste to reduce the amount of waste, and recycling stationery into other items. I thought this might be an effective way to create materials to make them more environmentally friendly. Based on this, we thought that following things are necessary in order to protect the global environment through stationery.

Our goal is to get more people interested in stationery and to use eco-friendly stationery. I like stationery and have an interest in stationery, so I learned about the existence of eco-friendly stationery. And I think that in order to get people to know about the existence of eco-friendly stationery, they first need to get people interested in stationery. Last year, I conducted research on how to prevent people from turning away from stationery and increase the rate of stationery usage. So, I wanted to use the ways I came up with last year to get people interested in stationery. In detail, we recommend stationery that is suitable for each generation, and display stationery in public places, hold exhibitions and trial sessions at

stationery stores. Also, put stationery that people might be interested in at public places, display recommended or interesting stationery at stationery stores, and hold trial sessions. I thought that more people will become interested in stationery. I wanted to increase the number of people who are interested in stationery in this way. At the same time, I would like to get people interested in stationery and eco-friendly stationery. However, there are problems that even if people become interested in eco-friendly stationery, they may not use stationery. I think one reason is the issue of price. I think it is inevitable that eco-friendly stationery is more expensive than stationery that is made normally. However, one of the reasons why eco-friendly stationery is expensive is that there are few customers and demand is low now, so production volume cannot increase and prices cannot be low.

First of all, it may be difficult, but by lowering the price of eco-friendly stationery and selling it as much as possible, we can get as many people as possible to buy it, increase consciousness, increase sales, and gradually lower the price. I thought I may be able to do it. There are also examples of efforts to spread eco-friendly stationery by making it easy to get eco-stationery. An example of this is oil-based ballpoint pen Super Grip G Ocean Plastic which is made from recycled resin from ocean plastic. It is said to be the first pen in Japan that collects ocean plastic waste that has been discarded on land or in rivers and ended up in the ocean and reused as a material for stationery. In addition, much of the demand for Ocean Plastic is for novelty use by companies, such as types with white stems and clip plates that can be written with logos or messages. And there are many inquiries from major companies, with 500 million yen sold in six months since it was released. Looking at examples like this, I thought that people feel more familiar with eco-friendly stationery, and demand will increase. I think it is leading to the development of eco-friendly stationery by lowering the price. On the other hand, most eco-friendly stationery at the moment emphasis on design, rather than trying to make it cheaper. It is inevitable that the price will be a little higher and we will create a brand with eco-friendly stationery that has a cool design. I thought it is a good idea to attract attention to eco-friendly stationery.

In addition, I realized that buying too much stationery leads to environmental destruction so I continued my research on stationery and environmental issues. Therefore I realized that there are many people who have stationery at home that they do not use. We considered whether we should use it effectively and not waste it. Then, I came up with the idea of sending stationery to children who do not have access to education. Children who are unable to receive education cannot collect stationery and other tools needed for study. By sending stationery that you no longer use and stationery you bought but do not use, children will be able to study in developing countries and you can avoid throwing away stationery. This idea can contribute to environmental conservation, and help children in developing countries. I thought that this idea will lead to children being educated as well. After doing some research, I found out that some organizations were actually trying to donate stationery to children in developing countries. Therefore, I thought it would be a good idea to do that.

## Conclusion

In conclusion, I would like to spread the word, eco-stationery through this research. And I want many people to use eco-stationery. Also, I would like to create an opportunity for

children who are unable to receive an education and help such children by providing stationery. To this end, we are trying to increase interest in stationery, especially eco-friendly stationery, by putting eco-friendly stationery in public places such as schools. Therefore people can use it, and hold eco-stationery exhibits and trial sessions at stationery stores. We want to have people take them and contribute to the development of eco-friendly stationery. Also, in order to help children in developing countries and save the earth from an environmental perspective. I thought it would be a good idea to donate stationery that we do not use and need.

My future tasks are to think more about what I can do to get people interested in eco-friendly stationery and how to solve the problem of the relationship between demand and price for eco-friendly stationery. I also want to consider whether it is really possible to send unused stationery to children in developing countries.

## References

Choose something that is environmentally friendly! 8 sustainable stationery choices

<https://kuradashi.jp/blogs/kuradashi-magazine/806>

Equal education! Let's all collect stationery and give it to people in need around the world.

<https://www.naganosdgs.jp/approach>

Green Issues in Office Stationery

<https://www.greenjournal.co.uk/2021/11/green-issues-in-office-stationery/>

Approaching environmental issues! Explaining the seven types | Introducing the relationship with sustainability and SDGs.

[https://media.kepco.co.jp/\\_ct/17546322](https://media.kepco.co.jp/_ct/17546322)

# How to spread “CBD” safely

-Thinking about the mental health of modern people-

5420 Tsunoda Asuka

## Abstract

In modern society, many people suffer from sleep disorders or stress. However, we must exceed strict criteria to receive medical care, and the care using medicine takes a toll on our bodies. So, I looked for good ways to heal people who suffer from mental diseases without any toll on our body. Then, I found out about CBD. It is the components of hemp but it does not have addiction, so CBD is legal in many countries. However, in popularizing CBD, problems have emerged, such as the greater potential for crime and the inability to use it effectively due to lack of knowledge. So, I thought about the idea that could solve these problems.

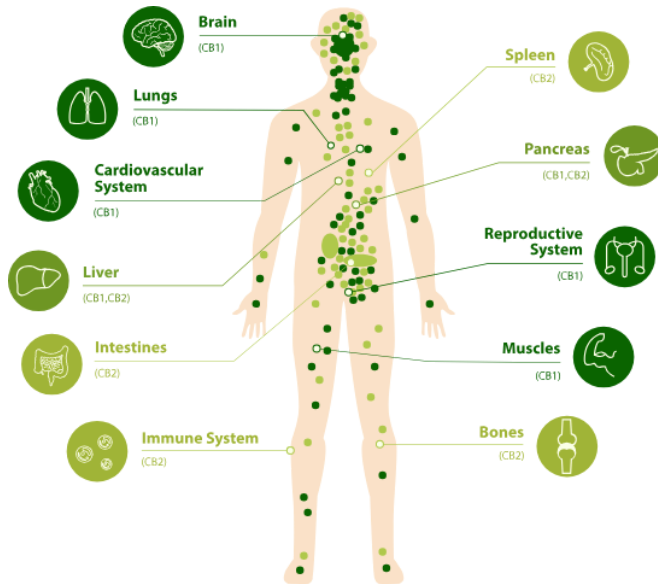
## 1. Introduction

I have been searching about CBD. The reason why I decided to search about this topic is because I found out the truth that there are many people who suffer from sleep disorders in the world: especially in Japan. As World Sleep Society says “Sleep is Essential for Health.”, we can not be healthy without enough good sleep. In addition, many people in today’s society are under mental stress because of the development of the Internet. However, strict criteria must be met to get diagnosed by a psychiatrist as having a sleep disorder or mental illness. In addition, treatment with sleeping pills can take a toll on our bodies. So, I wanted to find a good way to heal people without any harm. Then, I found out about CBD on the Internet. CBD is short for cannabidiol. It is one of the ingredients in hemp. It is extracted from hemp stalks and seeds. It has many positive effects. For example, relaxation, sleep improvement, and anxiety reduction. So, I think CBD can be used to reduce sleep disorder and psychological stress. On the other hand, in the world, there are many crimes related to hemp. So, I searched about CBD and think how to spread CBD around the world and how to make people use CBD effectively.

## 2. Discussion and Implication

First, I searched for details about CBD. As you can see from the figure below, CBD has a very positive effect on our body, for example relaxation, sleep improvement, and anxiety reduction. I focus on sleep improvement. It is believed that CBD may support sleep by activating serotonin, which has an effect on the autonomic nervous system, and CBD has a

“biphasic” characteristic, with low doses having “stimulant” effects and higher doses having “calming” effects. So it is important to know proper dose and time zone. In addition, CBD is not addictive. In contrast, THC, an ingredient in hemp, is banned in most countries because it is both addictive and produces a mental high. Illegal hemp needs to be



strictly regulated because it destroys a person’s life. And CBD must not be allowed to become a trigger for crime.

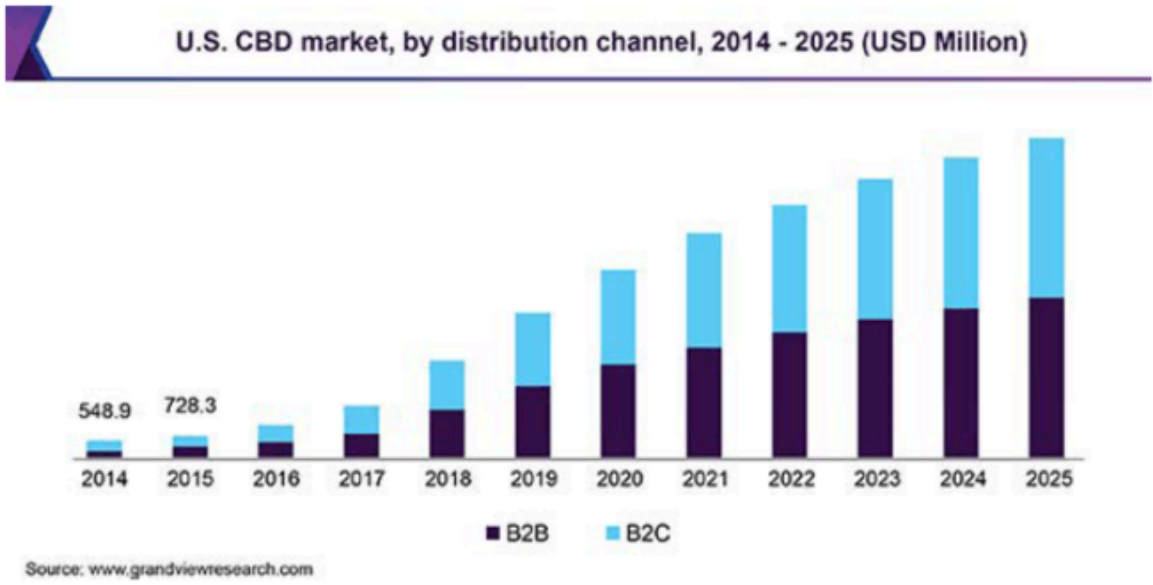
Second is about restrictions around the world. The global trend regarding hemp appears to be heading toward decriminalization and legalization. However, this is not an admission that it is safe. The reasons for legalization are “to prevent distribution by criminal organizations” and “legalization is more manageable,” never because it is safe. Even in countries and regions that have legalized hemp, possession and use by

minors, who are greatly affected by the harmful effects of hemp, is prohibited. In addition, only a small percentage of countries have made it legal, and the majority of countries regulate it as an illegal drug. 図を乗つける Some countries only approve it for medical use, and some regions, such as Singapore, China, and the African region, have banned even the use of CBD.

Third, I looked up how to take CBD. It is mainly taken in three ways: orally, sublingually, and by aspiration, with the following absorption rates. Oral (capsules, gummies, candy, chocolate, cookies): approximately 10%. Under the tongue (oil): around 20%. Inhaled (liquids and waxes): approximately 40%. And the proper dosage and correct timing will vary greatly depending on many factors, including each person’s weight and condition. Therefore, the correct usage should be recommended in an easy-to-understand manner.



Finally, I looked at attitudes toward CBD around the world. As shown in the figure below, the market for CBD is expected to continue to grow. In addition, many products related to



CBD are beginning to be marketed, as shown in the pictures below.



↑DropStone, Inc CBD gummies



↑The Coca Cola Company



↑CR Labs, Inc.



↑YES CBD

### 3. Conclusion

Based on my research, I have two main suggestions. The introduction of a universal CBD approval mark and the dissemination of information on how to use CBD properly. As I found out from my research, the attitude toward hemp varies from country to country. To prevent CBD from being distributed in countries where it is prohibited or illegal hemp ingredients other than CBD, I thought the Easy-to-understand display must be used when CBD products are traded throughout the world.

### 4. References

Information of insomnia—Ministry of Health, Labour and Welfare

<https://www.e-healthnet.mhlw.go.jp/information/heart/k-02-001.html>

The pros and cons of hemp (marijuana) restrictions

<http://jssm.umin.jp/report/no31-2/31-2-02.pdf>

Hemp and Cannabinoid Use in Medicine

<https://www.jstage.ist.go.jp/article/jsptsuppl/43/0/43-3-C-S31-4/pdf/-char/ja>

Global Trends in Hemp

<https://www.jstage.ist.go.jp/article/jiscrim/44/0/44-126/pdf/-char/ja>

Knowledge of CBD, international affairs, research

<http://cannabis.kenkyuukai.jp/images/sys%5Cinformation%5C20171206225443-F93DD6CFE8B1C092970601FFD88BDBE2E5F96AE8B22F18642F02F65C6737547F.pdf>

benzodiazepine-like drug

<https://www.e-healthnet.mhlw.go.jp/information/dictionary/heart/yk-030.htm>

CBD Benefits

[https://oem-make.com/healthyfoods/hf-column/cbd\\_oem](https://oem-make.com/healthyfoods/hf-column/cbd_oem)

Is cannabidiol safe for cancer patients?

<https://www.cancerit.jp/69440.html>

Cannabidiol (CBD) Critical Review Report

<http://cannabis.kenkyukai.jp/images/sys/information/20200921103710-DB754AC13A95C5E225F5538C81E58E6C430926661E31BAE9EA764C859E33ECBA.pdf>

An article: CBD, an ingredient derived from hemp, is rapidly gaining popularity among young people.

<https://newsdig.tbs.co.jp/articles/-/153953?page=3>

# The Future of Food

## We all need to eat food to live

5421 Notsu Taiku

### **Abstract**

I have been researching a similar topic since I was in junior high school, and I decided to continue that research this year because I am interested in it. I believe that this research will finally make a great contribution to solving one of the world's major problems, "hunger". I collected information on the Internet. Today, both in the world and in Japan, the number of people suffering from "hunger" is increasing. The type of hunger is a little different between Japan and the world, but both are the same in that they are not getting the nutrition they need. Therefore, I would like to use an edible 3D printer to create food that contains enough nutrition to meet the needs of the person and provide it to the people. By doing so, I believe that these people will be able to move out of the category of starvation.

### **1.Introduction**

Since I was a junior high school student, I have been researching the theme of space, and in the course of that research, I focused my research on space food. However, since I was exploring Japan at the time, I was unable to complete my research on space food, a theme that couldn't be suggested only in Japan. While I was researching space food, I found an idea for an edible 3D printer. I then changed my research theme from space food to printing out food. I found this research very interesting and fascinating, and I thought it was a dream come true, so I decided to continue my research this year on a similar theme, using the results of last year's research.

### **2.Discussion and Implications**

This research will help to reduce the number of hungry people. It can also be used in my earliest research, space food, and may be applied to the terraforming of humans to the moon and Mars in the future. In a more personal way, it will reduce the need to go home and cook, reducing and the burden of household work. In addition, since the nutrients can be freely changed, it is possible to realize meals that don't make you fat no matter how much you eat. This is very useful for people who want to lose weight or fighters who need to lose weight. I set the research question, "Why do the number of hungry people keep increasing?" For world hunger, I think it is because the food supply isn't keeping up with the population growth and a lot of food is wasted. As for hunger in Japan, I think it is because the standard of living in Japan is so high that families with low incomes can't afford to spend money on food and are forced to cut down on food expenses. I believe that if we increase food production and reduce food loss to the limit, some people in the world will be able to avoid hunger. Also, in Japan, if income increases, people will not have to worry about food, and I think the government should provide more support where it can. However, the situation isn't yet solved in reality, so I would like to propose a solution to this problem by advancing this research.

### **3. Conclusion**

The world's population is increasing every year. Just the other day, the global population surpassed 8 billion people. Along with this, the number of hungry people worldwide is also on the rise. Why is hunger increasing globally? Even though some of us have more than enough to eat, why are there still people who cannot afford to feed themselves? This can be attributed to several factors, such as the worldwide inability of food production to keep up with population growth and the significant food waste by those who have enough to eat. There are people in the world who could eat a bit if given the chance. For some, the challenge is not having anything to eat at all, while for others, it's the inability to access the nutrients they need. I have contemplated ways to help both groups of people. Of course, there would be no problem if food production increased worldwide, food waste decreased, and all the food needed by those currently suffering from hunger reached them. That would be the ideal scenario. However, the reality is that this hasn't been achieved yet. If it were possible, it should have been done by now, and action needed to be taken immediately.

I considered using a 3D food printer to solve these issues. There is a project called "Open Meals" that aims to create a sushi restaurant without sushi chefs, called the "Future Sushiya," where sushi is printed out using 3D printers. In this project, three major technologies—FFM, FOS, and HID—are employed. FFM refers to the machine that produces the food. FOS serves as the brain, instructing the FFM on what kind of food to make and considering nutrients, flavors, and smells. HID is a machine that thinks about what each individual needs based on their health status. With this technology, it is possible to create any taste, appearance, and texture. Therefore, I thought of using insect-based food as the raw material for the 3D food printer. Insect-based food is easy to process, and its carbon dioxide emissions during production are significantly lower than those of livestock such as cows and pigs, despite having nutrition comparable to, if not surpassing, that of cows and pigs. However, consuming insect-based food directly is met with resistance, both from individuals and the environment. To overcome this, by using insect-based food as the raw material for the 3D printer, I aim to transform the taste, appearance, and texture, making it a food that anyone can eat without resistance. This food will provide only the necessary nutrients for each individual, eliminating unnecessary intake and realizing a future diet. I believe that by making this process accessible worldwide, we can reduce hunger globally. Furthermore, if the machine becomes smaller and can be placed anywhere, connecting it with smartphones would enable remote operation. This could result in situations where warm meals are ready when returning home. As the machine advances, it might even be possible to bring it to the International Space Station, printing out meals in space. This eliminates the need to transport months' worth of provisions for multiple people into space, allowing for the production of food on-site using materials produced in space.

### **4. References**

<https://discoverjapan-web.com/article/29913> Discover Japan  
<https://www.open-meals.com/> Open meals  
<https://spaceshipearth.jp/insectmeal/> Insect food

# Internet Addiction

～To protect children at school camp～

5422 Hashiba Una

## Abstract

Currently, with the spread of the Internet, various problems on the Internet are being recognized as problems. We can look up anything on the Internet easily. Recently, online games and online classes using the Internet for coronavirus prevention have been offered, and the Internet has become an indispensable part of our lives. On the other hand, the Internet also has its disadvantages. For example, there is Internet addiction, which leads to excessive use of the Internet, leakage of personal information that should not be known to others, and trouble on the Internet. Among these, I decided to focus my research on "Internet addiction" because the number of addicts has been increasing rapidly in recent years, and I was almost addicted to my smartphone as well.

Finally, I have two suggestions. The first is to have elementary, junior high, and high school students take an addiction check using the Internet Addiction Test once a year. Second, I am considering the implementation of "school camps," which are simplified versions of rescue camps. I believe that forcibly regulating the Internet will not be seen to be effective, so I want to treat them without making them feel bad.

## 1 Introduction

Recently, online games and online classes using the Internet for coronavirus prevention have been offered, and the Internet has become an indispensable part of our lives. On the other hand, the Internet also has its disadvantages. For example, there is Internet addiction. So my research question is "How to protect children from Internet addiction". I focused my research on elementary through high school students.

First, I looked into the efforts of South Korea, which is an advanced country in the fight against Internet addiction. In Korea, there is an activity called a "rescue camp".

Rescue Camp is an activity in which camps (long-term overnight experiences) are held at youth educational facilities to heal from Internet addiction. This activity is being held in Japan today, but it is not very well known.

I have two suggestions to solve this problem.

The first is to have elementary, junior high, and high school students take an addiction check using the Internet Addiction Test (hereafter IAT) once a year, and depending on the results, have them receive counseling or go to a specialized hospital (to be introduced into school physicals).

Second, I am considering the implementation of "school camps," which are simplified versions of rescue camps.

The camps would be held at schools during long vacations, such as summer vacation, to eliminate or reduce access to the Internet to treat or prevent Internet addiction. We believe that forcibly regulating the Internet will not be seen to be effective, so we would like to implement a variety of activities in addition to study.



## 2 Discussion and implications

The goal of treatment for Internet addiction is not to cut the Internet out of the patient's life completely but to help the patient change and gain control over his or her use of the Internet. Since it is impossible to completely eliminate the Internet from a person's life, it is important to help the patient improve his or her relationship with the Internet, rather than telling the patient to stop. This is an important aspect of the problem.

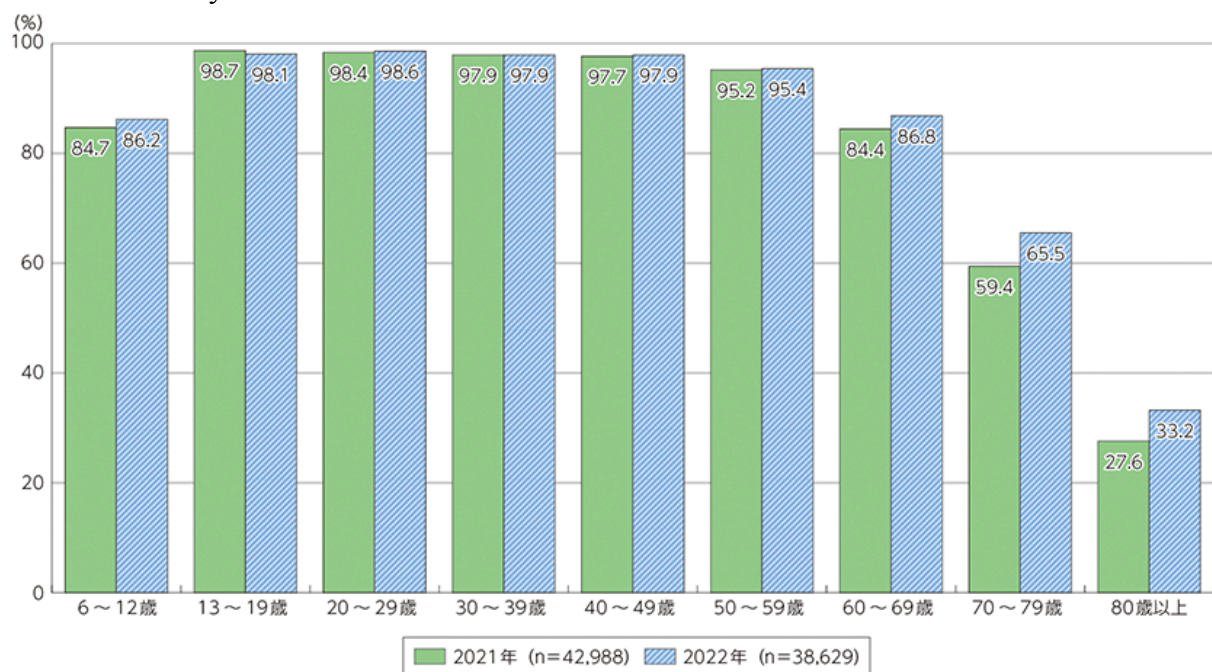
The final goal of the study is to spread the word worldwide about the need to prevent and treat Internet addiction so that more people will understand and take action to prevent Internet addiction.

### •What I found out

Internet usage rates by age group. The largest percentage of people using the Internet are between the ages of 20 and 29, indicating that 98.6% of people will be using the Internet in 2022. Other than that, the percentage of use is also high, except for the elderly.

However, even among the elderly, the utilization rate is increasing between 2021 and 2022.

Since this figure shows that the youth have a much higher usage rate, I decided to focus my research on the youth.

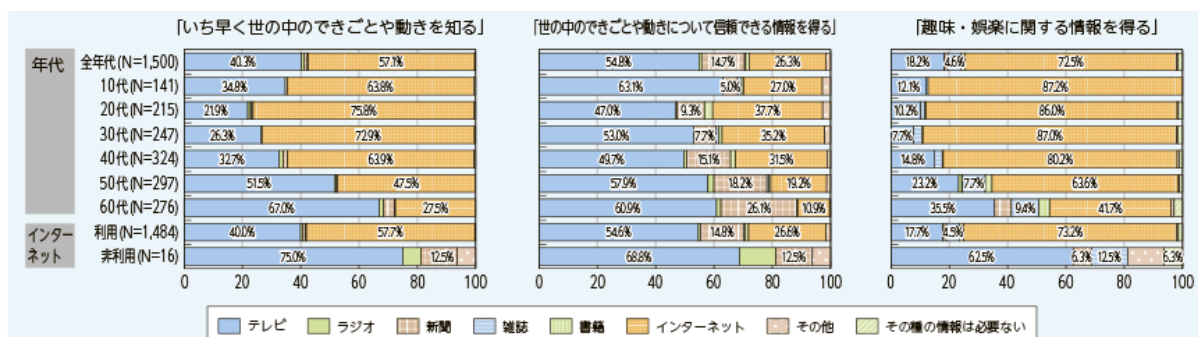


<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r02/image/n5201030.png>

Next, we examined media used for different purposes. The Internet was the most popular media used to "quickly learn about events and trends in the world" among all age groups.

Internet use was also higher than "TV" among those in their 10s, 20s, 30s, and 40s.

The Internet is the most popular media for obtaining information about hobbies and entertainment among all age groups. The percentage of users in their 10s, 20s, 30s, and 40s exceeded 80%. I think this is the cause of Internet addiction.

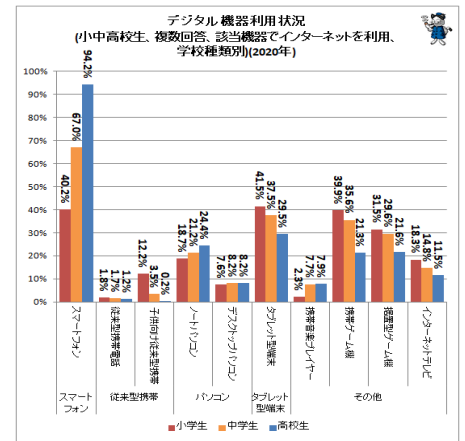


<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r04/image/n3801040.png>

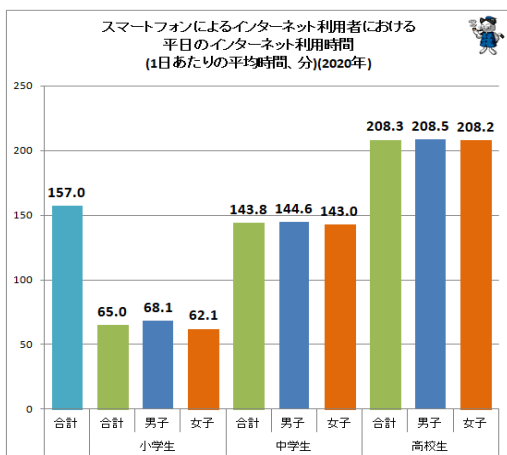
I believed that it was important to keep today's youth from becoming addicted to the Internet in order to eliminate Internet addiction so I focused on the students.

This is the "Students' Use of Digital Devices". The graph shows that smartphones are the most commonly used devices. 40.2% of elementary school students, 67.0% of junior high school students, and 94.2% of high school students use smartphones.

<https://news.yahoo.co.jp/byline/fuwaraiizo/20210709-00244474>



How much do students use their smartphones per day?



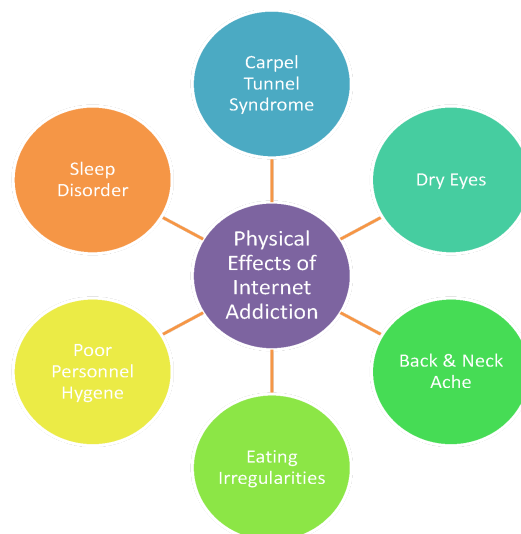
The graph shows "Students' Weekday Smartphone Use Time. Elementary, junior high, and high school students are spending more time on their phones. The gender gap is longer for boys in elementary school, but there is almost no difference among junior and senior high school students. High school students spend more than 14% of their day on the Internet using smartphones. If they sleep 8 hours a night, this amounts to more than 20% of their waking hours.

Internet addiction has a variety of negative effects such as Sleep Disorder, Carpal Tunnel syndrome, Dry Eyes, Back & Neck Ache, Eating Irregularities and Poor Personal Hygiene.

### 3 Conclusion

#### Suggestions

1. Implement an addiction check using the IAT once a year at elementary, junior high and high schools, and depending on the results, provide





counseling or have students go to a specialized hospital. (Introduce this into health checkups conducted at schools).

2. In addition to suggestion 1, we are considering implementing a "school camp" that is a simplified version of a "rescue camp".

The purpose of the camp would be to use long vacations, such as summer vacation, to eliminate or reduce exposure to the Internet at school to treat or prevent Internet dependence.

We would like to implement a variety of activities in addition to the study because we do not think that forcibly regulating the Internet alone will be effective.

We are currently considering who will be in charge and who will be the administrator, but we are thinking of having a school teacher and a specialist doctor.

#### **4 References**

High School Students Use the Internet an Average of 4 Hours a Day : Survey by Cabinet Office

<https://www.nippon.com/ja/japan-data/h00707/> April 15

Is smartphone dependence causing relationship problems? Let's explore the background causes.

[https://edutmrrw.jp/2016/technology/1111\\_smartphone\\_impact](https://edutmrrw.jp/2016/technology/1111_smartphone_impact) April 15

Internet usage

<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r02/html/nd252120.html> May 13

Smartphone Usage Rates

<https://www.moba-ken.jp/project/others/ownership20200317.html> May 13

What is Internet Dependence? The problem and its impact on health May 13

[https://www.nhk.or.jp/kenko/atc\\_367.html](https://www.nhk.or.jp/kenko/atc_367.html)

Outpatient Internet Addiction

[https://www.tmd.ac.jp/med/psyc/hosp/hosp\\_subspe/hospital\\_subspecial\\_netdepend/hospital\\_subspecial\\_netdepend.html](https://www.tmd.ac.jp/med/psyc/hosp/hosp_subspe/hospital_subspecial_netdepend/hospital_subspecial_netdepend.html) November 9

Internet Dependence

<https://kompas.hosp.keio.ac.jp/sp/contents/000913.html> November 9

Internet Dependency Day/Night Care December 7

<https://www.enomoto-clinic.jp/care/internet/#scroll-section> 2

Low nutrition and osteoporosis also increasing "Internet addiction"

[https://style.nikkei.com/article/DGXNASFK06036\\_W3A300C1000000/](https://style.nikkei.com/article/DGXNASFK06036_W3A300C1000000/) December 7

Gavage News

<http://www.garbage news.net/archives/2253315.html> December 14

Family Link March 17

<https://play.google.com/store/apps/details?id=com.google.android.apps.kids.familylink&hl=ja&gl=US>

Japan is very different from China and South Korea, "Japan is very behind" in dealing with addiction [doctor warns].

<https://news.yahoo.co.jp/articles/45c11d4304df85c6e090ae1f6036bccf053dbe02> May 11

Teenagers' addiction to smartphones is growing serious. The government also offers a training camp program to help them break out of South Korea.

<https://www.cnn.co.jp/tech/35144253.html> May 11

Children's "Internet Addiction": Learning from "South Korea," a leading country in countermeasures.

[https://style.nikkei.com/article/DGXNASFK0100W\\_R00C13A8000000/](https://style.nikkei.com/article/DGXNASFK0100W_R00C13A8000000/) May 11

15-year-old boy who was banned from playing smartphone games commits suicide, possibly due to smartphone addiction.

<https://iphone-mania.jp/news-344569/> May 11

Training Camp Program

[https://kurihama.hosp.go.jp/hospital/case/tiar\\_report02.html](https://kurihama.hosp.go.jp/hospital/case/tiar_report02.html) June 1

About Internet/Game Addiction

Various Symptoms and Treatments

<http://www.n-ushieli.com/treatment/dependence.html> June 1

The effectiveness of China's measures against online game addiction--minors are limited to one hour a day on holidays and weekends.

<https://japan.cnet.com/article/35175996/> October 19

Evaluation of the Korean Game Shutdown System

<https://ides.hatenablog.com/entry/2020/01/27/175716> December 19

Ministry of Internal Affairs and Communications

<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r02/html/nd252120.html>

December 20

# Reuse of Pencils and Mechanical lead

How to reduce of remaining lead in pencils and mechanical pencils

5423 Haruyama Saki

## Abstract

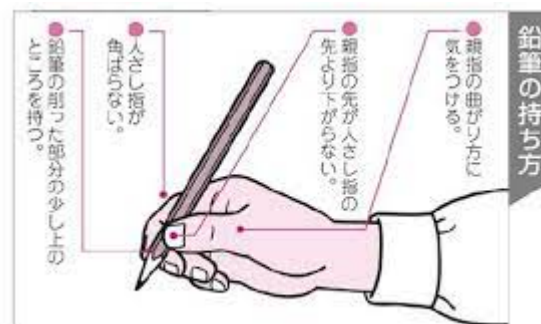
We students use writing instruments every day. This has the problem of the remaining lead. In the world, graphite can be found in abundance. However, graphite which emits carbon dioxide when burned has been thrown away as the remaining lead of pencils. Also, the melting point of graphite is 3,500°C. Of course it is bad for the environment. It is difficult to make pencils lead again with remaining lead collected. At this point, I suggest creating rocket pencil leads by reusing the remaining leads and to popularize rocket pencils once again. If it could be achieved, we can reduce carbon trash.

## 1.Introduction

These days, the problem of global warming has become serious in the world, and we aim to realize “Carbon Neutrality”. Under this situation, I focused on the remaining leads of pencils. Not only students but also business-people use disposable writing instruments every day. Whether because they are necessary or because the amount of waste per product is small, disposable writing instruments have not received much attention in terms of recycling. However, it would be a great achievement if the amount of waste could be reduced because it is a familiar item to many users of writing instruments. Then, I made a research question. My research question is “What can we do to avoid trash pencils and lead?”. I want to think about ways to reduce the trash of writing instruments around us. I researched based on the Internet, books, and interviews with Tombo Corporation. I came up with suggestions based on my research.

## 2.Discussion and Implications

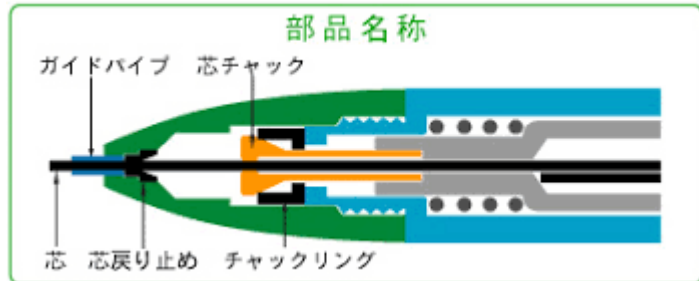
I used pencils, not mechanical pencils, when I was an elementary school student. School rules required using pencils. There is the practice that elementary school students have to use only pencils, not mechanical pencils. So I have a question why elementary school students need to use only pencils. According to Ms.Kosuda, who was my elementary school teacher, there are reasons to learn how to hold it correctly from a young age. Also because the lead is softer and less stressful on the hand than



<https://kosodate.popy.jp/detail/534>

ballpoint pens, and Japanese fonts are complicated and difficult to write with a pen. However, according to Sabrina and Nico, who were my host family in Germany, they were allowed to use writing instruments other than pencils like mechanical pencils when they were in elementary school. I guess this is related to the local lifestyle. I think changing the local lifestyle that elementary school students use only pencils is difficult for me. So I can't learn the way of reducing pencils wastes from abroad.

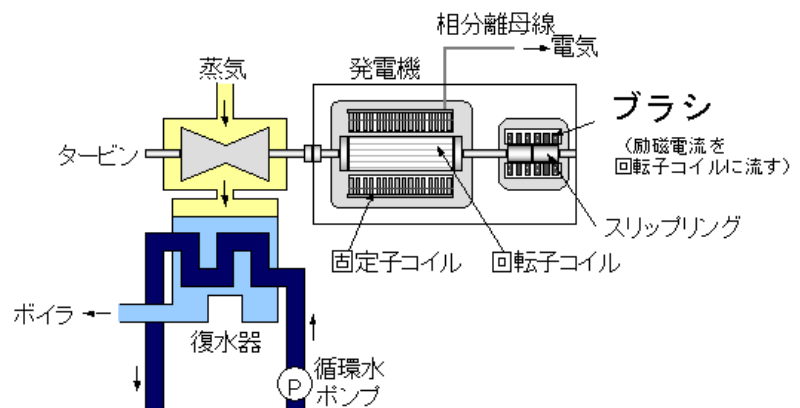
Next, I found the tip-chuck mechanical pencils which can use the lead to the last 1mm. The basic mechanical pencils have a chuck inside to hold the lead, and the lead is pushed out of the chuck. Therefore, the length of the chuck holding the lead and the length from the chuck to



<https://www.tepco.co.jp/cc/press/05052004-j.html>

the tip of the pen, about 1.5 cm, is usually the remaining lead. This tip-chuck mechanical pencil is made with the chuck as close to the tip as possible, which allows for the use of less remaining lead. I thought that if I could spread this, I could reduce the amount of remaining leads. However, this is patented by PILOT Corporation so it can't be spread so simply. Hence, I think it seems difficult to propose the widespread use of this tip-chucking mechanical pencil.

I next focused on graphite, the material of the pencil leads. Pencil leads are made by mixing graphite and resin, kneading them together, firing and oiling them. Graphite has five outstanding advantages. They are lubricity, electrical conductivity, thermal conductivity, heat endurance, and chemical endurance. Then I came out to collect leads and make recycled leads. However, I found that it is impossible to make recycled



<http://www.iwima.org/sharp-pencil/03-1sharp-pencil/03-1sharp-pencil.html>  
日本筆記具工業会

leads through knowing the way of leads. In 2005, TEPCO and Tombo Corporation developed a lead made from graphite, which was used as waste power generation brushes from thermal power plants. Generator brushes are components made of high-purity graphite that are used to transmit electricity to the rotating shaft of a generator. They are used in contact with the rotating shaft, so they need to be replaced routinely, and until then TEPCO had been dumping them as industrial waste. They first crushed the generator brushes into graphite particles. They then mixed this with other graphite as material for recycled leads to make high-quality recycled leads. This manufacturing process indicates that Pencil leads are made of high-purity graphite. Pencil leads that have already been mixed with graphite and resin cannot be crushed to a high purity, so it is impossible to make Pencil leads again. In order to remove graphite from the leads and

reuse it, it must be melted again at high heat. This is not good for the environment. Therefore, it found it difficult to turn leads into recycled leads.

Next I focused on the rocket pencil, an item that everyone had in their hands in the 1990s, when the rocket pencil boomed. A rocket pencil is a mechanism that allows the user to switch the lead part of the pencil so that the sharp lead can be used immediately without the need to cut the pencil lead. In the 1970s, in a culture where elementary school students used pencils and mechanical pencils were still a luxury item, the "Tenshir" also known as the rocket pencil, released by Kokuyo Corporation, was a novelty. However, the price of mechanical pencils dropped and they became very common. Rocket pencils declined accordingly. Recently, however, rocket pencils have been enjoying renewed attention in the abacus segment of the industry. Since the abacus is played while holding the pencil, a short pencil is recommended for the abacus, since using a long pencil may cause the top of the pencil to touch the abacus, resulting in wrong answers. So, rocket pencils, which are shorter in length and can be sharpened without sharpening the lead, are used in abacus examinations. From here, I thought, it would be a good idea to collect leftover pencil leads to make rocket pencils.

### 3. Conclusion

Next, we thought of a way to collect leftover lead. We think it would be effective to collect them at retailers and places where writing materials are used, like eco-caps. I thought it was important that the locations be places where users are likely to think about recycling. For example, libraries, schools, community centers, stationery stores, and convenience stores. I think that collecting the pencils as they are will facilitate processing.

The future prospect is to continue the research with the plan of proposing the creation of a system to collect pencils that have become short and are no longer in use, and process them into rocket pencils. It is currently in the ideological stage, so there are still many issues to be solved.

- To find a way to take the lead out of pencils and process it.
  - To think about how to reuse the wooden parts of the pencils
  - To think about how to sort the collected pencils into different densities.
  - To collect solid data to support the research, such as what is done with short pencils, the current usage rate of pencils, the actual usage rate of pencils in elementary schools, the usage rate of rocket pencils in the abacus industry, etc.
  - To make clear the effect and significance of the rocket pencils when they are actually made.
- The goal is to solve the above issues.

### 4. References

シャープ芯のエコ | 株式会社トンボ鉛筆

<https://www.tombow.com/mamechishiki/s62/>

使い切れないシャープペンの芯 : MOTTAINAI 事務局スタッフ

<https://blog.excite.co.jp/mottainai-staff/10491780/>

[エコマーク認定商品情報]芯までリサイクルシャープ芯

<https://www.ecomark.jp/ecomarkdb/15112016.html>

「シャープペンシル用リサイクル芯」の開発および商品化について

<https://www.tepco.co.jp/cc/press/05052004-j.html>

シャープ芯芯までリサイクルREW052B

<https://www.monotaro.com/g/01469582/>

短い鉛筆の利用法。最後まで使い切ったり、寄付できるの？

<https://gomamomo.com/41.html>

トンボ鉛筆 鉛筆 木物語 2B 1ダース LA-KEA2B | 鉛筆 | 文房具・オフィス用品

<https://www.amazon.co.jp/%E3%83%88%E3%83%B3%E3%83%9C%E9%89%9B%E7%AD%86-%E9%89%9B%E7%AD%86-%E6%9C%A8%E7%89%A9%E8%AA%9E-1%E3%83%80%E3%83%BC%E3%82%B9-KEA2B/dp/B000THTOYC?th=1>

残芯について | 株式会社トンボ鉛筆

<https://www.tombow.com/faq/34s/#:~:text=%E4%B8%80%E6%9C%AC%E5%BD%93%E3%82%8A%E5%B9%B3%E5%9D%8710mm,%E3%81%A8%E8%A8%80%E3%82%8F%E3%82%8C%E3%81%A6%E3%81%84%E3%81%BE%E3%81%99%E3%80%82>

【文房具の穴】鉛筆を使うことは森林資源を消費しているのか？

<https://www.fumihiro1192.com/entry/20160828/1472335200#:~:text=%EF%BC%88%E5%9B%9E%E7%AD%94%EF%BC%89%E9%89%9B%E7%AD%86%E3%81%AB%E3%81%AF%E4%B8%BB,%E3%81%AF%E4%BD%BF%E3%81%86%E3%81%93%E3%81%A8%E3%81%8C%E3%81%A7%E3%81%8D%E3%81%BE%E3%81%9B%E3%82%93%E3%80%82>

8.炭素(カーボン)の性質ってどんなの? | -レイホー製作所

<https://www.0ho.co.jp/carbon/p8/>

ABS樹脂最後の1mmまで書けるシャープペン 0.5mm | 筆記具・消しゴム 通販 | 無印良品

<https://www.muji.com/jp/ja/store/cmdty/detail/4549738960447>

シャープ芯のあれこれ(Q&A) - 日本筆記具工業会

<http://www.jwima.org/sharp-pencil/s04-1sharp-pencil/s04-1sharp-pencil.html#>

シャープ芯の作り方 | 株式会社トンボ鉛筆 12/1(木)

<https://www.tombow.com/mamechishiki/s56/#:~:text=%E3%82%B7%E3%83%A3%E3%83%BC%E3%83%97%E8%8A%AF>

発電機ブラシ\*1をシャープ芯へ再利用するのは、日本初

<https://www.tepco.co.jp/cc/press/05052004-j.html>

そろばんでえんぴつを使うのはなぜ? - 関目のそろばん塾 12/9(金)

<https://kakitajuku.com/index.php?QBlog-20150717-1>

シャープペンシルの歴史 | トンボKIDS

[https://www.tombow.com/sp/kids/mechanicalpencil/history\\_world.html](https://www.tombow.com/sp/kids/mechanicalpencil/history_world.html)

かつて流行した「ロケット鉛筆」が、ある習い事で今大人気! | TBS

<https://topics.tbs.co.jp/article/detail/?id=5362>

# English Education in Japan

The spread of international schools and human resources development

5424 Hirai Meru

## Abstract

I want to spread international schools in Japan. Students who go to such schools are very good at English, because foreign teachers teach them and the classes are usually done in only English. By doing so, Japan can develop talented resources who can speak English. Those people will be active in foreign countries and easily adapt to globalization.

In conclusion, the expensive tuition and the lack of teachers are preventing the spread of international schools. So, I think the system of the educational environment should be changed. Specifically, to change the procedure to work as foreign teachers, and to spread “free childhood education”. By using this system, families will be provided constant subsidies from the government. By learning about the benefits of the system, the burden of school fees will decrease and international schools will become more accessible.

Acquiring English will lower the hurdle to the challenge of going abroad.

Because they do not have to worry about the language. In addition, if more Japanese are able to understand specialized fields such as management and medicine overseas, more people will be able to engage in activities abroad. I believe that this will lead to the development of Japanese people who can be active not only in Japan but also in the world.

## 1 Introduction

The research question for my study is "What should the Japanese government do to develop global human resources by improving the English skill of Japanese children? "

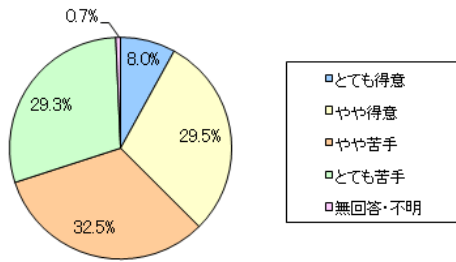
A global human resource is a person who can profit and contribute to economic activities by conducting business around the world. English is needed to develop them.

Educational reform began in 2020. English was regarded as the same as Japanese and arithmetic in elementary schools. The number of words we should master by high school graduation has increased by about 2,000 words. By these changes, the government must think it is important to catch up with the development of a global society. However, according to Graph 1, many Japanese are not good at English. Therefore, to improve the English proficiency of Japanese people is necessary.

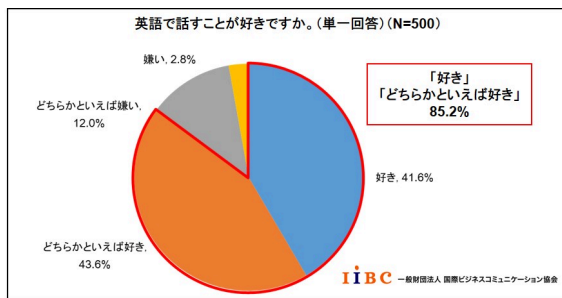
I focused on international schools as a means to achieve my goal

## 2 Discussion and implications

(graph 1)

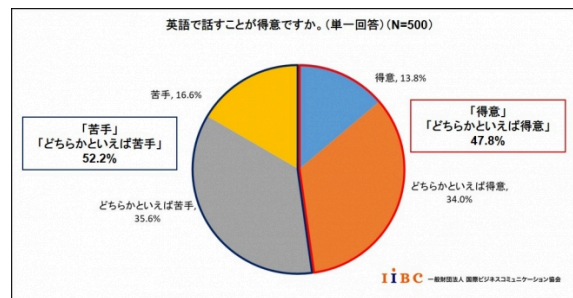


A 2009 Basic Survey on English in Junior High Schools showed that about 60% of students didn't have a college of their English skill.



(graph2)

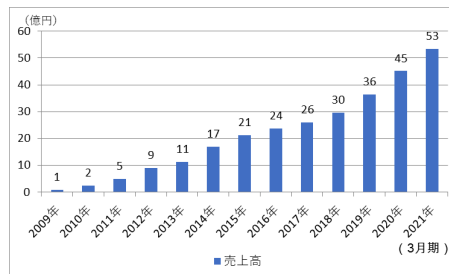
Also, in a survey of Japanese businesspersons, more than 80% of the respondents "like" to speak English, but less than half of them answered that they are not "good" at speaking English. There is no relation between liking and being good at English.



(graph3)



(graph4)



(graph5)



On the other hand, graph4 shows the number of people who take an English proficiency test (eiken). Graph5 shows the number of registrants who use online English lessons.

By these data, we can say that many Japanese want to improve and learn English.

But, some people want to live in Japan all the time or think that they have no plans to use English in the future. I thought it would be good if there were schools for only those who want to speak English fluently and live abroad in the future.

In addition, we did not learn to speak Japanese based on grammar, but came to speak it naturally through our parents and other familiar people. Then when we reached elementary school, we learned its nouns and verbs.

If children learn English in the same way, students who have high English communication skills will grow.

So how can children be exposed to English from an early age? There are various ways, such as attending an English conversation class or buying English teaching materials, but I feel that children who attend international schools have very high English ability. This is because the teachers are foreign and most of the lessons are conducted in English.

From those perspectives, International school is a good way to focus on particular people.

International schools were originally established and developed for foreign children living in Japan. With the internationalization of education, they provide education in English while meeting the requirements of Japanese schools. There are less than 200 international schools in Japan. There are some reasons why they don't become popular.

First is the cost. It is known that the tuition fees are really expensive. Some people give up to enroll in these schools because of their economic problems.

But in 2019, a system called "free childhood education" has begun. If both parents are working, single mothers, or single fathers, we can use this system.

The percentage of married couples who work together is about 66%. It means that the program would apply to more than half of all families.

The child will receive 37,000 yen per month. It amounts to 444,000 yen per year, which will greatly reduce tuition costs.

The second is the Japanese employment system. Foreign teachers have to do many procedures to get teaching licenses in Japan. (employment permission, visa etc) This system is complicated for foreigners.

The third is that sometimes international students are regarded as not finishing compulsory education. However, almost all the students try to enroll in foreign universities after graduation. Also, there are choices to pass the high school graduation test before university examination or go to international schools until kindergarten and elementary school.

### **3 Conclusion**

In conclusion, the expensive tuition and the lack of teachers are preventing the spread of international schools.

And, I concluded that "the system of the educational environment should change." Foreign teachers are necessary to run such schools. So, the government should accept English teachers in an easy way.

For example "Majoring in a subject related to the necessary skills or knowledge, and completing a special training program at a special training college in Japan." is needed to get a teaching license now. I think it's good to delete this requirement if they majored in it when they were in university.

In addition, since the system of [free childhood education] started three years ago, it is necessary to make many people aware and spread awareness about it. By learning about the benefits of the system, the burden of school fees will decrease and international schools will become more accessible.

Acquiring English will lower the hurdle to the challenge of going abroad.

Because they do not have to worry about the language. In addition, if more Japanese are able to understand specialized fields such as management and medicine overseas, more people will be able to engage in activities abroad. I believe that this will lead to the development of Japanese people who can be active not only in Japan but also in the world.

### **4 References**

International School Tuition

[https://www.kdi.ac/fs/column/20220602\\_international-school-tuition/](https://www.kdi.ac/fs/column/20220602_international-school-tuition/) 2022.5.10

Free Childcare Leads to Rush of Parents to International Schools

<https://istimes.net/articles/1258#outline25> 2022.5.10

Does the free kindergarten education program also approve international schools?

<https://hoken-room.jp/student/7724> 2022.7.05

Results of Survey on Actual Conditions and Motivation for Learning English

<https://www.iibc-global.org/iibc/press/2019/p123.html> 2022. 7.05

Examination Status Eiken

<https://www.eiken.or.jp/eiken/about/situation/> 2023.6.12

# To control the progression of myopia in children

## Utilization of digital health

ID 5425 氏名 Fujimoto Yuko

### **Abstract**

The number of people who are myopia is sharply increasing and that becomes a problem called the myopia pandemic. Actually, according to Brian Holden Institute of Vision Research, Australia, the myopia population is expected to increase to 4.758 billion people, half of the world population, by 2050. In 2020, the number of them is 2620 million. Also, the intensely myopia population is likely to increase to 938 million and have the risk of blindness one in ten. If myopia proceeds and becomes intensely myopia, the retina is stretched which connects to pathological myopia and becomes the cause of reduced or distorted vision. What is worse, blindness is likely to occur.

Then, in my research, in order to suggest how to prevent myopia, I did my research on these three terms.

① the cause of proceeding myopia

② the difference of school health survey and myopia survey to clarify the advantage of myopia survey

③ use of digital health

About ① the cause of proceeding myopia, four points: brightness, time, distance, and blink which are thought the environmental cause by using of digital devices are the important terms. Also, about ② the difference of school health survey and myopia survey to clarify the advantage of myopia survey, myopia survey is the useful way so that we can know whether we are myopia or not and the degree of myopia to recognize how we should be careful to prevent myopia. About ③ use of digital health, we can record our daily health data which we take by ourselves and the data would make us take actions to accomplish the goal.

Therefore, I suggest these things.

1, We should take the myopia survey and record the data on “Digital Therapy App” which makes use of digital health.

2, We should measure brightness, time, distance, and blink frequency when we use digital devices and record the data on “Digital Therapy App”.

3, We provide the users of “Digital Therapy App” with some technologies which make them connect the data to their actions to prevent myopia.

### **The reason of my research**

These days, the number of people who are myopia is sharply increasing and that becomes a problem called the myopia pandemic. Actually, the myopia population is expected to increase to 4.758 billion people, half of the world population, by 2050. However, the causes of proceeding myopia are genetic and environmental factors. In

the case of the latter, we could prevent myopia by consciously changing the environment. So, I focused on the cause of myopia and how we can prevent it in our daily lives.

### **Purpose and Significance of the Research**

If myopia proceeds and becomes intensely myopia, the retina is stretched which connects to pathological myopia and becomes the cause of reduced or distorted vision. So, when the number of myopia people increases with the word "the myopia pandemic", the number of people who suffer from how they see things increases. The use of digital devices, which is one of the causes of development of myopia, is difficult to limit in today's digital society. Therefore, it is necessary to suggest how to prevent myopia in this study in order for people to balance their health when living in a digital society.

### **The way to research**

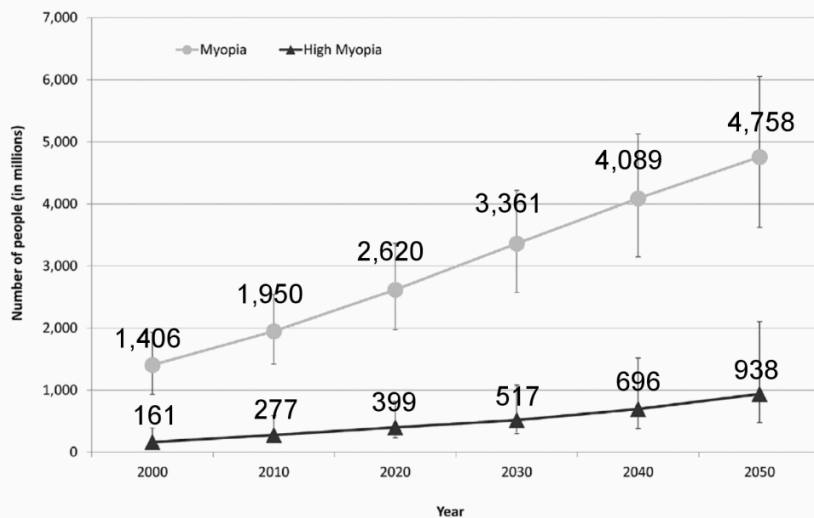
In this research, we propose solutions to problems mainly based on information collected through the Internet. First, I examine the environmental factors of myopia and how they influence the progression of myopia. Next, through the Internet, I examine the differences between the "School health survey" conducted at schools every year and the "Myopia survey" conducted by some schools by the Ministry of Education, Culture, Sports, Science and Technology, and the points needed to prevent myopia. Finally, by utilizing "digital health", I suggest how to prevent myopia.

### **Research result/discussion**

<Current circumstances>

Currently, the number of myopic people is rapidly increasing around the world, creating a problem called a "global myopia pandemic." According to Australia's Brian Holden Vision Institute, the number of myopic people is expected to increase to 4.758 billion people by 2050, roughly half the world's population. Furthermore, the number of people with severe myopia is predicted to increase to 938 million people, and it appears that one in 10 people may be at risk of blindness. As myopia progresses to a state of severe myopia, the retina is stretched, leading to pathological myopia, resulting in decreased visual acuity and distortion. As the disease progresses, blindness may occur.

## 世界の近視人口の推移



Source: American Academy of Ophthalmology, Vol.123, May 2016

<What I research in this study>

Then, in this study, I researched

- ① the difference between school health survey and myopia survey
  - ② the cause of development of myopia
- in order to suggest how to prevent development of myopia.

- ① the difference between school health survey and myopia survey

About ① the difference between school health survey and myopia survey and the benefits to utilize myopia survey,

Is there anything that helps us recognize myopia or not and how to recognize the degree of myopia?

There is a school health survey that students take every April at school to conduct visual acuity testing as a health examination. However, it doesn't survey about details, such as myopia, hyperopia, and astigmatism. So, students have no choice but to recognize the decrease in eyesight, using glasses or contact lenses in order not to affect their lives. The school health survey is a survey to check whether students have a visual acuity of 1.0 or not by viewing the vision screen from a distance of 3 meters. If their visual acuity is less than 1.0, school recommends students to see an ophthalmologist and submit the results of the medical examination to the school with the signature of having been examined.

But, according to the results of the 2020 school examination post treatment survey (Nagano prefecture), which had a high response rate, the percentage of children not receiving medical examination was around 40% in elementary schools, over 50% in middle schools, and over 80% in high schools. This indicates that many children do not receive medical care because it is only a recommendation to see a doctor.

区分	健診実施	要受診	受診数	未受診	未受診率
小学校	21,416	6,086	3,520	2,566	42.2%
中学校	11,673	4,734	2,032	2,702	57.1%
高校	8,908	2,803	533	2,270	81.0%
特別支援学校	512	132	50	82	62.1%
無回答	3,448	1,222	580	642	52.5%
全体	45,957	14,977	6,715	8,262	55.2%

↑ the treatment survey results after school health survey in 2020

(Nagano prefecture) : eye test

Also, the information of this school health survey for 9 years is in the health certificates preserved for 5 years at their school after they graduate to discard them.

Now, the survey results are replaced from paper for preservation with terms to digital. But the survey is vague because eye tests let students recognize their eyesight with four-level decisions and corrected eyesight is also the target to check. Moreover the survey results are not enough because the rate of students who see doctors after school health surveys is low.

For these reasons, the eye test of school health surveys is not enough to motivate students to change their behaviors for their eye health because enough surveys and valuable results that connect for students to make use of them are important.

## ② the cause of development of myopia

There are two possible causes of vision loss: genetic and environmental factors. However, since heredity is invariant, only environmental factors were considered in this study. According to "Environmental Factors of Myopia in School Children" by Tae Igarashi, three environmental factors are thought to be involved in the progression of myopia: education, outdoor activities, and screen time. This education in which students face problems and notebooks on their desks indoors, shorter time for outdoor activities such as playing outside, and increased use of digital devices lead to an increase in near work time. This longer near work time is said to be closely related to the progression of myopia. Currently, there are no specific surveys or research results to investigate the causal relationship between the use of ICT devices and the progression of myopia, but it is a fact that the myopic population is increasing with the digitalization of society. There is also concern that the use of digital devices is related to the progression of myopia, as it is one of the causes of longer near working hours. In addition, Researcher Holden, who predicted and published the global myopia and high myopia population, pointed out that changes in the developmental environment of children are behind the rapid increase in the myopia population worldwide. Therefore, I decided to focus on the increased use of digital devices as an environmental factor in the progression of myopia.

When, exactly, do digital devices have a negative impact on eyesight? According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the following were found to have an impact: "when used in a room that is too bright or too dark," "when used for a long time," "when used in a bad posture and close to the screen," and "when dry eyes are experienced without blinking.

In fact, Internet penetration is spreading throughout the world, and the progression

of myopia due to digital device use is a global problem. However, it is impossible to drastically reduce the use of digital devices in the future, as each student is given a terminal. Therefore, in order to reduce the negative effects of digital device use as an environmental factor for myopia control, I considered brightness, time, distance, and blinking to be the four most important research targets.

First, let us discuss brightness. Working in dark areas shortens the distance between the eyes and the digital device, making it impossible to maintain the recommended distance.

Second, it is about time. Keeping the ciliary muscle (the muscle that focuses the eye) tense for long periods of time is not good for myopia. In fact, it is believed that staring at a digital device for long periods of time can promote myopia if the ciliary muscle is left engaged. Therefore, it is recommended that after 20 to 30 minutes of staring at a screen, one should look at least 5 meters away for at least 20 seconds.

Next, let's look at distance. The distance to the screen should be at least 60 cm for a computer and 30 cm for a tablet. Furthermore, using digital devices with poor posture or while lying down can easily lead to myopia and "chatter eyes," a difference in visual acuity between left and right eyes. Therefore, it is better to use digital devices with a straight back, good posture, and at a reasonable distance from the device.

And then there is the matter of blinking. Dry eyes without blinking can cause a wide range of symptoms, including glare, eyestrain, and vision loss. However, there is no cure for dry eye, and it causes a long-term decline in quality of life. Therefore, blinking should be moderate to prevent dry eye and the worsening of its symptoms.

### **<Perspective of my research>**

Through this, in order to prevent myopia in children,

- ① to collect the detailed data of myopia
  - ② to appreciate collected data correctly
  - ③ to change their behavior so as to make use of the data
- these three points should be achieved.

#### ① to collect the detailed data of myopia

First, about ① to collect the detailed data of myopia, I want to suggest that we should make use of the "myopia survey". Now the use of digital devices is increasing and every student can receive their own digital devices. Then, in order to clarify the myopia in children, a survey of myopia among children in 2021 is conducted. In this survey, whether students are myopia, hyperopia, and astigmatism or not and the measurement of the degree of myopia, the length of the ocular axis, spherical power of transmission (refractive examination under adjustable anesthesia), and anterior chamber depth are checked. In addition, questionnaires are being conducted for children to examine lifestyle habits such as outdoor activities and time spent using devices, and for schools to introduce digital devices and provide instruction on rest from near work. Thus, it appears that surveys are being conducted to quantify the details of myopia and to examine its relationship with environmental factors such as digital devices and near work. Therefore, a survey on the actual condition of near-sightedness is considered to be an effective means of obtaining detailed data on whether and to what extent each individual has near-sightedness, and of recognizing how much care must be taken to prevent near-sightedness.

## ② to appreciate collected data correctly

Second, about ② to appreciate collected data correctly, I suggest that we collect the data which shows the influence by environment which are bad for children's eyes. That is because we have to change our consciousness of our own reality of myopia and connect to inhibit progression of myopia. For this purpose, it is necessary to compare the degree of nearsightedness with national averages and other data, and to understand the causes of nearsightedness. From the above, regarding the use of digital devices as a possible environmental factor in the progression of myopia, we found that brightness, time, distance, and blinking are four important targets in preventing myopia.

First, we discuss the data on brightness and visual acuity. We thought it necessary to clarify the relationship between the illuminance of the room and the screen and the transition of visual acuity.

Next, I would like to discuss the data on time of use and visual acuity. We thought it would be good to know how the time spent looking at the screen using the camera function affects visual acuity.

Then, I would like to know the data related to the distance between the screen and the eye and the visual acuity. It would be great if we could use the camera function to measure how close people are to the screen when using digital devices, and clarify the relationship between this and changes in visual acuity.

Finally, data on dry eye and visual acuity. It would be good if a special camera could be used to collect data on the degree of dryness of the eyes to determine the relationship with visual acuity.

## ③ to change their behavior so as to make use of the data

Third, about ③ to change their behavior so as to make use of the data, I suggest that I make use of "digital health". Digital health refers to any medical treatment using information and communication technology, specifically telemedicine and online medical treatment, but also the use of digital terminals to measure pulse rates and electrocardiograms in order for patients to monitor their health in their daily lives.

For example, one type of digital health is called "digital therapeutic apps. The goal of this is to help patients recognize what they need to do for their health and live their lives with care, focusing on their everyday lives, rather than on medical examinations by doctors or tests with medical equipment. This "digital therapeutic app" utilizes a smartphone to record physical conditions and presents diagnostic advice to help patients proceed with treatment. Specifically, in Japan, CureApp SC Nicotine Dependence Treatment App, Japan's first treatment app for nicotine dependence, was launched by Cure App in December 2020 after clinical trials, pharmaceutical approval, and insurance coverage. Patients measure the carbon monoxide concentration in their breath, which rises when they smoke, daily with a special device and record it in the app, and enter their medication status and whether or not they are experiencing side effects.

Another type of digital health is mobile health. Mobile health is the use of digital terminals to measure heart rate, ECG, BMI, and WBGT, an indicator of heat stroke, to determine health status. The results of technological development can be applied to medical devices and pharmaceuticals, one of which is "Dry Eye Rhythm. One such application is "Dry Eye Rhythm," an application that allows users to measure a score (dry eye index) that indicates the degree of dry eye using an iPhone, and includes three measurement items: "blink frequency," "practical visual acuity," and "dry eye question index (OSDI). The "blink frequency" is measured using the



iPhone's camera-based face recognition function (CIDetector). Specifically, the number of times a person blinks can be measured by taking a picture of their face as it appears on the iPhone display and holding it for 30 seconds.

Since Japanese people have good access to hospitals and a good insurance system, they are characterized by a less preventive approach to digital health, in which they "record the relationship between their daily activities and their health status, and use this information to improve their lives. However, in some countries, access to hospitals is not good and the insurance system differs in some areas from that in Japan, making it easier for systems using the concept of digital health to be accepted worldwide.

From the above,

- ① to collect the detailed data of myopia
  - ② to appreciate collected data correctly
  - ③ to change their behavior so as to make use of the data
- the conclusion of these three perspectives are

- ① to recognize the degree of myopia making use of the "myopia survey"
- ② to collect the data which shows the affluence by environment which are bad for children's eyes
- ③ behavior modification by making use of "digital health"

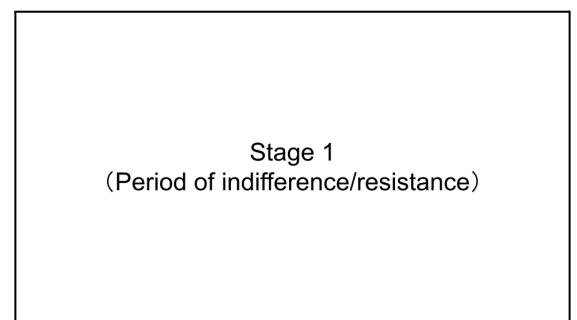
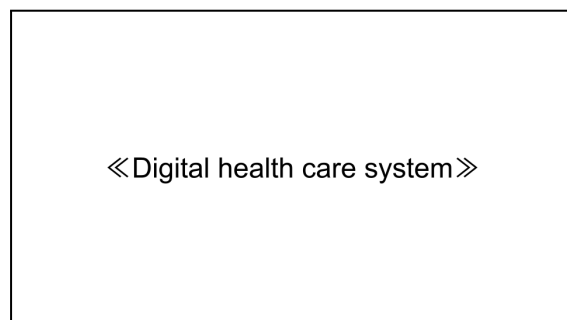
### Conclusion

I want to make a "Digital health care system" which can fill these three perspectives.

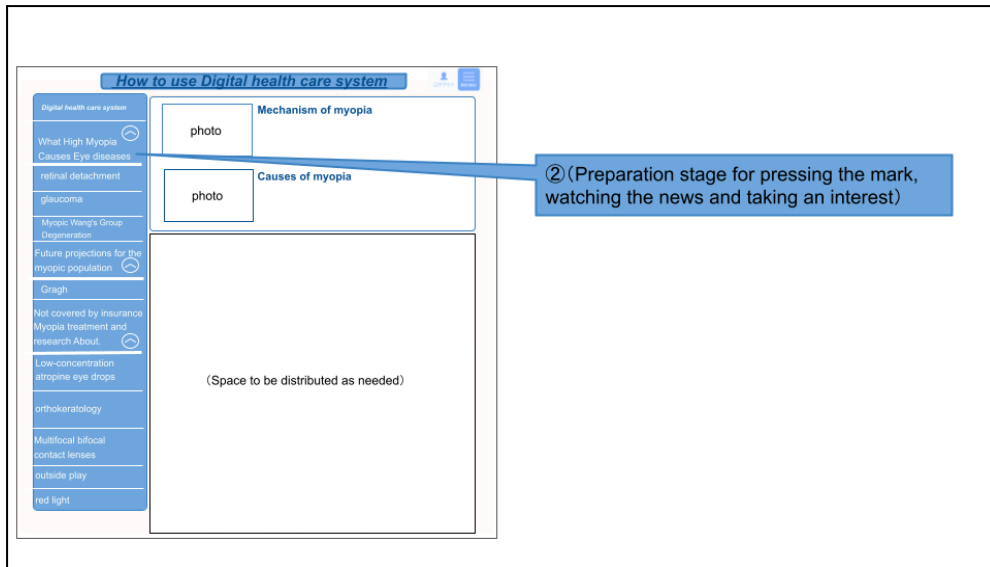
- ① to recognize the degree of myopia making use of the "myopia survey"
- ② to collect the data which shows the affluence by environment which are bad for children's eyes
- ③ behavior modification by making use of "digital health"

<< Digital health care system >>

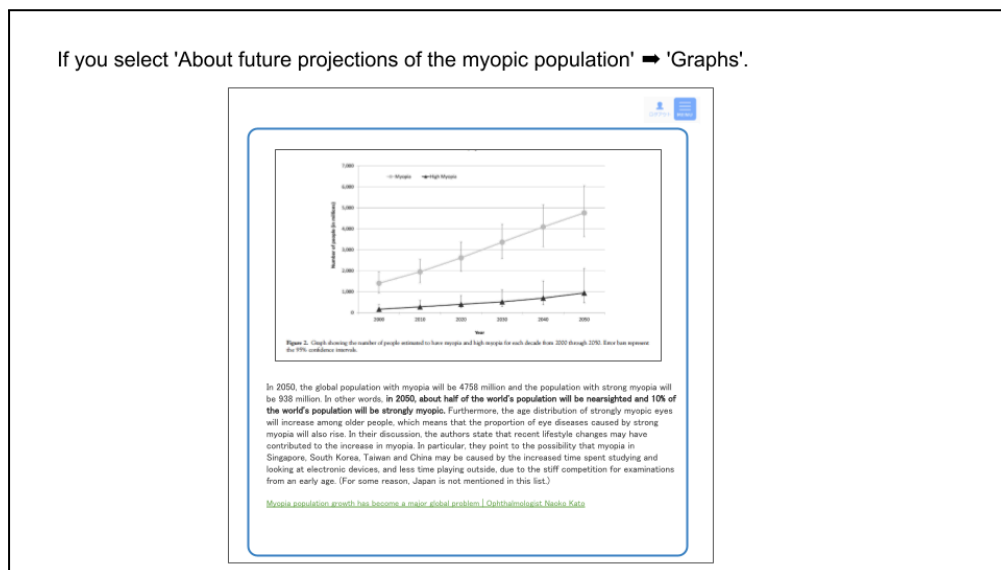
- ① The first screen of Digital health care system
- ② Stage 1 is the period of indifference/resistance



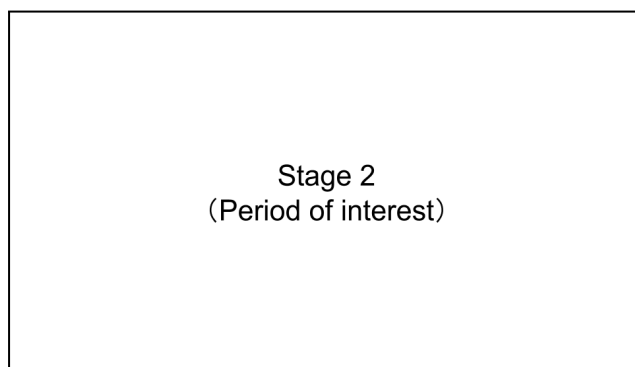
③ Users can watch the news and take an interest by choosing items.



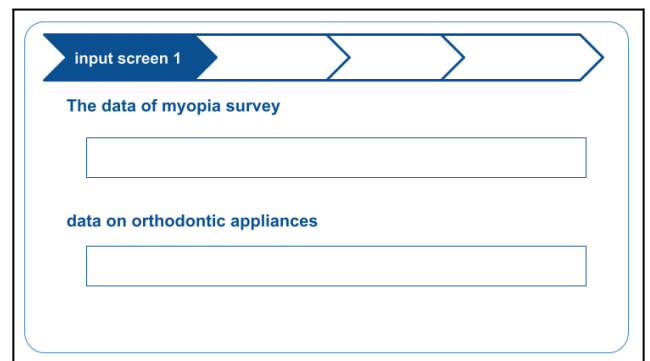
④ If users select “About future projections of the myopic population”, users can watch the graph of it and explanation about it.



⑤ Stage 2 is the period of interest.



⑥ Users input the data.



⑦ Users input the data.

The screenshot shows a navigation bar at the top with three steps: 'input screen1', 'input screen2', and an empty arrow-shaped box. Below the navigation bar, there are three questions, each followed by a text input field:

- Question: "How many hours a day do you use your digital device?"
- Question: "What do you spend most of your time doing with digital devices?"
- Question: "What is the distance between the screen and your eyes?"

⑧ Users input the data.

The screenshot shows a navigation bar with four steps: 'input screen1', 'input screen2', 'Research and achievements', and an empty arrow-shaped box. Below the navigation bar, there are three sections:

- Section: "Research results on atropine eye drops" with a text input field.
- Section: "Research results on outdoor play" with a text input field.
- Section: "success story" with three empty oval shapes.

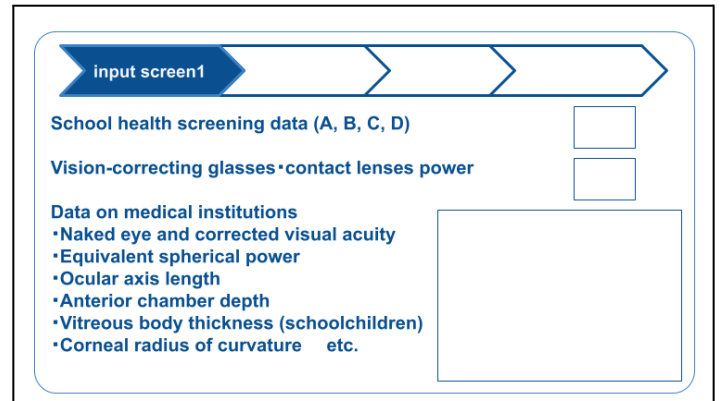
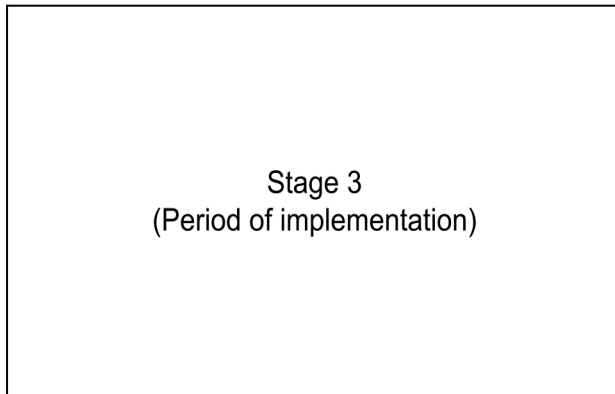
⑨ Users check the level of interest. If students check 3 or 4, they can go to next stage and if students check 1 or 2, they should return to stage 1.

The screenshot shows a navigation bar with four steps: 'input screen1', 'input screen2', 'Research and achievements', and 'checking'. Below the navigation bar, there is a section titled "level of interest" with a scale of four numbers: 4, 3, 2, and 1. Each number has a circular button with a checkmark below it. Brackets below the buttons indicate the next steps:

- Buttons for 4 and 3 are grouped with a bracket labeled "go to stage 3".
- Buttons for 2 and 1 are grouped with a bracket labeled "In this case, return to stage 1".

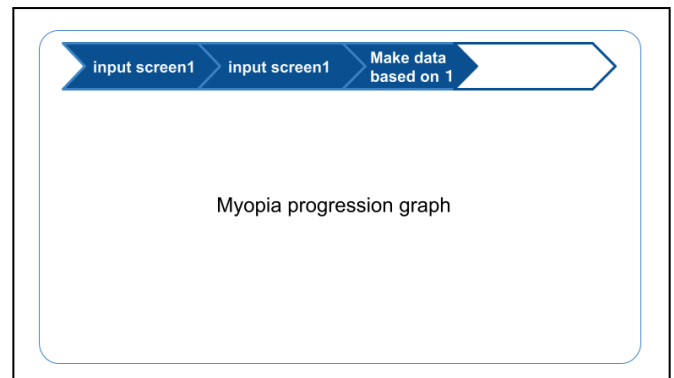
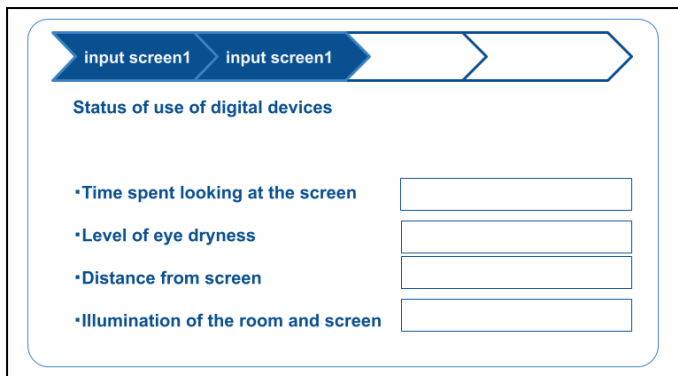
⑩ Stage 3 is the period of implementation.

⑪ Users input the data.



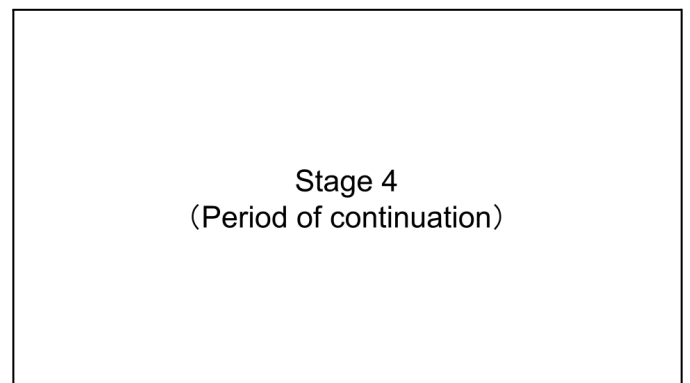
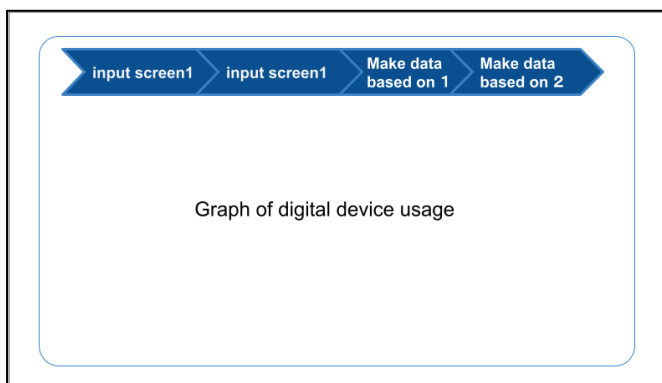
⑫ Users input the data.

⑬ The system show the myopia progression graph.

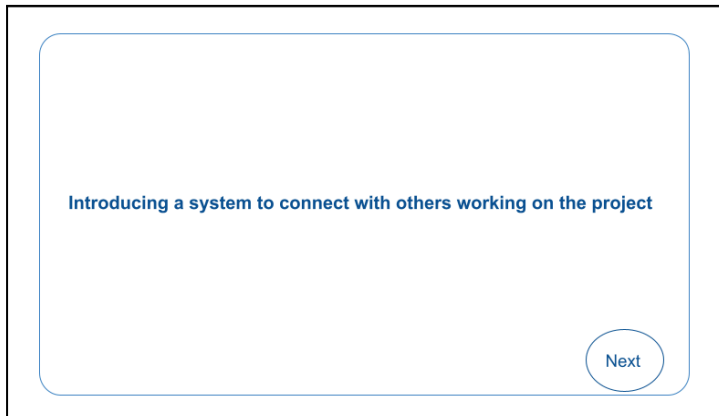


⑭ The system show the graph of digital device usage.

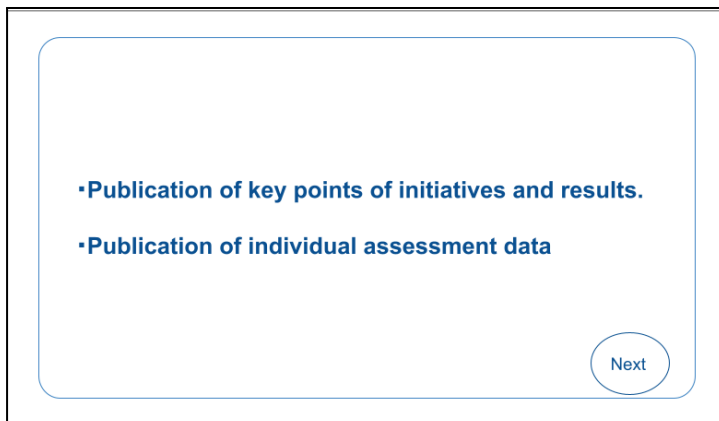
⑮ Stage 4 is the period of continuation.



- ⑩ The system introduce a system to connect with others working on the projects.



- ⑪ The system publishes key points of initiatives and results and individual assessment data.



## References

Myopia worldwide pandemic

<https://project.nikkeibp.co.jp/behealth/atcl/feature/00003/052900114/>

Global Myopia and High Myopia Population

<https://orthokeratology.jp/kinshi-increase/>

Myopia Population Trends

<https://jhei.net/news/2017/000496.html>

From High Myopia to Pathological Myopia

[https://moumaku.com/mcnv-eye/disease/about\\_mcnv/](https://moumaku.com/mcnv-eye/disease/about_mcnv/)

Environmental Factors for Myopia

<https://www.pieronline.jp/content/article/0039-2359/279020/117>

Environmental Factors for Myopia About Digital Devices

<https://www.hikichi-eye.jp/blog/1906>

Why Digital Devices Affect Vision

[https://www.mext.go.jp/component/a\\_menu/education/micro\\_detail/\\_\\_icsFiles/afieldfile/2018/08/14/1408183\\_5.pdf](https://www.mext.go.jp/component/a_menu/education/micro_detail/__icsFiles/afieldfile/2018/08/14/1408183_5.pdf)

2021 Survey of Children with Myopia

<https://www.hikichi-eye.jp/blog/1906>

Report on the Results of the 2021 Myopia Survey of Children in Japan

[https://www.mext.go.jp/content/20220622-mxt\\_kenshoku-000013234\\_1.pdf](https://www.mext.go.jp/content/20220622-mxt_kenshoku-000013234_1.pdf)

Lifestyle to prevent myopia

<https://koikeganka.com/news/oshirase/sick/3953>

How to deal with digital devices

[http://www.machida.tokyo.med.or.jp/?page\\_id=22394#:~:text=%E7%94%BB%E9%9D%A2%E3%81%B%E3%81%A7%E3%81%AE%E8%B7%9D%E9%9B%A2%E3%81%AF,%E8%A6%8B%E3%82%8B%E3%81%93%E3%81%A8%E3%81%8C%E5%A4%A7%E4%BA%8B%E3%81%A7%E3%81%99%E3%80%82](http://www.machida.tokyo.med.or.jp/?page_id=22394#:~:text=%E7%94%BB%E9%9D%A2%E3%81%B%E3%81%A7%E3%81%AE%E8%B7%9D%E9%9B%A2%E3%81%AF,%E8%A6%8B%E3%82%8B%E3%81%93%E3%81%A8%E3%81%8C%E5%A4%A7%E4%BA%8B%E3%81%A7%E3%81%99%E3%80%82)

About Dry Eye

<https://prtimes.jp/main/html/rd/p/000000371.000021495.html>

What is Mobile Health?

<https://www.ritsumei.ac.jp/research/radiant/gol/story5.html/>

dry eye rhythm

<https://xtech.nikkei.com/dm/atcl/feature/15/327441/110100137/?P=2>

Efforts to build an anonymous database

[https://www.jstage.ist.go.jp/article/jami/36/5/36\\_221/pdf/-char/ja](https://www.jstage.ist.go.jp/article/jami/36/5/36_221/pdf/-char/ja)

# Spreading Education in Developing Countries

## Possibility of Online Education

ID5426 氏名Maeda Gaku

### Abstract

Currently, it is known that a lot of children who live in developing countries cannot go to school. The aim of this study is to spread education in developing countries and reduce the gap between developed countries and developing countries. I searched on the Internet about the education of developing countries. Then I found three kinds of reasons: poverty, the lack of equipment, and health. I focused on the lack of equipment and considered how children can study without going to school. As a result, I thought they would be able to take online classes with the “TUMIQUI Smart Kit”, which is developed by SUCRECUBE Japon. Therefore, I interviewed the proposers who made the kit. The results suggest that online education with TUMIQUI Smart Kit is one of the best ways to spread education in developing countries. The results also show that online education has the potential to become better education. To spread this method in developing countries, crowdfunding and making applications in which children can learn languages are good ways.

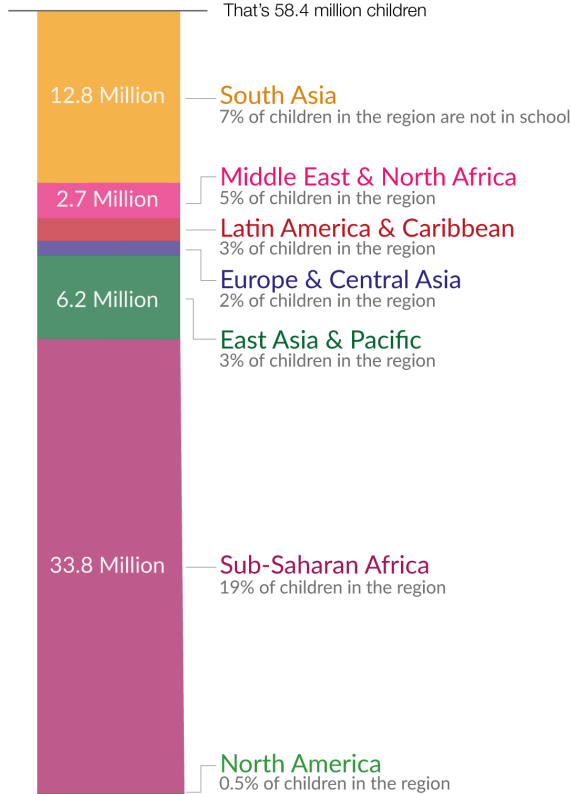
### 1. Introduction

According to UNESCO, about 60 million children of primary school age cannot go to school (Figure 1). In addition, the literacy rate of young people in the world is 86 % and about 773 million people cannot read and write. More than half of them live in developing countries. The literacy rate of sub-Saharan African countries such as the Republic of Chad, the Republic of Niger and South Sudan is about only 40% (figure 2). Education is one of the goals of SDGs but people cannot solve it. If people cannot go to school, there are many disadvantages, for example, they cannot receive social services, they have to get a job which does not need reading and writing, and they cannot learn major languages so they cannot work in the city. My study's purpose is to spread education in developing countries from the perspective of a student and reduce the gap between developed countries and developing countries. First, I searched about education in developing countries on the internet. After that, I interviewed the people involved in online education in developing countries.

# Where are the 58 million primary school age children who are not in school?



8% of the world's 787 million children of primary school age are not in school. That's 58.4 million children

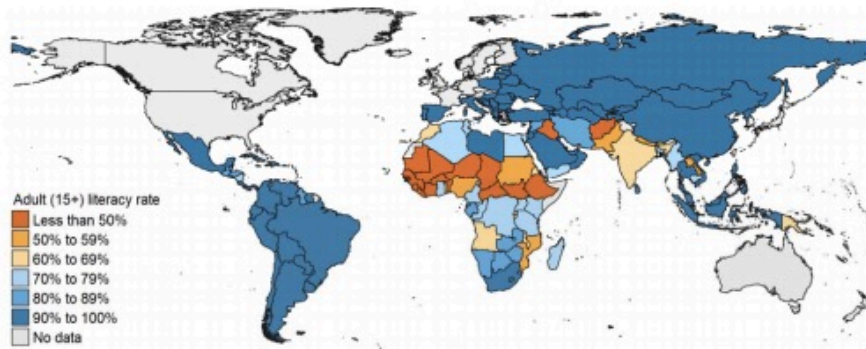


Data source: UNESCO for the year 2019

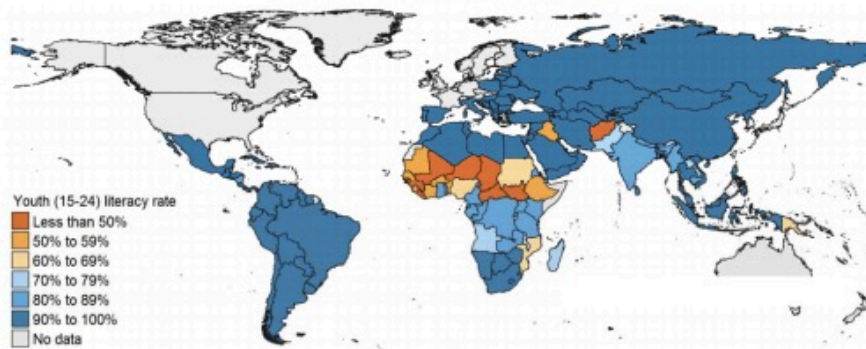
Licensed under CC-BY by the author Max Roser

Figure 1

Adult literacy rate by country, 2016



Youth literacy rate by country, 2016



Source: [UNESCO Institute for Statistics](https://www.unesco.org/en/unesco-institute-for-statistics), July 2017

Figure 2



## 2. Discussion & Implication

First of all, there are three devastating reasons for lack of education.

The first reason is poverty. If the country is in poverty, the government cannot support money for education. If the people are in poverty, they cannot only pay their school fees but also the children have to work. Poverty is also one of the goals of SDGs.

The second reason is the lack of schools and teachers. In the areas which do not have any schools, children have to walk to a dangerous place for about two hours, so their parents do not let them go to school. Only one teacher has to teach more than 50 children in the classes which do not have enough teachers. In addition, their quality of teaching is very low because some teachers take only elementary education. It is not enough.

The third reason is about health. Health problems such as water shortage, starvation and lack of medical treatment are devastating in a lot of developing countries.

Besides these reasons, some girls cannot go to school because of religion, some boys have to fight in the war as soldiers, and the parents do not understand how important education is. What is more, some of these reasons are included in SDGs such as poverty and health, and they connect each other, so the problem of education in developing countries.

I cannot solve all of these reasons, so I focused on the lack of schools and made a research question, “how can the children in developing countries study without going to schools?” I thought of three solutions.

The first solution is the home tutor style. The children do not need to go to school because the teachers go to the children. However, the home tutor style needs more teachers, so it is difficult to carry out.

The second solution is to teach each other. Some children go to school and they teach other children. This solution does not need many teachers, but almost all children do not have enough teaching abilities. In addition, it may become the cause of discrimination in developing countries.

The third solution is online style. This solution is equality for not only children but also adults and does not need many teachers. What is more, it is sustainable. However, they need electricity, radio waves, and devices to do online lessons. Then I found “TUMIQUI Smart KIT”, which was developed by the TUMIQUI Project in SUCRECUBE Japon.



There is a portable solar panel, a charging and storage device, a communication tool which can connect to Wi-Fi, and an LED light bulb. If a village has it, many children can do online lessons. I contacted the representative director, Koichi Sato, and chief customer officer, Miho Sato to ask about the problems of the TUMIQUI Project. They told me that there are not enough devices to do online lessons in Senegal. It is difficult to do online lessons in developing countries, but it is very sustainable, and it will help to develop the quality of education in developing countries.

### 3. Conclusion

Now, a lot of children cannot go to schools in developing countries. It is difficult to solve because there are many reasons, and they connect each other. To solve one reason, the lack of schools, I suggest doing online lessons with TUMIQUI Smart KIT. However, there is not enough money to get devices to do it. To solve this problem, I think crowdfunding is one of the best ways. A lot of people want to support education but some of them do not know what they can do. Crowdfunding is one of the easiest ways for them. In addition, I am thinking of a new way to spread education, and application development, because the ICT penetration rate in developing countries is high (Figure 3). I heard that a Japanese girl makes learning applications in developing countries. I will contact someone who knows a lot about development.



Figure 3

Mobile phone sales in Africa (millions)

### 4. References

Rate of children who can't go to school

<https://ourworldindata.org/children-not-in-school> (5/25)

Literacy rate

<https://ourworldindata.org/children-not-in-school> (5/25)

Shukru Cube Japon Co.

<<https://www.sucrecube.co.jp/>> (6/10)

Three causes of education problems and solutions.

<[https://www.worldvision.jp/children/education\\_01.html#d0e9d87eb78fa54e47cd213ca7606442](https://www.worldvision.jp/children/education_01.html#d0e9d87eb78fa54e47cd213ca7606442)> (6/23)

ICT penetration rate in developing countries

<<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/h26/html/nc112000.html>> (7/10)

The number of students per teacher in elementary school in the Central Asian Republics

<<https://graphtochart.com/education/central-african-republic-pupil-teacher-ratio-primary.php>> (7/21)

Safe Water | Water and Sanitation | UNICEF's Main Areas of Activities

<[https://www.unicef.or.jp/about\\_unicef/about\\_act01\\_03\\_water.html](https://www.unicef.or.jp/about_unicef/about_act01_03_water.html)> (9/8)

Hunger Issues

<<https://volunteer-platform.org/syokuryou/>> (10/15)

Child Labor Data | Child Labor Network (CL-Net)"

<<https://cl-net.org/child-labour/data.html>> (10/15)

Diffusion rate of telephones

<[https://note.com/umemoto\\_abp/n/n400ef0b9f133](https://note.com/umemoto_abp/n/n400ef0b9f133)> (11/9)

# A New Way To Eliminate Space Debris To accomplish sustainable space development

5427 MAKITA YUYA

## 1. Abstract

The space debris problem is one of the most serious problems which we must address to fulfill the sustainable development in space. We researched for several methods of removing the debris and suggested a new way that uses a satellite with expandable arms which hit the debris to change its orbit and drop the earth. In the future, we would like to examine strong materials for the arms and the way to acquire the debris.

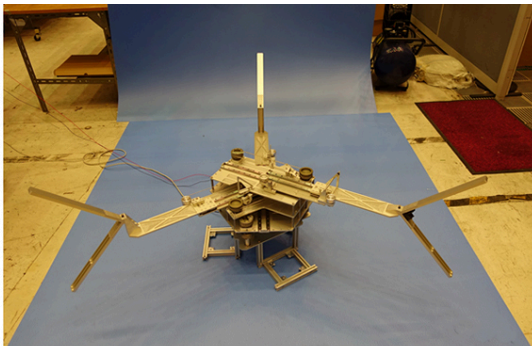
## 2. Introduction

We cannot ignore the space debris problem when we advance space development. Space debris is unwanted artificial objects in orbit, and the number is estimated to be 20,000 larger than ten cm, 500,000 to 700,000 larger than one cm, and more than 100 million objects larger than one mm. These objects are rotating at high speed (seven to eight km/s) in orbit, and collisions with satellites and other operational objects can have serious consequences. Moreover, according to Donald J Kessler(1978), collisions between space debris become increasingly likely as the density of space debris increases in orbit around the Earth, and a cascade effect results as each collision in turn creates more debris that can cause further collisions. Eventually, debris will multiply to the point where space exploration becomes impossible. Therefore, we have to solve the problem as soon as possible. In this paper, We discuss a new way of removing space debris.

## 3. Discussion and Implication

Several ways have been suggested to solve the space debris problem. Some examples and their pros and cons are shown below:

- Capturing debris with robot arms



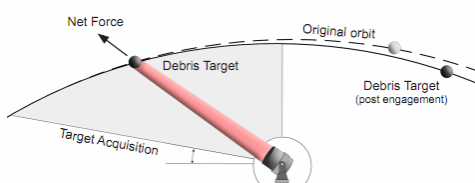
We launch the satellite with robot arms and capture debris.

Advantages: We can remove debris certainly.

Disadvantages: It is difficult to approach and capture debris.

<https://www.kenkai.jaxa.jp/research/debris/deb-capture.html>

- Changing the orbit with the laser to drop the ground

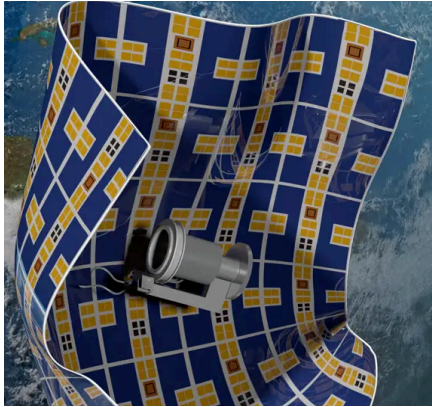


Advantages: We can diminish the debris at little cost.

Disadvantages: There is a risk of military use.

<https://www.technologyreview.com/2011/03/14/196356/nasa-studies-laser-for-removing-space-e-junk/>

- Wrapping the debris with a thin net equipped with a satellite



Advantages: We can launch it less expensive due to its tiny size.

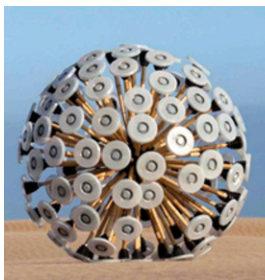
Disadvantages: It is difficult to protect satellites from cosmic rays.

<http://www.popsoci.com/space-debris-clean-up-spacecraft>

As these examples show, they have advantages and disadvantages, and no one method alone can solve this problem. Therefore, it is safe to say that utilizing the various methods comprehensively can be a good solution. Referring to the methods above, we suggest a new satellite with expandable arms which hit the debris to change its orbit and drop the earth. We cannot use this satellite to remove big debris, such as rocket components and unused satellites, but it is not single-used and it can eliminate a lot of debris.

We illustrate an object which is the most similar to the satellite. Each silver circle is equivalent to each arm. Using more arms enables us to hit the debris more efficiently without consuming a lot of fuel to control the aircraft's orientation.

However, this method has problems. It is very difficult to acquire the high-speed debris. Also, the debris has huge energy, which will break the arms when they hit.



#### 4. Conclusion

In the future, we would like to investigate strong materials that could be used for the arms and research methods for accurately capturing debris.

#### 5. References

<https://www.kenkai.jaxa.jp/research/debris/deb-faq.html>

JAXA : スペースデブリに関してよくある質問 (FAQ) '22 12/14

<https://www.bbc.com/news/science-environment-43418047>

BBC : Big harpoon is 'solution to space junk' '22 12/19

<http://www.popsci.com/space-debris-clean-up-spacecraft>

This spacecraft is thinner than a human hair and can capture space debris | Popular Science '22 12/20

Donald J. Kessler and burton G. Cour-Palais, "Collision Frequency of Artificial Satellites: The Creation of a Debris Belt" Journal Of Geographical Research (1978)

# Images Beyond The Word

## How to express things in our brain

ID 5428 Name Mashimo Yuka

### Abstract

In recent years, technologies related to BMIs (Brain Machine Interface: A device that reads brain waves and uses the brain's commands to operate a computer, or sends direct stimulation from the computer to the nerves to provide sight and taste without the use of sensory organs) have developed, and some researchers have attempted to make BMIs more practical. BMIs include two types of machine: invasive, such as SUA/MUA/LFP and ECoG, and non-invasive, such as EEG, MEG, NIRS, fMRI, etc. The invasive type is more accurate, but it has risks such as infection because of surgery, and cannot be used for healthy people now. On the other hand, the non-invasive type has the advantage that it can be used for healthy people now because it does not require surgery, although there is a high possibility of noise. In this study, I compared the features of each BMIs with the communication media and searched for the best way to communicate with healthy people using non-invasive BMIs. The result of the analysis found that the best BMI that can be used by healthy people is ECoG, and that the best media of communication are text and images that are connected to concrete objects. However, while ECoG has excellent temporal and spatial resolution, it is not known whether it is best for producing text and pictures.

### 1. Introduction

In recent years, the technology of BMIs has been increasingly developed: BMI is a device that measures the state of the brain and input this information into a computer to operate the computer, or on the contrary, the brain receives the stimulation sent by the computer to provide sensations. Many studies on BMIs began with Dr. Chapin and his colleagues in 1999 and have continued to this day. They reported that in their study, a mouse was able to move the water fountain's motorized arm and drink water just by thinking. Today, studies are being conducted to improve the accuracy of BMIs and for use by healthy people in their daily lives. Therefore, I decided to compare the features of media of communication to the features of BMIs in order to help healthy people communicate using BMIs in their daily lives.

To compare the characteristics of BMIs, I based on the statements in previous studies. Also, six different BMIs were used for comparison. When comparing the features of the media of communication, I used our own evaluation rubric which is inspired by an article written by Hideki Touyama (2009). The rubric includes needs of surgery, size, time resolution: how short intervals it can measure, and space resolution: how much detailed data it can measure. The six media used for comparison were inspired by the history of human beings. If it were possible, I would have liked to do an experiment with the device to reveal if there is a connection between the type of BMIs and the media of communication, but I cannot do the experiment, so I would like to find out through comparing and referring to the data.

## 2. Discussion and Implication

BMIs can be categorized into two types: invasive and non-invasive. The invasive type requires surgery to implant electrodes into the brain and cannot be used in healthy people's lives now because of the risk of infection. However, it is highly reliable. The other is the non-invasive type, which measures the state of the brain from the outside by covering the head or using a large machine. For this study, I examined the features of six different BMIs.

### ○BMI(invasive)

#### 1.SUA/MUA/LFP

#### 2.ECoG

#### 1.SUA/MUA/LFP

This is a method in a category called extra-cellular recording. This method implants electrodes in the brain and sends the information to a computer. This method is highly accurate and the size of the machine can be reduced, but it is difficult for healthy people to use because it requires surgery. At this time, people with disabilities in brain and body functions are using this method as a communication tool in the experimental stage.

SUA(Single Unit Activity) is the method to read spike signals from a neuron. MUA(Multi Unit Activity) is similar to SUA, but it reads spike signals from neurons. LFP(Local Field Potential) is different from these two methods because it is a method of reading electric fields and potentials.

#### 2.ECoG

There are two types of ECoG(Electrocorticogram): invasive and non-invasive. The invasive type implants a sheet of electrodes into the brain, while the non-invasive type uses sensors that cover the whole head. Both methods have the advantage of being able to measure a wide area of the brain without unbalanced measurement, and also have the advantage that the electrodes are stable and do not slide easily. Furthermore, the size of the measurement device can be reduced. There are many studies using ECoG, and some products have been put into practical use.

### ○BCI(non-invasive BMI)

#### 1.EEG

#### 2.MEG

#### 3.NIRS

#### 4.fMRI

#### 1.EEG

EEG measures brain waves and makes it possible to reduce the size of the machine. However, the possibility of noise caused by slight movements of the person being measured,



such as blinking, is large, and its reliability is not as high as expected. It is also affected by the volume of the skull and brain itself.

## 2.MEG

MEG measures the magnetic field generated by brain activity. It is almost the same mechanism as EGG, but has higher performance than EGG. However, the problem with MEG is that it is difficult to miniaturize the machine. This means that it cannot be used in the daily lives of healthy people.

## 3.NIRS

NIRS uses infrared light to measure the movement of blood vessels in the brain. It can be miniaturized and requires no surgery. However, it has low temporal resolution.

## 4.fMRI

fMRI is a method of measuring cross-sectional views of the human body using magnets and electromagnetic waves. This has the advantage of high accuracy and the ability to map the entire brain, but it also has the drawback of large machines.

The features of the six methods are listed in the table below(table1). The perfect BMI for daily use by healthy people would be something that can be used without surgery, is small in size, and has high performance. Therefore, I conclude that non-invasive ECoG is the most appropriate.

		surgery	size	time resolution	space resolution
invasive	SUA/MUA/LFP	yes	small	○	○
	ECoG	yes/no	small	○	○
non-invasive	EEG	no	big	×	×
	MEG	no	big	○	×
	fMRI	no	big	×	○
	NIRS	no	small	×	○

(table1. Features of BMIs)

Next, I will summarize the features of the media of communication. I was inspired by a study that referred to the history of human communication and classified the media of communication into six categories.

○the media of communication

1,A cluster of information that has no meaning

2.A cluster of information that has meaning(=text)

3. Pictures representing abstract objects
4. Pictures representing specific objects
5. Movement and facial expression
6. Prepared options

We evaluated these communications from three perspectives: accuracy (whether the information is conveyed to the other person correctly), universality (whether the same information is conveyed to all people), and freedom (whether the thought is conveyed to the other person freely). The results of the evaluation are shown in the table below (table2). The results of the evaluation showed that a meaningful cluster of information (text) and pictures representing concrete objects are good tools to communicate.

	1	2	3	4	5	6
accuracy	×	○	×	△	×	△
universality	×	△	×	○	×	○
freedom	×	○	○	○	△	×

(table2. Features of media)

### 3. Conclusion

Finally, I tried to find a connection between the features of BMI and the communication tools. However, I cannot find any previous studies that show a relationship, and my evaluation of the data is not accurate, so I cannot say with certainty that there is a relationship. My hypothesis is that the ECoG will have advantages in the measurement of language-related areas that use a large portion of the brain because it can measure the whole brain without bias and has both high temporal and spatial resolution. Therefore, I expect that a useful product will be created that uses ECoG to measure about "text". I also believe that image-based output can be used with ECoG to measure a wide range of areas related to vision. In the future, I would like to complete this research by experimenting to determine the relationship between the features of BMI and the features of the communication media.

### 4. References

- Takafumi Suzuki(2012):Motor output-type Brain-Machine Interface  
[〈https://www.jstage.jst.go.jp/article/jnns/19/3/19\\_112/\\_pdf〉](https://www.jstage.jst.go.jp/article/jnns/19/3/19_112/_pdf)
- Hideki Touyama(2009)「Keywords you should know」Vol. 63 No.6 pp.772-776  
[〈https://www.ite.or.jp/contents/keywords/FILE-20120103131221.pdf〉](https://www.ite.or.jp/contents/keywords/FILE-20120103131221.pdf)
- Tasuku Kashiwamura(2021)「Life design report」  
[〈https://www.dlri.co.jp/files/ld/151980.pdf〉](https://www.dlri.co.jp/files/ld/151980.pdf)
- 「総務省 | 令和元年版情報通信白書」  
[〈https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r01/pdf/index.html〉](https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r01/pdf/index.html)

Keiichi Watanuki(2010):ブレイン・マシン・インターフェース技術とその応用  
<[https://www.jstage.jst.go.jp/article/pscjspe/2010S/0/2010S\\_0\\_611/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/pscjspe/2010S/0/2010S_0_611/_pdf/-char/ja)>

Osamu Hasegawa(2013):Decoding Visual Images from Electrocorticogram  
<  
[https://niigata-u.repo.nii.ac.jp/?action=repository\\_uri&item\\_id=9373&file\\_id=20&file\\_no=1](https://niigata-u.repo.nii.ac.jp/?action=repository_uri&item_id=9373&file_id=20&file_no=1)  
>

Yukiyasu Kamitani(2008)「リレー解説 サイボーグ医療」Vol.45 No.5 pp.431-436  
<[https://www.jstage.jst.go.jp/article/sicej/47/5/47\\_431/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/sicej/47/5/47_431/_pdf/-char/ja)>

Takufumi Yanagisawa(2022)「脳神経外科ジャーナル」Vol.31 No.9 pp.558-563  
<[https://www.jstage.jst.go.jp/article/jcns/31/9/31\\_558/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/jcns/31/9/31_558/_pdf/-char/ja)>

Yasunari Hashimoto, Junichi Ushiba, Yutaka Tomita, Akio Kimura, Meigen Riu(2011)「  
Japanese Journal of Cognitive Neuroscience」Vol.13 No.2 pp.171  
<[https://www.jstage.jst.go.jp/article/ninchishinkeikagaku/13/3/13\\_249/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/ninchishinkeikagaku/13/3/13_249/_pdf/-char/ja)>

Kunio Ohno, Toshiko Kumura(2017)「研究報告ドキュメントコミュニケーション(DC)」Vol.1  
pp.1-8  
<[https://ipsj.ixsq.nii.ac.jp/ej/?action=repository\\_uri&item\\_id=184652&file\\_id=1&file\\_no=1](https://ipsj.ixsq.nii.ac.jp/ej/?action=repository_uri&item_id=184652&file_id=1&file_no=1)>

## 5. Bibliography

Meigen Riu(2015)「認知リハビリテーション」Vol.15 No.1 pp.1-8  
<[https://www.jstage.jst.go.jp/article/cog rehab/15/1/15\\_2010.001/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/cog rehab/15/1/15_2010.001/_pdf/-char/ja)>

Toshiki Yoshimine, Takufumi Yanagisawa, Jin-ichi Sawada, Takanori Hazama, Hideki Mochizuki, Hirata Masayuki(2013)「臨床神経学」Vol.53 No.11 pp.1405-1407  
<[https://www.jstage.jst.go.jp/article/clinicalneuro/53/11/53\\_1405/\\_pdf/-char/ja](https://www.jstage.jst.go.jp/article/clinicalneuro/53/11/53_1405/_pdf/-char/ja)>

# Direct Communication

## The need for collective house

5429 Mitsuhashi Kazuma

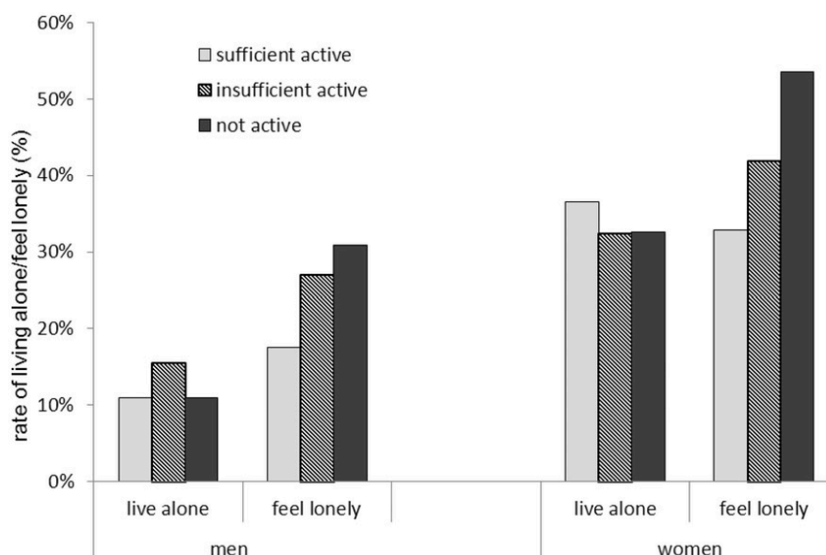
### Abstract

These days the number of elderly people is increasing rapidly, which is called the aging population, in the world, especially in developed countries with highly sophisticated medical support. One of the effects is the increasing number of lonely and unseen deaths because they are not always taken care of by relatives. Another is the increasing number of people who are suffering from dementia. That makes them need some help. By the way, most people seemingly get along with neighbors. However, they do not know about them very much because almost nobody communicates with them at least once a week. Then few can receive mutual help. I think that one of the solutions for these problems is to use collective houses efficiently. The collective houses are the same as shared houses in that three to twenty people can live together. On the other hand, it makes a difference between collective houses and shared houses that the collective houses have some rooms that are shared and rooms that are not shared but the shared houses have only shared space. Then, I think collective houses for only elderly people can be precious instead of nursing homes for the countries which have high healthy life expectancy. It can prevent the progress of dementia and help them to become independent. However there are some issues, and one of them is that the houses can only suit elderly who can manage themselves.

### 1. Introduction

Collective houses for elderly people are not widespread in the world. First of all, there are a few collective houses. This way of living originated in Sweden, Denmark, and other Scandinavian countries in the 1970s as a countermeasure for their aging societies in the Nordic region, which had an aging population before Japan. However the new reinterpretation of future house styles is now being considered for sustainability. In developed countries, more and more people get older because of high medical techniques and they will need everyday help. Then, I hope that by using several houses everyone can feel comfortable and relax. I focused on daily communication because the more busy we are, the less opportunities we have to communicate with each other. Especially with neighbors. Communication can better affect mental health

and physical health. The house styles can help us revive communities like neighborhoods and also for elderly people the neighbor-communication encourages them to be healthy and prevent diseases.



## 2. Discussion and implications

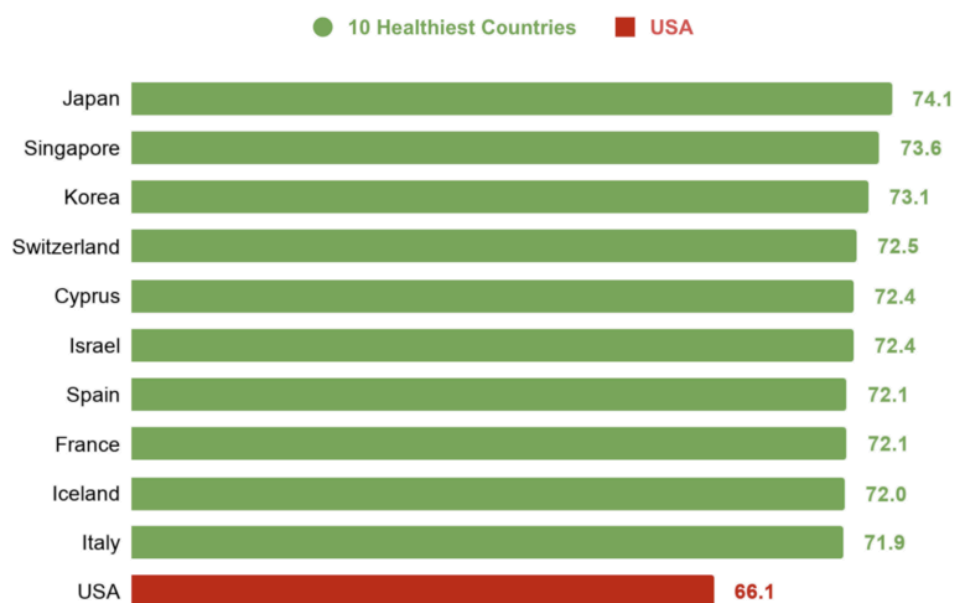
First, I found the styles of houses that provide people with communication, such as cooperative houses, co-housing, and collective houses. All these styles are not known much because people are not interested in them, or hate houses shared all. Simultaneously, I think they are definitely needed in the future because these houses would help people reduce the burden of household chores and something you are worried about. Especially for elderly people it is very tough to do what they have to do. They really seek help and wish to be healthy. The more elderly people reclaim help for them, the more nursing homes there are. However the cost of enrolling in nursing homes is quite high, and young people feel much of a burden to care about them.

Collective houses are a way of living that is not bound by conventional notions of family, welfare, or housing, but rather a way of living that allows people to live freely while creating new ways of interacting with each other. This is a space in which people share a part of their lives together. Communication is expected to increase in the shared spaces. This allows for independence and the development of broad and rich relationships with people who are not related to each other. One of the researchers says that even if people do not live alone some of them feel lonely. Collective houses are not as inexpensive as shared houses, but they offer more private space. The greatest advantage of a collective house is that you can live together with people of many

generations, and they can lend you a hand with things that would be difficult for you to do on your own. Multi- living is common, and a wide range of people can move in, including families raising children, people living alone, and the elderly. In a collective house, the building does not come first, but the

residents come together first to think about how they will live. In other words, there is no need to worry about the next tenants. I focused on collective housing for not multiple people but elderly people. Elderly people who are living in collective houses need to maintain almost themselves, so the collective housing is for people who are living a healthy life. One of the advantages of collective housing is that those can learn and share their opinions among multiple generations. However collective houses for elderly people can be affected sufficiently. I need to think about the need for collective houses for only elderly people who can manage themselves. The highest healthy life expectancy by country is Japan, and the

Healthy Life Expectancy by Country



healthy life expectancy has been increasing gradually all over the world. More and more people in different countries would reclaim their communication with each other and collective housing is a good idea to satisfy them with communication and connection and also one of the research says that “using talking therapies to effectively treat depression in adults over the age of 65 may be clinically linked with slightly reduced rates of future dementia diagnosis.” In other words, increasing communications can prevent diseases.

### 3. Conclusion

I think collective houses will be needed in the future, especially in countries which have high healthy life expectancy. I recommend that the countries introduce collective houses for elderly people for management among them, and they also will help them create sustainable communities in the houses. They can receive mutual help and prevent some diseases. I put a special emphasis on living together, and creating sustainable communities. However the problem is that residents in collective houses are limited to people who are able to maintain their own lives. To spread collective housing all over the world, I need to think about healthy life expectancy. I am still considering how to increase the healthy life expectancy.

### 4 References

[https://www.homes.co.jp/cont/press/report/report\\_00021/#:~:text=%E5%AE%9F%E9%9A%9B%E3%81%AE%E5%B1%85%E4%BD%8F%E6%9C%9F%E9%96%93%E3%81%AF,%E3%82%B1%E3%83%BC%E3%82%B9%E3%81%8C%E5%A4%9A%E3%81%84%E3%82%88%E3%81%86%E3%81%A0%E3%80%82](https://www.homes.co.jp/cont/press/report/report_00021/#:~:text=%E5%AE%9F%E9%9A%9B%E3%81%AE%E5%B1%85%E4%BD%8F%E6%9C%9F%E9%96%93%E3%81%AF,%E3%82%B1%E3%83%BC%E3%82%B9%E3%81%8C%E5%A4%9A%E3%81%84%E3%82%88%E3%81%86%E3%81%A0%E3%80%82)

12/9

<https://chc.or.jp/collective/index.html>

12/9

<https://realestate-sale.link/collective-house/>

12/9

<https://newspitalfields.wordpress.com/2015/11/20/lange-eng-collective-living-2/>

12/9

<https://www.kff.org/other/state-indicator/number-of-nursing-facilities/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

11/22

<https://dortemandrup.dk/work/lange-eng-cohousing-community-denmark>

11/22

<https://www.jeffnobbs.com/posts/trends-in-usa-healthy-life-expectancy>

12/6

<https://nieuweinstituut.nl/en/projects/ouderenhuisvesting/collectieve-huisvesting>

11/22

[https://www.researchgate.net/figure/Rate-of-people-feeling-lonely-versus-people-living-alone-as-related-to-level-of-activity\\_fig1\\_2307214171/26](https://www.researchgate.net/figure/Rate-of-people-feeling-lonely-versus-people-living-alone-as-related-to-level-of-activity_fig1_2307214171/26)

<https://www.ucl.ac.uk/news/2023/feb/link-between-talking-therapy-and-lower-rates-dementia-assessed>

2/3

# New Pneumonia Prevention in Developing Countries ~A Future for All Children with a Vaccine Patch~

5430 Reina Morohara

## **Abstract**

The highest cause of children's death is pneumonia, but its vaccine has not prevailed in developing countries. I considered the new way to spread the pediatric pneumococcal vaccine based on some problems of today's vaccine: cost, the shortage of doctors, and the shortage of medical facilities by researching on the internet and getting an expert opinion. As a result, I concluded that making the pediatric pneumococcal vaccine into the microneedle patch is the effective way. My future issue is to consider how to balance the profits of pharmaceutical companies and people's access to vaccines.

## **1.Introduction**

I believe it's imperative to reduce the number of children dying from pneumonia. The mortality rate among children under five years old is high, especially in developing countries in Africa and Asia. The highest cause of children's death is pneumonia, followed by diarrhea and septicemia. Currently, the method of treatment for pneumonia has been established, so the possibility of patients being on the verge of death is not so high. However, in 2018, pneumonia accounted for approximately 36.8% of deaths among children under five years old (Figure 1). In spite of the fact that pneumonia is a major reason of children's death under five years old, only 3% of global infectious disease research funding is allocated to pneumonia. People can prevent pneumonia by vaccines and treatments using low-priced antibiotics. However, tens of millions of people have not been injected yet. If 90% of children are injected, 610000 children can be saved. In 2020, the world's first forum on pediatric pneumonia was held and UNICEF jointly presented that about 9000000 children can avoid deaths caused by pneumonia and other major diseases if measures to fight against pneumonia are strengthened. We should achieve the goal of eliminating preventable deaths set by SDGs 3.

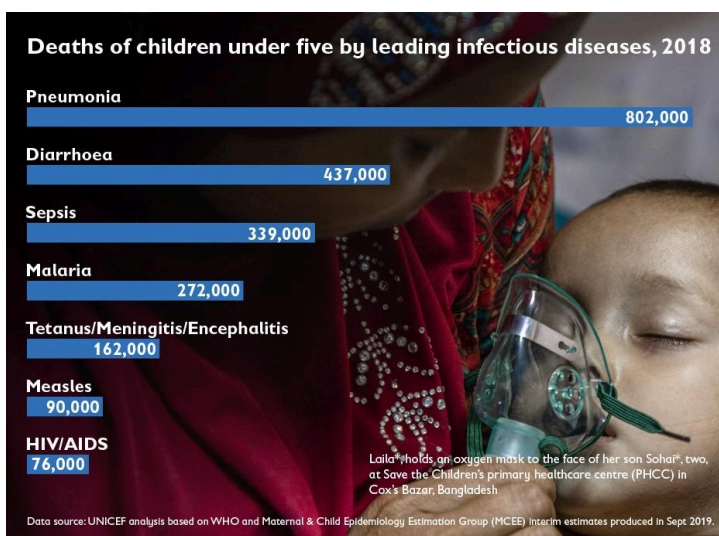


Figure 1 Deaths of children under five by leading infectious diseases,2018

Save the Children

([https://www.savechildren.or.jp/scjcms/sc\\_activity.php?d=3088](https://www.savechildren.or.jp/scjcms/sc_activity.php?d=3088))

I will focus on the vaccine in this study and set the research question: What measures should be taken to disseminate the pneumonia vaccine in developing countries? If the vaccine to prevent pneumonia spread widely in developing countries, it leads to saving a lot of children. However, there are three main problems in today's vaccine. First, vaccines are heat sensitive and need to be stored at low temperatures, which makes transportation and storage costly. Second, many vaccines are currently administered by injection, which requires medical technicians to administer the vaccine in spite of the shortage of doctors. Third, access to medical care is difficult due to the small number of medical facilities. Therefore, it is necessary to establish a new way of injection, so I hypothesized that making the pediatric pneumococcal vaccine into the microneedle patch is the effective way. In this study, I researched the present situation and the merits and demerits of the microneedle patch by mainly using the internet. However, there is little information about the microneedle patch because it has not spread in societies and taken clinical tests, so I listened to opinions of the expert who has researched microneedle patch. Then, I consider the most effective way to prevail the pediatric pneumococcal vaccine.

## **2. Discussion and implications**

The microneedle patch is made from high polymer compounds and there are tiny needles called microneedle patch (Figure 2). It is like a pimple patch. On April 2, in 2020, University of Pittsburgh School of Medicine reported that it cultivated a candidate of the vaccine which is injected by the microneedle patch. Its antigen is the spike protein of the covid -19 (SARS-CoV-2) and researchers found the increase of mice's antibodies. Microneedle patch is expected that people will be able to carry it all over the world cheaply and easily because it does not need to be stored at extreme low temperatures. Also, its cost to make is low and it leads to contributing to the wording: All people have access to basic health care services when they need them and at a cost they can afford, which is carried in Universal Health Coverage. Moreover, microneedle patch is expected that people can be injected smoothly even in developing countries which fall into the shortage of doctors because it does not need medical technicians due to its easy way to use. At present, the microneedle patch is mainly used in cosmetic products, but recently, it has been applied to vaccines. In September 2022, a Tohoku University research team confirmed the immunizing effect of a "stick-on vaccine" with numerous painless short needles in an animal experiment using mice. The skin surface layer is equipped with an excellent immune system by Langerhans cells, and it was expected that the paste vaccine would have a better immune effect than intramuscular or subcutaneous injections. The research team employed porous microneedles as short needles for the vaccine to be applied and conducted experiments. In January 2022, a research group led by Hiroaki Iwata, a lecturer at Hokkaido University Hospital, succeeded in developing a patch-type Japanese encephalitis vaccine that is applied to the skin. They succeeded in developing a patch-type Japanese encephalitis vaccine that is applied to the skin and published in the Lancet affiliate of the British medical journal at the end of last year. They claim that a smaller



dose of the vaccine was more effective in preventing the disease than a subcutaneous injection. The Japanese encephalitis vaccine that Hokkaido University Hospital has successfully developed into a vaccine patch is an inactivated vaccine, the same as the pediatric pneumococcal vaccine. According to an article by Dr. Shinsaku Nakagawa, Professor of the Department of Pharmaceutics, Graduate School of Pharmaceutical Sciences, Osaka University, "The majority of vaccine antigens currently in practical use are live vaccines that use bacteria or viruses with weakened virulence, or inactivated vaccines that use pathogens that have lost infectivity while retaining antigenicity through chemical treatment, etc. The majority of vaccine antigens are inactivated vaccines. Since these vaccine antigens are in particulate form, it is desirable to develop new transdermal vaccine devices to replace hydrophilic gel patches in order to develop transdermal vaccine preparations that can handle a wide variety of antigens. Therefore, it is anticipated that the specification of skin-dissolving microneedles instead of hydrophilic gel patches will be effective. Since the pediatric pneumococcal vaccine is also an inactivated vaccine, the use of intradermal dissolvable microneedles (Figure 3; Although the name is bio-dissolvable microneedles, the structure is the same in that the drug is dissolved in the skin for administration) would be appropriate. Although there are no examples of microneedle patches for pediatric pneumococcal vaccines, the successful use of microneedle patches for the Japanese encephalitis vaccine, which is also an inactivated vaccine, suggests that it may be possible to use microneedle patches for pediatric pneumococcal vaccines. I also actually spoke with Dr. Shinsaku Nakagawa. According to his talk, first of all, he said that the microneedle patch weighs 2mg to 3mg only in the part without needles. In addition, the micro-needle patch has a property that the more other ingredients are added to the patch, the softer the needle becomes. Therefore, the maximum amount of drug is limited to about 10% of the vaccine patch, or 0.2 mg to 0.3 mg. If more is added, the needle will not penetrate the skin and will no longer function as a vaccine. In the case of pneumococcal vaccines, the amount of drug for one type of pneumococcus is 2  $\mu$ g to 3  $\mu$ g. The current pneumococcal vaccine, in which 13 to 14 types of pneumococcus are administered at a time, requires approximately 20  $\mu$ g to 30  $\mu$ g, or 0.02 mg to 0.03 mg of drug. This amount is about one-tenth of the 0.2 mg to 0.3 mg limit, and therefore, it was anticipated that it would probably be possible to make a microneedle patch of the pediatric pneumococcal vaccine at the current intake level. However, even if making a pediatric pneumococcal vaccine into microneedle patch is feasible, the shape of the needle must be such that it can be inserted correctly into the person to be vaccinated. In addition, the length and strength of the needle must be adjusted according to race. In my study, the target population for micro-needle patched pediatric pneumococcal vaccine will be infants between 2 and 6 months of age in developing countries (for the first three doses, with additional doses to follow). Additional doses will be given later). The skin of infants is thin, measuring only about 1 mm, or about one-half the size of an adult. Therefore, we thought that the needle length should be designed to be shorter and thinner than that used for adults, but Dr. Nakagawa pointed out that since it has not yet been put into practical use, it is not possible to define a single suitable patch shape.

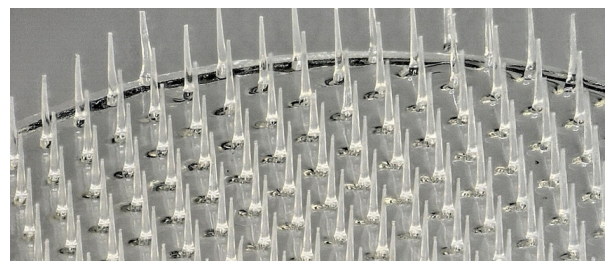
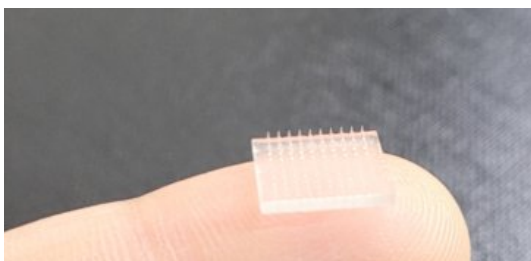


Figure 2 Vaccine patch(Microneedle patch)  
JoongAng Ilbo(Japanese)  
(<https://s.japanese.joins.com/JArticle/283278?sectcode=A00&servcode=A00>)

Figure 3 Bio-dissolvable microneedles  
GOOD DESIGN AWARD  
(<https://www.g-mark.org/gallery/winners/9dc94676-803d-11ed-af7e-0242ac130002>)

### **3.Conclusion**

In response to the research question "What measures should be taken to disseminate pneumonia vaccines in developing countries?", I propose the use of microneedle patches for pediatric pneumococcal vaccines based on the results of the above study. Since the pediatric pneumococcal vaccine is an inactivated vaccine, it is desirable to use intradermal soluble microneedle specifications in the vaccine patch. In addition, when creating a microneedle patch for pediatric pneumococcal vaccine, the target population for vaccination is infants in developing countries, and since infants have thinner skin than adults, I thought that the patch needle should be designed to be short and thin, but since it is not in practical use, a suitable shape cannot be determined. If the micro-needle patch pediatric pneumococcal vaccine is disseminated to developing countries, it will establish low-cost pneumonia prevention that addresses the shortage of physicians and medical facilities, and will help achieve universal health coverage and SDGs3. The first issue for the future is to think how to balance profits to pharmaceutical companies and people's access to vaccines. It has been pointed out that pharmaceutical companies, as profit-making enterprises, raise the price of drugs and make huge profits, which are then distributed to a very few people, such as shareholders and executives. In the case of the new coronavirus vaccine, people had to pay a portion of their taxes as a subsidy to the pharmaceutical companies, and then pay high prices for drugs developed and manufactured with the subsidies, with the profits going to a small percentage of the population(Figure 4).

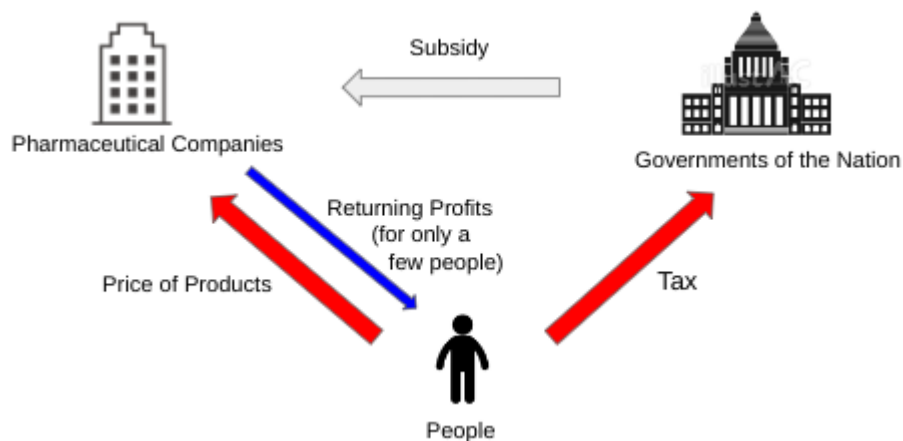


Figure 4 In case of the vaccine of Covid-19

It is also necessary to set up specific patch sizes and needle lengths that have not yet been considered, as well as to consider specific ways to disseminate patches in developing countries.

## **4.References**

United Nations Information Center (2017) "Universal Health Coverage (UHC) Health for All."

[https://www.unic.or.jp/activities/economic\\_social\\_development/social\\_development/universal\\_health\\_coverage/](https://www.unic.or.jp/activities/economic_social_development/social_development/universal_health_coverage/) (April 25, 2022)

UNICEF Japan Committee for UNICEF (unknown) "Even at this very moment. There are many lives that can be saved."

<https://www.unicef.or.jp/special/19sum/> (April 25, 2022)

UNICEF Japan Committee for UNICEF (2019), "November 12 is World Pneumonia Day: 800,000 children under five die annually from pneumonia"

<https://www.unicef.or.jp/news/2019/0160.html> (April 25, 2022)

WHO Association of Japan (2021) "United Nations : Mortality rate of children under 5 years old, a significant deviation from the SDGs target"

<https://japan-who.or.jp/news-report/2112-49/> (May 23, 2022)

MIRASUS (2021) "Africa's Medical Problems, What are the Solutions and Initiatives?"

<https://mirasus.jp/sdgs/health-wellbeing/364#:~:text=%E7%97%85%E9%99%A2%E3%81%8C%E5%B0%91%E3%81%AA%E3%81%84%E5%8E%9F%E5%9B%A0%E3%81%AE,%E3%81%AA%E3%81%84%E3%81%A8%E3%81%84%E3%81%86%E5%95%8F%E9%A1%8C%E3%82%82%E3%81%82%E3%82%8A%E3%81%BE%E3%81%99%E3%80%82> (May 23, 2022)

Healthy Stand (2022) "Stick it on your skin! What is a Vaccine Patch?"

<https://www.healthy-stand-japan.com/blog/1585> (May 23, 2022)

gooddo magazine editorial board (2022) "Let's learn about the current situation of medical problems in Africa and consider necessary support."

[https://gooddo.jp/magazine/health/africa\\_health/4033/](https://gooddo.jp/magazine/health/africa_health/4033/) (May 23, 2022)

Nikkei Biotech (2020) "U.S. University Develops New Corona Vaccine Administered by Microneedle Patch."

<https://bio.nikkeibp.co.jp/atcl/news/p1/20/04/06/06781/> (June 20, 2022)

UNICEF Japan Committee for UNICEF (unknown) "Just one vaccine can save a life."

<https://www.unicef.or.jp/special/17win/> (May 23, 2022)

UNICEF Japan Committee for UNICEF (2020) "Averting 9 million child deaths by strengthening prevention and treatment of pneumonia"

<https://www.unicef.or.jp/news/2020/0012.html> (May 23, 2022)

Save the Children (2018) Pneumonia will kill 11 million children by 2020."

[https://www.savechildren.or.jp/scjcms/sc\\_activity.php?d=2857](https://www.savechildren.or.jp/scjcms/sc_activity.php?d=2857) (May 23, 2022)

gooddo magazine editorial board (2021) "What is the difference between Japan and countries where many children die from infectious diseases? What are the efforts Japan is making?"

<https://gooddo.jp/magazine/health/3990/> (May 23, 2022)

Shinsaku Nakagawa, Graduate School of Pharmaceutical Sciences, Osaka University (2011) "Vaccines that stick to the skin!"

[https://www.phs.osaka-u.ac.jp/homepage/yaku/sotugo/pdf/h23\\_01\\_0.pdf](https://www.phs.osaka-u.ac.jp/homepage/yaku/sotugo/pdf/h23_01_0.pdf) (June 20, 2022)

Ltd., From Page Yume Navi Editorial Department (2012) "A vaccine that sticks saves the lives of 1.5 million children a year."

<https://yumenavi.info/vue/lecture.html?GNKCD=g004777&OraSeq=2794180&ProId=WNA002&SerKbn=3&SearchMod=3&University=V&Page=3&KeyWord=%E5%A4%A7%E9%98%AA%E5%A4%A7%E5%AD%A6> (October 17, 2022)

Ministry of Health, Labour and Welfare (2013) "Q&A on the Switchover of Pediatric Pneumococcal Vaccine."

[https://www.mhlw.go.jp/bunya/kenkou/kekkaku-kansenshou28/qa\\_haienkyuukin.html](https://www.mhlw.go.jp/bunya/kenkou/kekkaku-kansenshou28/qa_haienkyuukin.html) (December 12, 2022)

# **Causes and Solutions for Honeybee Decline**

5431 Yamagishi Maruto

## **Abstract**

Currently, the decline of bees is becoming a significant concern. Bees play a crucial role in aiding the pollination of plants. If they disappear, fruits such as strawberries might become scarce and very expensive. There are many issues causing the decline of bees, and I believe solving all of them is challenging. Therefore, I propose the introduction of urban beekeeping as a new method taught in schools to increase the number of bees being raised.

## **1 Introduction**

By researching “How much does the decline of bees impact the economy?” as the research question, we will then devise solutions based on the findings. Conducting this study will help us understand the extent to which the issues faced by beekeeping affect the economy. By clarifying this impact, we can propose solutions to address the problem.

## **2 Discussion and implications**

The United Nations Environment Programme (Unep) buzzes into the ongoing discussion of bee decline this week, with a report examining the global nature of the issue and some of the reasons behind it. Their top-line conclusions are that it is becoming a widespread, if not quite global, phenomenon, and that there is a multiplicity of causes. Declines - and in some cases, sudden collapses - of colonies in Western Europe, North

America and Japan have been widely reported (Richard, 2011). Richard,Black,2011,***Bees: a sting in the tale***

The decline of bees stems from various reasons. Within the agricultural structure, both urban and rural areas witness increased development encroaching upon natural habitats. This has led to a heavy reliance on agricultural produce for pollen and nectar, exposing bees to pesticides during the pollination process, resulting in their demise.

Biological factors contribute as well. Bees face longer foraging distances due to the spread-out availability of plants, decreasing their foraging efficiency. Labor-intensive practices in monoculture farming or within enclosed spaces lead to overwork and exhaustion. Moreover, there is a seasonal imbalance in the availability of pollen and nectar sources, making bees susceptible to viral diseases due to nutritional deficiencies. Nutrient inadequacies hinder the production (propagation) of worker bees, further exacerbating the problem.

Socially, the beekeeping industry struggles due to the scarcity of pollen and nectar sources necessary for sustained beekeeping. The industry often guards favorable foraging locations, making it difficult for new entrants. Additionally, honey lacks competitive pricing, making beekeeping less sustainable. An aging workforce and a dearth of successors compound this issue.

Furthermore, the loss of wild bee populations due to habitat destruction has intensified the reliance on bees for pollen cross-pollination, resulting in an excess demand. The limited number of beekeepers also struggles to increase bee populations for breeding purposes, facing difficulties in expanding bee colonies due to direct vulnerability to weather changes and other environmental factors, making problems harder to circumvent.

Research data suggests that although still in developmental stages and less efficient, bee pollination yields better crop quality than artificial pollination.

Traditionally, beekeeping is practiced by individuals specializing in honey production or those relying on bees for pollination. However, a new beekeeping method called urban beekeeping exists. Conventional beekeeping typically occurs in proximity to plants that yield nectar, essential for honey production. In contrast, urban beekeeping involves beekeeping atop buildings in urban areas. Urban beekeeping offers advantages such as easy initiation and contributes to urban greening efforts and biodiversity conservation.

### **3 Conclusion**

From these aspects, the declining bee population appears to be an urgent issue that should be promptly addressed, considering the significant economic losses associated with the decrease in bees. The factors contributing to the decline of bees are diverse, and solving them all at once is deemed extremely challenging. Therefore, I considered that by addressing one of the major issues, which is the decline in beekeepers, we could potentially boost the bee population. The decline in beekeepers can be attributed to the inherent instability of professions directly connected to nature, similar to agriculture, and the relatively lower visibility compared to other industries.

To tackle this problem, I focused on urban beekeeping initiatives in schools. I believe that providing opportunities for students to engage with beekeeping and bees through urban beekeeping in schools could reduce fear towards bees and increase awareness about the profession of beekeeping. Additionally, activities such as tasting honey produced through beekeeping could offer a sense of achievement in producing one's own food and impart knowledge about the challenges of food production.

Therefore, my proposal involves incorporating beekeeping classes using urban beekeeping as part of school education. I believe that this approach could increase the number of beekeepers



and help halt the decline in bees. Future tasks include considering concrete methods to implement these ideas.

## References

Jammin Co., Ltd. (n.d.). Bees connect cities, people, and nature: Building a prosperous society through urban beekeeping—National Urban Beekeeping Network Bee Project. Retrieved from [https://jammin.co.jp/charity\\_list/201123-mitsubachi/](https://jammin.co.jp/charity_list/201123-mitsubachi/)

Ministry of Agriculture, Forestry and Fisheries. (n.d.). Retrieved from <https://www.maff.go.jp/j/tokei/>

Using drones for artificial pollination: The ace up the sleeve was soap bubbles! (2020, August 25). Agri Mynavi. [https://agri.mynavi.jp/2020\\_08\\_25\\_129037/#toc-1](https://agri.mynavi.jp/2020_08_25_129037/#toc-1)

Bees buzzing in the skies of Ginza, swallows dancing—beekeeping on building rooftops, replicating nature. (n.d.). <https://www.nippon.com/ja/japan-topics/g01011/>

About the Bee Project. (n.d.). Craft Honey. Retrieved from <https://crafthoney.thebase.in/about>

Yamada Apiary. (n.d.). Retrieved from <https://www.3838.com/>

Ginza Bee Project. (n.d.). Retrieved from <https://gin-pachi.jp/>



# What is "multiculturalism"?

～ To improve Japanese English Skills ～

ID : 5432      Name : Aya Yoshida

## Abstract

What do you imagine when you hear the word, "multiculturalism"? I imagine some situations where people are open and friendly, where people from different backgrounds respect each other, and people are spending valuable time in cooperation. These days, multiculturalism is a popular topic around the world, but is Japan a multicultural society? In my research, based on the definition by the Ministry of Internal Affairs and Communications, the realization of multiculturalism indicates the realization of living together with foreigners while recognizing mutual cultures. In modern society, minorities are respected and individuality is recognized. Japan may fall behind countries such as the U.S., U.K., and China as such a society progresses. For these reasons, I want to study multiculturalism. I will use the opinions on the internet, people around me and foreigners (foreign students and tourists).

My idea of multiculturalism is not limited to relationships with foreigners. It indicates relationships with people of different genders, ages, professions, nationalities, disabilities, faiths and ways of thinking, and so on. However, I focus on relations with foreigners because Japan depends on other countries for food imports, and so on, and I believe that relations with foreign countries will be important in the future of Japan. When Japan maintains its current situation, international organizations predict that Japan's share of world GDP will decline. If multiculturalism is in progress, new encounters with foreigners will be created. Different cultures have different ideas, so new ideas will emerge. I hope that this will lead to further development and innovation in Japan.

Results of previous studies. I searched the situation of multiculturalism in Australia, Brazil, and Sweden, which are developed countries like Japan. And these countries' multiculturalism is in more progress than in Japan. I want to refer to these countries' attempts.

## 1 Introduction

Last year, in my research, I considered the improvement of Japanese English skills. Compared to other Asian countries such as China and South Korea, Japanese English skills are significantly inferior. Because of these reasons, there are few foreigners living in Japan, fewer foreign workers are accepted than in other developed countries, and the Japanese have fewer opportunities to interact with foreigners because of prejudices against foreigners. In other words, multiculturalism in Japan is not in progress because of these situations. Therefore, this year, I decided to focus on the realization of multiculturalism in my research. My idea of multiculturalism is not limited to relationships with foreigners. It indicates relationships with people of different genders, ages, professions, nationalities, disabilities, faiths and ways of thinking.

However, I focus on relations with foreigners because Japan depends on other countries for food imports, and I believe that relations with foreign countries will be important in the future of Japan. When Japan maintains its current situation, international organizations predict that Japan's share of world GDP will decline to 5.3% in 2020, 3.8% in 2040, and 3.2% in 2060. It means that "if Japan maintains the current situation" must be changed. If multiculturalism is in progress, new encounters with foreigners will be created. Different cultures have different ideas, so new ideas will emerge. I hope that this will lead to further development and innovation in Japan. Of course, the advancement of multiculturalism in Japan does not necessarily mean that Japanese English skills will improve. In the first place, I do not know what the situation of progressing multiculturalism is spreading. Also, Japanese people have prejudice against foreigners, and I think it is difficult to solve this problem because it will take a lot of time to solve. It is good to focus on some kind of points in my research.

## **2 Discussion and implications**

I searched the situation of multiculturalism in Australia, Brazil, and Sweden, which are developed countries like Japan. First, Australia. Many kinds of people live in Australia because it was a British colony in the 18th and 19th centuries. Also, the government holds events to promote multiculturalism, so multiculturalism is in more progress than in Japan. Second, Brazil. Brazil has a vast land area and a variety of climates, so there are many kinds of people such as native Indians, Portuguese who ruled Brazil, Africans who came from Africa as slaves, and immigrant Europeans and Asians. As time passed, people became more and more mixed, and multiculturalism was built. However, Brazil also has many unresolved problems that need to realize multiculturalism. Third, Sweden. It has accepted immigrants and refugees from Italy and Greece and secured a young labor force. Multiculturalism is in progress because of citizens who share common values. In that country, immigrants and their descendants occupy 25% to 30% of the population, and multiculturalism is in progress. This is because the citizens and non-nationals understand each other. According to a foreign student, there are people of various races living in Sweden, and there are more opportunities to interact with them than in Japan.

Here, I will explain about my experience of interaction with foreigners. Last year, my English teacher made some opportunities to interact with students from Taiwan, and I could talk with them in English. I think it is a great experience for me to communicate with students in my generation in English. From this experience, I want to incorporate such activities into schools all over Japan.

## **3 Conclusion**

From this information, I think about how to improve multiculturalism in Japan in the future. If the colonial period is one of the factors in regions where multiculturalism is in progress, Japan can't use them as references. Therefore, it is difficult to incorporate the efforts of Australia and Brazil and to put them into practice in Japan.

This time, I will refer to the efforts of Sweden, a developed country in a similar situation to Japan, but without colonialism.

However, since it is impossible for me alone to solve immigration and other problems, I have come up with two proposals that will lead to solutions to this problem. Last year, my teacher created an opportunity for us to communicate with Taiwanese students online. There, I experienced communicating in English with native English speakers. I thought that the experience of communicating in English while still a student would lead to a solution to my research. First, to create opportunities to interact with foreigners at schools. Second, to use applications which can communicate with foreigners.

In regards to the future research, I have to think about how to encourage people to interact in Japan, how to spread the project like I experienced, and how to incorporate efforts in other countries such as Sweden into countries where multiculturalism is not progressing such as Japan.

## 4 References

<https://haa.athuman.com/media/japanese/teacher/3006/>

日本は多文化共生になってる?! ~留学生から見た日本社会~

<https://www.timeout.jp/tokyo/ja/open-tokyo/multicultural>

日本における多文化共生のリアル

[https://www5.cao.go.jp/keizai-shimon/kaigi/special/future/sentaku/s3\\_2\\_15.html](https://www5.cao.go.jp/keizai-shimon/kaigi/special/future/sentaku/s3_2_15.html)

世界の中の日本経済の位置づけはどのようになっていますか。

[https://www.jica.go.jp/hiroba/teacher/case/jhqv8b0000035b9r-att/english\\_05.pdf](https://www.jica.go.jp/hiroba/teacher/case/jhqv8b0000035b9r-att/english_05.pdf)

多文化共生の進んだ国ブラジル

[https://project.nikkeibp.co.jp/mirakoto/atcl/global/h\\_vol29/](https://project.nikkeibp.co.jp/mirakoto/atcl/global/h_vol29/)

オーストラリアに垣間見る「多文化主義政策」

日常生活に浸透するダイバーシティと移民への定住支援

<https://www.reitaku-u.ac.jp/journal/1776584/>

多文化共生について考えてみよう!

多文化共生の取り組みや異文化コミュニケーションについて解説

[https://www.soumu.go.jp/menu\\_seisaku/chiho/02gyosei05\\_03000060.html](https://www.soumu.go.jp/menu_seisaku/chiho/02gyosei05_03000060.html)

総務省 地域の国際化の推進 | 多文化共生の推進

<https://education.jnto.go.jp/ja/tips-for-online-school-exchange/>

オンライン国際交流を成功させるためのヒント

<https://kimini.online/blog/archives/33085>

日本にいながらオンライン英会話で外国人の友達を作るおすすめの方法!

<https://online-study-tour.weblio.jp/internationalexchange/%E3%82%B9%E3%83%9E%E3%83%9B%E3%81%A7%E7%B0%A1%E5%8D%98%E3%81%AB%E3%81%A7%E3%81%8D%E3%82%8B%EF%BC%81%E5%9B%BD%E9%9A%9B%E4%BA%A4%E6%B5%81%E3%82%A2%E3%83%97%E3%83%AA%E3%81%AE%E3%81%8A%E3%81%99/>

スマホで簡単にできる! 国際交流アプリのおすすめ7選

# How to Solve Japan Energy Issues

## Energy issues with nuclear power generation

5433 Ryo Watanabe

### Abstract

There are lots of issues about the energy industry. I think the biggest one is CO2 emission. Actually, Japan depends on Thermal power generation for a long year. In addition, we had a big accident in Fukushima in 2011 so we cannot use most of the nuclear power plants since that time. Japan provided 5 percent of total power to people, so Japan found more facilities of Thermal power generation in order to complement energy. As a result, we have a serious problem with CO2.

Also, there are other problems. For example, the price of electricity, the self-sufficiency rate, and so on. In this research, I want to consider these issues.

### 1. Introduction

I started this research a year ago and I continued. It is because I was interested in energy issues and I wanted to seek this research.

Actually, Japan has many issues so we have to consider these issues. Then I started to think of a way to solve these issues. I think we depend on electricity in our daily lives so if we cannot use electricity, we can't live freely. I think the day when we cannot use electricity will come because Japan's energy generation system is unstable. I want Japan's government to improve this situation and I want to consider the way of solving these problems.

### 2. Objectives

There are lots of energy issues in Japan. I think many people don't mind these issues but I want you to change your mind because these are more serious issues than you think. First, I will talk about CO2 emission.

I think you know Japan discharges a lot of CO2 throughout the year but do you know how much of its emissions? In 2020, Japan will discharge 1.2 billion tons of CO2. It was more than 40 percent of all of Japan's emissions. It was the highest rate so I think reducing emissions of energy generation is a very important problem.

Second, Japan's energy sufficiency is low. The lack of a stable supply of electricity in the event of an oil crisis, for example, is considered to be a major problem. The number of thermal power generation facilities is decreasing.

### 3. Conclusion

Japan has a variety of environmental problems as listed above. The conclusion at the moment is to utilize the Paris Agreement to solve these problems and achieve an optimal energy mix. We also propose that nuclear power, which is one of the most difficult to realize, should not be used, contrary to the Paris Agreement. Instead, we propose to promote the development of highly feasible power generation, such as natural power generation and new oscillatory power generation. Therefore, it would be good if the proportion of thermal power generation in Japan's electricity mix could be relatively lowered.

#### 4. References

energy rate of Japan <https://earthene.com/media/156>

Japan's efficient energy system <https://www.isep.or.jp/archives/library/14470>

comparison with other countries about energy problem [https://accel.e-dash.io/article\\_0122/](https://accel.e-dash.io/article_0122/)

energy mix policy Paris achievement

<https://www.mitsui.com/solution/contents/solutions/re/61#:~:text=%E3%82%A8%E3%83%8D%E3%83%AB%E3%82%AE%E3%83%BC%E3%83%9F%E3%83%83%E3%82%AF%E3%82%B9%E3%81%A8%E3%81%AF%E3%80%81%E3%80%8C%E7%A4%BE%E4%BC%9A,%E4%BE%9B%E7%B5%A6%E3%81%8C%E5%AE%9F%E7%8F%BE%E3%81%97%E3%81%BE%E3%81%99%E3%80%82>

agency for natural resources and energy

<https://www.enecho.meti.go.jp/about/whitepaper/2018html/1-3-1.html>

the importance of energy mix and nuclear power

[https://www.kepco.co.jp/energy\\_supply/energy/nuclear\\_power/necessity/bestmix.html](https://www.kepco.co.jp/energy_supply/energy/nuclear_power/necessity/bestmix.html)

asahi shinbun

<https://www.asahi.com/sdgs/article/14700151>

new system of japan's generation

<https://orbray.com/magazine/archives/2610#:~:text=%E6%8C%AF%E5%8B%95%E7%99%BA%E9%9B%BB%E3%81%A8%E3%81%AF%E3%80%81%E6%A9%9F%E6%A2%B0,%E9%9B%BB%E5%8A%9B%E3%82%92%E5%BE%97%E3%82%89%E3%82%8C%E3%81%BE%E3%81%99%E3%80%82>

kanazawa univercity

<https://vibpower.w3.kanazawa-u.ac.jp/about.html>

softbank

<https://vibpower.w3.kanazawa-u.ac.jp/about.html>