Delivering Nutritious Meals to The World

How can We Bring Nutritious Meals to People in Poverty ?

Poverty Meals Nutritional Value - How to Deliver Nutritious Meals to People in Poverty

5101　Mahiro Asami

1，Research Summary

For the past year, I have been researching the theme of “Delivering Nutritious Meals to the World” with the research question, “How can we deliver nutritious meals to people living in poverty? As a background for this research, in South Sudan, currently the youngest country in the world, children are chronically undernourished to the extent that more than 4 million people, or 40% of the population, suffer from malnutrition. Moreover, an estimated more than 360,000 children under the age of five suffer from severe acute malnutrition worldwide. I hoped I could help in some small way and deliver nutritious meals. Through this research, I would like to reduce the number of people who die of starvation, even if only a little. The basic method of this research will be based on the Internet, and I would like to make a hypothesis based on that.I therefore wanted to proceed with the following.That is, I considered implementing a free school lunch program.In the early postwar period in Japan, poor and deprived families started to provide nutritious food to children who could not afford to eat rice. Doing this would improve child malnutrition.We would like to create an organization called KYUSHOOK to promote this policy. We would also like to raise funds through crowdfunding and corporate sponsorships.We want to do our best to make this policy possible.

2. Research Background

In South Sudan, currently the youngest country in the world, over 4 million people(40% of the population) are malnourished, including many children who are chronically undernourished Moreover, an estimated more than 360,000 children under the age of five suffer from severe acute malnutrition.The situation is so severe that local people say, “Children are now receiving a nutritional treatment meal once a week. Hearing these stories and the current situation, it was very distressing to think that similar situations still exist in other countries, so we decided to do what we could to improve the situation and deliver highly nutritious meals.

3Purpose and Significance of the Research

Subtitle is How can we deliver nutritious meals to people in poverty

By conducting this research, we wondered if we could contribute to reducing the number of people dying from hunger in the long term.

4Research Methods

Gather information using the Internet, from a hypothesis and consider whether or not it can be proven.v cIf the hypothesis can be proven, ask for advice from various people.Based on the advice I received, I will formulate my own hypothesis and conduct the research again, culminating in a presentation at the final stage.

5. Research Results and Discussion

The number of hungry people in Africa is 243 million, accounting for approximately 20.4% of the world's total hungry population. The main reasons for this are severe climate, protracted conflicts, economic stagnation, and economic downturn. The solution is to buy food from food banks and fair trade products, which are currently being implemented, and to donate to NGOs that are making efforts to solve the problem of hunger. About one-third of the food produced worldwide is wasted, amounting to 1.3 billion tons a year. The problem of “food imbalance” is that surplus food is thrown away in developed countries, while the number of starving people is increasing in developing countries. Currently in South Sudan, food is delivered to more than 300,000 people each month where air routes are connected. However, it is estimated that there are still 7.7 million people suffering from food insecurity. Currently, various organizations are working to solve this problem. In particular, even the WFP, which is said to be the most active organization, is in need of funds to provide assistance. The UN-WFP is only able to provide half of its normal food aid and has to prioritize emergency assistance to those who are closest to starvation. This got me thinking about something.

For more than 50 years, the UN World Food Program (WFP) has been implementing “school feeding programs” in developing countries. By distributing school meals in schools, children are encouraged to attend school and have the opportunity to receive an education. Household finances are also saved and nutritional status improves, so parents are encouraged to send their children to school. Through this program, girls are also able to attend school.

KYUSHOOK, an organization that delivers school lunches to Africa

We would like to provide free school lunches as Japan did after the war to reduce child malnutrition.This policy is very difficult to implement from the beginning. First, we will conduct a few trials.We would like to raise the issues that come up and solve them.

There is also a problem that children cannot grow up due to malnutrition: 1.4 million South Sudanese children under 5 years old are acutely malnourished. This time, we focused on children.

I thought about making school lunches free of charge and implementing this policy. In the early postwar period in Japan, poor and deprived families started to provide nutritious food to children who could not afford to eat rice. This may not improve children's nutritional deficiencies, but it may be a step in the right direction. We would like to propose these two recommendations to WFP, WFO, and private companies and encourage them to work together.

6. Conclusions and Future Challenges

I proposed school lunches to address malnutrition in Africa. However, this approach faces significant financial and security challenges. However, I am convinced that if we can do this, we can improve malnutrition, and I would like to explore how we can do this.

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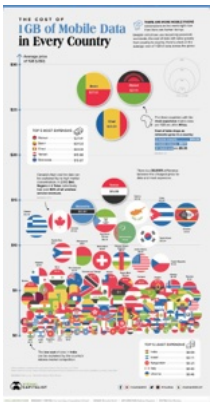
To advance ICT in the world

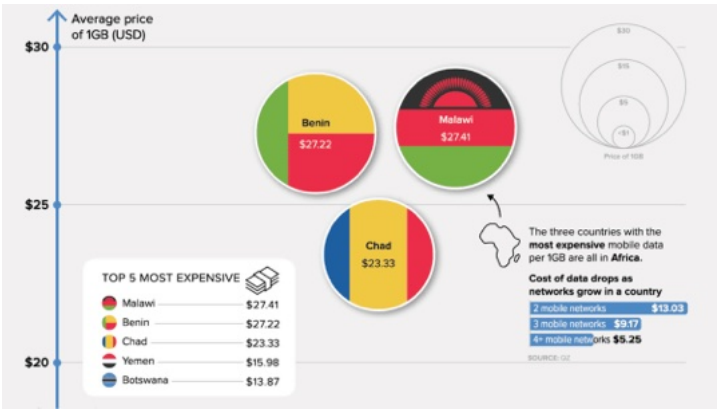
~How can we promote ICT infrastructure development in Africa?~

5102　Yuta Aso

Abstract

The reason for this title is I wanted to know how the Internet is used in developing countries, especially in Africa.The following is what I have found out.
Now,the Internet penetration in Africa is low. And there is the Serious problem of disparity between city and countryside.
Why is Internet penetration so low? I think there are two reasons.
First,Low average wages in Africa.
Second,The current situation is that local telecommunications providers have a monopoly on the telecommunications business.These are the recent conditions in Africa.
Next,I will introduce the ICT industry in Africa.
Rwanda is one of the most famous ICT countries in Africa.The reason for this is that the government is helping to develop. Because,there was a Civil war happen.
In Rwanda, 250 startups have started. 250 startups is a program providing money and technical assistance for company formation.The goal is to establish 250 companies by 2025.
This is an example of a company made by the program.
So, I found that the Internet is also important in Africa.
However, Africa has the problem of high costs for Internet use.So now, the plan is starting.
The name of the plan is 2Africa. It is a plan that aims to increase the number of Internet users in Africa and reduce costs by connecting 45,000 km of submarine cables.
This is underway and not yet completed, but I believe this will advance Africa's infrastructure.
where the rate is 25.1% compared to the global average of 47.9%, and understand how quickly it is currently spreading.
As we proceeded with my research, I found that Africa has a problem: the high cost of mobile data rates. The highest data rates in the world are in Africa, with $27.41 per GB in Malawi in southeastern Africa, the second highest was $27.22 per GB in Benin, West Africa, and the third highest was $23.33 per GB in Chad, central Africa, all in Africa (about $2,510). The third was Chad in central Africa at $23.33 (about $2,510).





1.Introduction

The motivation for my research on this topic was that I was curious about how the Internet, which we usually take for granted, is used in other countries, especially in places where the Internet is not widely used. I also wanted to know how low the Internet penetration rate is in developing regions, particularly in Africa, which is 25.1% compared to the world average of 47.9%, and to understand how quickly it is spreading in those countries

2.Discussion and implications

While researching the Internet situation in Africa, one of the other ICT issues with Internet penetration in Africa was the high cost of mobile data communication.
Mobile data refers to the data used when accessing the Internet without a Wifi connection. When we looked into this mobile data communication fee, we found that in Africa, the price is 700 yen per 1GB (in South Africa), which is equivalent to 4 hours of work for someone earning the local minimum wage. This is the equivalent of four hours of work for a person working at the local minimum wage.
Also, when examining the top 3 mobile data communication costs per 1 GB worldwide, Malawi in southeastern Africa comes in first at $27.41 (approx. 2950 yen) per GB, followed by Benin in West Africa at $27.22 (approx. 2930 yen), and Chad in central Africa at $23.33 (approx. The third was Chad in central Africa at $23.33 (about 2,510 yen), all of which are African countries.
Given this situation, I set my goal to “promote the development of wifi connections in Africa. First, regarding the Internet penetration rate in Africa as a whole, the Internet penetration rate in Africa was about 25%. However, there is a disparity between urban and rural areas within Africa, so I narrowed my perspective a bit and looked at countries in Africa where Internet penetration is particularly low. The results were Burundi, South Sudan, and Uganda, with penetration rates of only about 6-9% each. (in 2020).
However, there is a growing belief among African youth that access to the Internet is a fundamental right, and predictions are that high data rates could be the subject of intense debate. The results of an interview survey of approximately 4,500 people between the ages of 18 and 24 across the African continent showed that while 71% of respondents considered wifi as a universal service a basic human right, only one in eight could afford the cost of a permanent wifi connection.
In short, I believe that by increasing Internet penetration, we will be able to meet the demand of Africans, especially the youth, and lower the cost of Internet access.
Interestingly, while Internet penetration is low, smartphone ownership in Africa is relatively high at 64% (in 2021). Despite this high ownership rate, I believe that the high cost of telecommunications has made it difficult for the ICT industry to develop.
The reasons for the high cost of Internet access in Africa are the inadequate infrastructure and the fact that the few African telecommunications carriers are able to unilaterally set consumer prices.

In order to solve this problem, a project called 2Africa is being promoted in Africa. This is a submarine cable connecting 23 countries in Europe, Africa, and the Middle East, and is expected to increase the number of Internet users by 1.2 billion.

3.Conclusion

2Africa is a project promoted by large companies around the world, and in order to assist such a project in Japan, we would like to investigate the merits and costs involved on the part of the companies promoting the project and find solutions from there.
In addition, in order to develop ICT technology faster after the Internet has spread widely, partnering with Uganda, currently known as an ICT powerhouse in Africa, to promote the development of the ICT industry.

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To extend healthy life expectancy

How can we extend our healthy life expectancy?

5103 Satsuki Ueno

Abstract

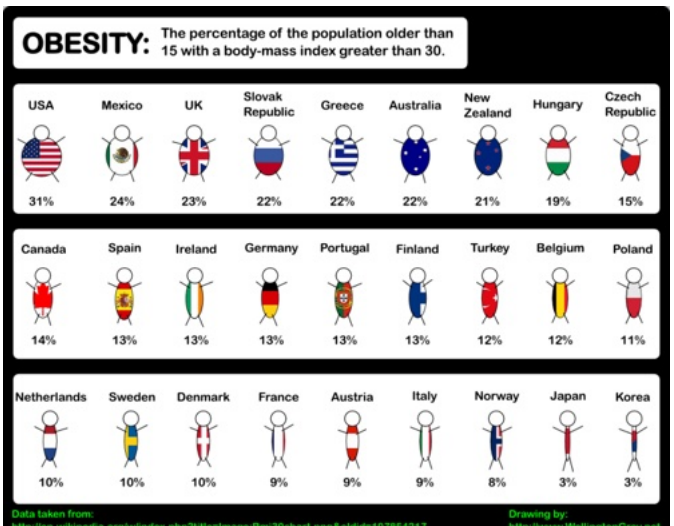
Currently, there is a gap of about 10 years between average life expectancy and healthy life expectancy.To reduce this gap, I began my research based on the question “How can we extend our healthy life expectancy?”According to The Japanese Society for Pediatric Endocrinology's research, healthy life expectancy and obesity are closely related, and obesity from children affects even adults.Therefore, I proposed to improve school lunches and promote food education.

1.Introduction

The average life expectancy in Japan is 84.4 years ,but the number of healthy life expectancy is 74.1 years. This means there is a 10-year gap. Even in other countries, the gap between average life expectancy and healthy life expectancy is large. The gap between average life expectancy and healthy life expectancy is large means that people will need the help of medical and long-term care services until they die.So we have to reduce the gap.There have been studies on the causes of shorter healthy life expectancy.They showed that diseases of the circulatory system such as ischemic heart disease, heart failure, and cerebrovascular disease significantly impact healthy life expectancy.Therefore, I carried out a study on ways to increase healthy life expectancy based on the causes mentioned in previous studies. The causes of shorter healthy expectancy are that diseases of circulatory affected lifestyle-related diseases.Then I believe that healthy life expectancy can be extended by preventing lifestyle-related diseases, especially obesity. I conducted this research by gathering information on the Internet.Also,in my research on life expectancy, I decided to focus on the G7 countries because they have the best living environment.

2.Discussion and implications

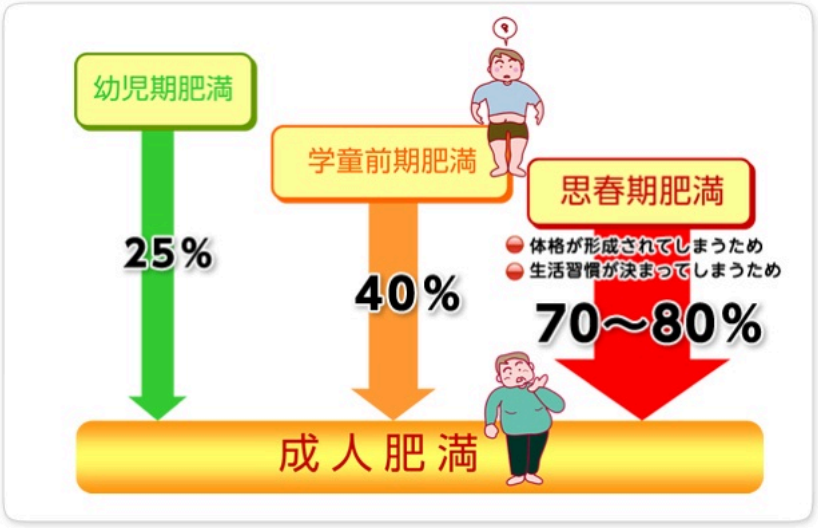
First of all, I analyzed the life expectancy rates and the healthy life expectancy rate for each of the G7 countries.The longest was 84.3 years in Japan and the shortest was 78.5 years in the U.S.The average life expectancy of the G7 was 81.7 years. The longest healthy life expectancy was 74.1 years in Japan, the shortest 66.1 years in the U.S., and the average for the G7 was 70.9 years.Through this data,I can understand that a gap of approximately 10 years between the life expectancy rate and the healthy life expectancy rate is evident.What is the difference between Japan and the U.S. I think that it is the obesity rate.Refer to the left figure. This shows us the obesity rate in each country.According to this figure,Japan was 3 percent, the U.S. was 31 percent, and the average of G7 was 14.5 percent.The average of the U.S. was



10 times higher than Japan and about twice as high as the average of G7.

By the way, is obesity really related to healthy life expectancy? Dr. Steven Grover of McGill University in Canada revealed that healthy life expectancy for men aged 20-39 years compared to normal weight is 8.4 years for first-degree obesity, 11.8 years for second-degree obesity, and 18.8 years for super obesity, and 6.3 years, 14.6 years, and 19.1 years shorter for women in the same age group, in that order. The study also found that those who are obese from a young age can expect to live up to one-third of their lives with cardiovascular disease and diabetes.

Other lifestyle-related diseases that have been shown to shorten healthy life expectancy include diabetes, hypertension, and dyslipidemia, as well as metabolic syndrome, which is a combination of these diseases. In addition, obesity, if left untreated, can worsen lifestyle-related diseases and cause arteriosclerosis by making blood vessels brittle and damaging them. These findings suggest that obesity is related to healthy life expectancy.The figure below also shows that 70-80% of adolescent obese individuals become adult obese, indicating that obesity from childhood has a significant impact on adult obesity.



Therefore, I considered two ways to reduce obesity: improving school lunches and promoting nutrition education.

So I looked up school lunches in different countries and compared them.



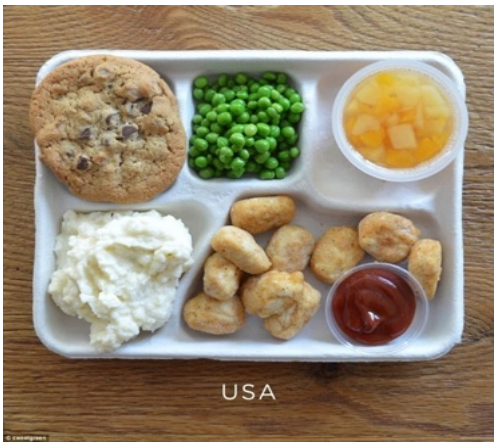
Japan



Italy



France



United States



United Kingdom

Comparing these photos, school lunches from Japan, Italy, and France appear to be nutritionally balanced with a large amount of vegetables, while those from the United States and United Kingdom appear to be nutritionally unbalanced with a lot of carbohydrates. Focus on the obesity rates in these countries, it was found that the rates in Japan, Italy, and France were less than 10%, while the rates in the United States and the United Kingdom were more than twice as high as those in the former three countries, at 31% and 23%, respectively.

Based on the above, we believe that the key point that needs to be improved in school lunches in the U.S. is the unbalanced nutritional balance of the menu.

Finally, we would like to focus on the relationship between healthy life expectancy and reduction in the burden of social security costs. One study, titled “Impact of Compression of Morbidity on Medical and Nursing Care Expenses,” considers the period during which a person lives in need of nursing care 2 or more as an unhealthy period, and simulates how future medical and nursing care costs would be affected if this period were shortened by 10 years from the current level, The simulation results show that if the incidence rate of people requiring long-term care were to be reduced by about 1% per year in order to shorten the period, the 10-year cumulative total of long-term care and medical care costs would decrease by 4.5 trillion yen and 800 billion yen, respectively. The problem of increased lifetime costs will be solved if the benefits of increased healthy life expectancy, such as the ability to work, the increase in income, income taxes and social insurance premiums generated from such work, and contributions to society through volunteer activities, exceed the increased medical

costs. Thus, it is clear that if people live healthier lives, their lifetime medical costs will be lower even if they live longer, thereby reducing the burden of social security costs.

3.Conclusion

To improve school lunches, I suggest a system that divides the food into categories of main meal, main dish, side dish, and soup, and allows one to choose from several varieties in each category. I believed that this would allow them to provide well-balanced school lunches like those in Japan while respecting diversity.However, this proposal needs a little more work because the issue of food loss is left unaddressed if the popular menu items are unbalanced.

I also believe that nutrition education needs to be carried out on a global scale.Nutrition education means education to help children develop a healthy diet throughout their lives by learning about food and eating and nurturing their interest in food.Without nutrition education, lack of knowledge about nutrients necessary for growth and health development leads to increased risk of poor growth and lifestyle-related diseases due to poor nutritional status.

Currently in the U.S., there is no common curriculum or guidelines for nutrition education, and each school and teacher decides the content of their classes. Therefore, knowledge of food differs from person to person.Meanwhile, in Japan, the Basic Law on Nutrition Education was enacted in 2005 and the Basic Plan for the Promotion of Nutrition Education in 2006.The Basic Act on Food Education is the only law on food education in the world. It was created in the face of incidents of food safety concerns, such as mislabeling of the place of produce.It is about learning about food, being able to choose food, and having a healthy diet.The term “nutrition education” itself has existed since the Meiji era (1868-1912), but it is said that it was around the time of the Basic Law on Nutrition Education that nutrition education began to be promoted in a full-scale way.Therefore, we propose that laws be enacted to promote nutrition education in countries other than Japan, as enacting such laws would be effective in promoting nutrition education.If the content of nutrition education classes can be standardized based on the laws that have been established, all students will be able to gain correct knowledge about food.

I believe that obesity can be reduced if we can develop healthy eating habits and correct knowledge of food from school life. And as obesity is reduced, the number of lifestyle-related diseases will also decrease, resulting in an increase in healthy life expectancy, which will reduce the burden on society as a whole by reducing the burden of social welfare costs.

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About Obesity

What is the ideal waste separation system?

To have an hygienic and eco-friendly system all over the world

5104 Luna Emmett

Abstract

Drawing on the waste management practices in Maebashi, Japan, and Helsinki, Finland, this research identifies key components for an effective and sustainable waste sorting system such as early collection times, accessibility of sorting information, and non-compliance with collection days present challenges. Based on these insights, a proposed waste sorting system includes features like flexible waste disposal times, comprehensive recycling (including PET bottle deposits), bio waste composting, and user-friendly waste separation tools. Challenges, including public awareness, collection logistics, reducing plastic bottle usage and handling biowaste, are addressed with specific solutions such as educational campaigns, refillable bottle systems, and compostable waste bags. The study concludes that an adaptable, region-specific waste sorting system is essential for reducing waste, promoting sustainability, and engaging the public in environmental efforts. Further research is needed to refine solutions for specific regional and climatic conditions.

1 Introduction

One effective method for reducing waste is waste sorting. Currently, household waste sorting systems vary by region. In this study, the goal is to propose an ideal household waste sorting system which is low cost, convenient for both citizens and cities, and can be adapted for use in a variety of regions.

This research is based on experience with two different systems. First, the existing sorting system and the problems of the system in Maebashi were considered, leveraging knowledge gained from participating in the Maebashi City 'Jibungoto-ka' (Personalization) Conference as part of volunteer activities. Furthermore, the report also incorporates information obtained from a field survey conducted in Finland, a country well known around the world for its highly developed waste disposal system.

2 Discussion and implications

1)Waste Sorting System in Maebashi

In Maebashi, waste is sorted into the following categories: "Paper & Clothing," "Plastic Containers," "Recyclable Waste (Glass Bottles, Empty Cans, PET Bottles)," "Hazardous & Toxic Waste," "Burnable Waste," and "Non-Burnable Waste."

The city issues three sizes of designated bags: large, medium, and small. For small amounts of waste, residents may use transparent or semi-transparent bags (smaller than 20 liters) instead of the designated bags.

Collection days vary by region.

Waste must be placed at the designated collection spot by 8:00 AM on the morning of the collection day.

The maximum amount of waste that can be placed at once is 20 kg.

The problems found in this system:

・The 8:00 AM deadline cannot be met depending on the occupations and the lifestyle rhythm.

・When waste is not placed out on the correct collection day, it will not be collected.

・The Sorting categories are too complex and could be a bother for many people, and the information about the sorting rules are difficult to access, especially for foreign residents or children due to the complicated rules that are explained in Japanese, moreover using Kanji characters

2) Waste Management in Finland

〈Houeseholds〉

Household waste can generally be taken out at any time, and is collected by the city once a month. One Helsinki mother said that to make the separation system better, "Separating waste should be enjoyable" to avoid a drop in motivation caused by the complexity of waste separation, and that “Biodegradable trash bags should be distributed for free” because the need to pay for them might hinder the usage of the eco-friendly bags.

〈Waste Categories〉

・organic waste

In Helsinki, it is stipulated by law to subscribe to the city bin or have your own compost. Bio waste that the city collected is used for electricity.

・Plastic

Bottles have a 98% recycle rate. The city recommend not washing the plastic bottles to prevent the waste of water, because they are washed at the recycling center anyway. A deposit system (picture ○) is used to encourage recycling.

・metal

・fabric

・glass

・paper

・cartons

・batteries/electronics

Take out to a different place than the others to collect.

・general garbage (tissues, tooth brushes, pencil ends, scraps of cloth and paper, etc.))

The only type of garbage the city collects.

〈The Envac System〉

The Envac system is a waste collecting system that makes the urban environment cleaner, healthier and more sustainable. The smart system reduces air pollution and carbon emissions caused by waste collection traffic, eliminates smell and mess associated with traditional waste collection and makes unsafe and

unsanitary waste collection a thing of the past. The waste inlets (Image 1) are connected to an underground pipe network. The emptying cycle is done at pre-programed times or when the units are full. The waste is transported at 70 kph speed, using negative airflow that sucks the bags to a remote collection station. Emptying takes only minutes per waste stream. Being underground makes the Envac system resilient against extreme weather events and with smart automation, it is reliable even in times of societal pressure such as pandemics or large events such as sports tournaments or music festivals. The collection station is located 2 km from the central urban area.

(Image 1)



3)Elements needed in the Waste System

The following elements are essential for an ideal system, based on volunteer activities and the field survey in Finland.

・The waste can be taken out anytime
・All recyclable waste is recycled
・Free or low cost bio garbage bags
・A fun and clean way to separate waste that everyone can understand

4)A Preliminary Proposal for a Separation System

From the research above, the following is the initial suggestion for the separation system.

・PET Bottles
A deposit system is recommended.
・Hazardous & Toxic Waste
Must be collected on certain days and places for safety.
・Bio Waste
Must be composted in households, or collected to use as energy or agricultural fertilizer.
・Paper

・Fabric
・Plastic
・Glass
・Empty Cans
・general garbage (not from upper statement)
・others
Other types of waste, such as cartons and cardboard must be separated depending on the region.

Waste excluding “Hazardous & Toxic Waste” and “Bio Waste” will be collected once per set period, and residents can take them out anytime.

5)Problems found in initial system

・How to collect Bio Waste

Depending on the region, bio waste cannot be left outside for a long period of time, sometimes needing to be collected during the day. A way to collect waste safely and clean without setting a collection day requires consideration.

・How to decrease the amount of PET bottles

Though recycling is treated like it is the solution to pollution, becoming an excuse to consume plastic bottles instead of more environmentally friendly options, the toxicity of plastic actually increases with recycling, causing changes to the body’s natural hormone levels (Harvey, 2023). The only real solution to ending plastic pollution is to massively reduce plastic production. How to reduce usage of plastic bottles from households requires consideration.

・How to make separating waste be fun

Having many categories of waste can connect to confusion and difficulty of organizing. A way to solve this problem requires consideration.

・How to provide Bio garbage bags

The garbage bags used currently are mostly made of plastic. A way to provide Bio material garbage bags to residents requires consideration.

・Methods for raising awareness of the waste sorting system

Due to the complicated system, an easy way to learn the system requires consideration.

6)Solutions to the Proposed Problems

・How to collect Bio Waste

In regions where the bio waste is needed to be collected in shorter terms, using the Envac System is proposed. The waste will be collected every set period to keep the neighborhood hygienic. The collected waste will be turned into energy, which will be used to fuel the system.

・How to decrease the amount of PET bottles

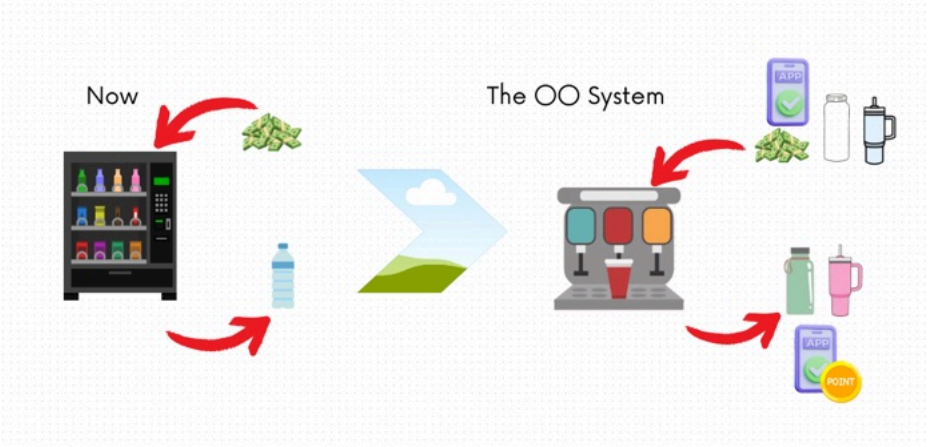
As stated above, the usage of plastic bottles must be reduced. The only real solution to ending plastic pollution is to massively reduce plastic production. To do so, the following ○○ system (Image 2) is proposed.

The ○○ system is a system where instead of buying bottles for a drink, people can refill their bottles with any drink from the machine. To encourage people to use this system, there will be an app that gives you points for refilling your bottle instead of buying a plastic bottle. The points can be used to get a discount for a new bottle or the next refill. Enabling the Trade of the points for coupons for local stores will also be effective.

・How to make separating waste be fun

To make separating waste easy and fun, governments can collaborate with many brands to make a household bin with sections for each category that is easily understandable. They will come in many different shapes and colors, designs making separating the waste more easy and fun.

(Image 2)



3 **Conclusion**

From the research above, the following is the initial suggestion for the separation system.

・PET Bottles

The ○○ system or a deposit system is recommended.

・Hazardous & Toxic Waste

Must be collected on certain days and places for safety.

・Bio Waste

Must be composted in households, or collected to use as energy or agricultural fertilizer. In regions where the bio waste is needed to be collected in shorter terms, using the Envac System is proposed.

・Paper
・Fabric
・Plastic
・Glass
・Empty Cans
・general garbage (not from upper statement)

・others

Other types of waste, such as cartons and cardboard must be separated depending on the region.

Waste excluding “Hazardous & Toxic Waste” and “Bio Waste” will be collected once per set period, and residents can take them out anytime. The system needs small changes for each region according to the population and climate.

As a challenge moving forward, it can be pointed out that the issues “Methods for raising awareness of the waste sorting system” including the education towards children and ”How to provide Bio garbage bags ” have not been resolved. In the upcoming research, these future opportunities for development and a detailed plan for each climatic classification will be examined.

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Recycled plastic
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How to Solve Lack of Water

To Solve Problem of Purification Equipment in Desert Regions

5105 Kakimoto Atsuki

Abstract

These days, The problem, lack of water remains an open question even though many people raise the issue and prod someone into action to save water. From a sustainability perspective, I thought it necessary to acquire water from sources other than groundwater, and purification equipment would be suitable. The purpose of this study is to solve the problem of purification equipment in desert regions in order to obtain potable water on their own. There are two problems with using septic systems in the desert. First, that the temperature is so high that the water evaporates before it can be purified. Second, there is little water available in the desert for purification in the first place. I hypothesized that the solution to these problems was to use underground space in the desert, and to use urine as a source of water.

First, what does it mean to use underground space in the desert? In this environment, I think water evaporation should be controlled.Second, Why use urine as a source of water? There are many means to obtain water, for example, import water, desalinate water, and purify sewage and groundwater. However, these cannot be used in areas not facing the sea, a burden on finances or there is no water to purify. Then, I will find out if urine can be used as a raw material that can be circulated. I think it is important to purify before using slow filtration methods. I think sedimentation pond is qualified. The method is separating turbidity and water.

In conclusion, We can solve water problems with underground space and combinated slow filtration methods and sedimentation ponds. Also, these methods don’t need specialized technology, so it can also play a role in job opening.

1 Introduction

These days, The problem, lack of water remains an open question even though many people raise the issue and prod someone into action to save water. We see from chart I that more than six hundred million people don't have access to clean water.

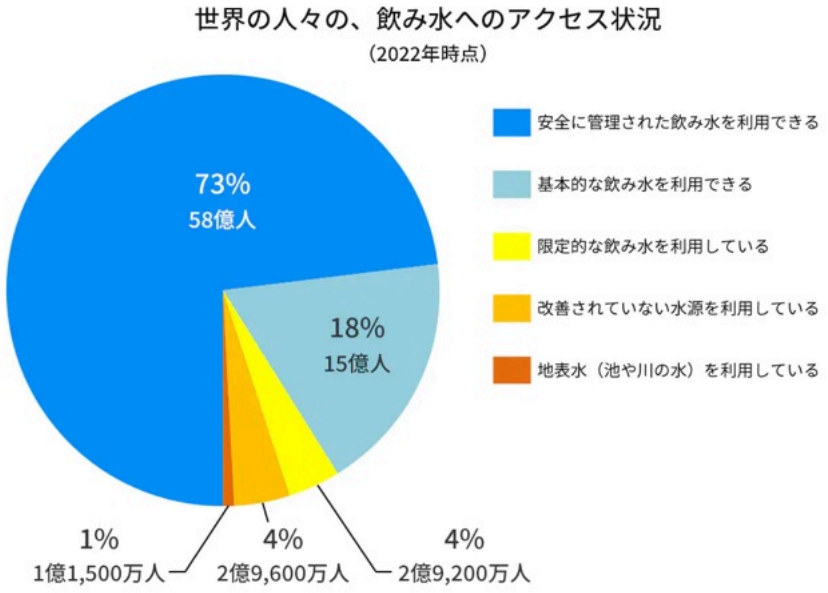


chart I

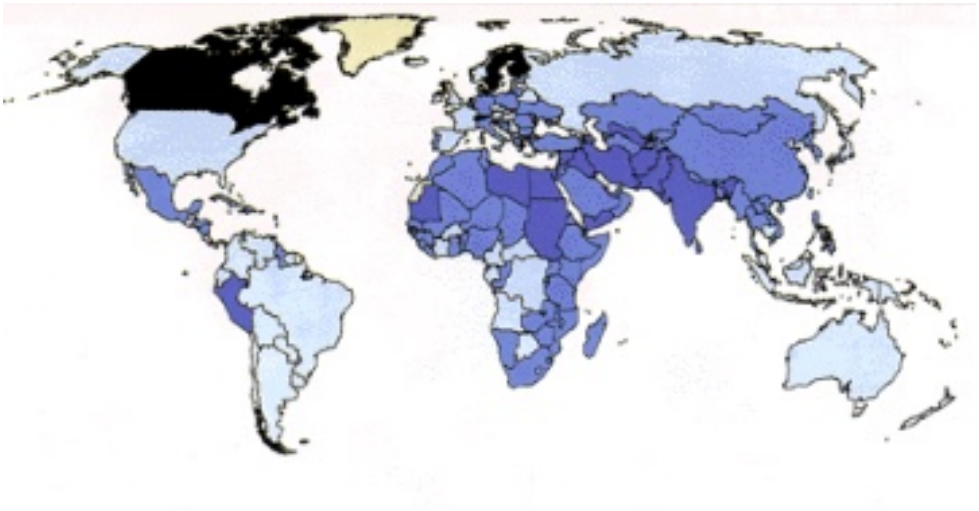


table I　The darker the blue, the more severe the water shortage in the area.

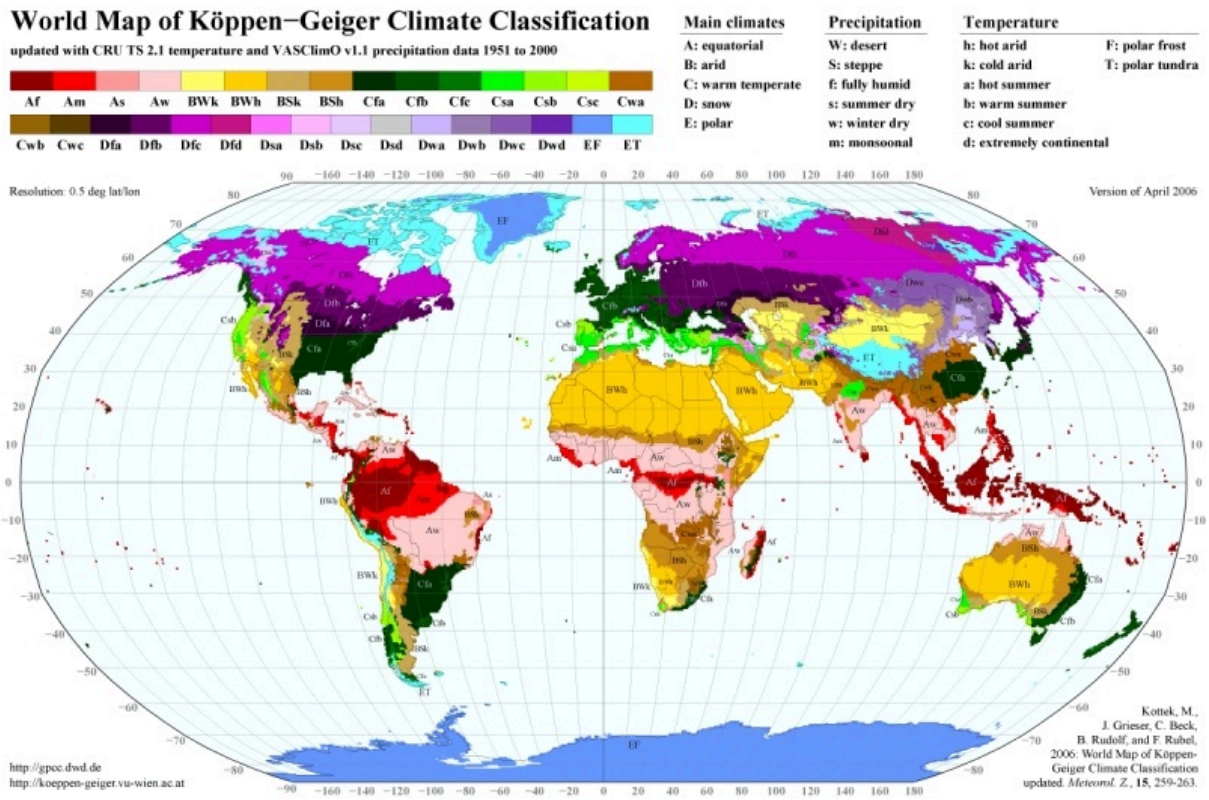


table II

A glance at table I and II will reveal that the issue is severe in desert regions in particular, so I decided to think about the problem of water shortage in desert areas.
Mongolia(Yoshizawa,2008) revealed people in Mongolian can use groundwater sustainably. In addition, water production in the buried valley is found to be possible in Burkina Faso in arid area(Yasushi Fuziwara and Motoo Fuzita,2010). These studies show it is possible to use groundwater even if it is in arid and semiarid areas. However, another study shows the temporal trend of annual mean groundwater recharge is decreasing(Noori,R., Maghrebi, M., Jessen, S. et al. 2023).

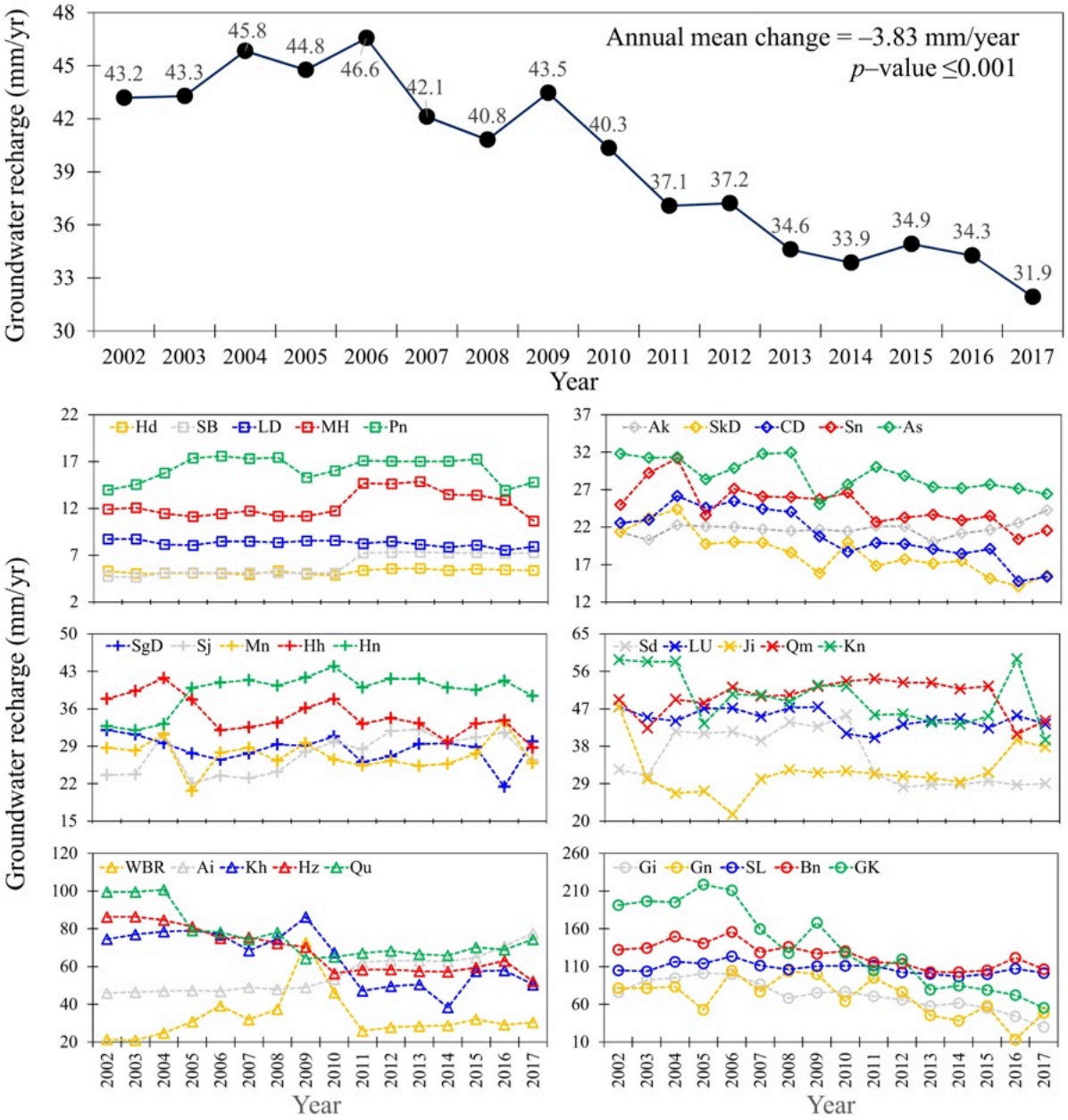


chart II

Therefore, from a sustainability perspective, I thought it necessary to acquire water from sources other than groundwater, and purification equipment would be suitable.
The purpose of this study is to solve the problem of purification equipment in desert regions in order to obtain potable water on their own. There are two problems with using septic systems in the desert. First, that the temperature is so high that the water evaporates before it can be purified. Second, there is little water available in the desert for purification in the first place. I hypothesized that the solution to these problems was to use underground space in the desert, and to use urine as a source of water.
I will discuss whether this is possible based on previous research

2 Discussion and implications

First, what does it mean to use underground space in the desert? This is taken up as an example by the Australian Underground Coober Pedy. It is located in the rocky desert of South Australia.There, all infrastructure is maintained underground, and temperatures reach 40 degrees Celsius in the above-ground summer, but underground temperatures remain at 23 degrees Celsius. In this environment, I think water evaporation should be controlled.Second, Why use urine as a source of water? There are many means to obtain water, for example, import water, desalinate water, and purify sewage and groundwater. However, these cannot be used in areas not facing the sea, a burden on finances or there is no water to purify. Then, I will find out if urine can be used as a raw material that can be circulated. The components of urine can be purified by slow filtration methods.

表 5　緩速・急速ろ過法の水質改善効果の比較

対象物質	緩速ろ過法	急速ろ過法
濁度	◎	◎
油度	◎	◎
色度	◎	◎
細菌	◎	○
NH_4-N	◎	×
臭気	◎	×
マンガン	◎	○
トリハロメタン原因物質	◎	○
過マンガン酸カリ消費量	◎	○
ABS（LAS）	◎	×
藻類プランンクトン	◎	50-30%
小動物	◎	○

注：◎：極めて効果的、○：効果的　×：効果なし
（緩速も急速も特殊処理を含まない）

table III

Relative composition of plasma and urine in normal men			
	plasma g/100 ml	urine g/100 ml	concentration in urine
water	90–93	95	–
protein	7–8.5	–	–
urea	0.03	2	×60
uric acid	0.002	0.03	×15
glucose	0.1	–	–
creatinine	0.001	0.1	×100
sodium	0.32	0.6	×2
potassium	0.02	0.15	×7
calcium	0.01	0.015	×1.5
magnesium	0.0025	0.01	×4
chloride	0.37	0.6	×2
phosphate	0.003	0.12	×40
sulfate	0.003	0.18	×60
ammonia	0.0001	0.05	×500

table IV

However, this method has the problem that purification takes too long, and a great burden on biomass which carry out purifying.

Then, I think it is important to purify before using slow filtration methods. I think sedimentation pond is qualified. The method is separating turbidity and water. This method also takes too long. but it takes too long time without sedimentation pond, and finally we purify the water with a slow filtration method.

3 Conclusion

We can solve water problems with underground space and combinated slow filtration methods and sedimentation ponds. Also, these methods don't need specialized technology, so it can also play a role in job opening. However, water is decreasing by 2 %. Then we should collect rain. As something to investigate in the future, it is necessary to select a place to use as a cave.

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How Musicians Can Earn a Stable Income

Connection among Music Players

5106 Kato Yukari

1 Abstract

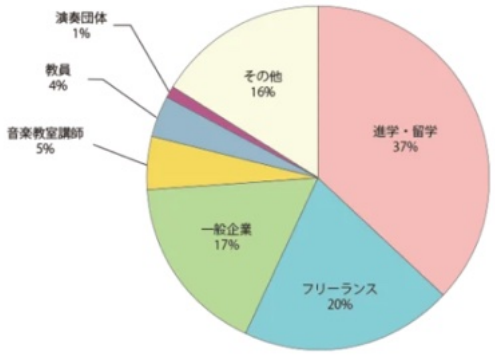
This study explores how to support musicians, who often face financial difficulties. Through online research, I identified two key issues: the large number of freelance musicians and the lack of connections between them. In response, I propose the creation of an app specifically for musicians. This app would allow musicians from all over the country, who are registered on the platform, to freely chat with one another, request extra musicians for performances, and invite others to concerts at any time. The goal of this app is to increase connections among musicians and make it easier for them to secure performance opportunities.

2 Introduction

I love music, and I have been interested in a career as a musician. After researching, I found that the average annual income of musicians listed in the "Annual Directory of Performers" by the Japan Performers' Association is 7.1 million yen. However, it has been reported that 21% of musicians earn less than 3 million yen annually. There is a wide range of income among musicians. So I would like to explore ways in which musicians can increase their earning potential.

3 Purpose and meaning of this research

The graph below illustrates the career paths of music university graduates. From the graph, it is obvious that the proportion of freelancers is higher than that of those who join performance organizations. This suggests that a large number of music graduates will pursue careers as freelancers after graduation.



(Gragh 1)

In particular, freelancers tend to have unstable incomes. It helps explain the wide range of income among musicians. Therefore, the purpose of this study is to explore the question: "How can musicians make it easier to earn a stable income?"

4 Discussion and implications

In this study, I propose creating an app specifically for musicians. The reasons for this proposal are explained below.

First, I will explain the differences between freelance musicians and orchestra members. Regarding salary, orchestra members receive a fixed monthly salary, providing them with a stable income. In contrast, freelance musicians do not have pre-arranged work like orchestra members, meaning their income is unstable.

Next, regarding insurance and pensions, freelance musicians do not have access to benefits like maternity or sickness allowances, which are available to orchestra members. Additionally, the pension benefits they receive are typically much lower—about half of what an orchestra member would receive. Freelancers also need to pay their own insurance premiums and handle their own tax filings.

In summary, orchestra members receive more stable salaries and better social security benefits. However, as we can see in Graph 1, many musicians ultimately pursue careers as freelancers. Freelance musicians earn performance fees by participating in one-time engagements such as concerts and events. However, this alone is usually not enough to provide a sufficient income. As a result, some musicians supplement their earnings by accepting extra work in orchestras (guest performance requests), teaching in private lessons, and selling books or CDs, while continuing their performance activities in parallel.

Guest performance requests for orchestras, wind ensembles, and chamber music groups occur when regular members are unable to perform due to illness or other reasons, and a substitute musician is called in to fill their place. However, in order for a musician to be called in as an extra for an orchestra, they typically need to have connections within the organization. Since freelance musicians often work individually and tend to have fewer connections with other musicians, it can be difficult for them to secure performance opportunities.

Therefore, I believe that fostering connections between musicians and increasing performance opportunities could help support musicians in earning a more stable income.

The app I have in mind for musicians would allow musicians from all over the country, who are registered on the platform, to freely chat with one another. They would be able to request extra musicians for performances, invite others to concerts, and communicate with anyone, anytime. Users could also upload videos of their performances to promote themselves.

There are three main benefits to creating this app.

1st, Musicians would have easier access to performance opportunities. 2nd, Orchestras, especially smaller ones in regional areas, would be able to easily find and invite extra musicians when they are unsure of who to call. 3rd, it would make music more accessible to the general public. By enabling musicians from around the world to easily plan performances together, not only would concerts become more frequent, but performances in various other venues would also increase. This, I believe, would help make music more familiar and accessible to people.

5 Conclusion

In this study, I propose the creation of an app specifically for musicians. This app would allow musicians from across the country who are registered on the platform to freely chat with one another, request extra musicians for performances, invite others to concerts, and communicate with anyone at any time. Through this app, I hope to increase the connections between musicians and make it easier for them to secure performance opportunities. Moving forward, I plan to consider the management of the app and the associated operational costs.

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Making Japan a society full of diversity

Bringing overseas education to Japan

5107 Kanaya Yu

Abstract

I am stady to improve the quality of gender education in Japan. My research background is because I want to become a teacher and I am interested in education-related fields.

First of all, Japan's gender gap index has recently been ranked 118th out of 146 countries in FY2024, up from 125th place last year. However, this still shows that Japan's gender inequality index is low compared to other countries. This is because the wage gap between men and women for the same job is getting worse in Japan's economic sector, and in the political sector, this is reflected in the small number of female Diet members.Perhaps because of this, Japan has fewer problems with gender disparity year by year, but it is still inferior to other countries.One of the reasons for this is that gender education in Japan is not very developed.I believe that prejudice against diversity arises because gender education in Japan is not very developed.

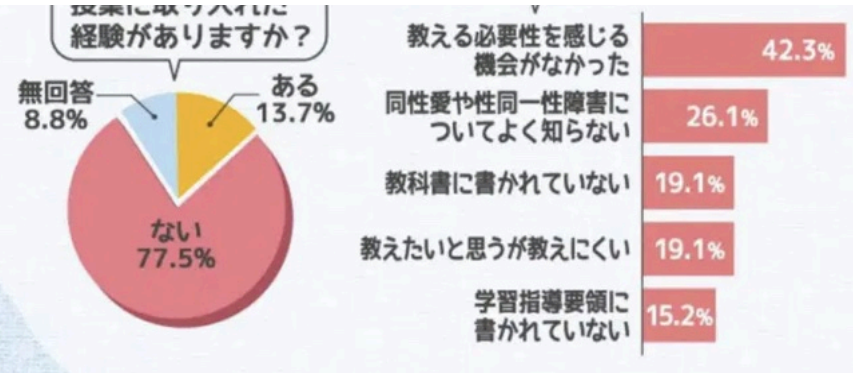
1introduction

The background of my research was that I had an interest in education-related fields.After that, I learned that Japan currently has more problems with gender disparity than other countries, and I started researching it, thinking that Japan's education may also be the cause of the problem.After doing some research, I found that gender education in Japan started later than in other countries, and in the past there were far fewer schools offering gender education than there are today.For this reason, I wanted to research and find out what needs to be done at schools in order to improve the current gender disparity in Japan.Therefore, I decided to focus my research on Japan's old gender-related laws and systems.I would like to learn about the characteristics of other countries with small gender disparities and apply them to Japanese education with the aim of improving the quality of learning.

2

First,problems of gender discrimination in Japan include differences in labor wages depending on the job and differences in the ratio of men to women in jobs.For example, the number of female parliamentarians is low, and the proportion of female principals and vice principals in schools is low.The reason for this may be that the proportion of people who have received gender education is small.

The graph below shows whether gender education is incorporated into lessons and why they answered that way.The graph shows that about 80% of teachers do not cover gender education in their classes.Reasons for this include the feeling that there is no point in teaching gender education and teachers themselves not knowing the details.



I think this is also related to Japanese laws.In Japan, the 1998 ban on education about life was established, and as a result, an increasing number of children are unable to understand issues such as gender disparity.This shows that Japanese education is less developed than other countries.I believe that this is connected to the current situation in Japan.Here I focused on Finland, where gender education is well developed.Finland has been focusing on gender issues earlier than other countries, including enacting transgender laws and starting sex education in 1970.Here I focused on Finland, where gender education is well developed.Finland has been focusing on gender issues earlier than other countries, including enacting transgender laws and starting sex education in 1970.

3conclusion

Based on the above, I believe that the reason why Japanese education has not developed is that due to restrictions on education, those who teach cannot have accurate knowledge and information, and this is a chain reaction.For this reason, I propose to incorporate gender education that incorporates the discussion that Finland and other countries have adopted. This is because if you just listen to Japanese music, it will just slip out of your head.However, by holding discussion classes, students can learn new opinions other than their own and deepen their original opinions.

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How to protect innocent people from false accusations

Reasons of false accusations and solutions

5108 Kumagai Ao

1. Abstract

Few people know what happens to people who are arrested by false accusations. If someone is arrested because of false accusations, they will be placed under investigation for up to 23 days, and, if they are found innocent at that time they will be released from people who interrogate them. However, if they make a false confession once, it is difficult for them to be released. Furthermore, at worst, they may be killed by the death penalty. First, false accusations mean that an innocent person is regarded as a guilty person, and put in prison, so it is differ from a misjudgment which regards an innocent person who should be regarded as a guilty person. At first, I was one of the people who made a mistake in their meaning, because I think false accusations are the same as misjudgments. False accusations are sometimes in the news, but not often in the headlines. However, false accusations are evidence that someone involved in another person who has no relationship with the incidents and harms such people, so I think that guilty people and people who judged them, and all of the people in the world should consider false accusations.

The research question is “How to protect innocent people from false accusations”. In fact, there are some incidents around us, and few people are able to return to society even if they are found innocent after years of some trials being falsely accused. Also, judges have a final decision, and then they need “recognition”. One study shows that people’s recognition rates are declining, and that this is sometimes linked to false accusations, so how should we improve recognition rates? Unfortunately, I could not find a clear way to improve it, however, I came up with two new ideas. The first solution is “Visualization of suspect interrogation” and the second solution is “Vetting system for evidence”. I would like to create a world where there are no crimes before false accusations. However, in fact, cases of false accusations have been a problem all over the world for a long time, so I would like to continue to think about it even if I am not a person who is involved in some incidents.

2.Introduction

In 2020, the number of false accusations in Japan, which is said to be one of the safest countries in the world, was 748,559 (number of cases recognized) and 294,206 (number of cases arrested). The number of cases of recognition means the number of crimes recognized by the police and other investigative organizations, and the number of arrests means the number of cases arrested by the police and other organizations. If this is the number for Japan as a whole, what is the number of false accusations worldwide?

Next, I will explain the “Sacco Vanzetti Case,” the largest false accusation case in the world, because we do not often hear the news of false accusations. This case was a robbery and murder that took place on April 15, 1920 in the U.S. state of Massachusetts. The first robbery took place in 1919, when a shoe factory's cash carriers were attacked, but the robbery ended in failure. The incident occurred the following year. In Braintree, Massachusetts, another shoe

factory was robbed by a gang of five men who shot and killed the treasurer and his escort, and also $16,000 were robbed. Arrested at the time were anarchist Italian immigrants Nicola Sacco and Bartolomeo Vanzetti. Sacco was a socialist who had worked at the shoe factory that was attacked and was on vacation on the day of the robbery. Vanzetti was a fishmonger, an anarchist, and had been arrested for robbery. At the time of his arrest, the Communist Party was being hunted in the U.S., and it was easy to be labeled a man of principle for trivial matters. Therefore, even though they were innocent, they were falsely accused due to discrimination. The two men were subsequently executed, but their innocence was recognized 50 years later. Discrimination was so severe in the U.S. at that time that blacks were seven times more likely to be falsely accused than whites. Also, a previous study, “TRUE AND FALSE ACCUSATIONS OF CHILD SEX ABUSE” by R A Gardner, was presented in 1992. In this paper, he describes how to avoid false accusations in the interrogation process.

3.Purpose and meaning of this research

To begin with, a false accusation means “to convict an innocent person and put him in jail,” and it is completely different from “to acquit a person of a crime he should have been convicted of. At first, I was one of those who misunderstood the meaning of “misjudgment”, because I thought it meant a wrong judgment. False accusations are sometimes in the news, but they do not make much of a headline. However, since false accusations are evidence that many people have been wrongly convicted and hurt others, it is necessary for those who are guilty, those who have been judged, and those who have not to take a deeper look at the matter.

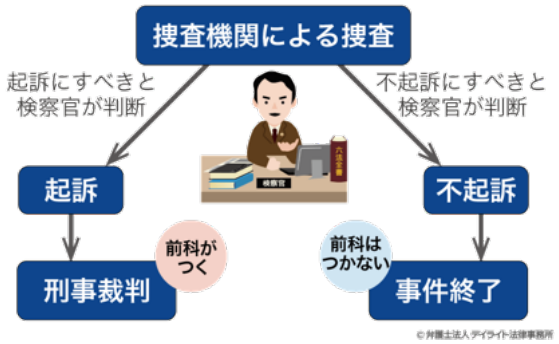
4.Research methods

I mainly use the Internet and books to find out more information about false accusations and people's rate of awareness of them. I also use previous research to find out if there is anything that can be connected to the current study.

5.Discussion and Implication

First, I examined the number of crimes in Japan. As mentioned above, in 2020, there were 748,559 cases of false accusations (number of cases recognized) and 294,206 cases (number of cases arrested) in Japan, which is said to be one of the safest countries in the world. Among them, according to attorney Shogen Morita, Aichi Prefecture receives about 500 to 700 requests every year to clarify suspicions of false accusations.

First of all, what causes false accusations? In the case of bullying, we sometimes see the troubling idea that the bully is at fault. Neither bullying nor false accusations are the cause of false accusations, but the cause of false accusations is the way people make judgments. The first reason is the police officers who catch an innocent person with a preconceived notion that he or she is a criminal, the prosecutors who prosecute without any doubt because they caught him or her, and the judges who pass sentences based on blind faith in the evidence presented by the prosecutors.



The figure on the left shows the process of being found guilty of a crime. The investigative agency, the prosecutor, and the judge each have a criminal record if they are found guilty of a crime in their respective professions.

The second cause often cited in Japan is the “existence of false confessions” and “nondisclosure of evidence. The Hakamada case is one of the cases where this became an issue. Mr. Hakamada, a suspect in the Hakamada case (who later turned out to be the victim), was forced to “confess” because he could not endure the long interrogation period. Although there was no strong physical evidence in the Hakamada case, the prosecution presented a garment with blood on it, but since there was no size or evidence to cite, the prosecution went to the trouble of making one up.
For this reason, I propose that interrogations of suspects be made more visible in order to prevent false confessions. Second, we propose a system of evidence disclosure. In the Hakamada case, evidence advantageous to the defense was not disclosed, so I propose a system in which all evidence in the prosecution's possession is disclosed.
Therefore, the first of the proposals is to “make the interrogation of suspects more visible. A system of presence of defense counsel will ensure that suspects are not coerced into confessing to a crime.The second is a “system of evidence disclosure. Since current Japanese law does not require disclosure of all evidence to the prosecution, it may be necessary to review the law from the beginning.

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The pay gap between men and women in sports

To realize the gender equality

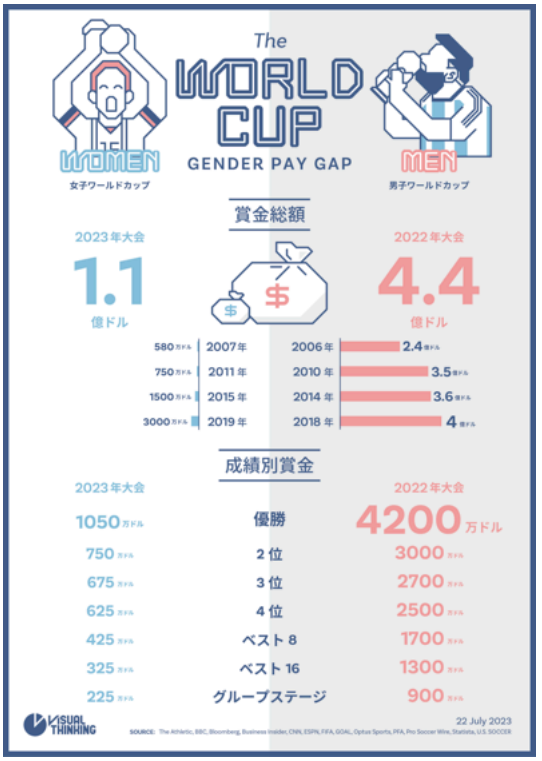
5109 Kobayashi Minaha

1.Abstract

Recently, there is a problem about the pay gap between men and women in all of the sports. I made a research question, “how can we improve the pay gap between men and women athletes?” and stood to consider how to improve the problem. I consider that there are three ways to research my study; solving the basic cause, changing the system of prize money and creating a system to achieve income equality. Through my research, I found the cause of the pay gap is the difference in the level of performance but it is hard to improve. Then in conclusion, spreading the road map, “Pathway to gender equality in sport including pay equality”. This road map has a strong approach to progress on gender equality in sports such as the “Practical actions category”. To execute my result, the issues are how to spread it and do it work effectively in other countries.

2.Introduction

There is an issue of the pay gap between men and women athletes. Now the Pay Gap is one of the serious problems in the world and many women athletes protest against it for a long time. According to “Visual Thinking", the figure shows the disparity of prize money. In the 2023 women’s World Cup, the total amount of prize money is 1.1 billion dollars. Besides in the 2022 men’s, the total amount of prize money is 4.4 billion dollars and the difference between men and women prize money is 3.3 dollars [in Japanese yen, about 50 billion yen]. This difference has several problems compared to the old data, women’s prize money is increasing. However, looking at Prize Money based on Results, first place for the men's team could get 4200 million dollars while first place for the women's team could get 1050 million dollars. The difference is 3150 million dollars [in Japanese yen, about 48 billion yen]. In this way, detail distribution shows the disparity apparently. This prize money problem is not only in soccer but also in other sports. Most of the sports organizations like FIFA, soccer organizations consider the pay gap. Although, the aim of solving this problem is not clear. Therefore, in this research I think about the improving plan as well as possible.



3.Discussion and Imprecation

To solve this problem, I thought there were three solutions.The first is “solving the basic problem of pay gap. The second is “changing the prize structure”. The third is “creating a system to achieve pay gap equality”. I mainly used the Internet to study my research question.

Firstable, why does the pay gap occur in the sports world? The biggest reason is the difference in the level of performance. Most people think that men’s performance is higher than women’s. So it has caused a big difference in popularity of the sports and it affects the income. Most sources of athletes’ income have four ways; ticket, sponsorship, broadcasting rights and merchandising(example: goods and foods income). Also, I researched a system of income. In my research, most conventions’ prizes are from broadcasting rights fees, goods, tickets, etc. It also had an effect on popularity. As I mentioned, there is a difference in true abilities between men and women. So, it affects where the prize money comes from. From these studies, the “Popularity” mostly affects the bounty.

Next, I looked into the system of prizes, as it could not solve the underlying problem. In my research, I could not find out the complex system of prize money, but I found where the prize money came from. In the Soccer World Cup, the international soccer organization, FIFA, gathered the prizes from broadcasting rights fee and sponsorship fees. Broadcasting rights fee is a rights to broadcast sports matches and film productions exclusively on television or Internet. I could not find what percentage of the broadcasting rights fees and sponsorship fees went to prize money for the respective sports but I guess broadcasting fees have a large portion of prizes. This is because in recent years, while TV viewership is declining, online content is being rapidly consumed in an explosion due to the development of the Internet and the spread of smartphones. I thought of a way to solve this structure but it is hard because most media companies decide what to show according to the needs of their customers. In addition, customers’ needs may be connected with the popularity of sports. Eventually, a solution is impossible because it involves the first popular issue considered.

Then, I thought that it is difficult to solve the basic problem of pay gap and changing the prize structure. So, I came up with an idea “creating a system to make income equality”. I thought it would be enable us to see the difference in prize money intersexual. If the difference can be visualized, it helps to compare how close the difference has been closed. I studied what system is good to make. Therefore I found the works resemble my thought. That is “Pathway to gender equality in sport including pay equality”. This is a strong approach to progress on gender equality in sport. In this system, there are five categories that solve the problem of sexual equality. One of them is “Practical actions”. There are small categories(ex; base pay equality, total remuneration, has equality in prize money achieved?, etc). This helps you to see the level of resolution of the pay gap problem. This works only in Australia, but this system has a possibility to solve not only pay gap, but also other gender problems in sport.

↓“Pathway to gender equality in sport including pay equality”↓



4.Conclusion

In conclusion, spreading the roadmap of “Pathway to gender equality in sport including pay equality” is the best way to solve the problem. Additionally adding the category, “ Is the gap in broadcasting rights fees closing?” is also good because mainly prize money is broadcasting fees so I think this needs to be visualized. However, the conclusion has issues. “How to spread this map around the world” and “Does it work effectively in other countries?”.

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Review of education system in developing countries

~Resolve of poor problem~

5110 Saito Kanade

Abstract

I considered that developing countries have some problems with poverty. In detail, problems divide with health and education,and it is developing. Then, I focused on the education side and researched it. I found that developing countries made inadequate progress in learning, because these countries could not succeed in funding. According to one website, I found that only a few countries are doing this. I think it is important to invite state funds equally to everyone. Using an example like this, I considered that the government should adopt technology to developing countries. That is the subject of this study.

1.Introduction

Today's society is divided into developed and developing countries. Developed countries are the world leaders in technology and industry. On the other hand,developing countries still face conflicts and civil wars. In addition, these countries did not develop health care systems. So,these countries have some serious problems. For example, childrens death rate is high,and school systems did not develop. What do you think would happen if the school system did not develop?

Children cannot go to school and they cannot read letters. Disabilities to read are a problem in my life. For example, if the developing people cannot read letters,they cannot get a job without utilizing their knowledge. Their job is only power labor. I want to rescue children in such circumstances.

2.Discussion and implications

I hypothesized that the low school attendance rate is causing people to be unable to earn money consistently or have low incomes, and that this is where the poverty problem arises. I am going to write the main questions. The current situation faced by developing countries is mainly due to the way they utilize human resources, inadequate infrastructure, civil wars and terrorism. Possible challenges include water pollution, malnutrition, inadequate sanitation, and low levels of education. I believe that the two most important issues to solve poverty are environmental issues such as water quality and road pavement, and educational issues such as low educational standards and illiteracy rates. I decided to focus my research on the educational aspect for the time being. The educational issues include educational inequality, lack of budget for education, and poor surrounding environment. Let's take a closer look at educational inequality. The first is that half of low- and middle-income children are not able to attend school, and the second is that education budgets are unevenly distributed.

What can be done to improve the enrollment of children from low and middle income families? Suppose that education funds are distributed in a limited and unequal manner. This would lead to four problems.

1. insufficient teaching materials
2. more students per class
3. inadequate teacher training
4. inadequate school infrastructure.

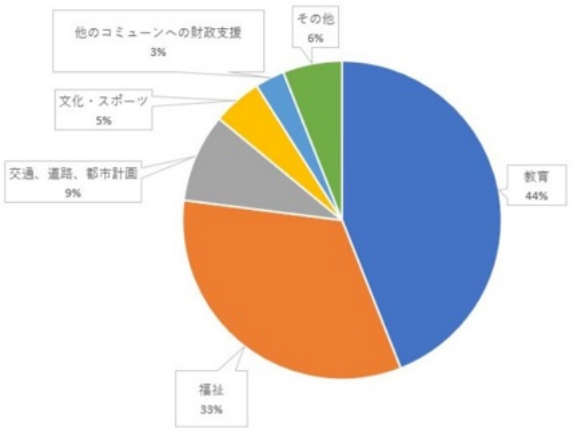
When this happens, attendance, enrollment, and quality of learning are affected. This is what is happening in developing countries today. How are these unbalanced education funds allocated? Let us look at education expenditures.

The difference between the poorest children and the richest children can be as much as four times greater. There were only five countries that were doing well there, out of all the countries surveyed by the sites we looked at. (Barbados, Denmark, Ireland, Norway, and Sweden) Those countries did not distribute funds only to the wealthiest, but also to the poorest equally. As an example, we examined the Swedish education system, which provides free education to children and young people between the ages of 6 and 16, along the lines of basic school ⇒ high school ⇒ university and college.

The types of schools are,

・Municipal public schools

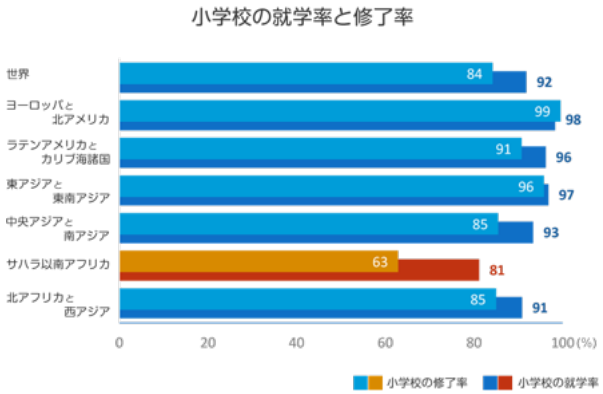
・Private, self-supporting schools with the majority of operating costs covered by public funds Private educational companies provide it.



This is a breakdown of the budget distribution for the City of Stockholm. About half of the budget is allocated to education. Indicating the importance the city places on this area. Tuition is free for children and young people between the ages of 6 to 16, and writing materials, bus fare to and from school and school lunches are provided free of charge.

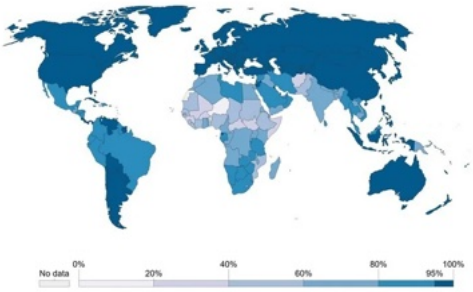
Because of this environment, only 3.8% of the population fails to complete compulsory education. In addition, according to a 2019 survey (targeting Swedes aged 25-75), about 3.8% of Swedes had less than 9 years of education up to the duty education. While in

Sub-Saharan Africa, the elementary school completion rate is 63%. That is to say, 37% of children do not even finish elementary school.



Japan had 100% completion and enrollment rates.

The next issue I would like to think about is the poor quality of education. There are 67 million African children who do not have access to elementary school. This is 1 in 11 people who cannot go to school.



As you can see from this document, only Africa is extremely low. Conclusion is that I want to rescue children in such circumstances. So I researched prior examples. I found it in Tanzania's trial. People tend not to go to Africa. Then, the government supported daily life and so on. After this effort, more candidates want to be posted to Africa.

In detail,the secondary school enrollment rate recovered from 5% in 1995 to 90% in2013. Through this trial,children can enroll in college. Of all, I want to increase this action, because I think the African government should improve the current situation.

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Music Therapy in Disaster Situation

～What can we do to reduce people's emotional burdens?～

― Disaster Music Therapy Supporting Disaster-Affected Areas ―

5111 Saito Yuna

1. Abstract

Currently, many disasters are occurring all over the world, and in Japan, which is said to be one of the most disaster affected countries in the world, mental damage caused to evacuees by disasters is one of the most serious problems. Therefore, I researched this study in order to reduce the emotional stress by using music therapy and my research question is “What can we do to relieve the emotional strain on those affected areas?” Although it is difficult to get specific data on music therapy, I used the Internet and books to gather information on the effects of using music and examples of music therapy practice, as some survey results show that many people in the world use music as a means to relieve stress.

First, regarding music therapy, I found practical results of Japan Philharmonic Orchestra’s “Music for Disaster Affected Areas” project and Kobe City radio broadcasts during the Great Hanshin-Awaji Earthquake. In addition, the results of music therapy for military personnel suggests that it is impossible to use music to reduce people’s emotional distress.

Therefore, I suggest that we visit disaster-affected areas to hold charity concerts and lend devices and equipment that can be used to listen to music. The cost of free concerts and equipment purchases would be considered expensive, but I thought we could solve this problem by collecting donations, subscriptions, etc. from not only the whole country where the disaster actually occurred but also around the world.

I am also considering remote performance, but due to video and audio lag, this was not my main suggestion at this time. We believe that this can be considered in the future, depending on technological advances.

Since music therapy is actually effective and is a psychological therapy that exceeds language barriers, we hope that it will become more well-known and more cases that will be practiced in the future.

2. Introduction

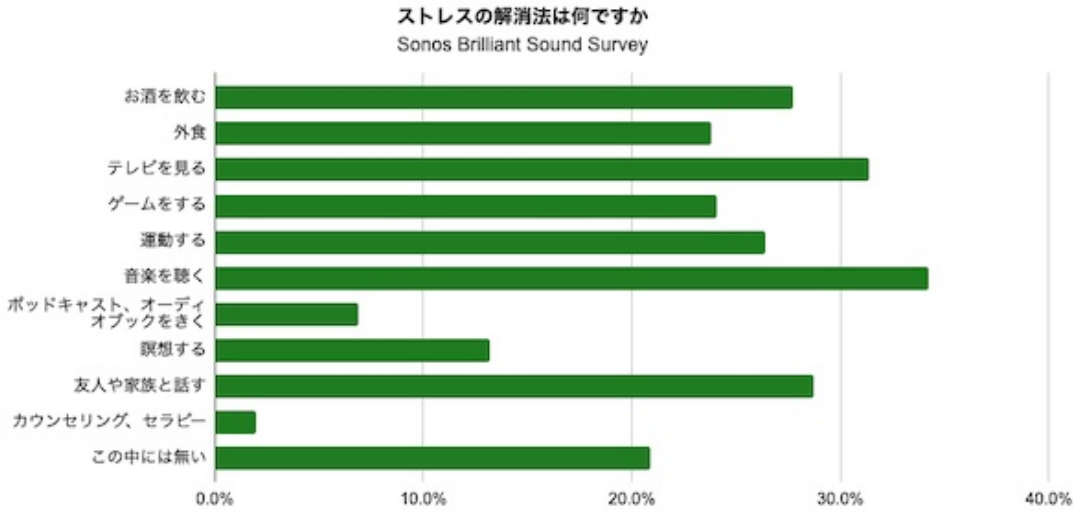
Currently, many disasters are occurring all over the world, and Japan is said to be one of the most disaster affected countries. According to the website of Cabinet Office, Japan's share of the world's total disasters is 20.8% in terms of the number of earthquakes of magnitude 6 or greater, 7.0% in terms of the number of active volcanoes, and 18.3% in terms of the amount of disaster damage, which is extremely high compared to it in other land areas, which is 0.25% of the world's total. In addition, there are still various problems caused by the effects of catastrophic disasters, one of them is the psychological damage caused to disaster refugees.

In order to improve the situation of many people with PTSD (Post Traumatic Stress Disorder) and other symptoms, I will consider ways to use entertainment to reduce people's emotional burdens. I have been interested in music, and last year I researched music therapy, so I thought I would use the results of that research.

3. **Research Purpose and Significance**

My research question is “What can we do to relieve the emotional strain on those affected areas?”

Music therapy is used to treat various types of psychotic patients, but it is not a major therapy and is not well known by many people. However, there are many people who listen to music or sing as a way to relieve daily stress, without being bound by the rigid name of music therapy. According to a survey conducted by an American consumer electronics company, which asked 12,000 people around the world, more than 30% of the respondents answered “listening to music” as the best method of stress relief.



Therefore, I decided to gather information, thinking that listening to music might be an effective way to relieve stress for people affected by the disaster.

I used the Internet and books to gather information about music therapy and PTSD.

I would also like to talk to people who actually use music therapy or specialists in mental illness and psychotherapy.

5. **Discussion and implications**

First, as a result of gathering information, I found some practical examples of music therapy.

A total of 10 military personnel suffering from PTSD were given music therapy which was collaborated with a singer/songwriter to write a song and listen to it for one week.

As a result, indexes showing PTSD and depression were reduced by 30% and 20%.

In addition, a radio station in Chuo Ward, Kobe City, performed music broadcasting on the radio, which was done after the Great Hanshin-Awaji Earthquake. In order not to stimulate people's minds more than necessary, the program started out with classical music with only instruments, then moved on to Western music with singing, and then to J-POP, placing priority on easing the victims' mental stresses as much as possible. As a result, they did not receive any of the expected complaints, but instead received letters and e-mails of appreciation.

Another example of musical support in the affected areas is the Japan Philharmonic Orchestra's "Music for the Affected Areas" program. This is a record of visiting concerts and other activities to bring smiles back to the Pacific coast of the Tohoku region, where the Great East Japan Earthquake damaged greatly, and they are still providing continued support more than 12 years after the disaster. The Japan Philharmonic has also provided similar support to the areas affected by not only the Great East Japan Earthquake, but also the Kumamoto Earthquake and the disasters caused by heavy rains in Okayama Prefecture.

I also learned that there is a music therapist who has been providing music therapy in the Tohoku region affected by the Great East Japan Earthquake. Kuninori Tomoda, who has been providing music therapy for eight years on the Sanriku coast of Iwate Prefecture, said that he continued his activities with the policy of not taking anything from the people there, not staying too long, and stopping when even one person says no more. He says that it is important to volunteer based on the premise that it is not music therapy that takes from the other person.

Based on the results of this information gathering, I offer the following two suggestions.

The first is to visit disaster-affected areas to perform and hold charity concerts. I propose that visiting concerts by musicians be held in the neighborhoods of evacuation centers in the affected areas, similar to what the Japan Philharmonic Orchestra has been doing.

However, I also considered that this proposal had the disadvantage of potentially becoming an activity to force people to listen to music. It would be a complete reversal if the goal of relieving the mental burden of the people in the affected areas were to cause them to feel uncomfortable.

To compensate for this shortcoming, I came up with the second proposal that lending out equipment/devices that allow people to listen to music. This has the advantage that CD players and other small music devices can be lent out at evacuation centers and other places where disaster victims come and go, allowing each person to listen to their favorite tunes. However, there was some concern about the cost of collecting the equipment to be lent, so we propose that the equipment be purchased with funds raised through donations, subscriptions, fundraising, etc.

By using both of these methods, we believe that the activity can be carried out with no hardship on anyone.

6. **Conclusion**

Based on the information gathered, I propose that several types of music therapy be offered

to disaster evacuees. Music therapy is a psychological therapy that has proven to be successful and often does not require verbal communication, more types of music therapy may be practiced with the development of future technology.I would like to develop more effective proposals to achieve one of the SDGs goals, “health and well-being for all,” in terms of mental health.

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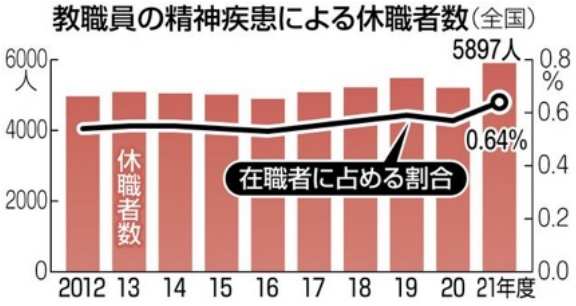
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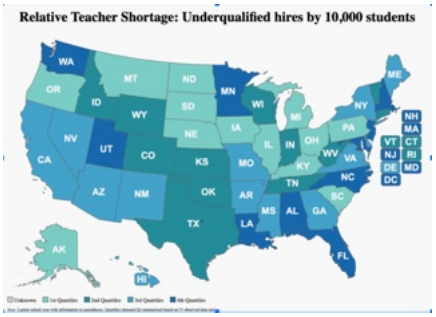
To Solve Teacher Shortage
～ How Can We Improve Teacher's Working Condition ～
- teacher shortage・working condition・SDGs4 -

5112 Sato Haruto

Abstract
In my research I focused on the teacher shortage.This is the problem of a lot of advanced countries.In Japan,the number of teachers administrative leave is increasing year by year. According to my research,there is also the problem of teacher shortage in America.Other advanced countries are the same.For these,I decided to research about this problem.My research's purpose is to improve some teachers' work conditions and increase the number of students who want to be a teacher.When I researched,I focused on one problem and researched how to solve the problem.First,I focused on the teacher's bullying.After I researched about the problem,I focused on the amount of teacher's work.By these research,I recommend three opinions.First,to use American anti-bullying way to exterminate bullying for teachers and students .Second,allow teachers to use school counselor.Third,introduce some ideas to decrease teachers clerical work.These opinions must improve the teacher's working conditions.

1.Introduction
◯Why research
・According to my research,the number of teachers on administrative leave in Japan is increasing.
・Research abroad,I found an article that says the number of teachers in the world is not enough to achieve the SDGs4(Quality Education).
・An article with a graph shows the number of teachers in America is lacking.
◯Purpose of research
I focus on solving some problems of the teacher's work.
→I want to increase the number of students who want to become a teacher.
◯How to research
(1)research some problems about teacher's working conditions
(2)choose one problem from (1),and consider how to solve that problem with Internet
(3)by solving that problem,making a good sicle





↑the number of teacher administrative leave ↑American teacher shortage

2.Discussion and Implications

◯Researching
①about bullying teacher
・There was a bullying incident in Japan. In this case,a senior teacher made the younger one eat too spicy curry.Moreover,the senior did other things to their younger one.
・The senior was evaluated by the student's parents.
→He may be less likely to be noticed by teacher's management.
②about anti-bullying measure in America
・There may be an enough measure in America(there is a lot of article said about measure in internet).
→ illustration which prompts stopping bullying,teachers learn how to solve bullying
③about teacher's clerical work
・There are a lot of clerical work for teachers and it is connecting to long working.
ex)scoring exam,considering a grade,making some documents etc…
◯Consideration
How to improve teacher's working problem
→・exterminate the bullying between teachers
・decreasing clerical work(making time to focus on other important works and time for rest)
⇒thinking how to solve these problems with some precedent



↑American anti-bullying illustration

3.Conclusion
To solve two problems said in 2,I suggest these ideas under this line.
①to use American anti-bullying way to exterminate bullying for teachers and students
It is easy to use and it must have good results,so it should be used in more areas.
②allow teachers to use school counselor
Some schools have a school counselor.
→allow teachers to use and connect decrease their stress
③introduce some ideas to decrease teachers clerical work
There was a program to decrease teachers working time in the UK.
→introduce some ideas which may connect to decrease teachers clerical work
・using ICT technology
・make a person in school who help teachers to do with clerical work
・make clear and list the work which is not necessary for teachers to do etc…

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“Protection of World Heritage Sites Using IT”

― AR, Impact, and Rarity Value ―

5113 Suzuki Takehiro

1. Abstract

The aim of my research was to create a service combining virtual reality (VR) and tourism to offer a new way of experiencing travel. I visited ANA NEO Corporation and learned that the Metaverse can help protect world heritage and cultural assets. The research methodology involved conducting a case study abroad, followed by a visit to a Japanese cultural heritage site to experience IT technology in use. I analyzed case studies to identify the benefits and drawbacks of IT technology in preserving heritage. Based on these insights, I proposed solutions to address the challenges identified in the case studies. Key issues included the loss of uniqueness and disparities in the spread of information. To tackle these problems, I suggested creating a service that shares the values of World Heritage sites more effectively. The proposed solutions focused on smartphone-based services, including digital archives, integration of the real and digital worlds, and engaging content. A digital stamp rally, easy-to-understand historical information, and virtual reality tours were all part of the plan. These services aim to both protect and promote World Heritage sites while providing new tourism experiences and reaching a wider audience.

2. Introduction

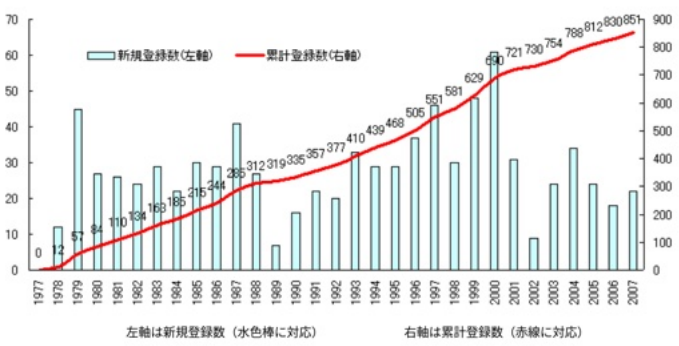
In March of last year, I conducted research for FEWC with the theme “Metaverse and Tourism.” As part of this research, I visited ANA NEO Inc., a company that uses metaverse technology for tourism services. Through this visit, I learned that the Metaverse can store many buildings as 3D data, allowing us to recreate historical structures in virtual space and preserve them for future generations.

Today, World Heritage sites are increasingly at risk of destruction, not only from natural disasters caused by climate change but also from conflicts. Some of these sites are damaged so severely that there may not be enough time or resources to repair or rebuild them properly. In this context, I believe it is very important to think about how we can pass down the existence and history of these World Heritage sites to future generations.

In this research, I am exploring ways to use IT to record and preserve the legacy of World Heritage sites, so even if they are damaged or destroyed, their existence and cultural significance can be remembered and shared with people in the future.

3. Purpose and meaning of this research

In this research, I aim to understand how combining IT with efforts to protect World Heritage sites could impact these sites and their surrounding environments. Today, there are emerging efforts



worldwide to protect World Heritage sites using digital technology. However, these activities are often small in scale. For this reason, I will gather examples of current preservation projects that use IT and digital tools to protect these sites. My focus is to explore what impacts IT could have on the heritage itself, as well as on related areas like the economy and environmental issues, as digital preservation efforts grow in the future.

This research aligns with the goals of SDG 11, "Sustainable Cities and Communities," which includes a call to "protect and preserve the world's cultural and natural heritage." Using technology to safeguard heritage for future generations can help us maintain these sites in their original form and pass down their cultural significance. In doing so, our unique cultural heritage or regional symbols may have a chance to create a meaningful influence on the global community. Through this research, I hope to explore whether this hypothesis is truly correct and to understand the broader implications of IT in heritage preservation.

4. Research methods

(1) Research overseas case studies using the Internet. In addition, students will visit Japanese cultural properties to experience examples of the use of IT technology.
(2) Through the case studies, derive the advantages and disadvantages of using IT technology.
(3) Create a proposal to solve the disadvantages.

5. Discussion and Implication

First, I found research that explores how introducing the metaverse to the tourism industry could help develop tourism resources in a sustainable way. The study concludes that metaverse tourism can go beyond the limits of traditional tourism. It has the possibility to support sustainable development as a new approach. This is especially important for Z and Alpha generation tourists, who value experiences that combine real and virtual worlds. The development of metaverse tourism could become a key tool for the future of the tourism industry. However, while metaverse tourism has a good impact on tourism resources, its connection to protecting World Heritage sites is unreadable. I want to research how not only the metaverse but other IT technologies might also impact this area.



To learn about heritage protection using IT, I researched examples in Japan and around the world. In Japan, there is a project called “Sendai Castle VR Go” at the Sendai Castle Site. By using VR goggles, visitors can see the castle as it was when it was first built. This allows people to compare the past and present of Sendai Castle, making it possible to learn about the site in a unique way. This approach could also be used for World Heritage sites.

Globally, the ASEAN (Association of Southeast Asian Nations) region has created the "ASEAN Cultural Heritage Digital Archive" (ACHDA), which collects digital records of

cultural heritage from ASEAN countries. Starting with Indonesia, Thailand, and Malaysia, the archive now includes about 160 digitized items, available to view online. ACHDA includes not only photos, audio, and video but also 3D models. Digitization of heritage from Cambodia, Vietnam, Myanmar, and Laos is in progress, and the goal is to expand to all 10 ASEAN countries.



These IT-based projects show that using IT to record data like location information and 3D models helps preserve World Heritage sites and maintain their value over time. This process can be defined as heritage protection and research using IT.

Next, I thought about the advantages and disadvantages of IT-based heritage protection. Thanks to the spread of the internet, especially among younger generations, IT-based protection could reach more people. Through social media and apps, information about heritage sites could spread widely.

The advantages of this approach are:

1) It provides an easy way to learn about World Heritage sites.

2) 3D models and detailed data allow people to explore these sites online, almost as if they were there.

However, there are also disadvantages:

1) Having so much information online might reduce the “special experience” of visiting in person, possibly affecting tourism income.

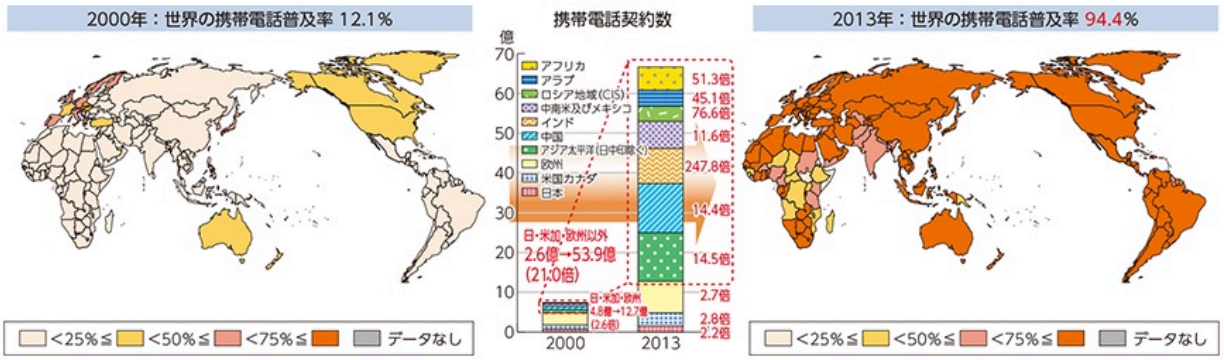
2) The difference in internet access around the world means that only some countries can use IT for heritage protection.

To solve these issues, two main solutions are needed:

1) Create services that combine the benefits of both online and in-person experiences at heritage sites.

2) Ensure these services are accessible worldwide.

One way to address the second point is to use smartphones for these services. Globally, smartphone usage rates are high, with over 7 billion devices in use, and in most areas outside of Africa, over 75% of people have a mobile phone. This shows that smartphone-based services can be a useful way to spread IT-based heritage protection without major barriers.



6. Conclusion

(1) Browsing the Digital Archive

This service lets users view 3D data and related materials of each World Heritage site on their smartphones. By looking at detailed information about buildings and cultural sites, users can learn about the value of sites listed as "Heritage in Danger" and help preserve their records. This service aims to promote and protect World Heritage sites.

(2) Services that combine reality and digital

We propose a service where users can go on a digital tour of World Heritage sites using smartphones, like a digital stamp rally. Users can collect digital stamps at each location and track their progress on the app. With a point system and rewards for collecting points, the service is expected to attract more visitors to the sites.

(3) Promoting the appeal of World Heritage sites

Through a smartphone app, users can access a variety of content, including videos and audio, to learn about each World Heritage site’s history and background in an easy way. By offering interesting facts through videos and quizzes, users will become more interested in World Heritage sites.

(4) Offering Digital Tours (about once a month)

Using virtual reality (VR) and metaverse technology, we will offer digital tours of World Heritage sites that are hard to visit in person. For example, with experiences like “Sendai Castle Ruins VR Go,” users can explore these sites as they were in the past and learn about their history. This service will be available once a month, giving users new ways to experience World Heritage sites.

If these services are realized, users will become more interested in World Heritage sites and learn how to help conserve them. However, there are some challenges to think about in the future. One key issue is funding to create and run the service, as well as making sure it can continue in the long term. This means we need to find ways to secure money, like through donations, partnerships, or crowdfunding. It is also important to have a clear business plan and strategy for growing the service.

To make the service sustainable, we need to generate some income, like offering paid plans or advertising. This will help maintain the service and keep users engaged. Marketing strategies are also important to keep users interested and to build trust with them. Over time, we plan to improve the service by adding new features and content.

By addressing these challenges, we hope to raise awareness about the importance of World Heritage protection and make this service widely used by many people. Our goal is to create a long-term plan that ensures the service is both funded and sustainable.

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Well Education for African Children

Improve High Quality Educational Environment

5114 Sekiguchi Reina

Abstract

There are many children who cannot go to school, in Africa about 48% of them are out of school. There is the vicious circle that children cannot go to school, cannot take enough education, cannot get a job, cannot earn enough money, and their children cannot go to school too. This study identifies the research question, "How can we create the environment in which children in Africa can be well-educated?". I decided to start improving the educational environment. One way to solve these problems is the “School for All” project run by JICA. This project aimed at improving children’s study environment with cooperation among school, parents, and local society, without leaving all to the government. As a result, children's basic academic skills have improved dramatically. I suggest “School for All +α”, an improved “School for All”, for African children to be well-educated. Specifically, there are three points: participating in maintenance of the classroom, introducing supplementary lessons from seniors to juniors, and sending Japanese volunteers for supplementary lessons. These suggestions will be able to improve children’s study skills more.

1 Introduction

There are many children who cannot go to school. In the world, about 14% of children cannot go to junior high school and 30% of them cannot go to high school. If we focus on the sub-Saharan African region, as many as 30% of children cannot go to junior high school. As for high school, almost one in two children, about 48% of them, are out of school. There are various causes of not going to school such as having to work for familiy, living far away from school, and religious issues. Other examples include not being able to buy stationery, too small classrooms to learn, lack of teachers, and so on. To summarize this, there is the nagative cycle that children cannot go to school, cannot take enough education, cannot get a job, cannot earn enough money, and their children cannot go to school too.

This study identifies the research question, "How can we create the environment in which children in Africa can be well-educated?". I believe that it will take a lot of time to break the vicious circle of children's inability to go to school, and that it is not so easy to solve the problem. Therefore, I decided to start improving the educational environment. There are various issues with the educational environment. I focus on three perspectives in this study. I consider how to improve Africa by using the Japanese foreign office’s website ”Let’s Look at Schools Around the World” as a reference.

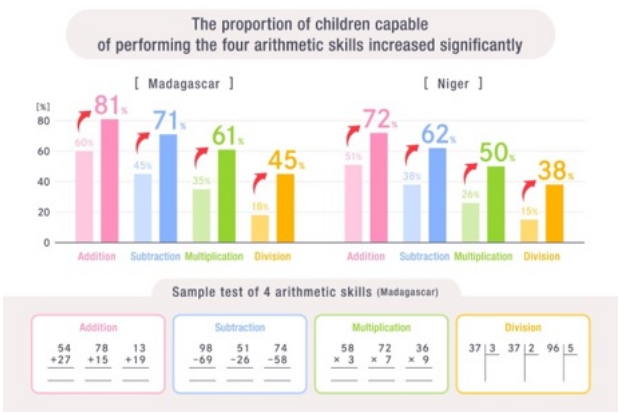
2 Discussion and implications

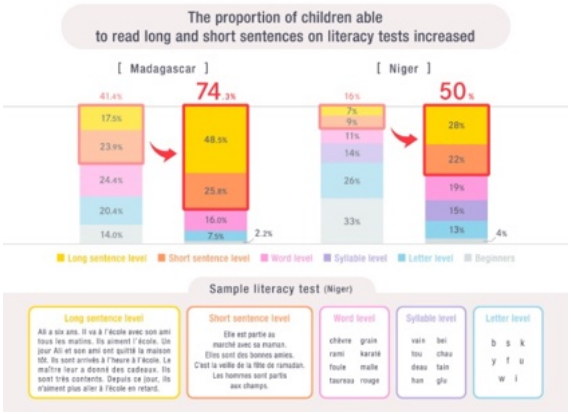
I focused on three perspectives. School facilities, teachers, and language barrier. I had heard that African schools have bad school facilities and lack of teachers. Also, I had heard that

there are many ethnic minorities in Africa, and not a few children cannot receive education in the language they normally use. Therefore, I chose these three points.

I searched the current situation in Africa by using the Japanese foreign office's website. In Africa, there are both developed and less developed areas, but the latter's situation is regarded as an African situation in this study. First, about school facilities, there are many areas where students cannot fit in the classroom because of too many students per class. It is common to have 40 to 50 children per classroom in Africa, but there is a class which has 80 students. Also, there is a lack of desks and chairs. Moreover, there are no toilet facilities and it makes it difficult to attend school. Second, about teachers, there are serious problems. The larger number of students per class, the stronger stress teachers will feel. Some teachers do not have enough knowledge to teach, which also makes them stressful. It is not uncommon for teachers to stop coming to school. Finally, about the language barrier, there are no notable issues.

After that, while researching the way to solve these problems on the internet, I came across the "School for All" project run by JICA. This project aimed at improving children's study environment with cooperation among school, parents, and local society, without leaving all to the government, started at Niger in 2004. This is spread to 9 countries in Africa, about 70 thousand schools. They improve the educational environment by reforming the classroom and purchasing textbooks or stationery, and support children's study by supplemental class. As a result, children's basic academic skills have improved dramatically.





※ graphs from JICA

I believe African children can take high quality education by expanding "School for All" to more regions. Accordingly, I would like to make suggestions that enhance this project.

3 Conclusion

In conclusion, I suggest "School for All +α", an improved "School for All", for African children to be well-educated. First, children should participate in classroom maintenance and cooking lunch which is done by the school management committee. They can learn about construction and cooking by experiencing these themselves like practical subjects, such as

technology and home economics, in Japan. I believe that learning these things can lead to future careers or develop into helping with household work. Second, introduction of supplementary lessons from seniors to juniors. Up to now, teachers and management committees carry it out, but not only that, introducing new lessons that teach their knowledge to others, can further absorb learning memory. Moreover, Japanese can help African children by sending Japanese volunteers to supplementary lessons and correcting work. Sending volunteers from many kinds of countries, volunteers can interact with many people who have multi-cultural backgrounds. “School for All +α” will also be a place for cultural exchange.

Nevertheless, these suggestions have some issues. They have to consider the danger of practical lessons, quality of supplementary lessons, and specific methods for dispatching volunteers. I hope to resolve these issues in the future.

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To Increase Worlds' GDP?

How Do We Increase Worlds' GDP by Using Stocks?

5115 Takasaki Yuka

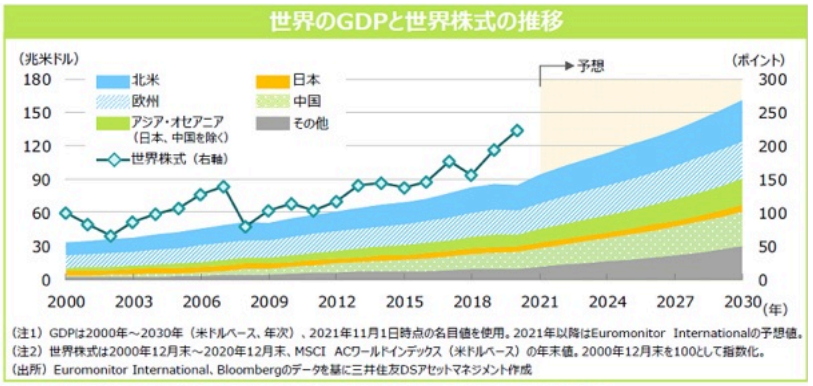
Abstract

Currently, global GDP is declining, but increasing GDP is one step toward achieving the goals of the SDGs. For this reason, I made a hypothesis: to create a mechanism for young people to achieve the goals. I found an English paper on the Internet and that said, "Education is actually closely related to the field of economy, and when one examines Turkey's efforts to become a modern society, it can be seen that education is the basis of the development movement". So I would like to use education to create a system for young people. The steps to start investing is to take classes on investment when students enter high school. If the young person has a certain level of knowledge and comes to be interested in investing, they start investing.As a future issue, it is necessary to consider what kind of lessons students can easily understand in a short period of time.

1 Introduction

Today, Worlds' GDP is decreasing. The decline of GDP means slump in economic activity. However, SDGs have the Goal of promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Therefore, I thought we should take actions to achieve the goal.

And I made a hypothesis to achieve the goal. "To make a system for young people to achieve the goal. When I researched some data on the internet, I found that young people who are investing were decreasing. And I also found that there was a relationship between stocks and GDP. So I based my research on this research question.

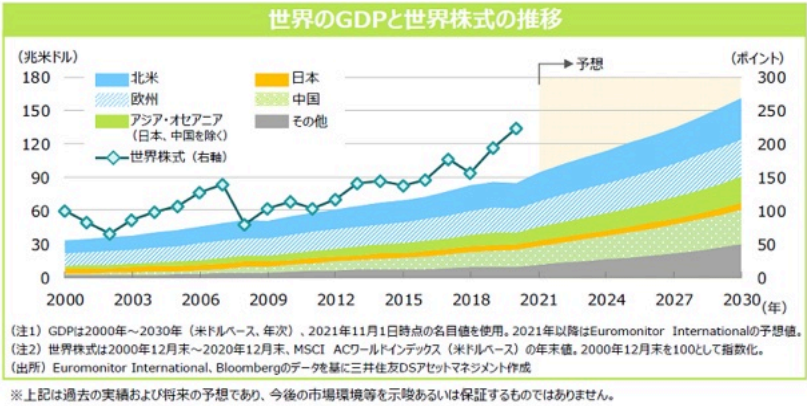


※上記は過去の実績および将来の予想であり、今後の市場環境等を示唆あるいは保証するものではありません。

I used the Internet, English language papers, and books as my method of research.

2 Discussion and implications

I found an English paper on the Internet said, "Education is actually closely related to the



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field of economy, and when one examines Turkey's efforts to become a modern society, it can be seen that education is the basis of the development movement. Within the westernisation movements that have been going on for about a century and a half, educational institutions and teachers have had a special place and education has been accepted as a dynamic social force that changes the structure of society and provides a better standard of living for society." So I think I would like to use education to create a system for young people.
Why are GDP and world stocks said to be highly correlated? The figure shows that when GDP increases, the price of world stocks increases. Therefore in the rest of this study I will assume that if world stock prices are increasing, GDP is increasing.

How can the rate of economic growth be increased in the facing of such a problem?

I thought that "index fund" might be an effective way to increase the rate of economic growth. An index is linked to the price movements of the whole markets.Some advantages of index fund are that the price movements are easier and simpler to understand than other investments, the costs are lower, and you do not need a lot of technical knowledge to invest.

3 Conclusion

So I think this advantage would make it easier for young people to start investing. The steps to start investing, in my opinion, are as follows

1 Take classes on investment when students enter the high school.
Some investment companies will allow people to open an underage account when people reach the age of 15. With the consent of the parents or guardians, the school will develop classes on investment and practical lessons using apps and other tools.

2 If the young person has a certain level of knowledge and comes to be interested in investing, he or she can start investing.

In this way, I hope to raise the investment rate of young people and increase GDP.
As a future issue, it is necessary to consider what kind of lessons students can easily understand in a short period of time.

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The solution of cat's cull

How to Conserve Protected Cats From Cull

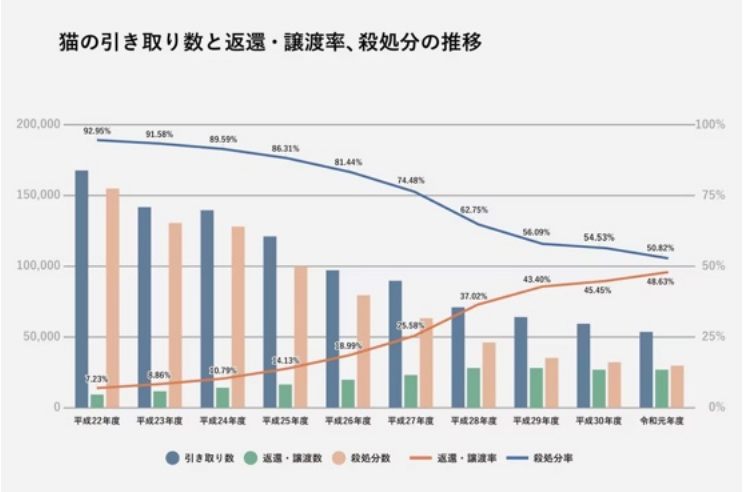
5116 Takahara Yui

Abstract

These days, many people live with animals as their pets, so we cannot disregard them. I am interested in animals and the problems about animal welfare is important for us to live in symbiosis with animals. I grasped precedent and issues. After that, I created new ideas. There are many medical studies that having a relationship with animals is good for our health, but the way to deal with animal welfare is different in each country. My suggestions through this study are "to make communities and prevent the abandonment of any pets" and "to cooperate with the local government and look for the new pet owners". They can contribute to the decrease of cull. I still have issues in the suggestions. However, I think that it connects to the solution of cull to make a good environment for pet owners and be conscious of the problems.

1. Introduction

In modern society, the demand for pets is increasing. One of the reasons is COVID-19 pandemic and the span staying at home. However, there are many cases of animal culling. In 2018, Japan culled 7687 dogs and 30757 cats. The receiving and transferring rate of animals which the Japanese local government took in is 32.6 % for dogs, 18.6 % for cats. The result is not good.



Also, cats' culling number is obviously greater than dogs.

According to an article, the reason is that there are stray cats. Some people give them food and stray cats breed. There are no stray dogs because people captured them to prevent hydrophobia. The fact that there are stray cats brings issues. That connects to increasing culling numbers and breeding too many animals. I think that it is better to focus on cats. I will expand the target. The research question of this study is "How to conserve protected cats from cull". Even if we can protect animals, it is not an appropriate way without the prospect of their future. We should consider how to live with animals. It is necessary to make the environment where people can have pets more easily. Founding consulting communities is effective to prevent the abandonment

of breeding. Also, this study aims for cooperation with the local government. The method of this study is checking the current situation of the problem and prior cases in the world. After that, I consider new suggestions and its issues.

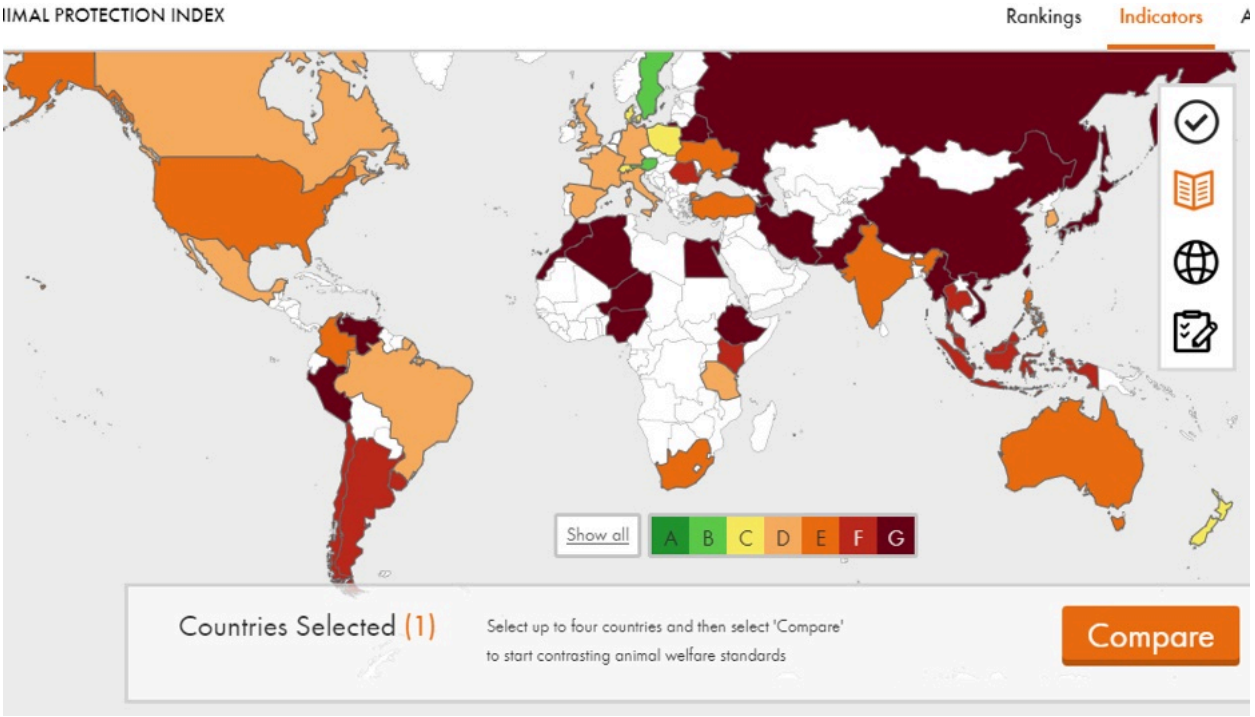
2.Discussion and implications

The rate of receiving and transferring animals in Japan is 32.6% for dogs and 18.6% for cats. The number of culling them is decreasing, but 7687 dogs and 30757 cats were killed in Japan in 2018. To protect animals has good points not only from the viewpoint of animal welfare. There are merits also for people by animals. According to Psychosomatic Medicine, animals can decrease stress level.

Journal of Vascular and Interventional Neurology said that cholesterol and blood pressure decreased by animal affection and Journal of Allergy and Clinical Immunology asserted that animals were related to improving immune systems and preventing allergy. In addition, it is said that we live more regularly and get chances to interact with other people in the society if we live with pets. The affections are indirect benefits. Many researches about medical merits by animals are done in foreign countries. However, the extract from the educational human science department in Yokohama University's paper said, "Multiple regression analyses showed the emotionally close relationships with pets had significant negative effects on depressive states and loneliness when the effects of socio-demographic variables, health status, and social support network were controlled." The results suggested the importance of emotionally close relationships with pets for quality of life in old age."

There is a former case, "Tier Heim" in Germany. It is a facility which is run by a private animal welfare group. The facility receives about 10 thousand animals in a year. Surprisingly, its transfer rate exceeds 90 %. Despite strict standards to transfer animals to new pet owners, they can hand over almost all animals there. That sounds like a good solution and we should mimic it, but it is difficult for Japan. Germany is famous for animal welfare, so many people are interested in the

problem in the country.



Many animal protection facilities have many volunteers and get many donations. It is hard for many countries like Japan to do the same thing. Building and running big facilities costs a large sum of money.

Next, I focused on local government. The cost of culling animals in Japan is from a thousand yen to 6 thousand yen. Reducing the number of culling is a merit for local governments.

However, the order of priority of the problem about animal welfare is different in each country. The European area is especially high level in the solutions of the issue. For example, Germany, France, the Netherlands, Austria, Switzerland, and Greece. These countries do not cull animals in principle. It is difficult for other countries to refer to the solutions. Especially, the order of priority of the problem about animal welfare is low in developing countries.

3.Conclusion

I suggest “make a pet owners community to prevent abandonment” and “cooperate with the local government and find people who can feed protected cats”.

First, I will utilize facilities such as a cat cafe. I want to cooperate with veterinary clinics and health centers in order to share concerns about pets and consult specialists. If we use the cat cafe’s space, we can have the opportunities to communicate with people. Also, that needs less money than making big animal welfare facilities. I think that we can decrease the number of culling and abandonment by making a good environment to have pets.

Second, I will cooperate with local governments. I want them to actively promote animal welfare and enhance citizens’ awareness to protect animals. For example, to give information about receiving animals and holding events like receiving and looking for animals gathering. To save money for culling is a merit for local government. Supporting local governments which move actively is under consideration.

There are some issues in the suggestions. That is to look for facilities and institutions that agree with the idea of the first suggestion and think and improve the detail system of the second suggestion. It is necessary to consider concrete actions and how to support facilities.

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Soccer and Discrimination

5117 武末 侑大

Abstract

These days,the more times I am involved with soccer,the more times I feel that racial discrimination exists there. I could see the news about some Asians who suffer from discrimination. As a soccer fan, I cannot miss this circumstance. That is why I have started this study. First of all, I researched current situations focusing on Europe's big five leagues mainly.Then, I made plans with the results. The plans are “strengthening collective regulation” and “activity with local children”. In the future, we will consider how to respond to the club’s profits and appeal to the club.

Background

One of my hobbies is watching soccer. I seldom go to the stadium to watch J-league games but I often use delivery services to watch the games in Europe.The most serious problem we see is booing, and racism that comes with it. anti-discrimination charity『kick it out』said that we received 1007 reports of discriminatory behavior.They also said that 49.3％ of them. This is the number of reports to one organization.Therefore the overall picture is probably even worse. In addition to discrimination against Blacks, there is also frequent discrimination against Asians, including Japanese. We conducted our research with the hope of communicating these current conditions and working together as one to eradicate discrimination.

Purpose and significance of the research

The research question was “How can we eliminate racial discrimination in the world of soccer, especially in the five major leagues? Currently, the United Nations has established a committee to discuss the issue of racial discrimination, and the entire world is united in its efforts to eradicate it, but racism and discrimination are still prevalent throughout the world. The most prominent of these is in the world of sports. In this study, we focus on soccer, the world's most popular sport, and propose a proposal to eradicate racism. The hypothesis before the research was simply to strengthen regulations and to have players call for such measures through social networking sites and so on.

Research Methods

We investigated the current situation by gathering information on the Internet and watching a game of a local J-League team, Zaspaksatu Gunma. In addition, we considered solutions through conversations with seminar participants and friends.

Research results and discussion

The first hypothesis of the study was that the players would call for the eradication of discrimination. However, even though the players who were victims of discrimination posted on SNS and other social networking sites to pray for the eradication of discrimination, the current situation has not changed. In May of last season, the problem of large-scale racial discrimination against black players in Spain became an issue, and teams and soccer fans around the world criticized it one after another, but racists' activities have not yet stopped. In the seminar, the idea of “collective regulation” was proposed. Collective control means that not only the person who made the racist comment but also the people around him or her and all the supporters who attended the game would be forbidden from the game for a certain period of time, or some other restrictions would be placed on them. This would be coercive and forceful to suppress discrimination. However, this would be to the significant detriment of the general supporters and the clubs, and we felt it was necessary to reconsider. Next, we discussed the project with children. As an outline, local children would be invited free of charge to watch home league games. In addition to increasing attendance, the goal of the project is to prevent racial discrimination in front of children by making them feel resistance to such behavior. This summer, Saspaxats Gunma held a ”10,000 Attractors Challenge. The challenge was actually accomplished, but the key was the invitation of local elementary school students. Not only were the cheering and surrounding stalls lively, but there was not much booing at the game. This was the result of a psychological reaction that made adults believe that booing, including racial slurs, in front of children was unthinkable. Based on this, we request that each club in each country regularly invite local elementary school students and small children to the games to curb booing, including racial discrimination.

Conclusions and future issues

The conclusion to the research question “To eliminate racial discrimination in the world of soccer, especially in the five major leagues,” is that “each club should invite elementary school children and younger to home league matches and thoroughly create an atmosphere where racial discrimination cannot take place. The next task is to think of a way to request clubs around the world to do so.

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How to Encourage Reintegration for Survivors of Landmine Damage

Protecting Civilians from Demonic Weapons

5118 Tanaka Akira

Abstract

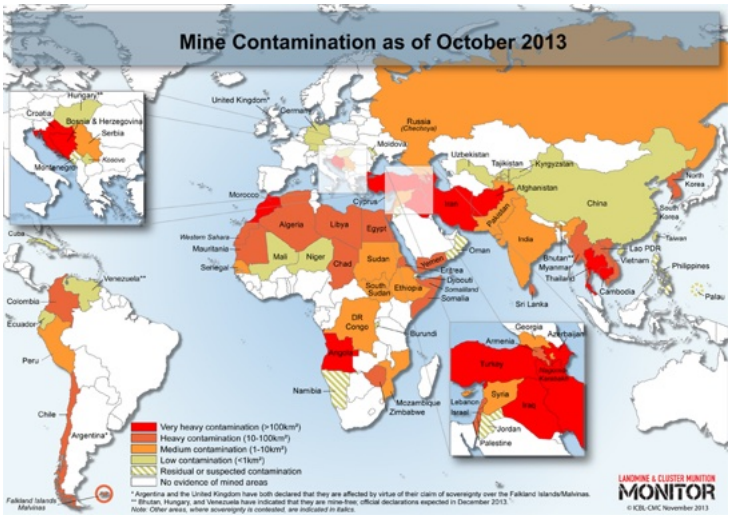
Landmine is a weapon designed to explode when touched or approached by a person or vehicle. Looking around the world, there are many landmines under the ground not only in countries that are involved in wars, but also in countries that have already completed their wars. That is because landmines remain until they explode regardless of the present situation. Landmine has three cruel features including it. They are Residuality, Brutality, and Indiscrimination. People damaged by it are said to be difficult to re-engage with society and feel isolated. I believe that reintegration is the most effective first step to get back their will to live. So I have researched how they get jobs and community, and overcome landmine's damage.

Introduction

Before, I read "*Shokugyo wa buso kaijo*" written by Seya Lumiko who is Executive Director, NGO Japan Center for Conflict Prevention. Then I learned about why soldiers are forced to go to battlefields. When I knew that even people of the same age as me go there, I felt strongly that I needed to know them, which led me to this study. The reason why I chose this topic is that landmines attack many civilians not involved in wars. I mainly have used the Internet, but I had good chances to ask professors about my study twice. One of them was in Switzerland. I visited ILO and could ask Mr.Momose, who is a Japanese worker there. He has been to an improving country and seen that people who were damaged by the war were not working. After that I started to focus on aftercares for them. The other was in Kenya. I could get an opportunity to visit a street children shelter and ask the founder how to care for them. These interviews gave me new perspectives. I would like to take this opportunity to thank them once again.

Discussion and implications

Today, it is said that there are about 230 million landmines all over the world.



One of the main reasons for this situation is the fact that landmines are inexpensive and can be mass-produced. Price per item ranges from 300 yen to 3000 yen. They are also small. Therefore, it is easy to distribute. Furthermore, once a landmine is buried, it takes immense money and time to remove it.

Cambodia Mines -remove Campaign (CMC) explained that landmines have three negative features. They are Residuality, Brutality, and Indiscrimination.

1.Residuality

It means there are still a lot of them left even now. The amount of them is about 50 million.Once buried, landmines operate semi-permanently, waiting for someone to step on them. In addition, since the purpose of landmines is to destroy the economic activities of the enemy, they are often buried in fields and water pumping stations where crops are gathered in abundance, in mountain forests where nuts and timber are harvested, and in public squares where people gather, putting people in a difficult situation.

2.Brutality

Landmines are designed not for killing people but for injuring. When someone is damaged by a landmine, it causes mental blows and fear in the surrounding witnesses. In addition, a large number of military forces are required to carry wounded people to rescue, and the subsequent treatment and rehabilitation is very expensive, placing a financial burden on the enemy. Landmine victims are torn out, blown apart, and maimed by flying debris, and it is said that only one in two will survive. Victims who survive can be left with severe disabilities, including amputated limbs and blindness.

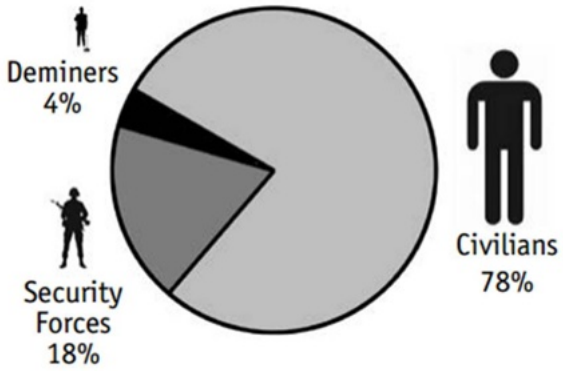
3.Indiscrimination

Landmines do not choose people whom they attack. Under a war, where they are buried would be buttlelines, however, they may change into civilians' residences. As a result, now, a lot of landmines are waiting to explode at the feet of those who step on them, regardless of whether they are soldiers or civilians, adults or children.

These are reasons why landmines are called Demonic Weapons.

At the end of the 1990s, it is inferred that 15000 to 20000 people were damaged by landmines each year. That means there were more than 40 victims in a day. Fortunately, the number of victims is decreasing. In 2012, 3,628 people worldwide were reported to have been killed by landmines in one year. That shows 10 victims every day.

(Landmine monitor Report2013)



Japan also used to manufacture landmines and the Self-Defense Forces possessed about 1 million mines, but in 1999 it joined the Ottawa Treaty and in 2003 completed the process of destroying the mines it had. Although 15,000 mines were left behind because they can have mines for use in the development of technology and training for mine clearance, by the end of 2018 that number had been reduced to 898 mines.

I visited ILO in Geneva and asked Mr. Momose about my research. He told me about the tough situation in Myanmar. He saw that disabled people and victims didn't work. They looked to have no will to work. As I mentioned, landmines are made to injure people and patients are often left with severe disabilities, including amputation of limbs and blindness. Hearing it, I started to consider how to care for them. Later, I saw an interview at the International Committee of the Red Cross (ICRC) with a person who wanted to be rehabilitated from a landmine injury and had successfully done so. They felt they were contributing to society by working, and they felt valued. This research will lead to the achievement of reintegration and could be a great help to victims who have lost the meaning of life.

Conclusion

Considering the provision of work as the first step toward reintegration, I propose the establishment of an employment window for victims. The employment window is the system that serves a link between companies seeking workers and victims seeking work. The employment window would maintain data on victims and refer them to companies. This data includes information such as level of disability, place of residence, internet environment, literacy, and so on. This data management would make it easier to assign work, and feedback is provided after the work is completed so that it can be used for the next assignment. By repeating this process, issues can be identified and changed to better services. It also provides a community among victims. Through the work, connections can be made within the community.

I want to aim to help victims “get back into the habit” of their day. Kenya has many street children (children without homes due to economic stagnation or widening economic disparity in the country, conflict, or natural disasters. They may be addicted to alcohol or drugs, especially in urban centers). I visited a person who runs a shelter for the protection of street children, and he told us that he is working to provide daily habits to the children to induce

their mental independence and their physical health. This would be effective not only for street children, but also as a way to reintegrate victims of landmines into society. However, there are things that I have to think about. What jobs they can do without the Internet, and who teaches them how to work are still left as problems. I would like to keep studying about these issues.

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Plastic-free Containers for Cosmetics

How to create non-plastic containers for cosmetics and generate economic benefits

ID 5119 Nakayama Rino

In research on cosmetics container recycling in Japan, I learned about the large number of cosmetics in circulation, the difficulty of recycling, and the amount of plastic used. Therefore, I researched materials suitable for making cosmetics containers and ways to solve the cost issues that arise when converting to these materials.

I propose bamboo and seaweed. They are easy to produce and process. It is also environmentally friendly because it absorbs carbon dioxide during cultivation.There are currently companies overseas that manufacture edible trays and wraps from seaweed plastic, which is also recognized for its resistance, water resistance, and flexibility.

One of the reasons these materials are not widely used is the high cost of production. In response, I propose a plan by using seaweed to reduce this cost by devising the location of the factory, the method of collecting the materials, and the manufacturing process of the products. First, the location of the factory. Seaweed is grown in many countries where there are major cosmetics companies and many consumers, so locating the factory will lead to a reduction in transportation costs. In addition, the cost of acquiring materials can be reduced by using materials that would otherwise be unnecessary for production. Furthermore, since seaweed can be used to produce paper, a single factory can produce everything from containers to label packaging using only one material. By reducing production costs through these three methods, I believe it will be possible to use the material as an alternative to plastic.

1 Introduction

I researched about the recycling of cosmetics containers in Japan.I found that 2,524,039,530 cosmetics were sold in 2021 and most of them cannot be used after 3 years because of hygiene and would be thrown away. There are big companies which produce more cosmetics than Japanese companies and they also use plastic containers. According to the French Institute of Public Opinion ’s research, France throws away 4 tons of cosmetics every day.

The preceding study,”Cosmetic Packaging to Save the Environment: Future Perspectives”.

In the specific case of cosmetic packaging, re-use is rarely applied, even chemical and mechanical recycling is not easily feasible due to difficulties in post use packaging collections, and due to packaging being often strongly contaminated by residues from the greasy and creamy cosmetic product, hard to remove by washing.

The percentage of contaminants consisting of residual liquid or cream products affects the recovery of single materials. Hence, this fraction is usually managed by incineration. This life cycle is thus less sustainable than that of rigid packages, and more sustainable options should be considered. In the future, if bioplastics will be used in cosmetic packaging, the scenario could be different. Cosmetic packaging is hardly collected and recycled, thus the use of sustainable compostable or environmentally biodegradable materials for cosmetic packaging is an important challenge and an opportunity for sustainability. Innovative bio-based and compostable materials are already developed and suitable for production of cosmetic

packaging while others are under development with very promising properties and perspectives. Consumer and policy awareness is important to support the development of sustainable cosmetic packaging, which represents an important step versus the saving of our environment.

Cosmetic Packaging to Save the Environment: Future Perspectives
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Cosmetics 2019, 6(2), 26; https://doi.org/10.3390/cosmetics6020026
Submission received: 18 March 2019 / Revised: 10 April 2019 / Accepted: 11 April 2019 / Published: 15 April 2019

The purpose of this study is to research alternative materials of plastic and suggest how to spread them worldwide.
I would like to pursue my research with this 3 steps.
1) To find the characteristics and issues of alternative materials for cosmetics containers.
2) Study alternative materials based on the elements for cosmetics containers.
Evaluation points for alternative materials
(1) preservability (2) Water resistance (3) Design (4) Ease of production
3) Consider ways to solve challenges in order for these materials to become more widely used.

2 Discussion and implications

Currently, aluminum, glass, wood, paper, stainless steel, and bamboo are used as alternative materials to plastic for cosmetics containers, and seaweed plastics and rice resins are becoming popular as alternative materials for cosmetics containers. Among these materials, I paid particular attention to seaweed plastic, bamboo, and wood. These materials do not use fossil fuels as a raw material, and even if they are illegally dumped and end up in the ocean, they are biodegradable and will decompose over time and not become microplastics. In addition, these plants absorb carbon dioxide during their growth, and thus are attracting attention as zero-carbon materials that can reduce carbon dioxide emissions as a result, even if carbon dioxide is emitted during manufacturing. Seaweeds, as marine plants that absorb carbon dioxide, were named “blue carbon” in a report by the United Nations Environment Programme (UNEP) .
In this study, the most important point is that the material be environmentally friendly as an alternative to plastic, so I will examine these three materials.

First,I consider the preservability of these materials.

Seaweed is currently developed as seaweed plastic by Notpla in the U.K. According to Notpla, seaweed can be made into a material with characteristics similar to rigid plastic, making it suitable for packaging delicate items. The company currently sells individually packaged edible oils that can be used up and stored for a long time. This indicates that it has high preservability.

Bamboo itself contains lignans, which are strong antioxidants. It is very resistant to various bacteria and works to reduce the number of bacteria (bactericidal effect) and inhibit their growth (antibacterial effect).

Wood, especially cedar and cypress, has a bactericidal effect. When the surface is coated with lacquer, the lacquer has a bactericidal effect.

Seaweed and bamboo can reduce oxidation, and bamboo and wood have sterilizing properties. However, the containers currently on the market use both bamboo and wood together with glass and plastic. The preservability of bamboo as a stand-alone material is weaker than that of seaweed plastic.

Second, I considered the water resistance.

The seaweed plastic can be made water-resistant by special processing, but the plastic made of 100% seaweed is easily decomposed by water. notpla's website also states that rigid plastic, which is suitable for packaging cosmetics, decomposes in a few hours when immersed in water.

Bamboo and wood do not lose their shape significantly when immersed in water, as is the case with seaweed plastic. In addition, the surface can be painted or otherwise processed to prevent water leakage.

The above shows that seaweed, bamboo, and wood are all vulnerable to water on their own. Therefore, they are not suitable for packaging products that contain water, such as lotion.

Third,I considered the design.

Since seaweed has the same appearance as real plastic, it is possible to create products with the same design as current products. Also, since the material is similar to plastic, complex molding, such as nozzle parts, would be possible. The material is close to being transparent, making it suitable for packaging products that need to show color.

Bamboo and wood can give a sense of luxury that is different from that of plastic. They can also be used to create an organic image, making them easier to use for companies that use organic materials. It also feels good to the touch and looks good enough to be used for many years. However, the appearance is all wood-grain, and paint needs to be applied to add color. It is difficult to create a large visual impact depending on the brand and product.

Finally, I considered the ease of production

Seaweed grows at a rapid rate of 2 meters per day. It can be harvested many times a year, making it possible to produce containers in a stable manner. Furthermore, seaweed does not require clean water and does not need to be fertilized, making it easy to produce. It takes only about two years from seed to harvest.

Bamboo, like seaweed, grows at a rapid rate of one meter per day, and holds the Guinness World Record as the fastest growing plant in the world. Bamboo grows in a warm and humid climate, so it requires no watering, artificial fertilizers, or pesticides. Bamboo takes three years from germination to maturity.

Trees take 40 to 50 years from the time they are planted to the time they can be used as lumber. In addition, human care, such as thinning, is required. Although thinned wood can be used, stable production cannot be expected in the case of mass production in the future.

	environment friendry	preservability	Water resistance	Design	Ease of production
sea-weed plastic	◎	◎	×	◎	◎
bamboo	◎	◎	○	○	◎
wood	◎	○	○	○	×

The results from the above studies are shown in the table above. If ◎ is scored 2, ○ is scored 1, and O is scored 0, seaweed scored 8, bamboo scored 8, and wood scored 5. Thus, with a tie for first place, seaweed and bamboo are the most suitable alternative materials to plastic.

One of the reasons why they are not widely used is the high production cost. Therefore, we propose a cost reduction plan.

First, I will devise a method to collect materials. The total amount of residuals such as stems that are discarded after being used as edible kelp and wakame in Japan is said to amount to about 15,000 tons per year. In Japan in particular, there is a large amount of seaweed waste, including debris left over after it is used for soup stock. By collaborating with seaweed farmers and restaurants, the value of these normally discarded seaweeds as ingredients can be created. By having producers and restaurants donate these seaweeds free of charge or at a low cost, it can be cheaper than purchasing the materials from the producers. This method will also benefit the seaweed farmers.

The next step is to devise a location for the factory. Seaweed is 96% farmed, and is produced in France, the U.S., Japan, China, and neighboring countries where there are major cosmetics companies and where cosmetics are consumed. Producing and collecting materials in the home country, where they can be easily grown, processing them in nearby factories, and selling them in the home country or neighboring countries will lead to reductions in production and transportation costs. In particular, countries like Japan and France, where oil production is scarce, should adopt seaweed plastic as a substitute for plastic.

Finally, packaging: the biopolymer needed to produce most of Notpla's products is only 15-20% of the seaweed resource, leaving the remaining 75-80% as fiber, which would

normally be discarded. However, the fibers can be processed and used to make a material similar to paper. Since this paper can also be printed, the processes necessary to produce products such as stylish labels, ingredient lists, boxes, wrappers, and other product packaging can be performed at a single factory using a single material without waste. By locating a factory that can perform all of these processes in the vicinity of the seaweed production area, it would be possible to reduce transportation costs and outsourcing costs for packaging.

3 Conclusion

Bamboo and seaweed have potential as alternative materials to plastic. In particular, the use of seaweed can reduce production costs. In fact, the use of seaweed has the advantage of providing a new industry and employment for seaweed farmers. Although the price remains high due to the difficulty of mass production, I believe that the cosmetics can be made sustainable by aiming for mass production while lowering the price based on the three innovations I have proposed.

There is still the issue of the impact on the ecosystem if too much material is taken in the production process. It is necessary to create a mechanism to cultivate new materials as well as to use them.

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How to Travel to Understand Different Cultures

To prevent discrimination comes from ignorance

5120 Hanzawa Miu

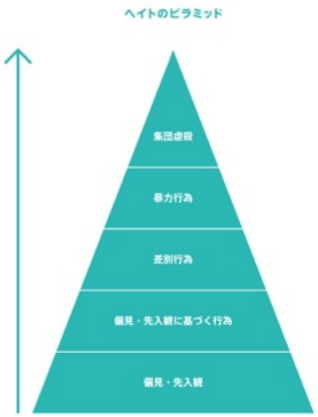
Abstract

The purpose of traveling is to understand the different cultures. And also, the main purpose of understanding the different cultures is to eliminate bias about different cultural backgrounds. So, my research question is “How can we understand different cultures by traveling?” Now, there is “Cultural traveling” supported by the Japanese agency of cultural affairs. The purpose is to understand the cultures using traditional buildings. However, only a few people who are interested in culture travel in this way. So, I suggest a new plan for traveling that these people can join easily. The plan is “Online traveling”, which uses video calls like zoom and google meet. The merits of online traveling are the low cost, the easy way to join, and detailed explanation by the local guide. I suggest that this plan should be worked on as a class in school so that students can learn about different cultures.

1. Introduction

First, I researched what the purpose of traveling is. According to the Tourism Agency in Japan, there are two purposes of traveling: to encourage the economy and to understand different cultures. I focused on the second purpose and regard tourism as a way to understand other countries.

Then, I found a figure that shows the process of discrimination. It says discrimination comes from “microaggression” based on prejudice and bias. (Microaggression means that people attack others unconsciously.) Moreover, lack of knowledge causes stereotypical thinking, which is the cause of prejudice.



Therefore, I think understanding different cultures is important to prevent people from discrimination.

I made my research question like this: How to travel to understand different cultures.

The significance of my research is that I can contribute to the SDGs goals by aiming to reduce inequality among countries.

As a premise, the way to understand different countries is to learn about the history and culture of a country. It is because customs are often based on historical backgrounds and can be understood by learning them.

Also, I researched what the ideal states of understanding different cultures are. I found a thesis that Milton Bennett, a sociologist in America, researched about learning different cultures.

According to his research, our goal is “Acceptance”, “Adaptation”, and “Integration”. “Acceptance” means to admit that we have different points of view and important things in each culture. “Adaptation” is to understand the different cultures and to act in a way of that culture.
“Integration”, the final goal of this model, is to switch some cultures depending on occasions.
Milton Bennett, “Developmental Model of Intercultural Sensitivity”, IDR Institute, https://www.idrinstitute.org/

2. Discussion and implications

According to the Agency for Cultural Affairs, the way to learn cultures is “Cultural Traveling”, which leads us to understand different cultures on a deeper level by traveling.
In Japan, the Agency for Cultural Affairs tries to promote Cultural Traveling in some ways.

1. Tell the stems of cultural resources and relativity with other resources
2. Introduce cultural/historical backgrounds with easy way to understand
3. Make use of information technology such as audio guides, information terminals, and VR.
4. Use various languages, not only English.

By doing so, tourists can learn about the culture of a country.

However, there is a problem about Cultural Traveling. The Japan Travel Bureau Foundation says that there is a big difference between people who are interested in culture and people who are not. 23% of people who are not interested in culture do this type of travel. On the other hand, 64% of people who are interested in culture do Cultural Travel.
It means people who have neither interests nor knowledge about culture do not take actions to understand them. It is not effective to realize my goal. Therefore, I want people who don’t have interest for Cultural Traveling to join to understand different cultures.
We should improve Cultural Traveling in three factors.

1. Easy way to join the plan (People who don’t have enough money or time to travel also can join the Cultural Traveling.)
2. Make a chance to learn (Not only enjoy sightseeing but also understanding a deeper level by studying in advance or listening to the guide’s introduction)
3. Make a chance to talk with local people (Listen to the voice of local people and introduce about our country each other)

Thinking of these factors, I want to suggest “Online Traveling”, which uses video call tools such as zoom or google meet. We can see landmarks in real time listening to the guide introducing the spots. During the COVID-19 disaster, a tourism company HIS did Online Traveling as an alternative way to travel.
When I visited HIS office in Singapore for a company interview about innovation, I could ask about Online Traveling. Mr.Tokura, a manager of the office, told us that their company was exerted a bad influence because of the COVID-19, so they had to start a new project to save

their company. He explained to us that Online Traveling is used for advance preparation for actual traveling, especially for preparation of school trips.
After COVID-19 finished, they reduced the Online tour. However, I think there are great merits to continuing Online Traveling after COVID-19 age, and I suggest using Online Traveling for the main purpose itself, not for preparations. I have three reasons for my suggestion.

First, it is easy and cheap, so it enables many people to try it casually.
They can join it in their house, and they only have to pay entry fees (1000 yen ~ 3000 yen) . It is much cheaper than going to the country, and they do not need to book an airplane and hotel, so those who don't have confidence to travel abroad, for instance, students, can try it.
Second, it is easier to ask guides than the usual type of traveling. There are tour guides already because they are on the video call. Then participants can get detailed information about the place and buildings. Guide is introducing everything they see during the tour, so even if guides are just walking, they talk a lot about that country. It helps us to understand the country more.
Moreover, they can ask guides using chat tools, and they have enough time to ask. Therefore, if they are not good at speaking foreign language, they are able to ask with letters using translation tools.
Finally, people feel free to interact with local people. Because it is a video call, almost all of the guides are living in that country. Thus it is an easy way to communicate with local people.

However, Online Traveling has a few problems.
First, participants can ask by writing a comment, but the answer is oral language. Therefore, if they cannot listen to foreign language, it is a little harder to understand.
Second, people who have no interest in traveling or cultures at all will not join the Online Traveling as well as the usual traveling. Also, it is no means of preventing prejudice to just enjoy traveling to developed countries because we do not have bias or a sense of discrimination to America or France. The discrimination appears with countries that people see as "lower level" than their own country.

I think the solutions to these problems.
As the first point, they can use simultaneous interpreting tools on video calls. I think it will be more correct and speedier in the future.
Speaking of the second point, I suggest that people should experience Online Traveling in classes in school.
In a class of integrated study, students choose one country and search about that country in advance. Then, they join the Online Traveling and listen to the guides and ask some questions. Moreover, I think not only listening to the guide but also introducing their own country is effective to understand the cultural differences.
As a point of note, a country from which foreign workers come should be researched because the discrimination often becomes a problem with residents and migrant workers. For example, 40 percent of foreigners have been refused to rent a house, according to research by

the Ministry of Justice. Furthermore, Japanese companies pay much lower wages to the foreign workers than Japanese workers.
I found an article about this problem from the New York Times, quote,

"The political resistance to immigration in long-insular Japan, as well as a public that is sometimes wary of integrating newcomers, has led to a nebulous legal and support system that makes it difficult for foreigners to put down roots. Foreign-born workers are paid on average about 30 percent less than their Japanese counterparts, according to government data. Fearful of losing their right to stay in Japan, workers often have precarious relationships with their employers, and career advancement can be elusive."

Motoko Rich and Kiuko Notoya. (Aug. 5. 2024).
"Japan Needs Foreign Workers. It's Not Sure It wants Them to Stay."
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From these points, I think that discrimination occurs easily between native people and foreign workers. Therefore, learning about the countries of origin of foreign workers is an important point to prevent discrimination.

3. Conclusion

My research question is "How to travel to understand different cultures", and in conclusion, I suggest that we should experience Cultural Travelings by using Online Traveling. By doing so, various people can join Cultural Traveling easily and make a deeper level of understanding with guides. Learning about a country leads us to prevent bias or discrimination about the country.
To do so, we can interact with people in a country where workers come from, in a class of integrated study.

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Use of Cloning Technology in Livestock Farming

5121 Fukushima Aro

Abstract

I wonder if cloning technology for livestock can be a solution to food shortages. Currently, various research institutions in Japan are producing livestock using cloning technology. Although safety is guaranteed, there are not enough individuals and it has not been distributed. Research on cloned livestock is progressing in other countries as well, and it is said that it is safe and there are no ethical issues. On the other hand, issues remain, such as the tendency of cloned livestock to die prematurely. Cloned livestock are not yet an effective solution to food shortages, as they are not currently available on the market.

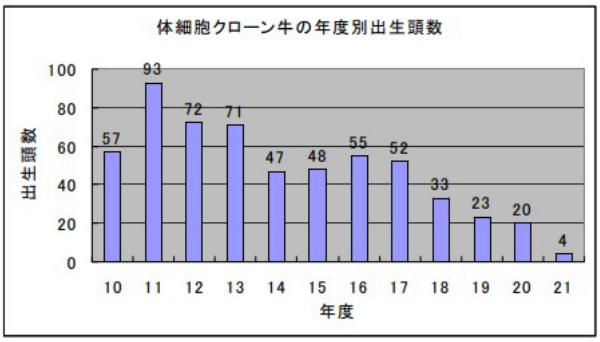
1, Introduction

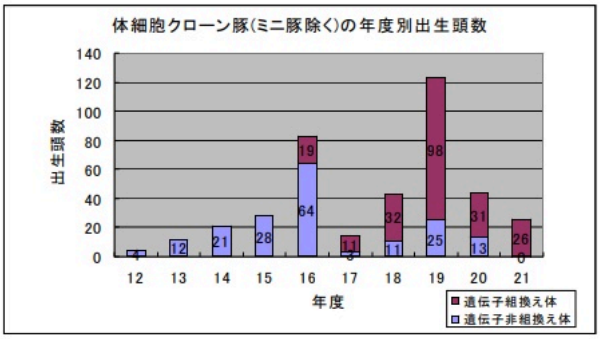
It is thought that the world's population will increase in the future, and the demand for food will increase. On the other hand, livestock, especially cows, consume a lot of feed, which contributes to worsening the food crisis. Cloning technology has recently attracted attention in order to meet the demand for food. Among these, for my research, we investigated the use of cloning technology for livestock.

2, Discussion and implications

・Current status of cloning technology in Japan

Since the first successful somatic cell cloned cow was created in 1998, various research institutions have been creating somatic cell cloned cows. In the livestock industry, they are continuing to conduct research to improve the production rate of somatic cell cloned cows, with the aim of applying them to testing the ability of breeding bulls. Furthermore, research into medical model livestock, such as the production of experimental pigs with immune function deficiencies, has been progressing recently by combining genetic recombination technology and somatic cell cloning technology. Since the world's first somatic cell cloned cow was born in 1998 at the Ishikawa Prefecture Livestock Industry Center, 575 cows have been born in Japan. All of these products were developed by institutions conducting testing and research, and are not produced by general livestock farmers. Of these, 66 are currently being kept at research institutions. In addition, 398 somatic cell cloned pigs (excluding miniature pigs) and 9 somatic cell cloned goats have been born, but as of September 30, 2009, none of them have been produced for research at testing and research institutions. They are not produced by ordinary livestock farmers. Of these, 34 pigs and 2 goats are currently being kept at the research institute. However, it is still in the research stage and a sufficient number of individuals has not been secured. Although the safety of meat derived from somatic cell clones is guaranteed, it is not distributed.





・Use of overseas cloning technology

·The US

Even after the Federal Food, Drug, and Cosmetic Act (FDA) report was submitted, the U.S. Department of Agriculture (USDA) recommended that livestock cloned using somatic cell clones has been made to refrain from shipping.

・Europe

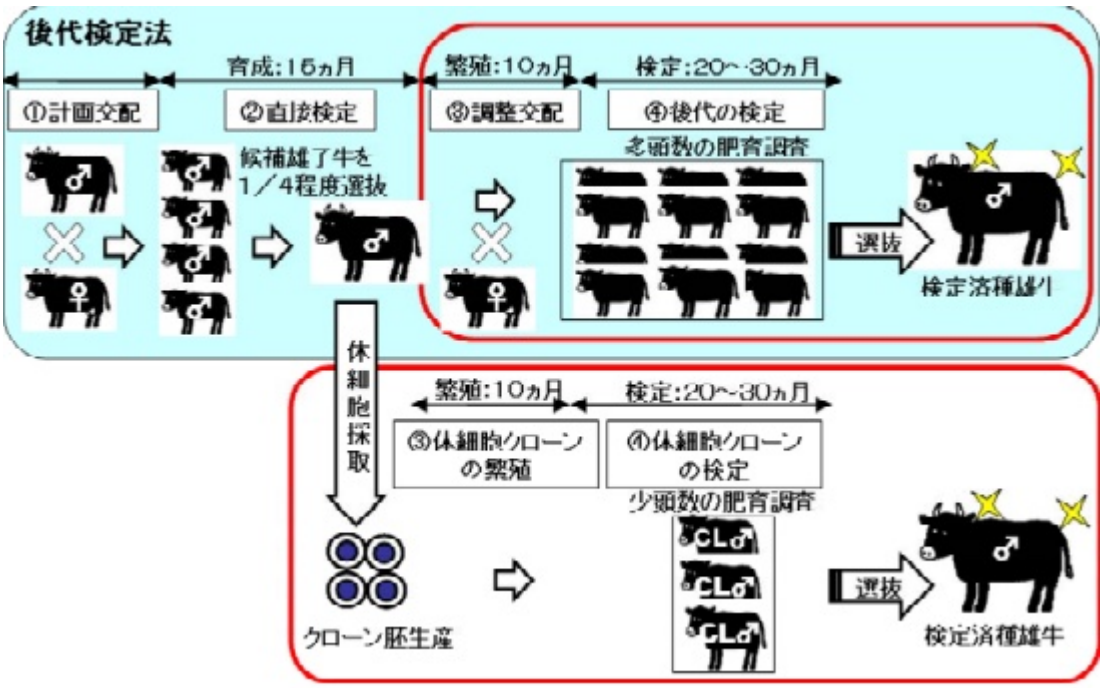
Livestock produced using somatic cell clones must undergo a safety review based on EU directives, and are currently not allowed to be distributed.

・Argentina

Goyaike, a private company in Argentina, succeeded in creating a somatic cell cloned cow in February 2004 after acquiring an American biotech company. The company has improved its technology regarding somatic cell cloned cows and is now contracted to produce somatic cell cloned cows. Goyaike's somatic cell cloned cattle department has seven staff members and has produced 50 somatic cell cloned cattle as of October 2006.

・Advantages of cloning technology

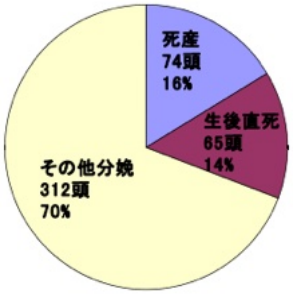
Regarding the use of somatic cell cloning technology in the livestock field, consideration is being given to its use in selecting breeding stock for improving beef cattle. The conventional testing method is to produce offspring of candidate breeding stock and select candidate breeding stock based on their performance. This method requires a large number of offspring, but by using somatic cell cloning technology, highly accurate testing can be performed using a small number of cloned livestock, which is expected to reduce labor and costs.



・Disadvantages of cloning technology

・Somatic cell cloned cows do not live long

The stillbirth rate and immediate postnatal death rate (the rate of death shortly after calving (approximately within 24 hours)) of SCNT-cloned cows are higher than those of general breeding cows, which are approximately 5% and 2%. 16% and 14% respectively.



・Ethical issues

The Basic Research and Development Plan for Life Sciences, decided on August 13, 1997, states that ``While the creation of animal clones has great significance in livestock farming, scientific research, and the protection of rare species, it is also of great concern to the public. In promoting experimental research, based on the Act on Animal Welfare and Management, efforts are made to balance scientific and animal welfare perspectives, and to conduct animal experiments appropriately. However, the implantation of cloned human embryos into the womb of humans or animals is prohibited by the "Act on the Regulation of Human Cloning Technology, etc. (Act No. 146 of December 6, 2000)."

・Evaluation of somatic cell cloned livestock overseas

[United States]

In January 2008, the U.S. Food and Drug Administration stated that somatic cell clones of cows, pigs, and goats, foods derived from animals, and foods derived from the progeny of somatic cell clones are prohibited from using conventionally bred livestock. The institution has published the results of a risk assessment stating that the food is as safe as food derived from. The United States Department of Agriculture states that there are approximately 600 somatic cell cloned animals living in the United States, and as of January 2008, most of them are used for breeding, so they are rarely distributed on the market. The government is asking users of somatic cell cloning technology to proceed with caution until the meat market, etc., can accept somatic cell cloning technology.

[Australia]

According to a report by the Food Standards Authority of Australia and New Zealand, cloned animals (cows and sheep) in Japan are still in the experimental stage, and as cloned animals themselves are expensive experimental animals, it is unlikely that they will be used for human consumption. Furthermore, regarding the general distribution of cloned animals in Japan, there is a voluntary agreement between cloning researchers and companies, and it is stated that cloned animals and their progeny are not distributed.As researchers, we have been closely monitoring international trends regarding the general distribution of cloned animals and their progeny products over the past several years, and are evaluating the food safety evidence included in the US draft risk assessment report.

[Europe]

In July 2008, the European Food Safety Authority published the ``Scientific Opinion on the Impact of Somatic Cell Cloning on Food Safety, Animal Health and Welfare, and the Environment". This document states that although there is limited information regarding safety as a food, it compares the somatic cell clones of cows and pigs and the meat and milk of their progeny with those derived from individuals through conventional breeding. There is no indication that there is a difference. It also states that there is no commercialization of cloned animals within Europe. In addition to this scientific opinion, the European Commission, which is a risk management body, has also taken into consideration the "Opinion on the Ethical Aspects of Animal Cloning for the Food Supply" prepared by the European Ethics Group for Science and New Technologies. We will consider future measures.

3, Conclusion

While the application of cloning technology to humans is prohibited in many countries around the world, the application of cloning technology to livestock is considered ethically acceptable. In fact, a certain number of cloned cows are calculated every year, and

even though safety is ensured, they are not distributed. Although further research is needed, this is not an effective solution to the food crisis.

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How to Construct Housing Sustainably
～Construction Using 3D Printers～
ー architecture environment refugees ―

17期生 5122 Anju Furusawa

Abstract

Recentry, in developed countries, they have many problems such as too many vacant houses or house shortage because of accepting too many refugees. In developing countries, there are shortages of money, staff, and also houses, too. If the population transition doesn't change, it is easy to suspect that the housing shortage will cause a more serious problem. In such a situation, 3D printed architectures are correcting a focus. It enables us to construct housing in short term, at a low cost, and also it is environmentally friendly, thanks to that it does not need much manpower or transportation of the ingredients.

If we use 3D printers, we can solve many problems such as refugee camps or architecture in developing countries, so I decided to use the printer in my research. My research question is "how can we build houses sustainably?" I used the web information on the internet, such as UNHCR, MIC:Ministry of Internal Affairs and Communications or OBAYASHI's homepages to solve the recent housing shortage especially in the refugee camps, by 3D printers.

In conclusion, buildings constructed by 3D printers are easy to repair and they do not emit much CO2 during construction than usual housing construction, so 3D printers can ensure sustainability and a dimension that is better for the environment. If 3D printers spread to construction companies, they can solve problems such as the shortage of carpenters due to aging. In addition, to solve hygiene problems in developing countries, dispatch engineers who can construct housing quickly by using 3D printers. The issue we have to solve is the ingredients of mortar. Generally, mortar is made from lime and it is one of limited resources. To make sustainable architecture, we should consider what other ingredients can be used instead of lime.

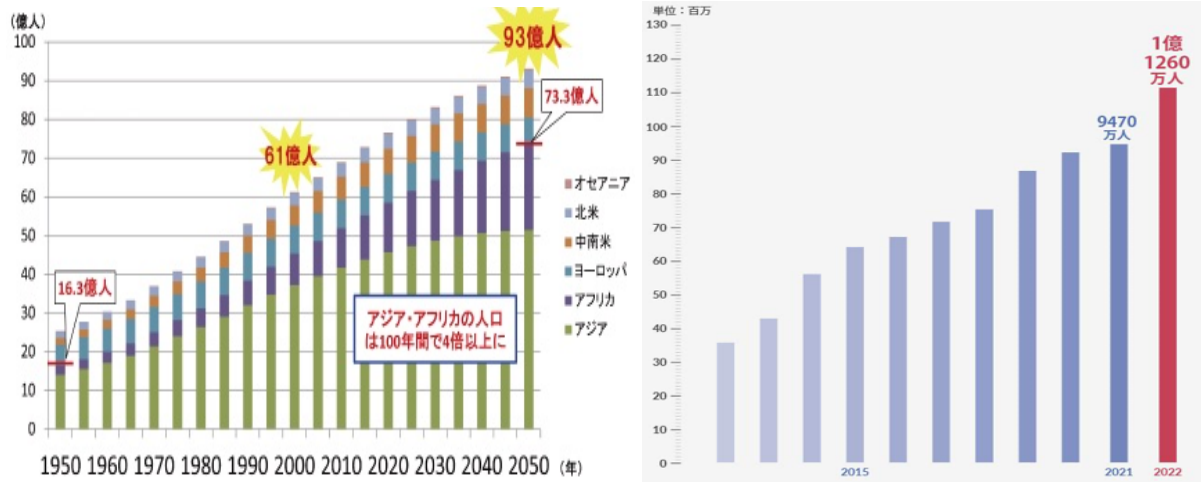
The Background of my research

In developed countries, there are vacant housing problems, housing shortage because of accepting too many refugees. In developing countries, there is housing shortage because of labor shortage or money shortage. According to the Ministry of Internal Affairs and Communications, it is suspected that the population of Asian and African will increase more than 4 times bigger than now in this 100 years, and the world population will increase about 1.5 times bigger than now until 2050（The graph is the bottom left side one). This is called the population explosion. On the right side, the graph shows a transition of the number of people who left home because of war or persecution (researched by The UN Refugee Agency). The

number of refugees is increasing year by year.

The more the population keeps growing, the more people will lose their houses, and depending on the social situation, the number of refugees might increase, too. Even if the supply is not enough but the demand is high, the price of a house will go up and finally, some people who could buy a house will not be able to. In this situation, the 3D printer is collecting focus. It uses a special mortar to make a wall by making a pile, so it does not require many carpenters and tracks to transport ingredients. By doing so, 3D printers can make houses environmentally friendly and at a low cost.

Based on these, I decided to use 3D printers to solve problems of housing and refugee camps.



The importance and the purpose of the research

The 3D printer does not require much manpower and it enables you to construct housing in the short term. It uses a special mortar for construction so it does not need someone to transport wood or steel and it does not produce garbage. Moreover, it can reduce the amount of CO2 emission by doing so. If we can build 3D printed housing anywhere throughout the world, it can solve many problems such as housing shortage or environmental problems. My research question is “What is the way to build houses sustainably?”

The way I researched

・Research about what kind of housing problems in the world and also what the 3D printer is nowadays by internet and books

・Suggesting the way to build houses

The result of the research

ⅰ What is 3D printers

A 3D printer is a way to construct housing by piling up mortar. First, do modeling by 3D CAD, which can model three dimensional objects, and based on that, the 3D printer moves the machine with a nozzle horizontally and piles the mortar. Nothing is special without mortar and 3D printers.
So why does it use not concrete but mortar?

Mortar is a building material that mixes sands, water, cement and concrete including gravel, too. 3D printer's mortar has
① high mobility（not to stack in the nozzle）
② thixotropic（to put together upper layer to lower layer）
③ a nature of gets hard in a short time（same reason as ②）
④ a nature not to get too hard（same reason as ②）
You can see the characteristics of mortar and that general concrete is too hard to use for 3D printers housing.

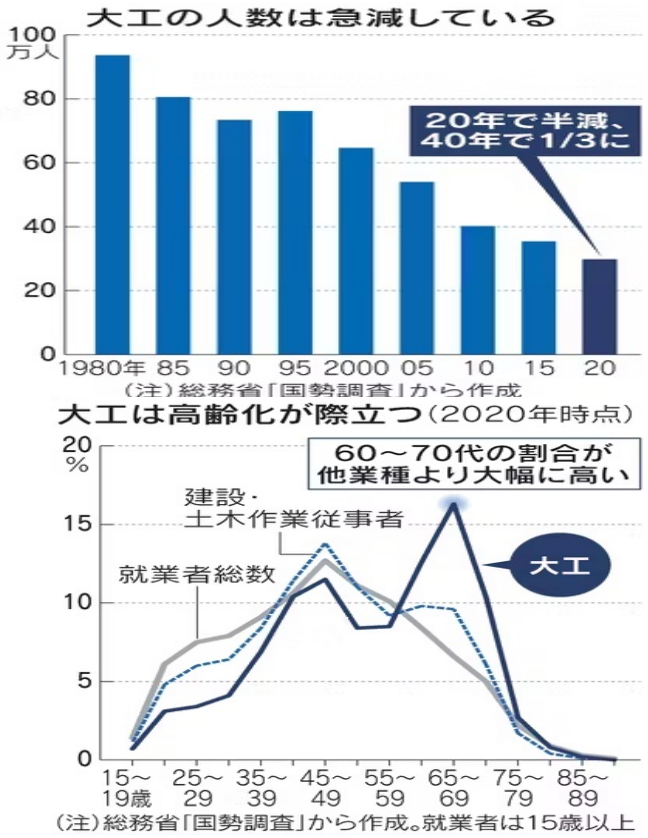
Merits for the 3D printer are
① It can complete construction in short term.
② It does not require many carpenters so you can save money.
③ Most of the ingredients is mortar so it does not need transportation woods by tracks which means it has lower CO2 emission than usual construction.
④ It is good at weavy design buildings.
⑤ It does not need much work such as preparing concrete.
⑥ You can build houses anywhere if you have only mortar and printers.
⑦ It is easy to repair because of the ingredients is mortar.

Demerits are
① There are many problems on lows, water construction and structure.
② It is hard to make mortar and keep it solid.
③ There is no sustainability on mortar.

For ①, in Japan, Obayashi Gumi got a permission from government for the 3D printer building safeness. In the US, a large-scale 3D printer housing complex is under construction so it is a problem depending on their countries. Also, mortar is made from lime and it is one of the limited resources.

ii About the solutions

The first idea was to make the 3D printed housing afford us to fold it. By doing so, we can transport the housing easier, especially removing to somewhere else. Unfortunately, because of ensuring the safetyness, it is impossible to bend the foundation.



For the second opinion, I came up with raising the diffuse rate of 3D printers to make 3D printers cheaper. Although, one big 3D printer will cost about hundreds of thousands of dollars to a million dollars, so it might be easier to spread it to architectural firms rather than the usual family. Nowadays, the construction industry is facing a serious shortage of workers. The number of carpenters is decreasing from about 900 thousand to 300 thousand, from 1980 to 2020. (The bottom left graff is quoted from Nikkei Inc)

Also, the problem of most workers getting too old to work is getting serious. According to the graph, about 60 to 70 years old carpenters occupies 17% of all of the carpenters. However, carpenters around 30 years old are only less than 5%. If they install the 3D printer, they can build houses with few people, so it can ease the burden of workers shortages in the future.3D printers require knowledge of architecture or 3D CAD: a special software for designing buildings. If it is a big construction company, they might have some technicians who have enough skills so they are suitable for an experimental generalizing trial of 3D printers.

Finally, dispatch engineers, who can construct housing quickly by using 3D printers, to developing countries. For example, in Bangladesh, there are big refugee camps but they also have many natural disasters caused by the monsoon. More than 500 of facilities for education, water stations, and toilets have been destroyed by it. Moreover, the old contemporary housing is easily washed away by the flood, so they have to build new ones somewhere safe immediately after the disaster. Not only on the occasion of facing disaster but also even in daily life, their residents are under difficult circumstances that they do not have places to earn enough money or places to educate their children. Depending on the case, sanitation is a big problem, too. Refugee camps in other countries are as good as this situation. If they have a 3D printer, a technician who can use the 3D CAD and mortar, it is not impossible for them to make temporary housing in two days. If we could dispatch engineers who can use 3D printers, it can improve their hygiene and make their lives easier.

Conclusion and another issue

Buildings made with 3D printers have a sustainability that is easy to repair. In other countries, they are guaranteed to be safe enough for human habitation. In Japan, some buildings have been certified as safe by the Ministry of Lord, Infrastructure, Transport and Tourism.

If the spread of these 3D printers to architectural firms increases demand, the supply will go up and the price of the printer can be reduced to some extent. Moreover, it can solve the shortage of architect workers because of the rapid increase in elderly.

Furthermore, at refugee camps, their temporary housing or water station is often destroyed by natural disasters and the fact disturbs children to go to school or adults to find a job. Considering their situation, if we could dispatch engineers who can use 3D printers more problems could be solved.

The issue we have to solve is the ingredients of the mortar. Generally, mortar is made from lime and it is one of limited resources. To make sustainable architecture, we should consider what other ingredients can be used instead of lime.

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Solving Water Shortage With Alternative Foods

5123 Ryotaro Hoshino

Abstract

1. Introduction

The reason I chose this topic for FEWC class was that I had an opportunity to search about the problems happening in the world in our English class and heard about water problems. As I searched about these problems, I came to know that agricultural water use occupied a large part of the whole water use.In fact, according to an article about water shortage, agricultural water use occupied 70% of whole water use.In addition, in some developing countries, they use their water resources for their agriculture, and industry to keep the economy even though they can't secure their water to drink. So I decided to set this theme and find out how we can reduce the agricultural water use in developing countries.

2. Discussion and Implication

Currently, 2.2 billion people in the world, or three out of every 10 people, do not have access to safe, controlled drinking water. Of these 700 million people lack access to basic water services. There are reasons why many people lack access to the water services.First, water pollution due to lack of sanitation.Second, increasing water use around the world, and finally, water-related conflicts.

In this study, I decided to research water consumption, particularly the decline in agricultural water use, which accounts for a large proportion of water consumption.As main factor for growing water use, I first researched about the increase of the population. The world's population has increased by 5 billion people in the past 40 years, which has increased the amount of water used in households by about six times and in industry by three times. Additionally, it is expected that the amount of the consumption of grains will be 28 billion in 2030.Contrary to that, the cultivated acreage per one person will keep decreasing because of the expansion of the world's population.Next, as an example of the amount of water used in agriculture, it takes 15,400 L of water to produce 1 kg of beef and 4,325 L to produce 1 kg of chicken. Therefore, I can say that we need to find a way to supply agricultural food without much land and water. As of the present study, many countries are working on creating a system where we can use water efficiently.For example, there is [CropSpec] , which is a laser growing system that we can get a handle on the growth condition of plants remotely by using. From other perspective, it is said that we should develop the agricultural technology for growing plants which are resistant against salt, such as tomatoes, potatoes, and cabbage

3.Conclusion

In the course of this research, I searched about food substitutes. Substitutional foods are foods made by substituting one food, such as meat, fish, or eggs, with another food, such as soy. As other example, there are oat milk, almond milk, eggs and soy meat. The advantages of alternative foods include that they are a solution to food crises and hunger, that they control fat and cholesterol intake, and that they are tasty for people with allergies and vegans. As a suggestion, I propose to open alternative food restaurants, by using only

alternative foods, to promote alternative foods to the public. However, the disadvantages of this proposal include who will open the restaurant, financial issues, and the cost of stable production of alternative foods in the first place. I am also considering using crowdfunding to address this point.

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How to Reduce the Victims in Bicycle Accidents

To Promote to Use Helmets

5124　山岸恒介

Abstract

On April 1, 2023, the wearing of helmets when using bicycles became an “effort requirement” in Japan. This is an important strategy to reduce the risk of head injury caused by bicycle accidents and keep us safe. However, in fact, many bicycle users seen on the streets, especially adults, do not wear helmets. I wondered that wearing helmets is still not widespread enough, despite the fact that the wearing of helmets is an “effort requirement”. I felt that I needed to research the condition of legislation and the actual proportion of people who are wearing a helmet in foreign countries. Bicycles are eco-friendly vehicles and they have high expectations as a sustainable vehicle for achieving the carbon neutral society. For that reason, the demand for bicycles may increase, and measures for decreasing the number of victims by bicycle accidents will be more and more important. In this study, I will research the condition of wearing helmets and legislation in foreign countries, and analyze what measures would be needed to ensure safety for bicycle users. By doing this, I would like to contribute to the spread of safe and sustainable use of bicycles.

1 Introduction

The Research Question of my study

What can we do to improve bicycle helmet use and reduce the number of victims of bicycle accidents?

The objective of the research

I would like to research what other countries are doing to improve bicycle helmet use, and to find examples that can be used as a reference in Japan, in order to consider ways to reduce the number of victims as much as possible. I would also like to research the scientific data about the effectiveness of helmets and actual examples of accidents so that as many people as possible can understand the importance of helmets protecting the head in bicycle accidents. I think that letting more people know the importance of wearing a helmet will lead to promoting safe cycling. Especially, by learning about advanced initiatives overseas, the program aims to understand what methods are effective in encouraging more people to wear helmets, such as making it compulsory, subsidy systems, safety education in schools, and public relations activities, and to use this information as a reference for initiatives in Japan.

2 Discussion and Implications

Some North European countries,such as Netherland and Sweden are known as “a leading country in bicycles”. In these countries, not only are bicycles an established part of daily life and used by many people, but also safety measures are in place. Sweden is famous for its very low number of fatalities not only in bicycle accidents but also in whole traffic accidents and the policy called “Vision Zero” makes the fatalities in traffic accidents in a low number.

According to a study in 2015, the number of victims in traffic accidents in Sweden was only 263. This is a very low number compared to other developed countries. Behind these results, there are some accident prevention measures, such as road design, thorough enforcement of traffic rules, and popularization of safety education.

I think we need to popularize bicycles as safety vehicles to develop a society where many people can use bicycles safely. If bicycles become common vehicles, we can reduce the amount of green-house gas and relieve traffic jams in big cities. Finally, we can make a decarbonized society.

The current situation of helmet wearing>

According to data by the Metropolitan Police Department, Ehime Prefecture had the highest rate of bicycle helmet use in the Japanese data, and the rate was 59.9%. Gunma Prefecture also has the third highest wear rate in Japan at 43.8%. The national average is only 13.5%, so the wearing rate in Gunma Prefecture is very high.（図1） One of the reasons is that Gunma Prefecture ranks first in Japan for the worst number of bicycle accidents among junior high and high school students, which is why many junior high and high schools require students to wear helmets. In our school, all students are required to wear helmets since this September. I also conducted research on helmet usage rates in countries other than Japan, but I was unable to find detailed statistics. From my research, I found that many countries have not yet established clear laws for helmet use. In particular, only a few countries require adults to wear helmets. In some countries, children are required to wear helmets, but it is not mandatory for adults in many cases.

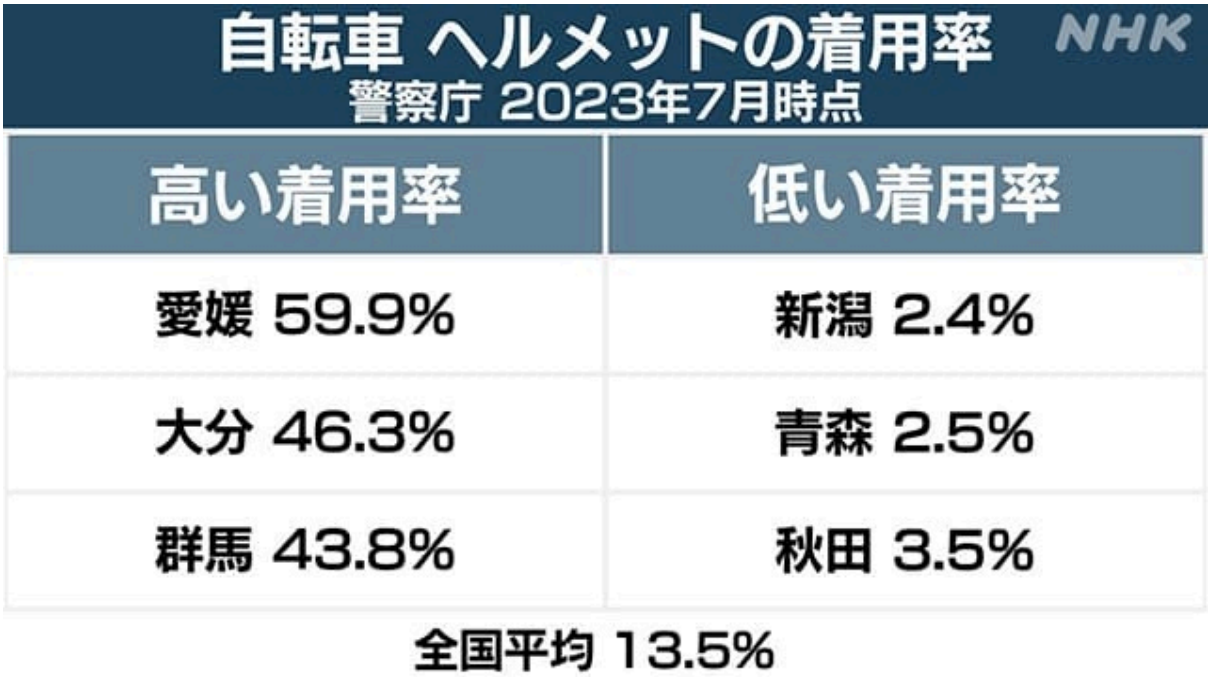


図1

The Effects of Wearing a Bicycle Helmet>

According to data from the Tokyo Metropolitan Police, about 60% of people who lost their lives in bicycle accidents sustained fatal head injuries (Figure 3). This indicates that wearing a helmet to protect the head is crucial for reducing the risk of death in bicycle accidents. Furthermore, it has been reported that the fatality rate in accidents is more than twice as high for those not wearing helmets compared to those who are, demonstrating the effectiveness of helmets as protective gear (図4).

Protecting your head in a bicycle accident is very important to avoid fatal injuries or serious long-term effects. Based on this data, I want more people to know that wearing a helmet is a key way to keep cyclists safe. Raising awareness about traffic safety and encouraging helmet use will help save lives and reduce the number of victims.

3 Conclusion

Why don’t many people wear helmets despite their benefits?
According to a survey by the Tokyo Metropolitan Government (Figure 5), the most common reason was “Because it’s not mandatory, only encouraged,” with over 40% of people giving this answer. Other reasons included “It makes my head hot,” “It’s troublesome to wear,” “It ruins my hairstyle,” and “The ride is short.” Especially opinions like “It makes my head hot” and “It ruins my hairstyle” are related to appearance and comfort. These complaints seem to

discourage people from wearing helmets.

Many people also mentioned “The ride is short” as a reason. This seems to reflect the idea that they don’t feel the need to wear a helmet for short-distance trips. To address this, introducing conditional laws, such as “Helmets are not required for short distances or speeds below XX km/h,” might be effective. Flexible measures like this could help more people understand and accept helmet use, contributing to reducing accident injuries, even slightly.

As the survey suggests, making helmet use mandatory could be considered to increase the wearing rate. However, it is also important to improve helmet designs, such as using materials that prevent overheating or creating designs that don’t ruin hairstyles. By enhancing both safety and comfort, we can reduce resistance to wearing helmets and aim for a society where cyclists can adopt safety measures without difficulty.

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Rescue of Abandoned Bamboo Forests

What Benefits Will Come from Saving Abandoned Bamboo Forests?

ー Bamboo Basket　Removal of Plastics　Abandoned Bamboo Forests ー

5125 Yamada Aoi

1. Summary

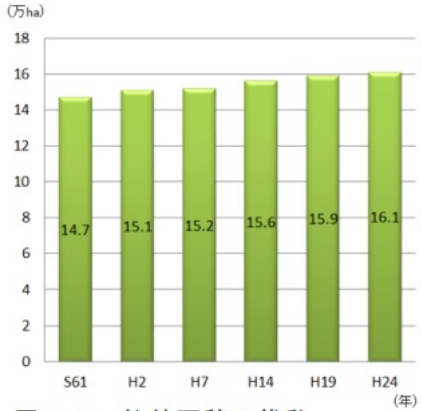
Abandoned bamboo groves have been increasing along with the decline in demand for bamboo shoots. Therefore, we aim to increase the demand for bamboo by using bamboo baskets, a traditional craft, as a substitute for plastic bags.

2. Research Background

Do you know the term “abandoned bamboo grove”? They are bamboo groves that were originally planted for bamboo shoot cultivation, but have become unmanaged and neglected.

Near my grandparents' house, there is a bamboo grove in a similar situation to an abandoned bamboo grove. The bamboos have fallen over and become discolored. It is pitch-dark and no one wants to go near it. No one can do anything about it. I started this research because I wanted to save the bamboo grove as soon as possible, and I wanted someone to take care of it and see it as a problem close to their hearts. As you can see from the graph below, there are many bamboo groves in Japan today, many of which are neglected due to the declining demand for and importation of bamboo shoots. I also began this research because I believe bamboo can be used to solve the problem of ocean plastic, which the world is struggling to solve.

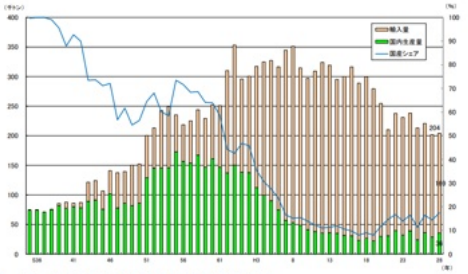
This research fits into SDGs 9 “industry, innovation and infrastructure”, 14 “life below water” and 15 “life on land”.



図－２　竹林面積の推移

注：数値は各年の３月31日現在

資料：林野庁「森林資源の現況」



図－３　たけのこの生産量と輸入量の推移

資料：農林水産省統計表

3. Purpose and significance of the research

Based on the research question “What benefits will come from saving abandoned bamboo forests?”, we thought that by changing the wood used for traditional Japanese crafts to bamboo from abandoned bamboo forests, we could draw attention to abandoned bamboo

forests, enable de-plasticization, and make people around the world aware of these issues. We thought that this would make people around the world more aware of these issues.

4. Research Methods

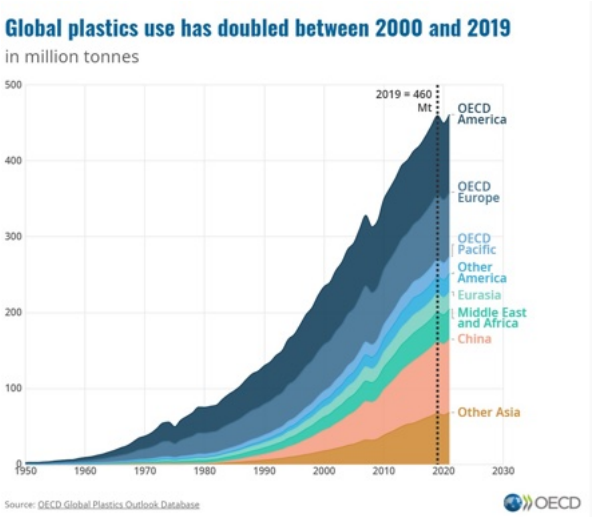
Investigate the current state of neglected bamboo forests and the problems of plastic
→De-plasticization through traditional crafts using wood →Use of traditional crafts

1 Find out the total amount of plastic products currently being used.
2 Investigate the current status of abandoned bamboo forests. ⇒Use the Internet
3 Examine the issues of traditional crafts.
4 Seek ways to solve the two problems through traditional crafts.

5. Research results and discussion

1. The challenge of de-plasticization from many perspectives

The amount of plastic waste illegally dumped on land around the world amounts to 350 million tons per year. In addition, according to the Ministry of the Environment, over 8.3 billion tons of plastic have been produced worldwide since 1950, and 6.3 billion tons have been discarded as garbage. Marine litter is a generic term that refers to “drifted litter” washed up on beaches, “drifted litter” drifting on the sea surface or in the ocean, and “seabed litter” piled up on the ocean floor. The most common breakdown is plastic items such as fishing lines and food containers and wrapping bags. The largest amount of plastic items are so-called “disposable plastics,” which are thrown away as soon as they are used. There have been many news reports about sea turtles with straws stuck up their noses and dead whales with huge amounts of garbage found in their bellies, etc. According to a survey by the Ministry of the Environment, at least 8 million tons of plastic waste is discharged into the ocean every year worldwide. This is said to be equivalent to the weight of approximately 222 Tokyo Sky Trees. It is estimated that 20,000 to 60,000 tons of plastic waste are discharged from Japan every year. According to Mr. Hayato Nakatani, lecturer at the University of Tokyo, most eco-bags are made of materials such as cotton and polyester, which naturally have an impact on the environment at the material making stage, and then spinning yarn and weaving cloth again. When you add up the environmental impact of the various stages of the bag's life cycle, it is known to emit 50 to 150 times more greenhouse gases than a plastic bag. Therefore, it is necessary to be aware of environmental issues from the material side.



2. About abandoned bamboo groves

Abandoned bamboo groves are bamboo groves that were originally planted for bamboo shoot cultivation.

The spread of these neglected bamboo groves to surrounding areas has become a major problem throughout Japan.

Problem 1: Danger of causing landslides

Bamboo groves planted for bamboo cultivation have the characteristic of spreading rapidly when left unattended. Furthermore, bamboo forests have one major characteristic that distinguishes them from forests.

That is the characteristic of shallow rooting. Trees have deep roots that hold the soil in place when it rains, but bamboo roots spread horizontally and are only about 30 cm deep.

Therefore, when it rains, the entire bamboo grove is in danger of sliding down the slope. The combination of the bamboo's high reproductive capacity and shallow rooting characteristics puts large areas of the mountain at risk of landslides.

This is one of the major problems of neglected bamboo forests.

Problem 2: Danger of toppling over.

The photo on the left shows a maintained bamboo grove, and the photo on the right shows a neglected bamboo grove. The photo shows that the neglected bamboo grove does not receive much sunlight. In neglected bamboo groves, the sun doesn't shine and the bamboo roots, which increases the risk of collapse.



3. De-plasticization with traditional crafts

Traditional crafts are daily necessities that have been handed down from generation to generation. According to a paper by Yasuhiro Sekine, the number of companies producing traditional crafts has decreased by about half from 44,954 in 1980 to 21,467 in 2005. The reasons for the declining trend in the traditional crafts industry are

(1) Sluggish demand
(2) Inability to mass-produce
(3) Lack of human resources and successors
(4) Decline and worsening of production infrastructure (raw materials, production tools, etc.)
(5) Changes in lifestyles and values of consumers and lack of information.

4. Suggestion

In order to rescue abandoned bamboo groves, increase the use of traditional crafts, and de-plasticize households, we would like to propose the creation of baskets using materials found in abandoned bamboo groves. Traditional crafts using bamboo baskets exist throughout Japan. One example is Suruga Bamboo Sensujii Zaiku in Shizuoka. This would solve the problem that the carbon dioxide emissions from the production of eco-bags, which have been used for de-plasticization, are higher than those of plastic bags, by using bamboo baskets, which are processed and dried by hand, as a substitute for eco-bags. The use of bamboo baskets as a substitute for the 30 billion plastic bags consumed in Japan is also expected to solve the problem of demand for traditional handicrafts. In addition, to address the shortage of human resources, which is one of the serious problems of traditional crafts, Pasona's human resource development program in Singapore should be used as a foundation for human resource development with an eye on foreigners, since there will be approximately 33.38 million foreigners visiting Japan from January to November 2024. It has been observed that many foreigners are interested in Japan. Therefore, by assigning them simple tasks in the process of making bamboo baskets, we aim to improve the efficiency of production and achieve a state close to mass production. In addition, by spreading the word about this kind of experience, we can aim to increase the number of foreign tourists. Since the goal is to make bamboo baskets for daily use, the durability of bamboo baskets will be an issue, but by using what are known as bamboo nails, it will be possible to continue using bamboo baskets for several decades. Also, unlike ordinary nails, there is no need to worry about rusting.



6. Conclusion

Our answer to the research question “What benefits will come from saving abandoned bamboo forests?” is that we can achieve de-plasticization by making bamboo baskets, a traditional Japanese craft, from abandoned bamboo groves. One of the challenges for the future is that it is difficult to wipe out the language barrier by incorporating foreign human resources.

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Reducing Plastic Waste

~ How can we reduce plastic waste in developed countries?

5126 Wakabayashi Suzuno

Abstract

The world produces more plastic waste than it can actually process. Plastic waste that has lost its way is exported to developing countries, causing environmental pollution. The objective of this research is to reduce the amount of plastic, especially plastic bottles, in order to solve the problem of marine debris, which is increasing year by year and becoming more serious. This project will research and summarize the global problem via the Internet. Currently, many methods to recycle plastics have been devised around the world. However, we propose that the best way to reduce plastic waste in the future, and to directly reduce plastic consumption, is to establish regulations regarding the use of plastic bottles. In other words, the promotion of "my bottle". Another proposal is to collect plastic and exchange it for train tickets. However, since there are no good ideas on how to recycle, we would like to focus on this issue and consider it in the future.According to the Ministry of the Environment, at least 8 million tons of plastic waste is discharged into the ocean every year. This is equivalent to dumping one garbage truck's worth of plastic into the ocean every minute. In addition, plastic production has increased 20-fold in the past 50 years, and by 2050 there will be more marine debris than fish. Of this marine debris, 65% is plastic. Furthermore, 70-80% of marine debris originates from households.

1 Introduction

◯Background

According to the Ministry of the Environment, 8 million tons of plastic waste is released into the world's oceans every year. Plastic production has increased 20- times in the past 50 years, and it is said that by 2050 there will be more ocean garbage than fish. Of this ocean garbage, 65% is plastic.

◯Previous research

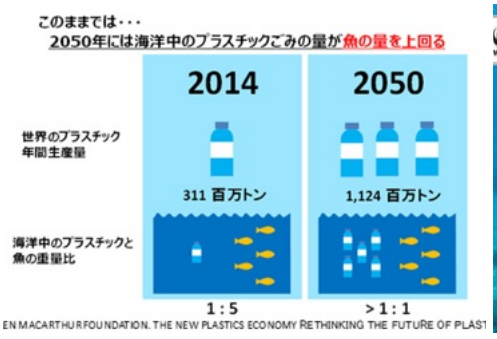
In today's era, plastic materials have become inseparable parts of our lives. Due to the low cost, easy availability, strength, moisture resistance, flexibility, and many other characteristics, plastic materials have widespread applications and are omnipresent. It is not the use of plastic itself, but it is their improper waste disposal that is creating detrimental effects on human, animal, and environmental health. Ruminal impaction due to plastic materials is one of the major but often neglected health issues of stray ruminants in urban areas of developing countries.

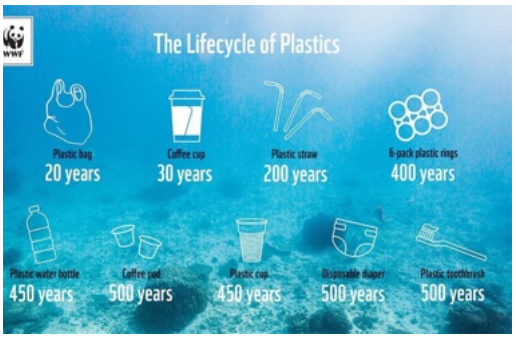
◯Research methods

Research on the Internet.

Substances that can replace plastic bottles and products that are currently being developed.
Plastic reduction efforts around the world.
Examples of environmentally friendly products that have become popular
・Investigate the effects of cases in the world →Summarize the measures taken by each situation in the world and what should be done in each country.
・Current situation in the world

2 Discussion and implications





規制の種類	国（施行年）
プラスチック袋の輸入・製造・販売・使用を禁止または課税対象に	南ア（2003年）、ボツワナ（2007年）、ジンバブエ（2010年）
プラスチック袋の輸入・製造・販売・使用を禁止	エリトリア（2005年）、タンザニア（2006年）、ルワンダ（2008年）、モロッコ（2009年）、ウガンダ（2010年、注1）、マリ（2013年）、モーリタニア（2013年）、コートジボワール（2014年）、カメルーン（2014年）、ブルキナファソ（2015年）、ガンビア（2015年）、ニジェール（2015年）、マダガスカル（2015年）、マラウイ（2015年）、モザンビーク（2016年）、モーリシャス（2016年）、セネガル（2016年）、ギニアビサウ（2016年）、カボベルデ（2017年）、ケニア（2017年）、セーシェル（2017年、注2）、チュニジア（2017年）、エチオピア（2018年）、ベナン（2018年）、コンゴ共和国（施行前）
プラスチック袋の 輸入・製造・販売・使用を一部地域で禁止	エジプト・フルガダ市（2009年）、チャド・ンジャメナ市（2010年）、ソマリア・ソマリランド地域（2015年）
（参考）プラスチック袋の規制を検討	ナイジェリア

注1: 2015年に製造規制を一部緩和。
注2: プラスチック製の食器、箱なども規制対象。
出所: 各国管轄省庁、管理局、報道メディア、国連環境計画を基にジェトロ作成

According to a report issued by the World Economic Forum, by 2050 the weight of plastic waste in the ocean will be greater than the weight of fish. The degradation of plastic takes 400 to 1,000 years or more. Plastic is never completely degraded. So, plastic will continue to drift in the oceans and rivers as “microplastics. To reduce microplastics, the methods below can be considered.

(1) Reduce the amount of plastic used
(2) Improve the collection rate of plastic waste and reduce its release into the ocean
(3) Collect plastic waste that has been discharged into the ocean
(4) Use biodegradable plastics

Efforts to reduce plastic waste are more advanced in developing countries than in developed countries. African countries are taking measures to abolish plastic bags and limit plastic products before developed countries. But, according to an article in the British newspaper The Guardian, in the year studied (2019), one billion tons of plastic were sent to developing

countries. However, according to an article in a British newspaper, one billion tons of plastic are sent to developing countries each year.

Developed countries had exported most of their waste to China. China accepted it for profit as one industry, but after China banned the acceptance of plastic waste in 2018 because of environmental pollution, the amount exported to Africa increased by four times. Developed countries switched their plastic waste exports to the next “developing” country to which they send it. Asian countries also banned imports. As a result, developing countries no more than 70% of their own plastic waste is disposed of properly, leading to environmental pollution. For these reasons, thousands of tons of plastic are at airports in developing countries.

My suggestions for reducing plastic waste are
1. Exchange plastic trash for train tickets
2. Make plastic trash collection a job for fishermen
3. Limit the sale of plastic bottles

1. Exchange plastic trash for train tickets

This was actually done in Indonesia in 2018. It is a new recycling program that exchanges plastic bottles and plastic cups for free ride tickets on city buses. Users can bring their plastic bottles to the bus terminal or directly to the bus to receive a free ride ticket. Each ticket is valid for two hours, and the amount of plastic bottles brought is based on the size of the bottle, such as 10 plastic cups or 5 plastic bottles per ticket. My suggestion is to do this not only on buses but also on public transportation. This effort will benefit not only the users but also the society. It will reduce traffic jams. This will increase the number of people using public transportation, solve the problem of traffic jams, and help prevent global warming. We would like to show that the plastic waste problem is so serious that many people need to take this effort. Although plastic waste reduction is a long term project, exchanging plastic for tickets will increase the number of public transportation users, and by the time the plastic waste problem is solved, public transportation use is expected to be more active.

2. Make plastic trash collection a job for fishermen

Corona Beer actually held a plastic trash fishing tournament in Mexico. The collected plastic was handed over to a local recycling company and converted into fishing gear. Until now, fishermen had returned plastic waste caught in their nets to the sea, but with the help of the competition, they have started collecting plastic waste in cooperation with a recycling company. A system was created to generate a regular income from the discarded plastic waste. I want to make this one of the jobs of fishermen, not a competition. Fishermen can increase their income by collecting trash entangled in their nets and drifting debris while fishing. Garbage, which used to hinder their fishing work, can now be a source of additional income. With the amount of trash reportedly outnumbering the fish, if this activity works, there will be more fish and the fishermen will make more money.
These two productions (1) and (2) will reduce the amount of marine debris that currently exists.

3. Limit the sale of plastic bottles

This is actually taking place at San Francisco International Airport in the United States. The airport has announced that beginning in August 2019, it will ban the sale of bottled water in plastic bottles with a capacity of one liter or less. The rule is the first of its kind at a U.S. airport and will apply to airport restaurants, cafes, and vending machines. Users will be required to bring their own reusable bottles or purchase water in glass or aluminum bottles as allowed by airport standards. There are also numerous water refilling stations located throughout the airport. The promotion of environmentally friendly 360-paper bottles is also expected to have a positive effect. These drinking water containers, which can be returned to the soil in 80 days, can replace current plastic bottles and reduce the burden on the environment. Plastic waste not only threatens the lives of sea creatures, but also takes a heavy toll on the fishing, aquaculture, and tourism industries that depend on its rich natural resources. According to a study by the Organization for Economic Cooperation and Development (OECD), economic losses amount to $13 billion (¥1.43 trillion) annually worldwide. My primary goal is to reduce plastic waste through the production of (1) and (2), and to eliminate 500ml plastic bottles by focusing on the installation of water fountains with the money that would have been lost if things continue as they are.

Currently, plastic waste is exported from developed countries to developing countries, but if plastic waste is reduced in developed countries, the cost of this export will be reduced, and developing countries will be able to focus their efforts on issues that are not garbage.

3 Conclusion

Although it is possible to reduce the amount of plastic, the issue of profit has not been considered, and we would like to focus on this issue.We would also like to investigate more detailed cost issues regarding the recycling of collected plastic waste, as they have not been investigated

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海洋プラスチックごみ問題について

◯Book

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グループ・コロンブス 編／井田仁康 総合監修／保坂直紀 指導

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世界のペットボトル利用

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Ruminal impaction due to plastic materials - An increasing threat to ruminants and its impact on human health in developing countries

Reduction of Invasive Species Issues

～What Is an Initiative that Benefits Both Japan and the World by Utilizing Wakame?～

5201 Amada Ren

1. Abstract

The purpose of this study is to reduce the world's ecological problems by using wakame seaweed. The ecosystem problem here is defined as the problem of invasive alien species. Originally, wakame is naturally distributed in East Asia, but since the 1980s, wakame has invaded many parts of the world as a result of human activities and has been reported from Europe, the Canary Islands, the Pacific coast of North America, Argentina, Australia, and New Zealand. These wakame are thought to have been introduced by attaching to seed oysters or ship hulls, or by mixing with the ballast water (water loaded as weight on ships) of ships. The invasive wakame can have a negative impact on native species and aquaculture fisheries, and has been listed as one of the 100 worst invasive alien species in the world (IUCN, 2000). On the west coast of the United States, wakame seaweed was found in the flotsam washed ashore from Japan after the tsunami caused by the Great East Japan Earthquake. As these findings indicate, wakame has expanded into areas where it had not previously existed and is destroying the ecosystem. This research aims not only to exterminate such wakame, but also to utilize the wakame collected in the process of extermination for various purposes. The research aims to utilize wakame as 1) foodstuff, 2) a source of oxygen in aquaponics, 3) seaweed fertilizer.

2. Introduction

In recent years, the overabundance of non-native species has become a problem. Therefore, I have been researching for two or three years to solve this problem by using non-native species as a food source. I have been researching a new way of environmental issues + café.

This year, the fourth year's focus is on the “world,” so I decided to look into alien species from Japan. The name that came up was “wakame” (Japanese common seaweed). Therefore, this year, we will research and study alien species including wakame. Wakame is a familiar seaweed on Japanese dining tables. It has recently been attracting attention as a health food and diet food. On the other hand, wakame is causing serious problems. Wakame is listed as one of the 100 worst invasive alien species in the world. It has also been named by the International Maritime Organization as one of the 10 aquatic species with the greatest environmental impact. In New Zealand, there was an incident in which lobsters died in large numbers when they multiplied to the point of filling the nets of lobster farms. This has even led to a call for people in New Zealand to report any wakame they find to government authorities. It is said that the only places left where wakame has no longer reached are the continents of Africa and Antarctica. It was Japanese wakame that caused this serious damage. The reason why they have multiplied around the world is said to be because, since the late 1980s, Japanese merchant ships have used seawater containing wakame migratory eggs in their ballast water, which was released along with the ballast water when cargo was loaded. Therefore, wakame will be the subject of this study.

Purpose and meaning of this research

Research Question

What is an initiative that benefits both Japan and the world by utilizing wakame?

Significance of Conducting Subject Matter Research

By utilizing non-native species as food and fertilizer rather than exterminating them, students can learn about the importance of life and gain an interest in environmental issues.

Hypothesis

ⅰ.Using Wakame as an ingredient

ⅱ.Utilize wakame in aquaponics

・Development of new markets

ⅲ.Using Wakame as a fertilizer

Research methods

1) Use of the Internet

2) Actually making seaweed plastic and seaweed fertilizer

3) Listen to an expert

3.Research results and discussion

Types of Seaweeds

Marine algae are photosynthetic plants that live in seawater and are classified into microalgae and macroalgae. In particular, macroalgae have long been used as food, feed, fertilizer, medicine, and industrial materials useful to humans. They have also been used as food for fishery resources and as spawning and breeding grounds.

Algae is the general term for all photosynthetic organisms, excluding land plants, and is a broad general term that includes a great variety of taxa rather than a taxonomic term that refers to one specific taxon.

Algae are divided into marine algae and freshwater algae, depending on whether they grow in seawater or freshwater Ecologically, they are classified as microalgae and macroalgae.

The number of algae species distributed in the world is usually estimated at about 40,000, but other sources indicate that there are 4 to 8 times more undocumented species than this. The majority of algae belong to unicellular microalgae called phytoplankton, which play an important role as basic producers in marine ecosystems. Multicellular macroalgae are divided by color into green algae, red algae, and brown algae, which are usually referred to as seaweeds. Microalgae perform photosynthesis similar to land plants, but are more effective at converting solar energy into biomass because they live in the ocean, where nutrients such as water and carbon dioxide are available.

Currently, there are about 500 species of seaweeds used by humans, and some of the most industrially important seaweeds are kelp, seaweed nori, Japanese seaweed, sea hair, and obaxa.

Classification of macroalgae and microalgae

Classification : Microalgae
Size : Microscopic size
Taxonomic group : Belongs to all taxonomic groups except brown algae
Habitat : Marine and freshwater
Representative species : Freshwater species (Chlorella, Scenedesmu, etc.)
Marine (Tetraselmis、Nannochloropsis, etc.)
Production method : Indoor culture tanks are used
Main target ingredients : Lipids

Category : Macroalgae
Size : Classification Size visible to the naked eye
Taxonomy group : Green algae, brown algae, red algae
Habitat : Most of the oceans
Representative species: Wakame seaweed kelp,Hondawara, Nori,Amakusa, Aonori, etc.
Production method : Current seaweed cultivation methods (e.g., prop-type)
Carbohydrates

Source : Meeting materials of Seaweed Research Center, National Fisheries Science Agency, Department of Agriculture, Forestry, Fisheries and Food, Aquaculture Management Division (2009. 4)

Distribution of Seaweeds
The global distribution of seaweeds is shown in the above figure, and among the seaweeds, only five taxa are cultivated: the red algae Porphyra, Eucheuma, and Gracilaria, and the brown algae Laminaria, Laminaria, and Wawa, which belong to the brown algae group. Laminaria and Wakame (Undaria), which belong to the brown algae family.

ⅰ.Using Wakame as an ingredient

Nutrients and benefits of Wakame
Wakame is not only low in calories, but is also rich in nutrients necessary for the human body. (See Table 1)

Table 1

	カロリー	水分	ヨウ素	ナトリウム	カルシウム	マグネシウム	リン
生わかめ	24kcal	89.0g	1600μg	610mg	100mg	110mg	36mg
カットわかめ/乾	186kcal	9.2g	10000μg	9300mg	870mg	460mg	300mg
カットわかめ/水煮（※）	17kcal	93.6g	720μg	310mg	76mg	37mg	22mg

参考：日本食品標準成分表 2020年度版（八訂）
（※）沸騰水で短時間加熱したもの

Nutrients and benefits

1. Iodine

Iodine is abundant in marine products such as wakame seaweed. Most of the iodine ingested from food becomes thyroid hormones, which are involved in various reactions in the body, such as development, growth, and metabolism.

2. Sodium

Sodium, along with potassium, maintains the water balance and osmotic pressure of extracellular fluid in the body, and is also involved in acid-base equilibrium, muscle contraction, nerve information transmission, and absorption and transport of nutrients. It also maintains extracellular fluid volume and circulating blood volume while retaining water, and regulates blood pressure.

3. Calcium

A small portion of calcium is found as calcium ions in the blood, muscles, and nerves, where it promotes blood clotting and prevents bleeding, and is also deeply involved in the activity of nerve cells in the brain.

4. Magnesium

Magnesium activates more than 300 types of enzymes, and also plays a role in muscle contraction, transmission of nerve information, and regulation of body temperature and blood pressure.

5. Phosphorus

Phosphorus strengthens bones and teeth and constitutes cells and DNA. In addition, it also plays a role in supporting metabolism and maintaining osmotic pressure in the body.

ii .Utilize wakame in aquaponics

What is Aquaponics?

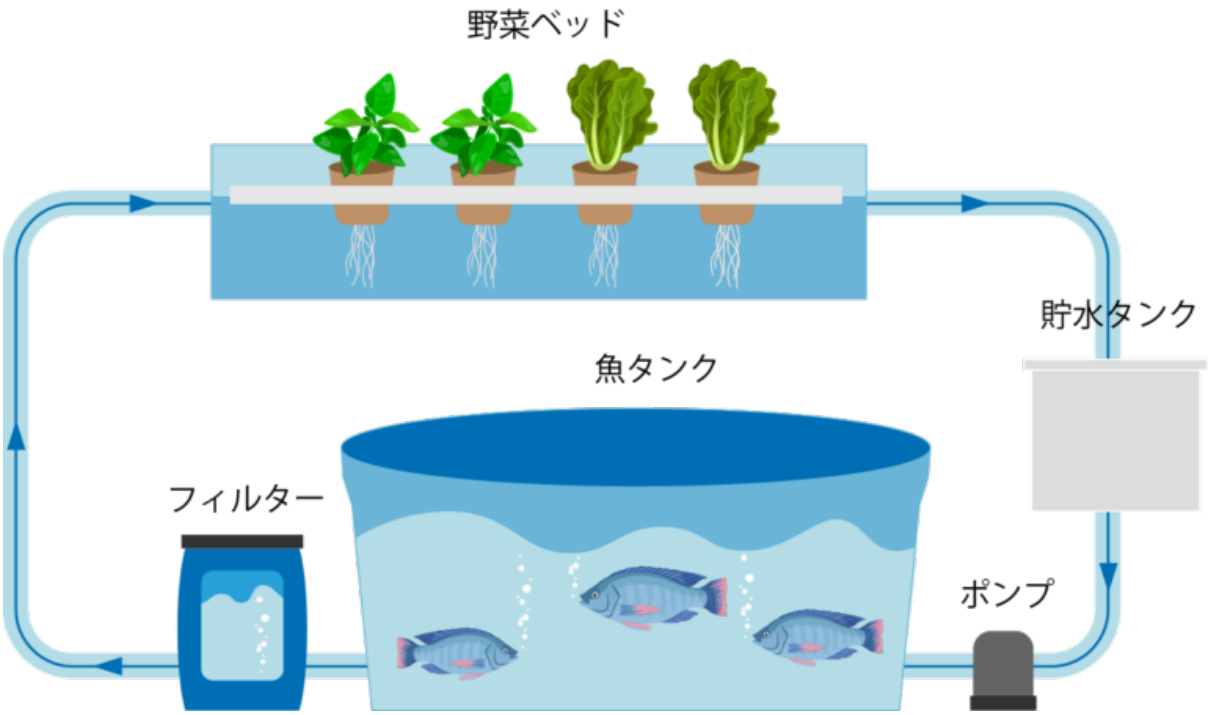
Recycling-oriented agriculture

As a sustainable agriculture that can balance productivity and environmental friendliness, it can create a cycle of “resources,” “energy,” “people,” and “information,” as well as vegetable

and fish production. Aquaponics is not just a recycling-oriented production system, but one part of a recycling-oriented business that can be designed to fit your company's strengths to create greater value. The spread of aquaponics throughout Japan will lead to more efficient use of resources and energy, and will also revitalize organizations, regions, and other communities.

Circular balance is important
The most important aspect of aquaponics is “balance. The food fed to fish becomes fish feces, which is decomposed by microorganisms to become plant nutrients. It is important to create an ecosystem of fish, microorganisms, and plants, and to establish a well-balanced circulation system.

Aquaponics Systems



Vegetable Cultivation
No pesticides, chemical fertilizers, or herbicides
No soil preparation, no watering, no weeding, no crop failure

Fish farming
No use of antibiotics and growth hormones

Role of Seaweed in the Sea
In addition to creating an environment where a variety of marine creatures can live, seaweed plays a role in cleaning seawater by decomposing organic matter in the water and supplying oxygen. It is also linked to coastal protection by stabilizing the seafloor, among other things.

Therefore, in this study, wakame is utilized in the aquaponics tank portion of the aquarium as a decomposer of organic matter in the tank and a supplier of oxygen. The seaweed will be

harvested from a region where wakame is an invasive alien species that has been on the rampage.

iii .Using Wakame as a fertilizer

What is seaweed material?
Seaweed as Feed
Characteristics and Effects
Seaweed, which absorbs all nutrients on earth and grows through photosynthesis, is a valuable and indispensable source of nutrients for livestock and fish because it contains abundant polysaccharides, minerals, amino acids, vitamins, trace elements, and other elements unique to seaweed that are needed by all living things.

While land plants contain substances that impair digestion, seaweed is completely free of harmful substances and can be used with peace of mind. In addition, seaweed is better for fish physiology than land plants, especially when fed to farmed fish. In recent years, the immunostimulants present in seaweed, a naturally occurring plant, have been attracting attention and are widely used around the world.

The use of seaweed powder in Atlantic salmon farms in Norway is particularly well known, and it has earned an outstanding reputation for its excellent taste. In addition to this, seaweed powder is considered important worldwide as a natural source of nutrition in the face of strict regulations on drugs and additives.

Seaweed is used not only as livestock feed, but also as food for sea urchins and other marine organisms that eat seaweed. Collecting and utilizing seaweed from areas of the world where it is a highly invasive alien species.

Seaweed Material as Fertilizer
Characteristics and Effects of Use
Seaweed has long been used in agriculture as an ideal organic fertilizer that is rich in more than 60 nutrients, including polysaccharides, minerals, vitamins, amino acids, and secreted components involved in natural plant growth, which are unique to seaweed. The reason for the long use of seaweed materials in agriculture is the various growth-promoting effects of the components contained in seaweed.

These components are also efficiently absorbed through leaves and roots, and have attracted much attention as plant physiologically active substances, making them ideal materials for the production of safe, secure, and high-quality crops. The main functions of the natural components contained in seaweed are as follows.
The Function of Polysaccharides
Alginic acid, the main component of seaweed, swells when it absorbs water and produces a very viscous aqueous solution. This property is effective in soil improvement.

First, as the content of alginates in the soil increases, moisture retention increases, soil moisture is stabilized, the growth of useful microorganisms is promoted, and the soil becomes more granular. These properties and functions of alginates are expected to improve soil structure, soil environment, and soil microbial layer.
In addition, sugars themselves serve as a source of energy and as a substrate for various substances in plants. They also serve as food for soil microorganisms, aquatic microorganisms, and other useful bacteria, which grow and provide nutrients to plants and improve their growth environment.

Amino Acid Functions

Amino acids contained in seaweed are easily absorbed by plants, and are absorbed through the roots and leaves. Normally, amino acids are synthesized in plants based on nitrogen components absorbed from the roots. The nitrogen component is decomposed by microorganisms in the soil, absorbed through the roots, and synthesized into amino acids while consuming energy in the plant body, which are then synthesized into proteins and other substances.

However, since seaweed amino acids are absorbed from leaves and roots in their original state, they are directly involved in the synthesis of proteins and other substances immediately after absorption. Compared to conventional fertilizers, it promotes the growth of crops more efficiently

The Function of Minerals

Minerals and other trace elements increase the absorption efficiency of nitrogen, phosphoric acid, and potassium components.

They also play a very important role in combining with amino acids and sugars to produce enzymes, hormones, and other substances necessary for the maintenance and development of life.

The Function of Natural Plant Growth Promoting Factors

Secreted components involved in plant growth have a very important role in overall plant growth, such as increasing flowering, promoting root and stem branching and elongation, improving cold tolerance, promoting fruit maturation, and preventing aging.

Plants whose growth is stimulated by the active ingredients contained in these seaweed materials naturally increase in number of cells, and the amount of nitrogen consumed increases accordingly. Nitrogen is necessary for the production of amino acids. Amino acids are essential for plants to make proteins, nucleic acids, growth hormones, enzymes, and vitamins. Crops are made from many cells, which are made from proteins, nucleic acids, etc. Crops continue to grow because they use amino acids made from nitrogen components absorbed from roots and leaves to make proteins, etc., and continue to increase the number of cells.

In addition, the growth-promoting action of seaweed materials efficiently consumes nitrogen components in the soil, which helps prevent residual nitrate-form nitrogen and other residues, thereby reducing environmental impact.

4.Conclusions

In this study, we focused on the utilization of the exterminated wakame seaweed, rather than its mere extermination, in response to the current problem of expansion of the wakame seaweed habitat. The first step is to utilize seaweed as a food source. However, since human consumption is limited, the seaweed that cannot be fully consumed is used as fertilizer. The problem is who will exterminate the seaweed and how? In future research, we would like to consider how we can quickly and inexpensively exterminate them so that we do not have to spend a huge amount of money on their extermination.

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How to solve the future food shortage

~How can we do to spread alternative meat?~

― starving　food shortage　alternative meat ―

17th generation　5202　Ikata Rena

1. Abstract

There are about seven hundred and thirty million people who suffer from starvation in the world.In africa, developing countries, population is growing now, so it can be expected that the number of starving people will also increase.Then I think that we can aim for a solution of starving problem with use of alternative meats and supplying starving people them.There are several kinds of alternative meats.Especially The typical meat substitute is soy meat, which is made from soybeans.They are sold by a lot of countries such as America, Japan.They are made from soys,so they do require the less land than meat made from livestock and it is kind for environment.Moreover,alternative meats contain much protein and low fat,so they have merit to eat them for young people who want to do diet or elderly people who aim at healthy.However,alternative meats also have some demerits.First,they are expensive.

Second,they are not known so much by people.Also they have problems with our health. Eating alternative meat can be taking too many additives or soy isoflavones.In these ways,alternative meats also have several disadvantages,so I came up with an idea that other alternative meat spread among people.Then I found the alternative meat called air meat.this meats the frontier meats invented by American company, Air Protein.

However,They are developing and not for sale yet,so I decided to support research and development.

2. Background of research

There are about seven hundred and thirty million people who suffer from starvation in the world.Starvation means a situation in which people are not able to eat sufficient food for a long time and become malnourished ,so it is difficult for them to survive and live socially.Mainly, this has been serious problem in Africa or Asia.One of large factors is natural disaster.They need more food to decrease the number of starving people,but it is difficult for them to grow crops or raise livestocks because of natural disasters or conflicts in these countries. To solve this problem,we suggest that we spread alternative meats in these countries.Alternative meats are produced earlier than animal meats and are kind to the environment.Moreover, production of them does not depend on weather or environment.Therefore I think they can contribute to solve this problem ,so I started this research.

3. objective of research

I think some African countries depend on support from developed countries,so I want to think about the suggestion that these countries can be independent through my research.The current support from developed countries are donation by UNICEF which uses for nutritional food such as,multiple micronutrient powder (MNP),therapeutic milk or plumpy nut.According to the below graphs,lifespan average in South Africa is shorter than that in the world.Infant mortality rate is also higher than average rate.Therefore, I think that we should improve the way to support starving people in Africa.

4. the way of research

I will research below on the Internet.

1. the starving population in Africa
2. the rate of spread of alternative meat
3. the kinds of alternative meat
4. whether alternative meat's nutrition is safe
5. Which kinds of alternative meat should we spread?
6. the way to spread alternative meat

5. Discussion and Implications

This graph shows that there are about 800 million undernourished people in the world. The number has not decreased over the past years. In addition, it can be seen that Asia and Africa are particularly concentrated among the undernourished population. I have always associated hunger and poverty with Africa, and so I conducted this research with the goal of reducing hunger in Africa.

Next, I looked at the assistance that is currently being provided to address hunger. There are two main ways in which governments are providing assistance. One is the cash assistance provided by the World Food Program (WFP). Cash assistance refers to the provision of food aid in cash to developing countries by people with money to spare, such as those in developed countries. Cash assistance can take many forms, including paper money, electronic money, mobile money, debit cards, and food vouchers that can be redeemed for goods at local contract stores. Originally, food aid was provided in the form of food aid, but there are many different types of meat substitutes. Cash assistance gives people the confidence that they are in charge of their own food. In addition, cash aid is more flexible in terms of food ingredients and the choice of where to buy them, more efficient in terms of reducing transportation costs, and more respectful of the recipients' wishes.

The other is a fundraising campaign conducted by the United Nations Children's Fund (UNICEF). The money raised is exchanged for therapeutic nutritional foods, micronutrient powders, therapeutic milk, and other items to help malnourished children. However, there are some challenges with these two types of support. First, because it is direct assistance, it is unlikely to lead to self-reliance in Africa. I would like to propose that African countries themselves can support their own people, rather than Africa being passive.

Next, I investigated the factors that contribute to the high number of undernourished populations in Africa. These include the destruction of farmland due to conflict, climate change/natural disasters, poverty, and lack of agricultural technology. In particular, since environmental factors such as conflict and climate are serious problems in Africa, even if we measured improvements in agricultural technology from developed countries, it would be difficult to reduce hunger by supporting agriculture because it is impossible to farm in the first place.

Therefore, the solution I came up with was to provide food aid through meat substitutes.

This graph shows that the market size is expected to increase every year.

Meat substitutes have various advantages. First, it is environmentally friendly. As an example, livestock have lower carbon dioxide emissions during production. Cattle contain a lot of methane gas in their burps. Methane gas is one of the causes of global warming because its greenhouse effect is about 25 times greater than that of carbon dioxide. It also reduces the land area used for livestock, since the land used for meat production closes about 26% of the land area. Furthermore, it also reduces water consumption. In addition, the production time is short.

1. plant-based meat substitutes
Meat substitutes made from plant-based ingredients such as soybeans, barley, wheat, and pea protein. Examples include tofu, seitan, tempeh, and plant-based burgers.
2. cell cultured meat
A technology that produces meat from actual animal cells. This includes beef and poultry. Cell cultured meat aims to improve sustainability and animal welfare.
3. mushroom-based meat alternatives
Meat substitutes that use mushrooms to mimic the flavor and texture of meat. Mainly shiitake mushrooms and eringi mushrooms are used.
4. seaweed-based meat substitutes
4. seaweed-based meat substitutes 4. seaweed-based meat substitutes This provides a plant-based food product while utilizing marine resources
5. tofu or seitan
Traditional foods such as tofu and seitan will be part of the meat alternatives as a source of plant-based protein.

These alternative meat products are increasingly diversified as food technology advances and demand changes. Especially representative is soybean meat, a plant-based meat alternative. This is marketed in the United States, Japan, and many other countries. It is made by soybeans and requires less land and has less environmental impact than meat produced by livestock. It is also low in fat and high in protein, making it a good choice for a wide range of people, including young people on diets and the elderly who are trying to stay healthy. However, soybean meat has several problems.

One is its high price. Alternative meats are manufactured through a number of processes. As of December 2022, the price of hamburger steaks made with meat substitutes at a major supermarket, Topvalu, was 1.7 times higher than that of regular hamburger steaks.

Second, awareness of meat substitutes is low. Although awareness of meat substitutes is increasing, the problem is that few people pick up meat substitutes due to the image that they are “expensive” and “not tasty. In particular, children and others who dislike soy are generally more likely to use alternative meats, and this is a factor that reduces their chances of using them. However, the reality is that only about 10% of respondents have actually eaten it. First of all, it is important to improve the image of meat substitutes and encourage people to actually try them. Other issues include the danger of increased deforestation and the expected decline of the livestock industry. Furthermore, there are health issues for us, and there is a risk that eating alternative meat every day will lead to excessive intake of additives, soy isoflavones, and other substances. Because of these various disadvantages of soybean meat, I considered promoting other types of meat substitutes. Next, I looked into cultured meat. Cultured meat is produced by culturing animal cells in vitro, and can be cultured with cells from other animals.
It also has the advantage over plant-based meat substitutes that its nutrients are almost the same as those of the original meat, so there is no hindrance when it is completely replaced with meat. Furthermore, the muscle and fat components can be adjusted. Therefore, it is

possible to produce meat with various forms and nutrients to suit different purposes. The only company developing cultured meat that sells it is an American company called Eat Just, which was the first in the world to receive approval from the Singapore government to sell cultured meat in 2020. It is now sold at restaurants in Singapore for about 2,000 yen. It takes two weeks to go from cells to cultured meat, and the cells used for cultured meat are obtained from a cell bank, without killing the animal.

The nutrients used to grow the cells are all plant-derived, so it is considered safe for us to eat. On the other hand, there are some challenges to the widespread use of cultured meat: it is less well known than plant-based meat alternatives, and there is a lack of bioreactors used in its production. In Africa, Mogale Meat (name of company in South Africa) is developing cultured chicken breast, and Newform Foods (name of company in South Africa) is producing cultured beef. Here is a comparison of plant-based meat substitutes and cultured meat. Since cultured meat was superior in terms of environmental friendliness and production time, we decided to use cultured meat in this study to provide support. Furthermore, at the CO2 Resource Recovery Institute, Inc. we developed an animal protein produced by UCDI® hydrogen bacteria that feeds on carbon dioxide and multiplies,

The protein has the advantage that 1 gram of the protein can grow to 16 tons in 24 hours. The company plans to sell the protein in the form of hamburgers and sausages in 2024.

6. comclusion

I would like to make two suggestions.

First, the UCDI® hydrogen bacteria developed by the CO2 Resource Recovery Institute, Inc. could be used not only as a food, but also as a feed for livestock by mixing it with corn and other vegetable proteins, which are the original feed. By doing this, it is possible to solve the serious environmental problems in the livestock industry today. It also has the advantage of being mass-produced and having a much higher protein content and nutritional value than the original animal protein known as fishmeal. This will lead to permanent food production by building an environmentally friendly livestock industry," thereby reducing food shortages. Another proposal is to collaborate with an American cultured meat company, eat just, to produce food in buildings such as Mogg's. This would also allow for stable food production in countries with unstable climates such as Africa. In addition, the food produced will not only be used for aid, but will also be sold domestically and internationally to generate profits that can be used for economic development, thereby achieving the goal of self-reliance for developing countries. One of the conditions for where to locate the plant is that it must be in a country that has not been in conflict for a long period of time. One issue for the future is that cultured meat is less well known than plant-based meat alternatives, and many people may be resistant to it. Therefore, we must consider how to create opportunities for people to learn about cultured meat.

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大豆ミートってなんだ？
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How to Improve Children's Literacy with Picture Book

～ To Improve Academic Skill ～

— Literacy Achievement gap Picture book —

5203 Yoha Umeyama

1. Abstract

I'm going to do research to improve academic literacy for children who can not go to school because of the gender gap in developing countries. It makes young generations become proficient in reading and writing and we can expect independent economic development in the future.
I researched some information on the internet and I found that boys in developing countries are required to go to school.However girls are required to do housework to support and care for their families.And also many parents don't allow them to go to the schools considering how dangerous the road and the school are.
Then,I would like to suggest "picture book × language study" . This is an activity where we send picture books which are not used now and translated to local language or English to the developing countries.We use an organization and can expect to improve language skills by reading picture books to children from their parents and local people.It makes it possible to learn language at home without going to the school for children in such countries.
And people, including us, can learn a new language or language which is spoken by a few people from a new point of view. And they can choose the level of language skills that suits their language skill one by one.
Also it would be more effective to read books by others so I need to search how much language skills their parents have and can they read books to their children. It's my next problem I should solve.
In addition, this reseach's goal is not just to improve academic literacy like basic reading,writing,addition and subtraction but also to improve hard mathematics and sentences.

2. Significant of this research

According to the graph which shows literacy in the countries near the equator,we can see that the differences are very huge with other countries. And it's a serious problem connected to their lives directly in those countries.If we can't read or write,we can't judge water to save our lifes or poison to die, can't take the explanation to get a new job.There are about 763 million people who are over 15 years old and can't read or write in the world,one in seven people.
One of the reasons why their literacy rate is low is that they can't go to school or if they can enter the school, they can't keep going to the school. First, I consider the idea that children can go to school more easily. However I thought it's about the long and bumpy way to the school, money for each family and lack of equipment.
That is why I concentrate on home learning,without going to school.

3. Objective of this reseach

My research question is '' How to improve literacy rate of children in developing countries regardless of gender".
Many people there think that just boys need to go school to work for their family.However

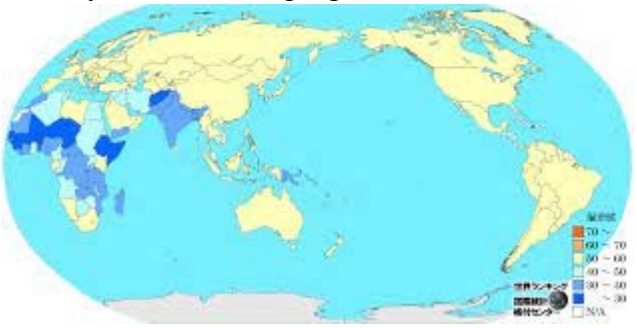
girls also need to learn to read or write to live.

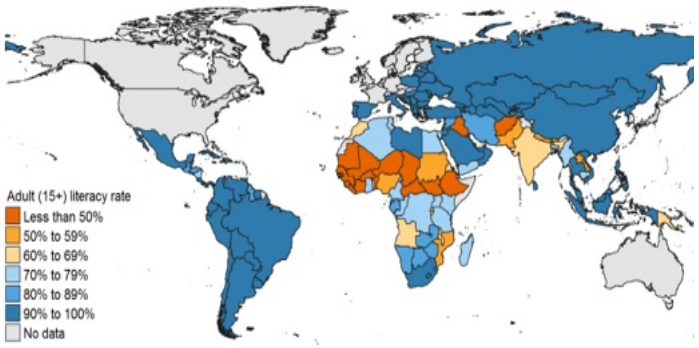
4. **Way to research**

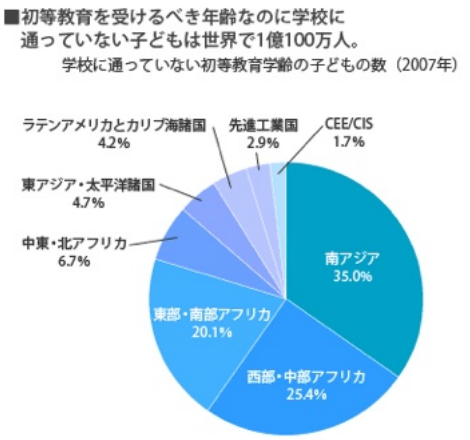
To research on the Internet
To look for Books at MultiMedia Library

5. **Conclusion**

Literacy rate in developing countries is lower than in other areas.







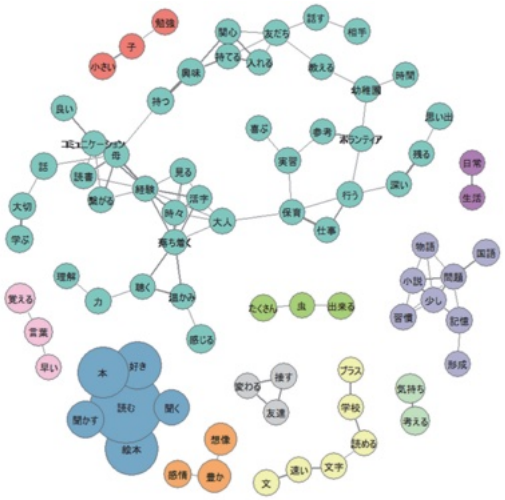
- アフリカ（33）：
  アンゴラ（2024年に卒業予定）、ベナン、ブルキナファソ、ブルンジ、中央アフリカ、チャド、コモロ、コンゴ民主共和国、ジブチ、エリトリア、エチオピア、ガンビア、ギニア、ギニアビサウ、レソト、リベリア、マダガスカル、マラウイ、マリ、モーリタニア、モザンビーク、ニジェール、ルワンダ、サントメ・プリンシペ（2024年に卒業予定）、セネガル、シエラレオネ、ソマリア、南スーダン、スーダン、トーゴ、ウガンダ、タンザニア、ザンビア
- アジア（9）：
  アフガニスタン、バングラデシュ、ブータン（2023年に卒業予定）、カンボジア、ラオス、ミャンマー、ネパール、イエメン、東ティモール
- 大洋州（3）：
  キリバス、ソロモン諸島（2024年に卒業予定）、ツバル
- 中南米（1）：
  ハイチ

This is related to the reason that children, especially girls, can't go to school.
Then I think we should create something to study that children don’t need to go to school than solve problems of school equipment or teachers.
The goal of this research is to deliver basic education for children who can’t go to school in developing countries.

According to the avoid graph,almost all children who can’t go to school live in developing countries, although Japan has a 100% of Primary education enrollment rate. They need some solutions with it.



That is the system of STUDY × PICTURE BOOKS to deliver picture books with translation isn't needed any more in Japan for the country has children who want to study but can’t go to school.
People in Japan like us write the sentences that are translated on the seals,and it’s delivered to one organization supporting this activity. That organization sent it back after they finished translation mistakes made by people in Japan. We can realize what’s wrong from the organization’s pointing out and send picture books with seals that have already been corrected to developing countries through the organization.Thanks to this,children don’t need to go school with danger so they can study at home at their own pace.Also it has the advantage of sending picture books,they can get new ways to study language.Moreover,it is good for people who want a way to study minority languages that don't have any textbooks.





This is the fact that language study from *Yomi Kikase* by their parents or other adults surrounded by them on a daily basis is the best way to use picture books.Reading books together makes children who have a lot of emotion and expression,and it’s best for children to appeal what they think and what they want to tell to other people. My suggestion is not only good for children’s literacy rate but also good for their hearts.
The literacy rate of over fifteen years old in Africa is under 50% so I couldn't get details.
So I need to research how literacy rates over fifteen years old actually are.

6. **Conclusion**

We use the system of STUDY×PICTURE BOOK and send pictures translated to developing countries.Then children try to improve their literacy rate by the picture book they received.
The effect of picture books is value formation,early childhood brain development and getting a multicultural perspective and if adults do *Yomi Kikase* to children,the effect can get bigger.
However,the literacy rate of under fifteen years old in Africa is under 50% so I’m not sure how much they can actually read and write.

So when this suggestion is available it is the situation that there is one adult who can read the books and it doesn't matter if they can write.

7. **Literature**

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Reducing Waste Through Sports

Effortlessly Reducing Clothing Waste

5204　北村流唯

Abstract

Last year, I worked on a project to reduce waste using soccer, which I'm passionate about. One issue with the J-League in Japan was low spectator numbers. I thought it would be great if we could solve this problem while also cutting down on waste. We came up with the idea of collecting unused clothes from people at the stadium and then giving visitors gifts made from those clothes. This approach could help boost attendance and reduce clothing waste.

This year, we expanded our project to a global scale. We researched clothing waste in the top five soccer leagues in the world. We discovered that the major leagues don't have attendance problems and that giving gifts isn't very effective. However, we noticed that ticket prices in these leagues are higher than in Japan, and other stadium expenses are also more costly. Because of this, we thought giving out discount coupons for stadium goods in exchange for bringing clothes could be a good idea.

We plan to donate the collected clothes to volunteer organizations or use them to create an annual event called "Eco-Match Day." On this day, players and fans in the five major leagues would wear special eco-friendly uniforms to raise awareness about environmental issues.

In the future, we hope to expand this campaign beyond the five major leagues to other regions and make it an international effort.

Research background

Last year, I explored how to reduce waste by combining my love for soccer with environmental issues. The J-League in Japan struggles with low attendance, so I proposed a plan to increase spectator numbers by collecting unused clothes at the stadium and giving them as gifts to visitors. This approach aimed to address both the attendance issue and environmental concerns, given that the apparel industry is the second-largest environmental polluter in the world, according to the United Nations Conference on Trade and Development (UNCTAD).

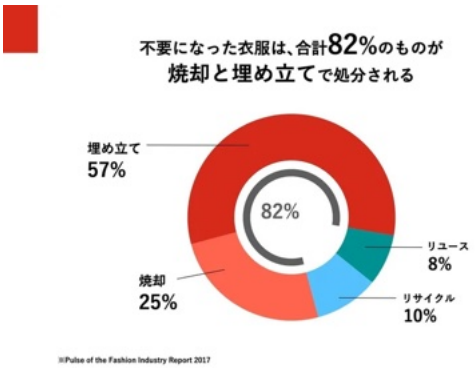
This year, we decided to expand our focus from Japan to a global scale. We want to build on last year's research to find a more efficient and practical way to reduce clothing waste worldwide.

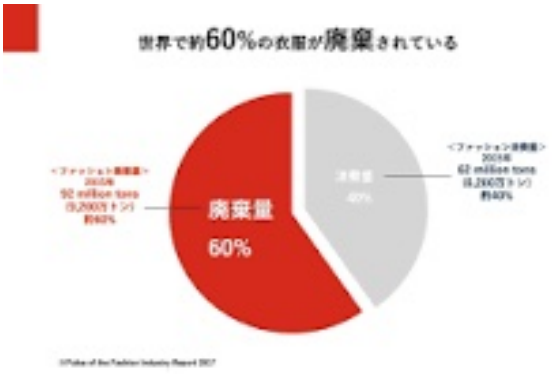
Purpose of the study

I mainly used the Internet.I have divided it into three phases.
First: to examine the problems of each league in the world;
Second:to devise ways to reduce the amount of waste;
Third: to make improvements in these areas.

Result of study

Currently,more than 60%of produced clothes are abandoned as trash in the world.Also,82%of no longer required clothes are disposed of by incineration or landfill.





In addition, 18% of the waste is reused and recycled, but a large portion of it is exported overseas, where they also face difficulties in disposing of the clothes. As a result, it is expected that the amount of waste will increase even further. I decided to address this issue by linking it to soccer. To do this, I began researching the problems faced by the top five soccer leagues in the world, using last year's research as a reference. Unlike the J-League, the top five leagues do not face issues with attendance. However, there are many problems not seen in Japan, such as littering in the stadiums. I also found that the top five leagues have very passionate supporters and generate much higher merchandise revenue compared to Japan. One of the biggest differences between Japan and the top five leagues is the price of tickets. For example, Urawa Reds' most expensive season ticket is 110,000 yen, while Arsenal in the Premier League has season tickets that start at 150,000 yen. Supporters are spending a lot of money just to watch the games, which means they may not have much left to spend on other goods or food inside the stadium. Furthermore, only the most passionate supporters can afford to buy merchandise, making it harder for middle-tier or new supporters to purchase items.

Based on this, I came up with a solution that collects used clothes in exchange for discount coupons for merchandise and food at the stadium, or for original items like scarves made from the collected clothes, to encourage middle-tier and new supporters to take part. Additionally, to expand this initiative, I thought it would be a good idea to have a special annual match across all five leagues where players wear uniforms made from the collected clothes. This would raise environmental awareness among both players and spectators. I also decided to make this match a universal event across all five leagues, calling it "Eco Match Day."

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Belgium

How to Protect Young people’s Job

5205　Kimura Kazui

Abstract

In Belgium, the youth unemployment rate is high, reaching about 20%. This problem is caused by slow economic growth, the education system's delay in meeting labor market needs, and regional disparities. There is a severe shortage of workers in fields such as IT, healthcare, and technical jobs, where there is high demand, but young people with the right skills are lacking. The government is increasing the acceptance of foreign workers, but there are concerns about a decrease in job openings and a rise in the unemployment rate.

Given this situation, I thought about what I could do. One solution is to offer opportunities for IT vocational training. It is important to create programs in collaboration with companies, allowing young people to acquire practical skills that can help them adapt to the labor market. As the demand for IT skills continues to grow, providing this kind of training can offer new job opportunities for young people, helping to solve the unemployment problem and contributing to sustainable economic growth.



Change in unemployment rate

Research Background

I like Belgium very much. I first learned about Belgium in 2017, when I watched the FIFA World Cup. That is when I became interested in the country. I was fascinated by its rich food culture, the beautiful townscapes, and the atmosphere of the people. Not only did I want to visit Belgium, but I also started to dream of living there.

However, Belgium faces many social problems, such as terrorism, economic inequality, language and ethnic conflicts, social exclusion of immigrants, poverty, and the sustainability of public services. In particular, the issues of terrorism and security have become more

serious in recent years. Since the Paris attacks in 2015, Brussels has been known as a "hotbed of terrorism." While the government has been working to arrest terrorists and strengthen investigations, the fundamental social divisions have not been resolved.

Belgium also has problems with language and ethnic conflicts. The country is divided into two main regions: Flanders, where Dutch is spoken, and Wallonia, where French is spoken. The language barrier and economic differences create social tension. The unemployment rate in Wallonia is high, and the region continues to face difficult economic conditions. In addition, there is a noticeable gap between urban and rural areas, with poverty concentrated mainly in the Brussels capital area. According to data from 2023, about 18.6% of people in Belgium are at risk of poverty or social exclusion, and in Brussels, the rate is as high as 28%.

Economic inequality has a big impact on education. Families with low incomes often lack educational resources, which affects children's academic performance and chances of continuing their studies. Children from wealthier families can take extra lessons, such as tutoring and extracurricular activities, but children from poor families do not have these opportunities, leading to a growing gap in academic achievement. Additionally, economic difficulties can negatively affect children's motivation and lower the chances of attending higher education. Especially among low-income families, the possibility of going to university is low, and the cycle of poverty continues.

Immigrants also face social exclusion, with many low-skilled workers having high unemployment rates. One reason for this is the unequal access to education and the job market. Many immigrants are concentrated in poverty and feel socially excluded, which increases the risk of radicalization and terrorism. To address social exclusion, it is necessary to equalize educational opportunities and provide economic support.

Furthermore, the sustainability of public services in Belgium is also a concern. While the social security system maintains a high level, the increasing public debt threatens the country's financial health, and future reforms to the system will be needed. Although pensions and unemployment benefits are linked to inflation, ensuring short-term stability, there are concerns about long-term sustainability.

These issues are all connected. Economic inequality and social exclusion encourage terrorism, and the worsening security situation deepens social divisions, creating a vicious cycle. To improve this situation, it is important to promote social integration and provide educational and job training opportunities. Especially, providing job training in areas like IT, where there is high demand, will help increase job opportunities for young people and support those in poverty.

Research methods

During my training in Singapore, I visited Yakult. There, I learned that by making small changes to existing products to meet local needs, they could create profits.

After hearing this, I decided to study the needs in Belgium in detail. By looking at past examples, I thought it would be a good idea to explore new opportunities based on what has worked before.

Findings

Youth Unemployment in Belgium

In Belgium, the economy is generally stable, but youth unemployment is still a big problem. The youth unemployment rate can be as high as 20%. This issue has a serious impact on young people, and there is a need to rethink their position in the labor market.

Causes

There are several reasons for youth unemployment. The main causes are:

1. Mismatch of Skills
   The education system in Belgium does not always match the needs of the labor market. Especially in fields like IT and technology, the skills required are changing quickly, and schools have a hard time keeping up with these changes.

2. Economic Slowdown
   Economic growth has slowed down, making it harder for new jobs to be created. After the pandemic, economic recovery has been slow, and many businesses cannot afford to hire young people.

3. Regional Differences
   There are big differences in the economy and job opportunities between different regions of Belgium. For example, the unemployment rate is higher in Wallonia, and this gap is caused by differences in industry and education in each region.

Solutions

To solve youth unemployment, the following actions are needed:

1. Strengthening Vocational Training
   Young people need to learn the skills that are in demand in the job market. Vocational training programs should be improved, and more opportunities for hands-on experience should be created by working with companies.

2. Increasing Internships
   More internships should be offered so that young people can gain practical

experience and improve their chances of finding a job. Companies should be given incentives to take in interns.

3. Supporting Regional Economies
   The government should invest in certain regions to create more job opportunities. Supporting local economies will help reduce youth unemployment in these areas.

Conclusion

Youth unemployment in Belgium is caused by a mismatch of skills, economic slowdown, and regional differences. If the right measures are taken, more job opportunities can be created for young people, and the economy can grow in a sustainable way. It is important for the government, schools, and companies to work together to solve this issue.

Labor Shortage in Belgium and Its Background

Belgium is facing a serious labor shortage in many sectors. The most affected areas are:

Types of Jobs with Shortage

1. Engineering
   There is a shortage of skilled workers in engineering fields like civil engineers and machine operators. The demand for these professionals is growing, but there are not enough qualified workers.

2. Manufacturing
   Jobs like welders and repair technicians are also in short supply, which affects the competitiveness of the manufacturing industry.

3. Construction
   There is a lack of workers in construction, such as construction laborers and managers, which can delay construction projects.

4. Healthcare
   Belgium is experiencing a shortage of nurses and other healthcare workers, especially as the population ages and the demand for healthcare increases.

5. IT
   There is a shortage of IT professionals, such as software developers and programmers, which can slow down the progress of digital transformation.

Economic Background and Changes in the Labor Market

1. Changes in the Labor Market
   Employment growth is expected to slow down in 2024, with a decrease in jobs in manufacturing and retail sectors. This makes it harder for job seekers to find work.

2. Accepting Foreign Workers
   To address the labor shortage, Belgium is welcoming more foreign workers, especially those with specialized skills, by offering incentives.

Future Outlook

1. Demand for Green Jobs
   There is an increasing demand for environmentally friendly jobs (green jobs), and there may be a shortage of workers in this field in the future.

2. Labor Movement Between Regions
   There is a growing movement of workers from Flanders to Wallonia, or from Wallonia to Brussels, as people search for jobs in different areas.

Conclusion

Labor shortages in Belgium are especially noticeable in fields like engineering, healthcare, and IT. This problem is expected to continue in the future. The government needs to focus on developing the right skills in the workforce and attracting foreign workers to help fill the gaps.

Trends and Predictions in the Belgian Job Market

The job market in Belgium in 2024 shows several important trends. Here are the current situation and predictions:

Current Job Market Situation

1. High Hiring Intentions
   In the first quarter of 2024, employers in Belgium are planning to create new jobs. The job market outlook is positive, with a +33% net hiring intention. This is a result of the labor shortage.

2. Decrease in Job Postings
   New job postings are expected to be only 16,000 in 2024, and 25,000 in 2025. Compared to previous years, there is a noticeable decrease in job postings, especially for white-collar positions.

3. Unemployment Rate Predictions
   The current unemployment rate is stable at 5.7%, but it is expected to rise to 9.1% in 2024 due to the decrease in new job postings.

Industry Trends

1. Strength of the Service Industry
   Belgium's economy relies heavily on the service sector, including commerce, transportation, and hospitality, which are major sources of employment.

2. Demand for Cybersecurity Professionals
   The demand for cybersecurity professionals is high, and by 2024, it is predicted that there will be a shortage of over 10,000 experts in this field.

Economic Recovery Predictions

The economy is expected to recover in 2025, with a growth rate of 1.3%. This is likely to lead to improvements in the job market.

Labor Movement Between Regions

There is a noticeable movement of workers from Flanders and Wallonia to Brussels in search of jobs. This reflects regional imbalances in the economy.

Conclusion

The job market is still difficult, but it is expected to improve with economic recovery in the future. Companies will need to offer jobs that match the skills of job seekers.

Job Search Apps in Belgium

In Belgium, there are several job search apps that can help job seekers find jobs efficiently. Here are some of the most popular ones:

1. StepStone
   StepStone covers a wide range of job listings in Belgium, and users can search by region and job type. It is easy to upload your resume and apply for jobs.

2. Indeed
   Indeed is a global job search app, and it also provides many job listings in Belgium. You can post jobs for free as well.

3. Google for Jobs
   Google collects job listings and makes them easily accessible to job seekers through Google search.

4. Jobs in Brussels
   This app focuses on job listings in Brussels and provides a variety of job opportunities.

Conclusion

These job search apps are very useful tools for finding job listings in Belgium. They make it easier for job seekers to find suitable positions and apply directly.

Reasons for Stable Unemployment Rate in Belgium

The unemployment rate in Belgium remains stable due to several factors:

1. Diverse Economy
   Belgium's economy relies heavily on the service sector, which makes up about 68.8% of its GDP. This helps keep employment stable despite economic changes.

2. Strong Employment Protection
   Workers' rights are well protected in Belgium, making it difficult for companies to easily lay off workers. This helps prevent a sharp rise in unemployment.

3. Unemployment Benefits
   The unemployment benefit system helps prevent a sudden increase in unemployment, as people who lose their jobs receive financial support.

Conclusion

The stability of Belgium's unemployment rate is due to the structure of the labor market, government policies, and the strength of the economy. As long as these factors remain in place, the unemployment rate is likely to stay stable.

Improving System Engineers in Belgium

System engineers in Belgium need to improve in the following areas:

1. Optimizing Infrastructure
   There is a need to optimize network infrastructure, especially in regions like Wallonia, and improve communication speeds. Using cloud services can help reduce costs and increase scalability.

2. Strengthening Security
   Improving cybersecurity is urgent. Setting up intrusion detection systems and firewalls is important, and educating staff on security is also necessary.

3. Automating Business Processes
   Automating business processes can improve efficiency. Engineers should use scripts and automation tools to help with this.

4. Improving User Experience
   System engineers should focus on improving the user interface and making systems easier to use.

Conclusion

System engineers in Belgium play an important role in optimizing infrastructure, strengthening security, automating processes, and improving user experience. By focusing on these areas, they can help improve the efficiency and security of businesses and organizations.

Establishment of a third party to solve “cultural appropriation
-The creation of an international cultural preservation organization-

5206 Kuraishi Nayuta

Abstract

1.Introduction

This paper explores solutions to the issue of cultural appropriation. Cultural appropriation occurs when people from one culture inappropriately use elements of another culture without understanding or respecting their meaning. In recent years, cultural appropriation has become a widely discussed problem, and the term itself has gained significant attention.

The origin of the concept is debated, with connections to ideas such as cultural colonialism and strategic essentialism. Although there is no clear consensus on its exact origins, the term became more commonly used in academic discussions about colonialism in the 1980s.

Why has cultural appropriation become such an important issue today? One possible reason is the spread of the internet and social media, which have accelerated globalization. Because people can now easily access different cultures online, they are more likely to adopt cultural elements without fully understanding them. This has made cultural appropriation more noticeable and problematic.

2.Discussion and implication

Several well-known cases illustrate the issue of cultural appropriation.

One example is Selena Gomez, who wore a bindi during a concert. The Universal Society of Hinduism criticized her, arguing that she ignored the cultural and religious significance of the symbol.

Another case involves Kim Kardashian, who named her shapewear brand "KIMONO". Many people viewed this as cultural appropriation of Japanese culture, leading to public backlash and a name change.

The French fashion brand Isabel Marant was accused of copying traditional clothing from indigenous Mexican communities, and Gucci was criticized for featuring white models wearing Sikh-style turbans on the runway.

These examples show how cultural appropriation often occurs in fashion, entertainment, and commercial industries, where cultural elements are used without proper understanding or respect.

One major cause of cultural appropriation is the internet and globalization. As cultural exchanges become faster and easier, people may overlook the deeper meanings behind cultural elements. This lack of understanding makes inappropriate usage more common.

Another factor is commercialization. Many companies and celebrities use cultural elements for marketing and profit, often without considering their impact on the original culture.

One possible solution is the creation of a cultural-sharing platform. This online platform would allow people who want to use cultural elements to discuss and negotiate with members of the culture they wish to borrow from. This system could help prevent cultural appropriation by ensuring that cultural elements are shared with respect and understanding.

However, this solution has two major problems:

Who owns culture?
Culture is difficult to define, and it is not a physical object or intellectual property. According to Oxford Languages, culture is "the intellectual activity of realizing human ideals; a lifestyle and expressions formed through the process of utilizing technology for human purposes." Since culture does not belong to one person or group, it is difficult to determine who has the right to approve or deny its use.

Uncertainty in online negotiations
Online platforms lack transparency, making it hard to confirm whether those involved in discussions are truly representatives of their cultural community. Also, the idea of sharing culture online is too abstract, making it difficult to implement in reality.

To create an effective solution, we need to address these problems. One approach is to establish rules or guidelines for cultural exchanges. Since cultural appropriation is a global issue, there will always be differences in values and perspectives. A standardized definition of culture and international guidelines could help prevent misunderstandings.
Another important aspect is cultural protection. Cultural appropriation often involves the exploitation and privatization of cultural identity. This issue is linked to cultural colonialism, where dominant cultures take elements from minority cultures without permission. To solve this, we need to ensure that minority cultures are protected and treated as equal in global cultural exchanges.

2.4 Proposal: Establishing an International Cultural Protection Organization
The main argument of this paper is that an international cultural protection organization should be established. This organization would function similarly to the International Union for Conservation of Nature (IUCN), which works to protect natural environments.
The benefits of such an organization include:
・Providing solutions and preventive measures for cultural appropriation
・Acting as a neutral third party to facilitate discussions between cultures
・Ensuring cultural preservation while allowing respectful cultural exchanges

Since the IUCN operates through a network of volunteer groups, a similar structure could be used for cultural protection, reducing financial challenges.
However, there are difficulties in implementing this idea:
1.It requires international cooperation. Countries with major cultural influence, such as the United
2.States, must be involved.
3.No existing foundation for such an organization means that building it from scratch would require

time and effort.
Other global issues may take priority, making it uncertain whether cultural appropriation will receive enough attention.

3.Conclusion

In conclusion, this paper proposes the creation of an international cultural protection organization to address cultural appropriation. This organization would function similarly to the IUCN, operating as a coalition of volunteer groups and cultural experts.
Cultural appropriation remains a major issue due to globalization, commercialization, and the lack of clear cultural ownership. By establishing international guidelines and providing a neutral third party to oversee cultural exchanges, we can help prevent cultural appropriation while promoting respectful and ethical cultural sharing.
To make this proposal more realistic, a pilot project could first be launched in a single country, forming a volunteer group dedicated to cultural protection. This would serve as a foundation for a future international organization, allowing gradual development and wider global participation.
By addressing cultural appropriation in a structured and ethical manner, we can create a world where cultures are shared with understanding, respect, and fairness.

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Toward a world where no one is deprived of food

~ “New Food” using emergency provisions ~

ID5207 Kuroki Kanade

Abstract

From the WFP and FAO definitions of hunger, I realized that the solution to hunger is to ensure enough energy and nutrition. Also, I realized that this goal is the same as the goal in emergency food, too. Then I decided to do a study involving hunger and emergency food.

Therefore my research question is “to reduce the number of hungry people in Africa during disasters ,what can be done in terms of emergency food?”
In the research questions, the scope is limited to disasters and Africa in order to ease the research process. But the ultimate goal is to create something that can be spread around the world.

In response to this research question I decided to create a new food. I decided to base the conditions for this on information from the Internet. And I came up with four conditions. ①Use corn and cowpeas for energy and nutrition ②Not a single cooking process and no water is used ③Small size ④Minimum 5 years during preservation possibilities

From these points, I decided that what I should make was anpan bread. Corn flour is used to make bread, and cowpea bean paste is kneaded into the bread. No cooking process and no water required as it is ready to eat right out of the bag. Bread can be eaten with one hand. And it can be stored for a long time as it is often found in Japanese emergency rations.

1.Introduction

735 million people.This number represents the starving population.
I was so shocked at how many there were so I decided to reduce this number. However, because I am just a student, I did not think I could suggest a great proposal to solve this problem, and I thoughtI have to narrow down the theme. So, I researched the definitions of hunger first.

”Hunger is discomfort or pain caused by a lack of food. It is different from food insecurity, which means lack of regular access to safe and nutritious food for proper development and an active and healthy life.”(from WFP)

”The Food and Agriculture Organization of the United Nations (FAO) describes hunger as an uncomfortable or painful physical sensation caused by insufficient consumption of dietary energy.”(from FAO)

I found these definitions. When I saw these definitions, I considered in terms of energy and nutritional needs, this would be consistent with the purpose of an emergency meal. Then, I decided to think about ways to solve hunger from the point of view of disasters and emergency food, which I have been researching.

My research question is “to reduce the number of hungry people in Africa during disasters ,what can be done in terms of emergency food?” In the research questions, the scope is limited to disasters and Africa in order to ease the research process. But the ultimate goal is to create something that can be spread around the world. The significance of this study is

①Solving the hunger problem ②Relief of the unemployed by securing labor during production ③Revitalization of local agriculture through local production for local consumption ④Propagation of Japanese technology and traditions.

I use the Internet to do my research.

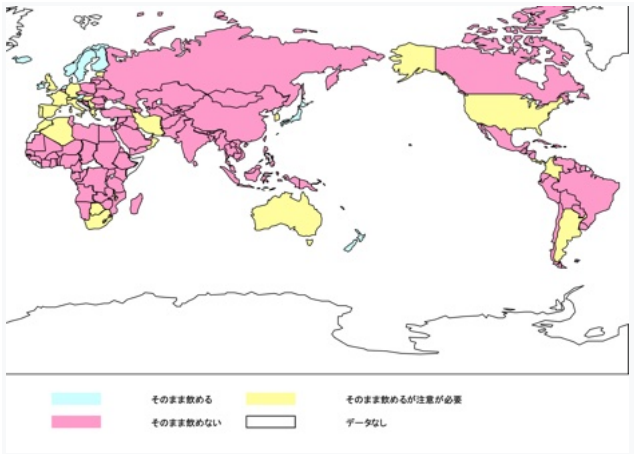
2.Discussion and implications

In response to this research question I decided to create a new food.
I decided to base the conditions for this on information from the Internet. And I came up with four conditions.

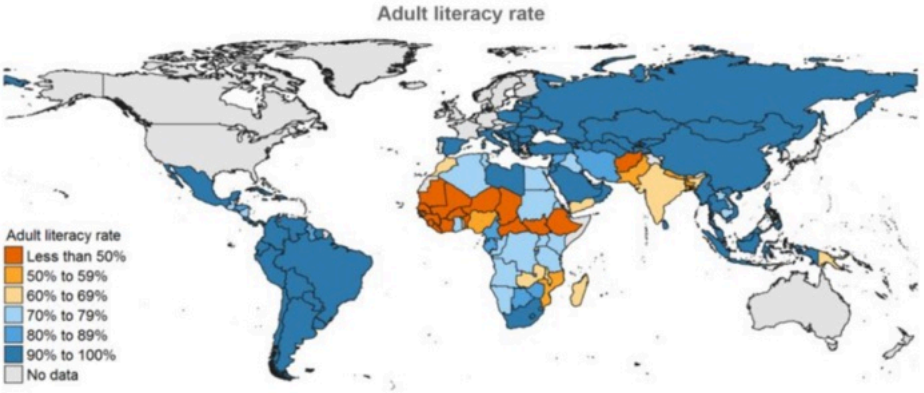
The first condition is “to ensure enough energy and nutrition”. Nutrients that are often lacking in emergency rations are energy, vitamins, minerals, fiber, and protein.
By using ingredients that contain many of these, I wanted to ensure that the nutritional balance would not be compromised. So I turned my attention to corn. Corn not only contains many of these nutrients, but also is produced in large quantities in Africa. (Production ranking: 9th South Africa) But, corn contains no protein. Thus I turned my attention to cowpea which are beans like azuki beans produced in Africa.The use of local ingredients can also reduce the transportation costs of materials and encourage the development of domestic agriculture.

The second condition is “no water and cooking required”.First, we note the ”no water”. This chart shows whether tap water in the world is drinkable as it is. (chart1) Most of Africa, the target of this project, is covered in pink, meaning that it is undrinkable as it is. Therefore, from the viewpoint of safety, emergency rations such as cup noodles and porridge, which use water, are not suitable.

The next section describes the perspective of “no cooking required”.This chart shows adult literacy rates around the world. It can be seen that many of the countries in Africa, the target of this study, have very low literacy rates. Children's literacy rates are even lower.If there is a cooking process, it is necessary to describe it, but if the text is not readable, it is useless. Therefore, it is necessary to make the process simple enough to be eaten right out of the bag, or to be sufficiently clear with an illustration.



(chart1)



(chart2)

The third condition is “small size”.The reason is quite simple. The larger they are, the more they cost to transport.It would also be impossible to carry something large in an emergency.

The fourth condition is “long-term storage”. If the food is produced in Japan and sent to Africa, it should not be inedible during transportation. And even if it were produced in Africa, it would be useless if it could not be mass produced and stocked up. I referred to Japanese emergency rations. Imuraya, the maker of a popular emergency ration called “Eiyo-Kan,” describes how it was developed to enable long-term preservation in a secret development story.

That is to “raise the sugar content”. I thought of raising the sugar content by using *anko* paste made with cowpea, which was mentioned in the first point.

In summary, ①Use corn and cowpeas for energy and nutrition ②Not a single cooking process and no water is used ③Small size ④Minimum 5 years during preservation possibilities

From these points, I decided that what I should make was anpan bread .Corn flour is used to make bread, and cowpea bean paste is kneaded into the bread. No cooking process and no water required as it is ready to eat right out of the bag. Bread can be eaten with one hand. And it can be stored for a long time as it is often found in Japanese emergency rations. Using ingredients from the land of Africa to make anpan, a traditional Japanese food, will not only solve hunger, but also promote Japanese food culture. In addition, since it can be produced with wheat instead of corn, it can be produced and stocked up all over the world. I know there are still questions about water during production, but at first it would be better to produce where there is enough water.

3.Conclusion

The conclusion is, “Make ‘anpan’ using Japanese emergency food technology.” It's important to stock up on food as you eat it on a regular basis.

I would like to think about the financial aspect in the future.

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To Protect People From Mental Diseases
～Appropriate Distance From Your Smartphone～

5208　Koike Shuhei

Abstract

The development of Internet technology makes our lives richer. However, it also has bad effects. Many people depend on SNS and their smartphones and they are given bad influence on their mental health. Thus, I looked for solutions to make you have a fulfilling daily life without depending on the Internet. I thought that to reduce the amount of time that you spend on the Internet is effective to prevent mental diseases. So, I suggested two solutions to reduce it. The first solution is that you should use a sleep app. Sleep apps can prevent you from being a night owl and you will spend less time on smartphones and SNS. Also, sleep disorders are one of the factors that contribute to mental illness. So I focus on sleep. The second solution is that companies and schools promote getting into the local community. If you get into them, you can make many relationships with people belonging to them without depending on the Internet.
I will reduce the number of people suffering from mental illness as much as possible by doing these solutions.

Introduction

Worldwide, there are 300 million people with depression, 23 million with schizophrenia, 50 million with dementia, and 60 million with bipolar disorder now. Recentry, the number of people who have mental diseases is increasing. Also, COVID-19 led to advances in Internet technology. The development of Internet technology has led to the automation and digitization of many things. New businesses and entertainment are emerging through the Internet. It makes our lives richer. However, it also has a bad side. Many people depend on SNS and their smartphones and they are given bad influence on their mental health. It is one of the reasons the number of people suffering from mental illness is increasing.

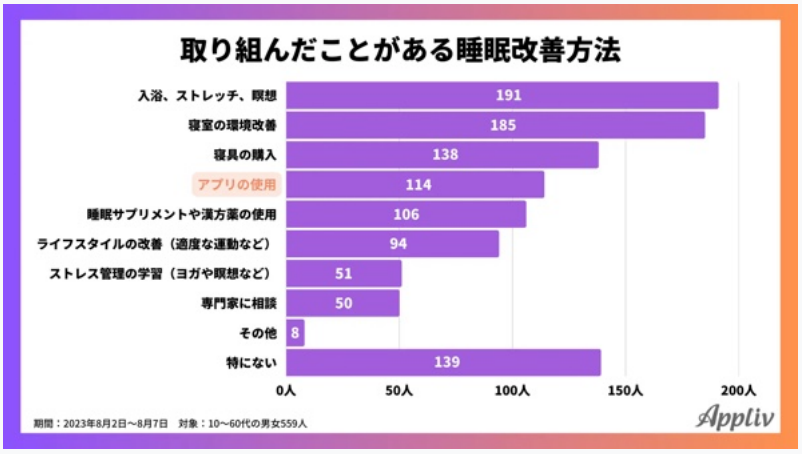
My research question is “ How can you live a fulfilling daily life without depending on the Internet? “. I thought that we can improve the mental health of people today as much as possible by reviewing how we interact with the Internet and our daily lives. I have researched for that purpose and it is my hypothesis that we should take steps to reduce the amount of time that you spend on the Internet as much as possible.

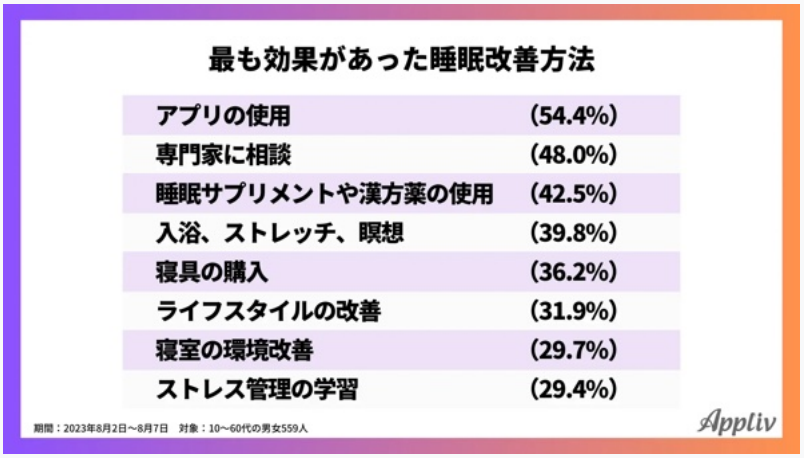
Discussion and implications

My hypothesis is effective because many studies show that. In fact, many people know that. So I researched how to reduce the amount of time that you spend on the Internet. I will suggest two solutions.

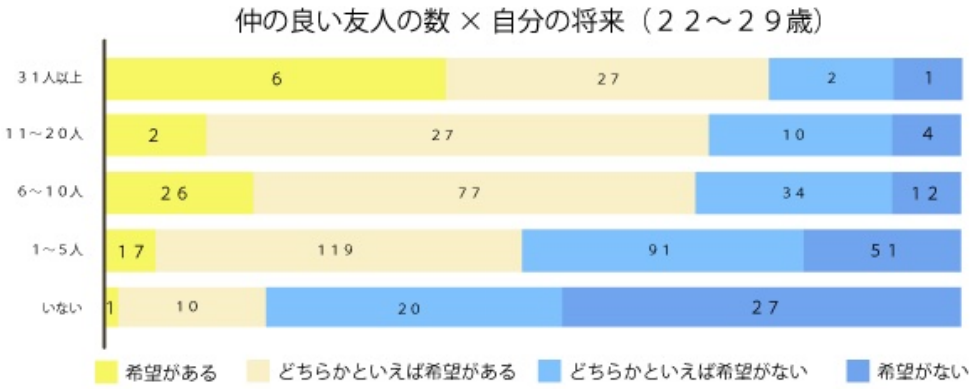
First, I suggest that you should use a sleep app. Excessive smartphone and social networking use increases the risk of depression, anxiety, self-harm, and suicide. In addition, it

increases the risk of sleep disorders and sleep deprivation is one of the factors that cause mental illness. So I focus on sleep. Sleep apps can prevent you from being a night owl and you will spend less time on smartphones and social networking sites. At the same time, it can be expected to prevent sleep disorders and mental illness by improving sleep quality and sleep duration. Look at these graphs. The graphs show the methods to improve sleep that people have worked on and how many people could actually feel the effects of the methods. According to the graphs, you find that not so many people use the app to improve their sleep. However, you also find that using the app is the most effective method to improve sleep. So I suggest that.





Second, companies and schools promote getting into the local community. If you get into the local community, you can make many relationships with people belonging to them without depending on smartphones and SNS. According to the graph that shows the association between the number of close friends and the presence or absence of hope for the future, you find that the more close friends people have, the more hope they have for the future. So, to belong to the local community makes you more positive. I think that will help prevent mental illnesses.



厚生労働省：我が国と諸外国の若者の意識に関する調査から一部改変して図示

Conclusion

I suggested two solutions to help people reduce their risk of mental illness. But, the solutions have many parts that can be improved. So, I will make better solutions and continue to gather more evidence to confirm the effectiveness of them.

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Language Education for Refugees

～Aim to guarantee the Future～

5209 Yuka Gogami

1. Abstract

In this research, I considered solutions to remove gaps in language education for refugees in countries where the language is not spoken by them, by using the Internet. Through this research, it found that the number of refugees is increasing, especially by war. In order to eliminate the gap in language education caused by the increasing number of refugees, I propose the construction of an apartment-type facility for refugees to live in. The aim of construction of the facility is to provide financial and linguistic support. Building apartments and supporting the refugees' life will help them to be independent and contribute to the economic development of the countries that host the refugees. The future challenge is high costs of running the facility, dependence on the facility of refugees, and the obstacles that prevent refugees from living on their own.

Refugees are defined as “persons in need of international protection who flee to another country because they are at risk of suffering harm in their own country on grounds of race, religion, nationality, political opinion or membership in a particular social group” (Article 1A(2) of the Refugee Convention), but in this this study, refugees are defined as war refugees who are displaced by domestic civil wars or wars with other countries.

3. Introduction

The background of the study is the increase of the number of refugees. Figure 1 shows a graph of the number of people displaced from their homes, by UNHCR; in 2022. There will be 112.6 million refugees. As the number of refugees increases, there is a gap in the treatment of refugees in the host country. Here, research was conducted to eliminate gaps among refugees, especially those related to language education. The reason for conducting research on eliminating disparities in language education is that refugees whose native language is not the language of the host country have very low levels of learning achievement, and many children leave school early.

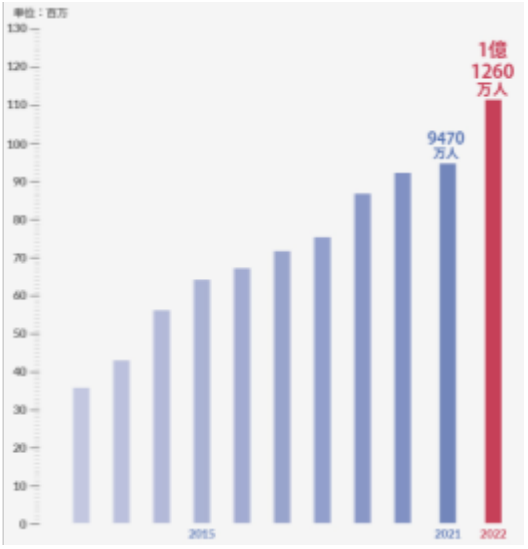


図1

The research question is “How to guarantee refugees not only temporarily but into the future?”

Nowadays, even if refugees receive temporary protection, they can’t expect long-term financial or educational assistance afterwards, and many countries require refugees to work independently while they have not yet mastered the language. While it is necessary to help refugees become self-reliant, the fact that support systems for this assistance vary from

country to country makes it difficult for refugees to feel safe in the host country. Therefore, I have considered a universal support system for language education.

The purpose of this study is to eliminate disparities in language education.

4. Discussion and implications

国　名	難民を対象とした生活支援	一般国民と同様に受けられる生活支援
オーストラリア	入国後１２か月まで，入国当初の集中的な支援として，移民・市民権省と契約した民間団体（サービスプロバイダー）が，空港への出迎え，オリエンテーション，衣料品などの手当，住居（自宅）を探す手伝いや家具等の提供，拷問や心的外傷に関するカウンセリングサービスなどを実施	例えば，失業者手当は単身者で最高２週間当たり４８９．７０豪ドル。この他にも各種手当（障害者手当や年金など）を受ける権利がある。受給期限なし。 政府の社会保障制度を通じた財政支援が基本であるが，コミュニティーが寄付金により移転費等を賄うケースやＮＧＯによる移転支援等があることもある。
ニュージーランド	マンゲレ難民定住センターで６週間の集中オリエンテーション・プログラムが実施されるほか，自立促進支援として，最初の１２か月，各種相談，モニタリング等が実施される。	社会保険事務所が個別にインタビューを行い，経済的支援ニーズを特定の上，定住先において，失業保険，疾病休業保険，障害者年金等の多様な社会保障スキームから支援が行われる。例えば，失業及び疾病休業の場合，２５歳以上の単身者は税引き後最高週当たり２０４．９６ＮＺドル，夫婦の場合子どもの有無を問わず同３４１．６０ＮＺドル。受給期限なし。 この他，当初の衣料品，生活必需品購入等の生活立ち上げ支援として社会保険事務所から再出発一時金として成人１人当たり１，２００ＮＺドルが給付される場合がある。
米国	「受入れ・配置プログラム（ＲＰＰ）」により３０日～９０日の基本的ニーズ（住宅，生活用品など）が提供され，直接支援費１人当たり１，１２５米ドル支給（一時金） 右記ＴＡＮＦに適合しない難民（単身や子のない夫婦）に難民金銭扶助（ＲＣＡ）を支給（最長８か月。額は州によって異なり単身の大人１人当たり約８０～約５４０米ドル）	一定の要件に適合する難民に対し，貧困家庭一時扶助（ＴＡＮＦ。受給期限は州によって異なり２～５年間。支給額は州によって異なり３人家族当たり約１７０～１，０００米ドル）。このほか，補助的栄養支援プログラム（ＳＮＡＰ。いわゆるフードスタンプ）がある。

図2

In the past few years, the war between Ukraine and Russia has caused a large number of refugees to flee the country as their citizens are no longer able to live in the country. Figure 1 shows that the number of refugees in 2022 was 112.6 million, a record high. Refugees who have fled their country may be able to return to their home country after several years, but the war could be long, with no way of knowing when it will end. As a result, they often become resettled refugees who spend the rest of their lives in the host country. The problem is the gap in the treatment of refugees in the host country. Figure 2 shows a table of daily subsistence benefits for refugees; although only three countries are included in the data, I examined daily subsistence benefits in about five other countries and found that they are basically continuous support for up to 12 months. However, this amount is not enough to live on, considering that refugees basically have to find a place to live on their own. For this reason, many refugees start working as soon as they emigrate to earn their living expenses. Figure 3 shows that refugees have the right to education, but support varies from country to country and is not well developed in many countries. Those who migrate to such countries work without learning the language.

国　名	語学教育の在り方
オーストラリア	移民・市民権省が運営する「成人移住者向け英語プログラム(AMEP)」により５１０時間まで提供。拷問被害者など特別な配慮を要する者は、追加受講が可能。教育・雇用・労働関係省(DEEWR)と州政府も同様のプログラムを実施している。
ニュージーランド	・マンゲレ難民定住センターでの６週間の集中オリエンテーション・プログラムの中で英語研修を実施 ・義務教育機関における外国人（学童）向け英語教育（最大５年間） ・大学・専門学校における外国人（成人）向け英語教育の無償提供　等
米国	移民・国籍法（ＩＮＡ）により、再定住支援プログラムにおいて英語研修を行うことが課されている。 ・「受入れ・配置プログラム（RPP)」（３０日間。９０日間まで延長可能）において英語研修を実施 ・一般の米国民が受けられる社会保障の枠組みにおいて、最長５年間程度、英語教育を受けられる。
カナダ	・企画競争の形式で選定された「サービス提供機関」が、政府との取極めに基づいて補助金を受け、語学教育を実施 ・ケベック州では、難民を優先的にフランス語コースへ登録。成人向けコースの場合、全体で９９０時間。識字弱者向けコースの場合、１，１００時間。
アイルランド	職業教育委員会（教育技能省所管）が担当し、１年間、週２０時間の語学教育が行われる。例外的に必要に応じ延長される場合もある。
英国	難民のみを対象とした特別な英語教育は行われていないが、各地方自治体の財政支援により、各地域の大学や教育機関が実施しているＥＳＯＬと呼ばれる無料の英語学習や、各種団体による外国人向け英語教育クラス等により、語学教育の機会が確保されている。
オランダ	定住支援期間中、半日は語学の学習に充てられる。語学に問題のある５歳から１８歳までの児童のため、政府等から財政補償を受けている普通の学校が特別教育を実施
スウェーデン	ＳＦＩと呼ばれる移民一般に提供されるウェーデン語学習講座（無料）を提供（２年間）。１２か月以内に修了した者には「ＳＦＩボーナス」と呼ばれる非課税の賞与金を付与（６千～１２千スウェーデンクローネ）
デンマーク	３年間の義務的社会統合プログラムの中で、週２０時間以上の語学教育を実施。すべての児童は公立学校に入学することができ、語学の特別クラスを受講することが可能
フランス	仏統合移民局との「受入れ・統合契約(CAI)」の契約期間中、語学レベルに応じて最長４００時間の語学支援が受けられる。このほか、ＮＧＯが欧州難民基金から財政支援を受けて語学支援を実施

図3

Then, I looked at which countries had the best language education for refugees. According to MIPEX, Sweden ranked first in the education sector in 2020. A study of Sweden's language education measures shows that a major feature of education for refugees in Sweden is that after an introductory class, they are required to take an absolutely compulsory education. In one Swedish city, support through an introductory class is permitted, and students can be enrolled in the class for up to two years. In the introductory class, language learning is basically conducted, and after two years of class, the student is obligated to attend school as compulsory education. While language education is only a right in other countries, we believe that Sweden is evaluated by MIPEX because language education is compulsory in Sweden due to the fact that all children and youth are guaranteed equal opportunities for free education in the public school system according to Law 7 of the Education Act.

However, there is a problem with Sweden's support for language education for refugees. That is, “language education for adults has not been made compulsory”. In Sweden, the duty to educate children is set, but the duty to educate adults is not defined by law. In addition, other countries do not have high taxes like Sweden, which makes it difficult to find a place to live with little living subsidies, and this is a point where education is not available.

- Therefore, I suggest two solutions.The first is to create a universal system of language education for refugees. By creating the same system all over the world, equality in education will be guaranteed, and in the future, the aim is to follow Sweden's example and make language education compulsory. In addition, by establishing rules regarding the obligation of adult education, adults will be able to engage in language education without their lives being financially strained.

The second is to build apartments where refugees who have taken refuge in host countries can live for free. The main reason why refugees are unable to receive sufficient language education is the financial difficulty in securing housing. We thought we could solve this problem by securing housing for refugees in advance and renting it to them at a reasonable price. By having refugees live in the same apartment, they can form a community with other refugees, which they hope will help eliminate the fear of living in an unfamiliar place. In addition, by constructing language education facilities and schools near the apartments, the project aims to create an environment that facilitates access to education.

By carrying out these suggestions, it is expected that refugees will learn the language of the host country more quickly and become self independent in a shorter period of time. This

will increase the number of refugees who can participate in society, and will lead to economic development in the host country. This will also create a positive cycle in which the cost of the program will be used to expand support for refugees and contribute to the development of the country.

5. Conclusion

This study focused on the gaps in the treatment refugees receive from asylum countries, particularly in language education with the aim of eliminating these gaps. In the process, financial and housing security problems were found to be obstacles to language education for refugees, and the study proposed the creation of a universal system for language education for refugees and the construction of apartments where refugees can live free of charge in asylum countries. The future challenge is that the number of people who speak the language of each country varies greatly depending on the country that accepts refugees, so it is necessary to adapt the language system to each country. Another problem is that the cost of constructing apartments is huge. To solve the cost problem, vacant houses can be utilized to solve both the cost problem and the problem of vacant houses.

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第三国移住プログラム報告

Society of Proactive Lifelong Learning

Interest-Based Learning Support for People

5210 Komatsu Miu

1. Abstract

“Learning” is a proactive, independent action to get knowledge or train your own skills. “lifelong learning” is a concept of keeping learning throughout your whole life.

Through this study, I research how to pursue happiness by lifelong learning. In particular, creating purpose in life is one of the most important factors of lifelong learning. Then, I focused on setting up a social system to assist the learning environment based on the idea of a cooperative learning atmosphere. These days, the world is entering the era of VUCA: short for Volatility, Uncertainty, Complexity, and Ambiguity. So, I consider it is significant to make a system that can provide opportunities in order to assist people to get their own skill through lifelong learning with respecting individual possibility.

I would like to set the goal of the study as a legislative proposal about lifelong learning.

Learning can be classified into 3 steps: fundamental learning (like literacy or compulsory education), skilling learning (like getting specific skills needed to work) and lifelong learning. It means that lifelong learning is located in the high-order meta stage.

So I target developed countries in this research as having a high-standard system of compulsory education and a progressing economy that is suited to promote lifelong learning. At this time, I will use the word “developed countries” as the member countries of the Organisation for Economic Co-operation and Development (OECD). I often research on the websites of international, official organizations, such as the United Nations, UNESCO, OECD, and so on. The reports written by UNESCO were helpful to get information about the situation in each country.

As a result, it is not suitable for the domain of education to set some new policies with huge impact because education’s effect stands on the pile of effort for a long time. So, we should start with small changes of law in each country, following the current situation.

Then, I classify some elements that are necessary for lifelong learning. Firstly, it is important to define lifelong learning as wide-range studying contents. It must not be limited to the range of lifelong learning as it is based on people’s curiosity. Secondly, it is necessary not to require viable results after learning. The effect gained by learning is accumulated only in your heart, so it is difficult to grasp the result from the perspective of others. You may feel constricted to think of individual inner content, such as non-visible effects of learning, in the criteria of law. Even so, the “governmental” approach definitely has a great effect on managing the system over society. For others, I suppose establishing a community and consulting center.

In conclusion, I strongly believe that lifelong learning should return individual learning activities to society and generate interest in the public. These days, the issue of ”experience disparity” shows the need for lifelong learning. Society has a responsibility to supply the environment that everyone can try learning based on their own curiosities. Therefore, I research this study about lifelong learning in order to implement the society with people's passion to learn.

2. Introduction

My research question is **“How to build a Social System that supports lifelong Learning with Improving Oneself?”** Then, I set the hypothesis below: **“Administrative approaches to lifelong learning can motivate people.”**

First, I notice the difference between the words ‘lifelong learning’ and ‘lifelong education.’

’Lifelong learning’ refers to all acts of learning over people's lifetimes, while ‘lifelong education’ is defined as the system of learning in line with mandatory education. These days, it is said that people can live more than one hundred years, so to deal with lifelong learning can fulfill their lifetimes mentally, physically and socially. At this time, it is notable that lifelong learning is a kind of act based on proactivity.

However, according to the white paper published by the Ministry of Education, Culture, Sports, Science and Technology in Japan, most people think that lifelong learning is only for people who have specific interests in some learning domains, not for “all” people.

Through this fact, I realised that it is important for all people to understand the real meaning/definition of lifelong learning. I then came up with the idea of creating an administrative system that would allow all people to take on any learning challenge, without barriers such as access to information, lack of skills or financial problems.

I have been researching this theme for three years, and have found that government-led campaigns or legislation have an advantage of being able to implement measures equally for all citizens. That is why mandatory learning is administered by governmental officers. However, it would not be a good idea to start a project of studying systems that oblige people to tackle their own learning, like ‘lifelong education.’ I would like to emphasize the importance of ‘lifelong learning’ based on people’s curiosities and motivations.

3. Discussion and implication

Firstly, I gather information about lifelong learning. I research the outline of lifelong learning, its ideal state, and guidelines for the future, based on data that have been published in the past.

The most famous report about lifelong learning is “Learning: the Treasure Within” published by UNESCO in 1996. The official name of it is Report of the International Commission for UNESCO 21st Century Education, and it is called Delors Report since it was issued under the strong efforts of the European Commission President Jacques Delors at that time.According to the National Institute for Educational Policy Research, the abstract of this report is below.

As a fundamental stage of learning, the learning can be classified for those 4 stages: Learning to know, Learning to do, Learning to live together, and Learning to be. The first and second ones, the learning to know and do are implemented by traditional school education for a long time, but the third one, Learning to live together, has to be implemented beyond the difficulties of war, conflict of religion and ethnicity and nourish the mindset to hope for world peace. The last one, Learning to be is the concept of learning that concludes all stages. This is completely different from the others from the perspective of learning humility and has an image of individuals with heart and brain for learning, the view for the future. As a result, this report tells us the importance of developing each person's hidden treasure of talents through these four learnings throughout their whole life. Then, UNESCO hoped those learning would play a role in people's coexistence.

At the same time, I noticed the report published by OECD: “Lifelong Learning For Al.” This report contains a statement from the 1996 meeting of education ministers and other ministerial-level education administrators from 25 OECD member countries on the theme “Making lifelong learning a reality for all” and an analysis of background materials. I quote the content from the public database of OECD.

OECD points out that the intrinsic value of learning should be paid more attention by everyone. This is the same as UNESCO's concept of "Learning to be." In addition, they recognize the need to provide learning opportunities for all, the importance of non-formal learning, diversification of means and methods of teaching and learning, and motivation and ability to engage in self-directed and independent learning.

In other perspectives, the content of lifelong learning is different from country to country. For example, Japanese implement lifelong learning as a hobby or to study their curiosity,while Canadians prefer learning in their office such as recreation activities, or Americans often learn to earn a degree even if they have already graduated, and Europeans tend to learn to get skills that can be used in their job. These differences come from the cultural background or how to put value on each country.

Secondly, after grasping the current lifelong learning, I began to research the disability to make some policies of lifelong learning.

One of the factors hindering lifelong learning in many countries, they believe, is a problem with the "life course," or the flow of life's big events, which has become common knowledge.

It seems that the obstacle to lifelong learning in each country is the problem with the "life course," which is established as common knowledge. That is the flow of major events in life.

Even in today's world where it is possible to choose a variety of ways of living, the core of the life course remains unchanged. The one-way life course of "childhood → education → work → retirement" only allows us to move forward as you get older. Along this course, we can never go back. In other words, we are always forced to make one-shot decisions that cannot be undone. The same is true for learning. This linear life course is effective in understanding each person's way of life. However, as long as we remain on this life course, we cannot escape the curse of a society based on careers and academic results.

It is acknowledged that sharing a life course has a certain number of positive advantages, such as being able to see into the future when steering one's life. However, I believe that there are many areas that need to be improved in order to respond to the future, including the fatal disadvantage of limiting infinite possibilities.

Finally, as the final and most important step in establishing laws, I investigated the state of legal systems in each country. Using the OECD portal site, I compared the differences in lifelong learning systems between countries. Because lifelong learning is a field that places more importance on a nation's social system than on the sophistication of education, it appears that lifelong learning systems are more closely related to aspects related to welfare direction than to correlation with educational standards or higher education institutions.

4. Conclusion

Before concluding my study, I emphasize that lifelong learning should be carried out based on individual motivations, so the official, administrative approach may be limited. In addition, it should be strictly forbidden to put restrictions on the contents of lifelong learning because interest each individual has varies from person to person. On the other hand, if the domain of lifelong learning had no restraint, people would get confused about how to make a stopping, concluding point of their learning. So, I propose some systems that recognize the result of lifelong learning step by step under some criteria. This also may be effective to keep learners motivated. In doing so, we have to pay attention not to make conflicts with the freedom of the field of study.

In addition, I think the existence of fellow learners must help learners. The formation of communities among learners who share the same goals is really meaningful based on the development of

individual learning activities, through a network of contacts to help people find their own direction or to deepen their research.

These are all assumptions of my proposal. Based on this premise, we move on to present the conditions for specific action plans and policy formulation.

The following are the elements that I think are necessary when developing legislation as an administrative approach to lifelong learning. Based on the above premise, the following bullet points are presented.

-To broaden the domain of content of lifelong learning
-Not to set an obligation to produce clear results through learning.
-To encourage creation of active sharing opportunities with affirming the importance of expanding the circle of lifelong learning
-To request the formation of a networking community of learners who are on the same goal
-To encourage the establishment of a point of contact where learners can feel free to ask for help with their studies

The proposal also refers to a concrete action plan to take advantage of this legal system. The study leave (sabbatical leave) is a project that has been introduced by some companies. Sabbatical leave is a paid leave system to encourage lifelong learning. Last year, some schools in Aichi Prefecture introduced this system on a trial basis, and it became a hot topic based on its innovation.

As for the actual situation of study leave, major companies such as Recruit, ANA, and Gurunavi stand out as companies that have implemented the current system. In addition, a venture business company, Tsunagu Solution Inc. introduced this sabbatical leave system and explained its effectiveness on their webpage. Employees who take advantage of the study leave system are obliged to share their qualifications and advanced exploration activities at research institutions on the company blog.

Of course, those projects are still introduced to big companies or new start-up companies due to management issues. However, those companies prove the effects of sabbatical leave. Through this system, even one person taking study leave can improve the abilities of a large number of employees. In other words, it raises the level of the company as a whole. Rather than seeking absolute and objective learning outcomes, the program provides an opportunity to summarize the significance of learning by sharing the subjective learning and feelings gained through that lifelong learning experience.

Thus, we thought that if the study leave system benefits the company by returning profits to the company, it would make it easier for the company to formulate the system. Furthermore, I strongly believe that implementing a student version of this system would be meaningful in terms of consistency in lifelong learning. Although the road to unified implementation is expected to be difficult, the system should be recognized as useful from the perspective of imposing a uniform system on all citizens.

Enriching one's life through lifelong learning may ultimately be a matter of one's own consciousness. However, it should be possible to support each individual in finding a theme that leads to their interests and that he or she can devote his or her life to exploring. Therefore, I propose an **administrative approach**.

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Reducing the Number of People Suffering from Addiction

-How to Avoid Internet Addiction even after Becoming an Adult-

5211 Saito Momoka

1. Abstract

In the world, children's Internet addiction was considered as a problem, but the effect of the covit-19 pandemic, the number of children who are dependent on the Internet is increasing. Therefore, I decided to find a way to avoid addiction even after becoming an adult. I will research the information, current situations, and counterplans about Internet addiction in the world, and analyze it and give my sugggestions.

According to my research, Internet addiction involved excessive secretion of dopamine. Also, China and South Korea had counterplans that restricted Internet use to children, so they were able to temporarily prevent Internet addiction, but they become more dependent on the internet as adults because of without internet restrictions. So, for this problem, I'll suggest that we introduce an education system of internet addiction and have the students analyze themselves in the class and share them to think about internet addiction.

2. Introduction

The motivation of my research was that I am interested in psychology, and I was aware of the excessive use of the Internet and smartphones, so I wanted to combine these two and save today's children from Internet addiction.

These days, Internet addiction is considered a serious problem. Therefore, I focused on children's Internet addiction, and gave suggestions for this problem. Also, the significance of this research is that it will help children get along with the Internet. Children are future bearers, so I think children need to get along with the Internet even after becoming an adult.

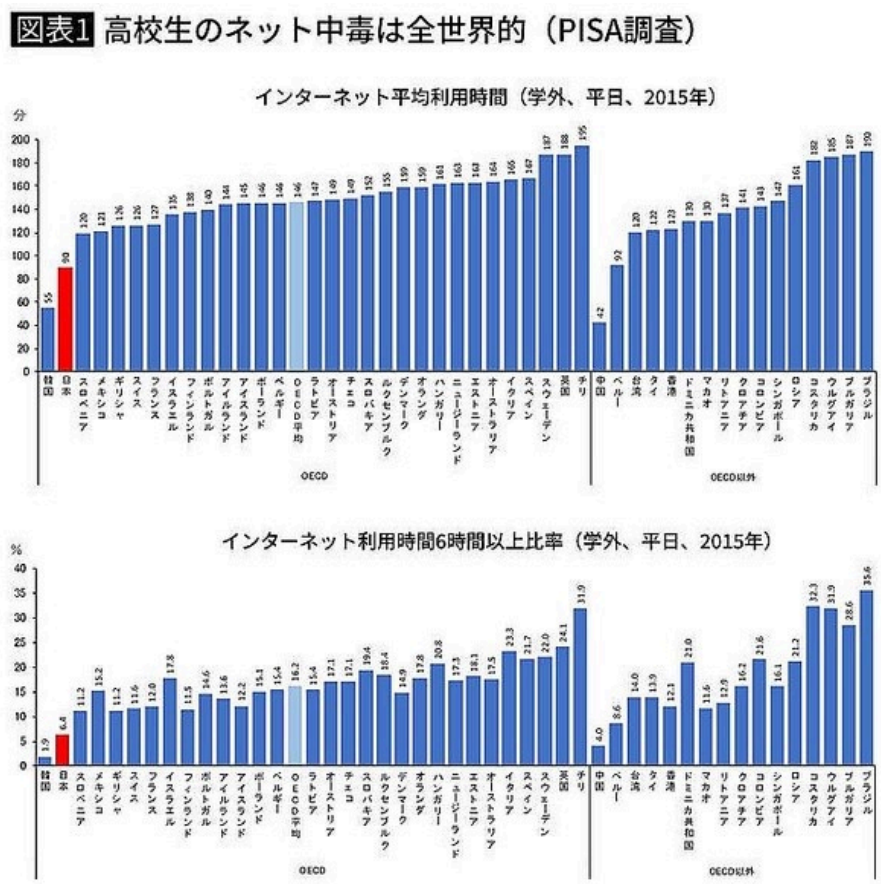
3. Discussion and implications

First, as a premise of my study, what is 'Internet Dependence'? The definition of Internet dependence is 'A condition in which a person prioritizes Internet use over other aspects of life, health, etc., and is unable to control the time and methods of use'(from the Ministry of Health, Labour and Welfare). Children have not yet developed the prefrontal cortex of the brain, so they are more likely to develop Internet addiction and the effects are more likely to last long into the future. Also, it is difficult to obtain statistics on specific numbers for this addiction because this dependence has not been defined medically.

Research has also shown that dopemine, which is secreted by the brain, is related to Internet addiction. The process of Internet addiction is as follows:

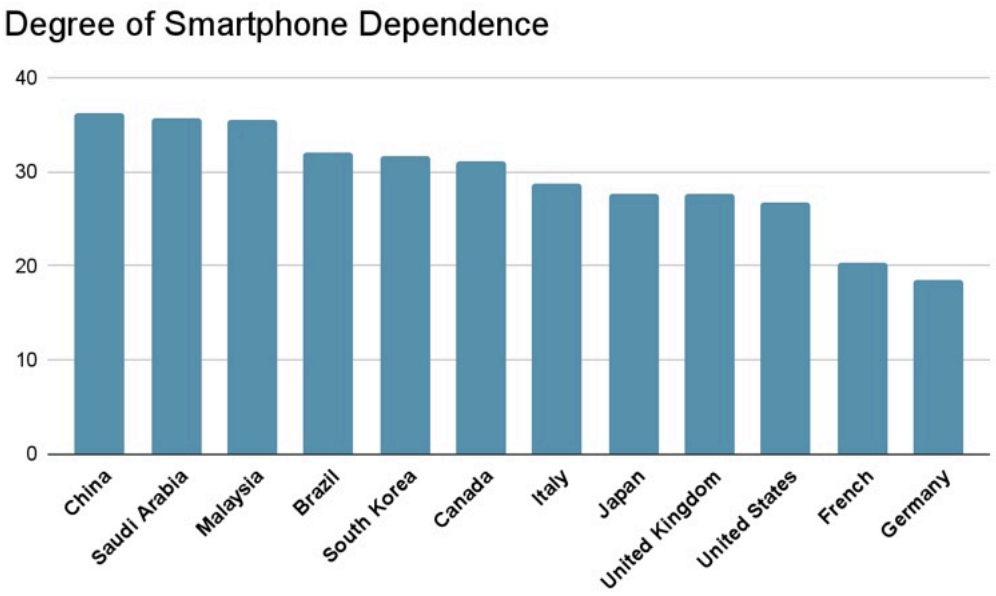
1)New information obtained from smartphones and the Internet stimulates the release of dopamine (a pleasure substance) in the brain.
2)Obtain pleasure / escape from unpleasant things
3)Dopamine fades over times and stress builds up
4)Seek new stimulation and use smartphones and the Internet again

This cycle, which continues a long period of time and keeps the patient dependent on external stimuli for dopamine secretion, is called dependence.



（注）15歳が対象。インターネット利用には携帯電話を含む。OECD平均の2012年から15年への平均利用時間の変化は平日が105分→146分、週末が138分→184分である。中国は北京・上海・江蘇・広東のみ。
（資料）PISA 2015 Results VOLUME III STUDENTS'WELL-BEING

Next, I researched about the state of smartphone dependence among children around the world. The graph on the left shows the results of the 2015 OECD PISA survey. The upper graph shows the average off-campus weekday Internet usage time, and the lower graph shows the ratio of off-campus weekday Internet usage time of 6 hours or more. PISA survey is an international academic achievement survey of 15-year-old school students from around the world. According to this graph, the average duration of Internet usage and the ratio of Internet usage of 6 hours or more were found to be high in Chile(195 min / 31.9％) and Brazil(190 min / 15.4％), but low in China(42 min / 4.0％) and South Korea(55 min / 1.9％). From these data, the severity of children's Internet dependence is spreading worldwide, regardless of whether they are in developed or developing countries.



The above graph is from a survey conducted by McGill University in Canada based on SAS(Smartphone Dependency Scale) of 15 to 35-year-olds in 24 countries around the world. This graph shows the values for the top five countries in the smartphone dependency ranking and the G7, based on a survey conducted by McGill University. According to this survey, China ranked first in smartphone and Internet dependence at 36.18％, while South Korea ranked fifth at 31.62％.

From these data, we can find that it is clear that China and South Korea show lower values in the PISA survey focused on 15-year-olds, but McGill University's survey focused on 15 to 35-year-olds shows higher values.

Therefore, I studied Internet addiction measures in China and South Korea further. China and South Korea have strictly limited Internet for children. In China, I learned that 'underage mode' is being applied to mobile devices, app stores, and apps. The main contents of the underage mode include limiting the number of apps available to minors and the maximum daily usage time of a smartphone to two hours. Also, South Korea has introduced a 'Youth Nighttime Game Shut Down System' for the 11 years from 2011 to 2022. This system would prohibit Internet use from midnight to 6:00 a.m. by those under 16 years of age. The results showed a decrease in Internet usage time in 2012, immediately after the start of this measure, but a steady increase thereafter. The system failed to have a positive impact on Internet addiction and improved sleep duration. So they can temporarily prevent Internet dependence for children, but when they become adults, they can use the Internet freely, and this makes them more dependent as a reaction to childhood restrictions.

So, I decided to reduce the total number of addictions in the long run without strictly restrictings. The Internet can be very useful depending on how it is used, and it is not generally considered a bad thing like illegal drugs or alcohol. This is why require different measures than other addictions.

Therefore, I decided that we should take action on this issue and strengthen efforts against Internet addiction in schools in each country. My suggestion is to incorporate a subject based on what has happened due to Internet addiction in a class like morality class in Japan, and

give everyone a chance to think about Internet addiction. But these measures may have already been done. So, I suggest adding a time for self-analysis to this class.

Also, one of the ways to get out of addiction was to find something fun for oneself. But I thought that the only 'fun thing' for the addicts is the Internet, which is the only place they can depend on, and therefore, they depend on it. I thought that if they knew that their own interests were outside of the Internet, it would be possible to prevent them from becoming dependent on the Internet in the first place.

4. Conclusion

In this study, I suggested that school classes in each country should handle teaching materials based on events caused by Internet addiction and conduct self-analysis.

However, it remains to be seen whether the same teaching materials will be effective for everyone, since each individual has a different attitude toward the Internet and a different level of dependence. I would like to think about this, and improve my suggestion.

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Improve Depression With Dietary Fiber

-Everyone Eat Flour of Konnyaku And Improve Depression-

5212 Sakoda Yuta

1.Abstract

These days, the number of people who have depression is increasing in Japan.That is about 1 in 15 people in their lifetime. We see a similar situation in the world. According to WHO, the number of depressed people in the world exceeds 300 million, and about 800,000 people commit suicide annually from depression. Depression drains people's energy and causes intense suffering. I thought that reducing the number of people with depressive disorders would be our contribution to the world. That is partly due to the explosion in coronavirus, but it has been going up since 1996, there must be a more fundamental problem. That is that society is changing into IT and performance-based. If this continues, as it develops, the number of people who have depression will increase. It is not realistic to stop the development of IT and meritocracy. However, I researched and found a website that describes the relationship between dietary fiber and depression. It said that recent research has revealed a direct relationship between the state of the body and the state of the mind. In other words, inflammation in the body is directly related to mental illness. Dietary fiber, which is also my research theme, has the ability to improve the intestinal environment, which means that I thought that taking dietary fiber might improve depression. In conclusion, I want to suggest an idea to improve depression with dietary fiber.

2.Introduction

What is depression in the first place?According to the Ministry of Health, Labour and Welfare, depression is a condition in which a person feels extremely depressed or uninterested in anything and feels intense distress to the point that it interferes with daily life. Currently, the World Health Organization (WHO) estimates that more than 300 million people worldwide have a depressive illness. Depression is an illness that anyone can suffer from, and at the same time, it is a challenge that all of us must work on. People with depression are diverse, and the causes of depression vary from conflict, pregnancy, poverty, and other factors. I limited my research to young people with depressive living in countries as rich as Japan, which is the position I can now most closely consider. The research method used the Internet and books to investigate the relationship between dietary fiber and depression, and methods to encourage dietary fiber intake were based on past methods disseminated through newspapers and social networking sites.

3.Discussion & Implications

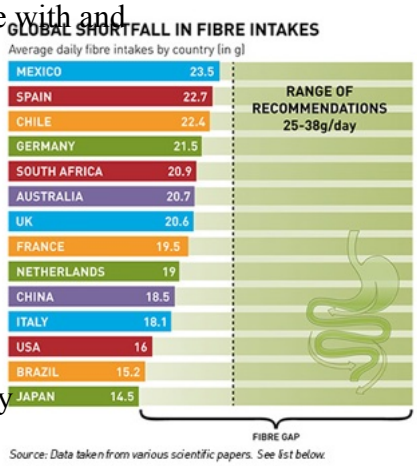
Recent research has spread the idea of the brain-gut correlation, in which the brain and the intestines are far apart but communicate with and influence each other, to the public. The intestines are widely distributed with vagus nerves, one of the parasympathetic autonomic nerves that control digestion and absorption, and 90% of its nerve fibers carry information from the end to the brain rather than from the brain to the end of the body. In addition, dopamine (feel-good hormone), noradrenaline (stress hormone), and serotonin (happy hormone) are said to be representative neurotransmitters in the brain that control emotions

(personality), and that most of them are produced in the intestines affirm the idea of brain-gut correlation.

In other words, when the intestinal environment becomes poor due to inflammation in the gut, brain messengers are not transported from the gut to the brain, resulting in a severely depressed mood and a lack of interest in anything.

The first article I found said that Mexico is one of the highest fiber intaking country in the world and one of the lowest suicide rate country in the world. In 2016, the number of suicides per 100,000 people in Mexico was 5.1 compared to 18.5 in Japan, a nearly 4 times difference. Also people in Mexico take 3 times as much dietary fiber as people in Japan. Also, further research revealed the following. Recent research has spread the idea of the brain-gut relationship, in which the brain and intestines are separated but communicate with and influence each other, to the public.

However, in recently, people's dietary fiber intake has been declining due to the spread of fast food. The chart on the right shows that the current dietary fiber intake in many countries around the world has not reached the target intake. Finding ways to increase people's fiber intake is the goal of this study.



3.Conclusion

In conclusion, I found the method of using konjac flour to promote dietary fiber intake easily. There are two reasons. First,konjac flour is easy to consume. Konjac flour contains a very high amount of dietary fiber, 80/100g (quoted from google) is four times that of rakkyo, which has the highest amount of dietary fiber among vegetables.. Konjac flour is made by drying konjac potato and making it into a powder, so it can be used in more situations in daily life than other products. It can be mixed directly into juice or smoothies, mixed into bread dough, or mixed with jelly ingredients, and can be used in a variety of dishes.

The second reason is that I live in Gunma Prefecture. Gunma Prefecture has a 93% share of the national market, so I believe that using Gunma as a base for producing konjac flour will help revitalize the local community in Gunma Prefecture. If konjac flour spreads throughout the world, it is certain that agriculture in Gunma Prefecture will flourish.

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眞田 正世さんの論文

Pavement For African Farms

To cope with the challenges in African farms

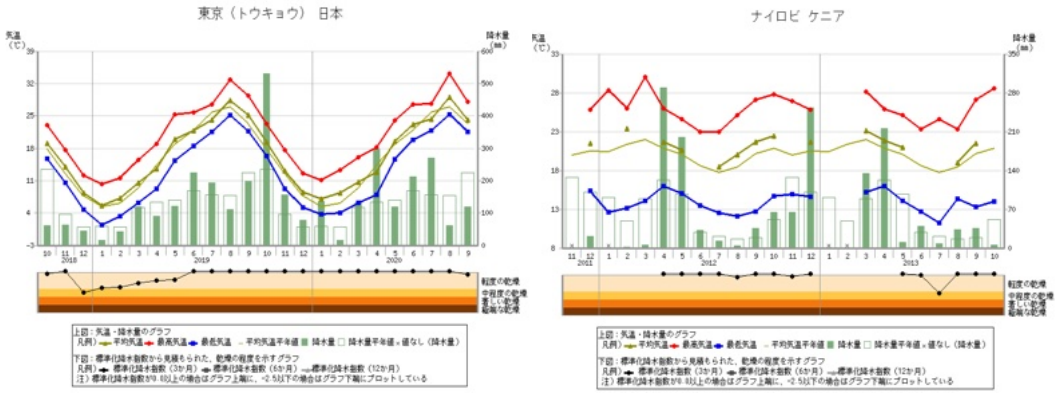
5213　Aoi Shiono

1 Introduction

"*Road transport is the most prevalent means of transport in the Sub-Sahara Africa and connects the regions and areas, where 70% of African people reside. Over 90% of all passenger and cargo transport in the region depends on road transport. The ratio of paved road, however, is around 15%.* "(Eiichi Asano)

In African farms, there are few well-constructed roads.They become so muddy that people cannot go through when it rains. It hinders farmers from shipping their crops to cities, which has a bad effect on their finances.

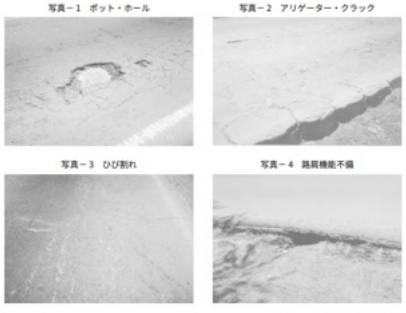
Also the wide gap between daytime temperature and nighttime temperature do harm on asphalt pavements. Therefore it is necessary to think of an alternative pavement other than asphalt that is suitable for Africa. In this study, I think of farms in Kenya for the subject.



Temperature in Tokyo and Nirobi

2 Discussion and implication

Asphalt pavements need drying in the process of paving. However, in the hot weather, they dry too quickly and there will be cracks on the pavement, without a highly skilled constructor. Also, in Kenya, the gap of temperature and rotation of rainy and dry season makes the pavements fragile.



Examples of Damages on Asphalt



Road in Kenya, Thika

On the other hand, for the advantages of asphalts, they are cheap and able to endure the pressure of cars and trucks. Thus I need to consider materials that are easy to construct and repair, tough enough for strains, low price and available for Kenyan people.

As a result of my research, I found three kinds of materials.Eco Clean Soil, sand bag, and brick.

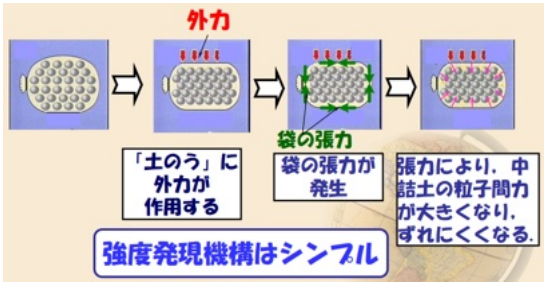
First, Eco Clean Soil is a kind of soil pavement, and it is made of granite sand and natural glue. It is produced by ECS Tech, a Japanese company. This pavement is generally for sidewalks, parks, and parking areas in Japan. It is good for nature, because of its natural material, however, it is weaker in strength.Also, it is not reasonable in cost.

分類	自然土系舗装材 エコクリーンソイル	類似量産品 固まる土製品	防草シート	アスファルト	コンクリート
強度	○ 一軸圧縮 8～10N/㎟程度	× データ無し	―	◎ 一軸圧縮強度 20N/㎟程度	◎ 一軸圧縮強度 21N/㎟程度
環境への影響	◎ 成分は土と同等。 環境への影響はなし	× 強アルカリ酸などの影響あり	△ PP材料など	― 原油の精製残分	― 強アルカリ酸の傾向有り
リサイクル性	◎ 砕いて再生可能	× 産業廃棄物	× 産業廃棄物	△ 一部ﾘｻｲｸﾙ可	△ 一部ﾘｻｲｸﾙ可
耐久性	◎ 施工実績20年	× 数年で劣化	× シートの剥離、破れ	◎	◎
施工性	◎ 簡単施工、家庭でも可能	◎ 簡単施工	○	× 専用機材が必要	× 専用機材が必要



ECS and other pavements

Second, sandbags are one of the easier ways of construction. The study ”Trial From Geotechnical Engineering”(Makoto Kimura) says that the sandbags are placed under the road and covered with soil, making it faster and easier to make the road foundation. The sandbags are subjected to external forces and the tension of the bags makes them more durable, making them suitable for areas with traffic of around ten vehicles a day.





Third, brick pavements are durable, easy to repair in parts and retain water. Concrete brick pavements, especially interlocking, are more durable because the bricks interlock with each other to distribute the pressure. Interlocking pavements have sand joints, which can lead to grass growth and ‘landslides’ where the blocks peel off due to being overweight.

When considering road pavements using these three methods, it was considered that earthbags should be used on paths between fields with little traffic, interlocking pavements should be used on larger roads with vehicle traffic, and Eco-Clean Soil should be used in the joints of these paths. The easy-to-install but less durable nature of sandbags was considered effective when used on narrow, low-traffic paths. As Ecoclean Soil is expensive, the amount

used should be reduced by using it for joints rather than for pavements. In fact, Ecoclean Soil is sometimes used for brick joints, which is expected to improve water retention and permeability and prevent the bricks from peeling. In addition, interlocking blocks will lose durability if they are mortared together, and sanding them will cause them to landslide. Therefore, the use of Ecoclean Soil for joints, which combines weed prevention and flexibility, is considered effective.

Because all of these are nature-friendly, if bricks are used, they are considered suitable for rural areas as they are easy to repair.

3 Conclusion

Based on the above, I suggest the use of sandbag pavements for narrow roads between fields and for roads with no vehicular traffic, and interlocking pavements with Ecoclean Soil joints for roads with vehicular traffic.

In the future, I would like to make better suggestions on how to make the foundations of brick pavements easier to build and stronger.

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Preservation and Inheritance of losing minority languages in the world
Individuality and Efficiency

5214 Yuzuki Shimizu

Abstract

The extinction of minority languages is growing while the movement of globalization is rising and English education has become popular. The object and reason of my research is to preserve and to inherit the minority languages in the world to keep respecting the diversity in each area and each country from now on. I searched about what was happening in world languages and endangered languages mainly by the Internet, papers published by UNESCO, and books. In conclusion and my consideration, we cannot stop globalization. However, while growing that, we can preserve our countries' languages or our first languages. I suggest a new internet service, "Langrary" in my conclusion. Hereafter, I plan to think about how to inherit local languages.

Introduction

I started this research because I was interested in world languages and I wanted to solve the problem of them. I want to be a Japanese teacher in the future, so I felt it was a good chance to learn about the words, the things that connect people to people. That is also the reason why I started this search. When I looked on the Internet, I found the word"extinction of languages". I was attracted to it because I could not imagine. Starting my search, I knew that the number of people who speak minority languages is decreasing in many areas in the world because of the decreasing population and globalization. Now UNESCO says that there are 6900 languages in the world and 3000 of them are endangered.

Also, 230 languages disappeared from 1950 to 2010. To preserve languages in the world, I put the words of "Preservation" and "Inheritance" to my theme.

Discussion and Implication

By running this research, we can solve the eleventh goal of SDGs, especially the target number 11.4. Why do we have to protect the minor languages? The beginning of my research, I came up with this question. If we make languages the same all over the world, we can exchange our opinions easily and take actions to solve the problems which the world has;such as global warming immediately and efficiently. In fact, in junior high school and high school, furthermore, recently in elementary school in Japan, the English education is adopted to aim to do global actions. In that situation, are there any reasons not to make languages the same and protect the minority languages consciously? There is one of the reasons why we protect the languages that it relate to protect the diversity of animals and plants. If the language disappears. The present distinguishments will also disappear. We cannot know the species. We have to wait until the researchers find it again, and during that time, many things may disappear. Actually, there are some medicines which were made by knowledge from minor tribes. For example, there is the Secoya tribe in Peru and Ecuador. They drink "yahei" from "yoko" trees. They drink it because of their spiritual belief, but it is medically proven to be strong psychedelic and have an illusion effect. Therefore, if one minor

tribe becomes extinct, their minor language will also become extinct, and finally, some medicines which we usually use may disappear.

Also, it is related to protecting the identities of people in the land and respecting diversity. Considering, it is strange to study English consciously to the same as the world because of the population of language which the people ordinarily speak. The skin colors, eyes colors, traditional food ,customs and cultures. The same as we respect those things, it should be also respected and should not to be unified.

However, even if I speak up that I wanted to protect the minor languages, there are people who work for it, but we cannot stop the globalization which is proceeding all over the world. The unity of the languages is the easiest and most efficient way, but I want to respect many languages. Then, I decided on my research question " How can we balance the globalization and protection of the minor languages?". Aren't there any ways for the minor languages speakers to be proud of the individual, not to adapt to the majority? Also, aren't there any ways to interact with the foreign people while protecting their diversity?

I made the hypothesis that the reason why the languages are decreasing is the population decline. I used the information from the Internet, the research paper written by UNESCO, books(the details will be introduced at the last reference), and exchanged opinions at seminar and the middle presentation.

I will describe the results and what I search with dividing into five parts; ⅰ The proceeding of globalization, ⅱ The extinct languages and the classification of languages, ⅲ The reason of the languages extinction ⅳ Precedent cases, ⅴ Suggestions.

i. The proceeding of globalization

I searched the number of people who are learning English in Japan and in the world, and I especially considered about globalization by English.

In the 10 years from 2006 to 2016, the number of English language learners aged 25 and over in Japan increased from 6.14 million to 8.04 million.(Figure1) In addition, starting in 2020, elementary schools will begin teaching English to students in the third grade and above.

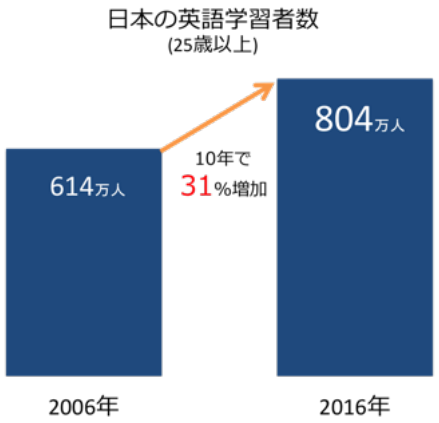


Figure1

Also, globalization is progressing in terms of the unification of languages around the world. According to figure 2, colored areas in the figure on the left represent countries in which

children under the age of 15 will be learning English at school in 2022, with blue representing optional learning and red representing compulsory learning. This shows that English learning has become quite widespread from an early age even in countries where English is not the native language. From the above, we can see that language globalization is progressing not only in Japan but also around the world.

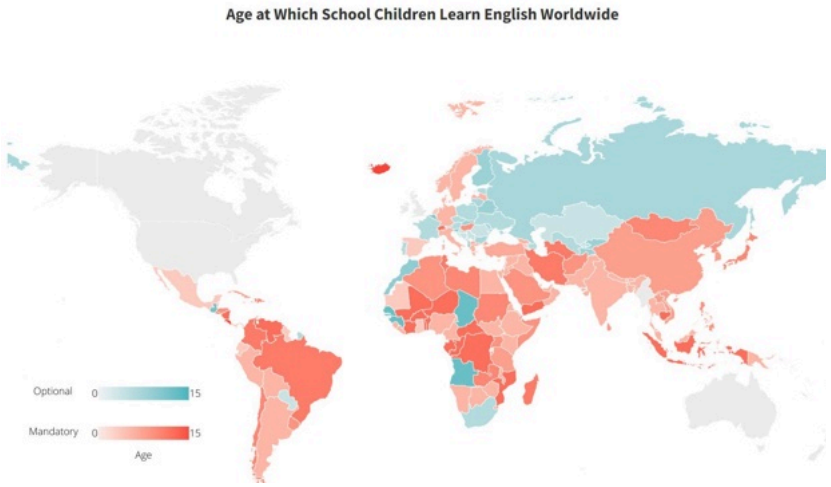


Figure2

ii. About extinct languages and language classifications
It was discovered that the last speaker of the "Bo" language in India died in 2010, and the last speaker of the "Yagan" language in Chile died in 2022. The death of the last speaker means the extinction of a language. The Ainu language is also in danger of extinction in Japan. In the paper "Atlas of the World's Languages in Danger" published by UNESCO, the world's languages are classified into six levels of risk of extinction.
The Ainu language, spoken by the Ainu people living in Hokkaido and around Russia, is classified as "Critically Endangered," one step away from extinction.

iii. Causes of language extinction
In the early stages of research, it was hypothesized that it was due to population decline, but as research progressed, it became clear that this was not the only reason for the extinction of languages. According to Atlas, the reasons are that linguistic unification has occurred in countries around the world over the past few years, due to ① urbanization balancing, ② economic concentration, and ③ cultural balancing. Just as powerful countries have dominated colonies, countries with languages that have many speakers have unified them by involving minority groups.

In addition, some minority language groups do not realize that the languages they speak are in danger of extinction. Without realizing it, the aforementioned ① to ③ occur, and the number of speakers decreases significantly or it is recognized that it is no longer possible to pass on the language. When I learned this, I felt that although it is very difficult to stop urbanization and cultural balancing, it may be possible to inform the people of minority language groups around the world about the risk of extinction and the current situation of the languages they use.

Based on the above research, I have come up with a policy for my own proposal. As this is part of my research theme, I will approach the issue from two perspectives: "preservation" and "inheritance."

iv. Previous cases
“Preservation”①Oral histories
This project was undertaken in the state of Odisha in India, and involved recording the stories, songs, and words of the people and the region on video. The videos are currently available on the video site YouTube.

“Preservation”②Ethnologue
This is an Internet website. When people search about languages on this website, we can know the world language map and the amount of speakers. Atlas shows the phase of the language danger 6 phases. In contrast, this site shows them with these four phases.

Institutional
Stable
Endangered
Extinct

“Preservation”③Kōhanga Reo
This is an education done in New Zealand to protect the language of Maoli. Adult teachers educate children by speaking Maoli language, and children learn it from daily life. I guess that learning languages from a young age will be efficient.

“Inheritance” Mahina ‘Ōlelo Hawai‘i
It is runned in the State of Hawaii in America.
In the Hawaiian language, Mahina means “month”, and Olelo means “languages”. When the Hawaiian monarchy was abolished in 1893, restrictions were imposed on the use of the Hawaiian language. Although restrictions were lifted in 1978, there were less than 50 speakers at the time. In order to revive the Hawaiian language, non-profit organizations and the Hawaii State Department of Education stepped up and implemented educational programs that made extensive use of the Hawaiian language. As a result, more than 8,000 people learn Hawaiian every year, and the number of speakers has increased to more than 25,000. The Atlas, which uses data from 2010, rated the Hawaiian language as "Critically Endangered," but according to the World Atlas of Languages, a language search site run by UNESCO, the current level of endangerment has moved one level closer to safety, to "Severely Endangered." Also, when searching for Hawaiian on the website Ethnologue, the level of endangerment is classified as the safest level, "Institutional." This shows that the efforts in Hawaii have been successful. In addition to educational programs, February is now designated Hawaiian Language Month, raising awareness among Americans in an

English-speaking country about preserving their native language.

v .Suggestions

I suggest that the website, which name is Langrary, allow people to search world languages. Langrary is a coined word and it means languages and libraries. In the website, we introduce not only the information of world languages but also the famous places or foods of the country in which the language is spoken, and some easy phrases such as “Hello” and “Thank you” to attract interest of elementary or junior high school students. Also, we put the fanfiction of learning languages and show the movie in which the actual pronunciations and the scene of speaking can be seen and listened to for free. However, we want to cooperate with non-profit organizations to operate the website. I want many people to think about the protection of minor languages and improve their interest in them,so I would not like to make a profit.

Finally, I thought about what we, students, can do to protect languages. Languages have no shape, so it is difficult to inherit from people to people and leave behind. Language scholars go around the world and they manage and research the languages and spellings, so we Japanese have a few opportunities to touch deeply to other than Japanese or English. Even though, in that circumstance, firstly we can know that there are many languages in the world and they are under the crisis of extinction. And having consciousness that languages are the things which have been piling up the long history of the region and people’s pride. Secondly, to have interest in your own country’s languages, dialects and sign languages. Unfortunately, it is difficult for us to revive or gain the minor languages. Therefore, I think the efforts of knowing the recent situations and seeing not only our languages but also other ones in the world.

Conclusion

The proceeding of globalization cannot be stopped. However, I conclude that we can balance it and preserve languages from previous description. Although, the future challenges are enormous. First, whether the suggestion of Langrary can be implemented or not. I haven’t searched the number of people who want to access the website, how effectively it works and reasons for it. I would like to think of the answers from now on.

Next, I would like to consider a proposal for inheritance. After much research and investigation, I have come to the conclusion that, although preservation may be possible thanks to the development of Internet technology and the great work of language scholars, it may be very difficult to transmit a language with only a few speakers to descendants and people in other countries, and to preserve the language users for future generations. This is the conclusion we have come to. Furthermore, there are those who argue that it is more efficient to unify languages worldwide. Is it worthwhile to carry on the inheritance of minority languages even if we have to fight against such an opinion? At this point, I do not have any clear state of these questions. Therefore, I would like to consider these questions in future research opportunities.

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『日本語が消滅する』著.山口仲美　2023年出版　幻冬舎新書

Save the Starving Children

~How to Improve Malnutrition by Increasing the Rate of School Lunch Provision~

5215 Jingu Yuri

1.Abstract

Recently, I knew that many children in Africa are undernourished, so I decided to research this problem from the perspective of school lunch to solve it by developing countries themselves. By researching this theme, developing countries can solve this problem themselves, so they can reduce the number of starving children sustainably. My research question is “How to improve malnutrition by serving the rate of school lunch”. Mainly on the Internet to research current conditions and initiatives, find their problems, and propose the most efficient ways to improve them. As initiatives to solve this problem through school lunches, I propose the use of food grown in school vegetable gardens, a parent-led school lunch preparation community, and the introduction of an AI for automatic school lunch menu creation. These are highly feasible and can improve nutritional deficiencies more efficiently and effectively than at present .However, if the number of participating parents increases, there are problems such as low per capita income and the AI can only be used in countries with a certain degree of development, so it’s the assignment how to solve these problems. It can contribute to SDGs NO.2 “zero hunger”.

2.Introduction

I think “starving and nutritional deficiencies” is one of the most serious problems in the world. 1 in 3 undernourished children under age 5 in sub-Saharan Africa. (Figure1 [source:SDG 17 Goals｜SDGs Club - Japan Committee for UNICEF]) Also the school lunch provision rate in Africa is very low at 27%, and we should improve and address the malnutrition of African children. I chose this theme because I wanted to save children who die because of unequal access to the food they need every day to live. At first, I thought that my favorite tomatoes could be used to solve the nutritional deficiency, but I found it difficult to achieve because they are not very effective against the benefits of using tomatoes, and also it costs a lot. Taking hints from the proposal “to provide school lunches with tomatoes,” which I came up with at that time, I thought that it could solve the malnutrition of children attending school by increasing the percentage of school lunches provided.



Figure1

3. Purpose and meaning of this research

My research question is “How to improve school lunch supply rate and help undernourished children”. By doing this research, we can achieve a positive cycle of improving the nutritional deficiencies of school-aged children and making them healthier, increasing their opportunities to learn and get an education and a good job, and preventing their children from being undernourished. I came up with “using crops grown in school vegetable gardens for school lunches” as a hypothesis for this research question.

4.Research method

I mainly use the Internet to research the current situation in Africa, its problems, and school gardens. Finally, I suggest a feasibility initiative to solve this problem. On October 11th, I went to JETRO, an independent administrative agency that aims to develop Japan by promoting trade and investment in Singapore. I listened to the innovation. So, I want to consider the proposal as a reference.

5. Discussion and Implication

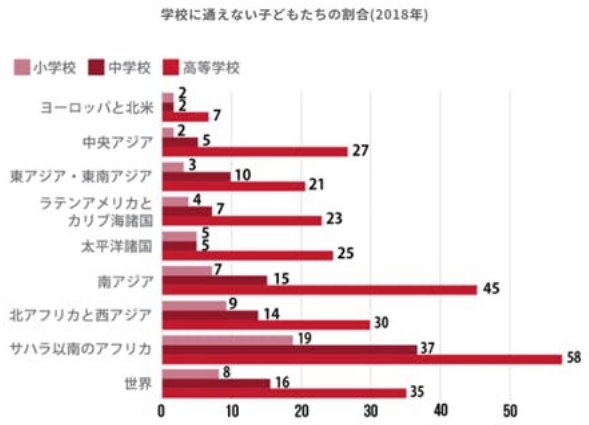


Figure2



Figure3



Figure4

First, the benefit of school lunches is that they can solve children's nutritional deficiencies. Data show that when school lunches were provided in Philippine schools, the percentage of undernourished children decreased by about 25% in a half year. Learning efficiency has also improved, and the number of children in Kenya who can read, write, and do the four arithmetic operations has increased by 15% in the two years since school lunches were provided.It is also said that having school lunches at school gives parents a reason to send

their children to school. Thus, school lunches have many benefits in addition to filling stomachs. As of 2021, the percentage of out-of-school children in sub-Saharan Africa is 20% in elementary school, 37% in junior high schools, and 58% in senior high schools, and the percentage increases as the year progresses. The percentage of children out of school increase as the years go by. The school attendance rate is also significantly lower than in other regions of the world.(Figure 2 [source:SDGsCONNECT]) Education can also be enhanced by providing school lunches from elementary school and improving children's health and family poverty.

The current situation of school lunches in Africa is as follows: one menu per day costs 30 yen, the number of children who can receive it is limited, and the nutritional value is low. Through this research, I would like to make a proposal to achieve the goal of "providing one nutritious meal to every child at a lower price. In considering my proposal, I do not consider one-way support, such as donations from developed countries to developing countries. I believe that monetary donations will only bring temporary improvements and will not lead to future development in developing countries, so I will consider proposals that enable developing countries to solve their own problems. However, I believe that technical assistance is important for development, so I also considered what Japan can do in this area.

Proposal 1 is to use food grown in school gardens for school lunches. I came up with this proposal after learning about the "10,000 GARDEN IN AFRICA" initiative. This initiative started in 2010, and now 3,800 vegetable gardens have been established in major regions such as Kenya and South Africa, as well as in conflict zones such as Somalia.(Figure3 [source:10000 Garden in Africa]) Therefore, in my proposal for a "school vegetable garden," children and their parents would grow food together in a vegetable garden set up in the school, and the resulting food would be used for school lunches. The children, however, grow the food as part of their classes, so it is compatible with their studies. The profits will be used as income for the parents. This system will help solve the problem of undernourishment of children, and will also help solve poverty, which is the root cause of undernourishment, by providing nutritional education to parents, enabling them to grow crops more efficiently at home. Furthermore, equal nutrition education may increase the number of farmers and improve food self-sufficiency in the future. In addition, during the busy farming season, the children can eat the rest of the food they consume for school lunches. A precedent is the introduction of a model for locally produced and consumed school lunches in Sierra Leone by the UN World Food Programme (WFP). It trained 70 women in the region to prepare tastier, healthier, and safer meals, such as overcooking leaves and using just the right amount of oil and salt, and began providing school lunches with food they had grown. This provided a valuable source of income and improved their quality of life. However, one of the problems with this activity is that the income is distributed among a large number of people, so the income per person is low, and it can only be done by women, making it unsustainable.

Therefore, I suggest Proposal 2: Create a parent-led school lunch-making community. Specifically, in addition to Proposal 1, the parents of the children would prepare school lunches using food grown in the school vegetable garden. This would provide a source of income for the parents and enable them to prepare nutritious meals at home. In addition, since this initiative is within the larger framework of parents, any relative, whether female or male, can participate in it. And developed countries should support this initiative in order to make it

more efficient and effective.
The developed countries need to support this initiative in order to make it more efficient and effective.
In order to improve the efficiency of Proposal 2, I suggest the introduction of Proposal 3: Automatic menu creation AI for school lunch menus. Automatic menu creation AI is a system that allows users to set nutritional value, cost, seasoning, and cooking methods in detail, and automatically create menus that meet these requirements. Many AI companies have been established in Africa, and it would not be difficult to use AI in Africa. Figure4 ([source:ICT4D.jp]) shows that there are many AI companies in the countries colored red.
Therefore, using automatic menu creation AI mainly in these regions, it is possible to provide nutritious school lunches without the need for a dietitian. In addition, by providing localized school lunches, food grown in school vegetable gardens can be used without wasting any food. School lunches with high nutritional value can be provided using only locally available food. On page 2, it is stated that the proposal is not for developed countries to donate money, but for developing countries to solve their own problems, and since I believe that providing technology is important for the future development of Africa, I approve this proposal. When I was taught about innovation at JETRO in Singapore, Mr. Yokoi said “People allow innovation that is suitable for our needs.” So this idea will be accepted by people there.

6.Conclusion

In response to the research question, “How can we improve the school lunch rate and help undernourished children?”, I have three suggestions: add agriculture to the classroom, educate children about nutrition in the school vegetable garden, and have unemployed parents take the initiative in growing crops in the school vegetable garden and using them to prepare school lunches. The parents who are not employed will take the initiative in growing crops in the school vegetable garden and preparing school lunches using the crops. The best way to do this is to introduce an AI system that automatically prepares school lunch menus to ensure efficient and effective provision of school lunches. The expected results of these proposals are to solve children's nutritional deficiencies and thereby improve learning efficiency, to develop eating and cultivation at home by providing nutrition education to parents, and to eliminate poverty by increasing parental income. The challenge for the future is that large groups of people may have lower per capita income, and the introduction of AI is likely to be available only in relatively developed countries within Africa, so it may not be possible to introduce it in countries where nutritional deficiencies are truly severe. introducing AI or training dietitians. I would like to conduct further research to determine which is better, introducing AI or training nutritionists, and whether there is a way to increase profits by utilizing crops grown in school vegetable gardens for purposes other than school lunches.

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Reducing the number of rabies

How can we overcome rabies?

5216 Takaashi Sakura

Abstract

According to the WHO website, more than 50000 people die every year because of rabies so my research question is How can we overcome rabies?

A lot of countries in Asia and Africa have not overcome it yet. Rabies can infect all mammals but I especially want to prevent infection to dogs because dogs are the main cause of rabies infection in humans in Asia and Africa. My hypothesis is that “if all stray dogs received a vaccine, rabies would disappear.” In Bhutan, all stray dogs were castrated and vaccinated. Also according to WHO, it has been shown that control of canine rabies can be achieved with sustained dog vaccination coverage of 70%. So my hypothesis was true.

In conclusion, I suggest giving oral vaccines to all stray dogs. Someone should spread food mixed with oral vaccines in areas where there are many stray dogs, and feed it to the stray dogs.

However, there are still safety issues that I would like to pursue, and I would also like to carry out experiments on different species in the wild to identify the odours that stimulate appetite.

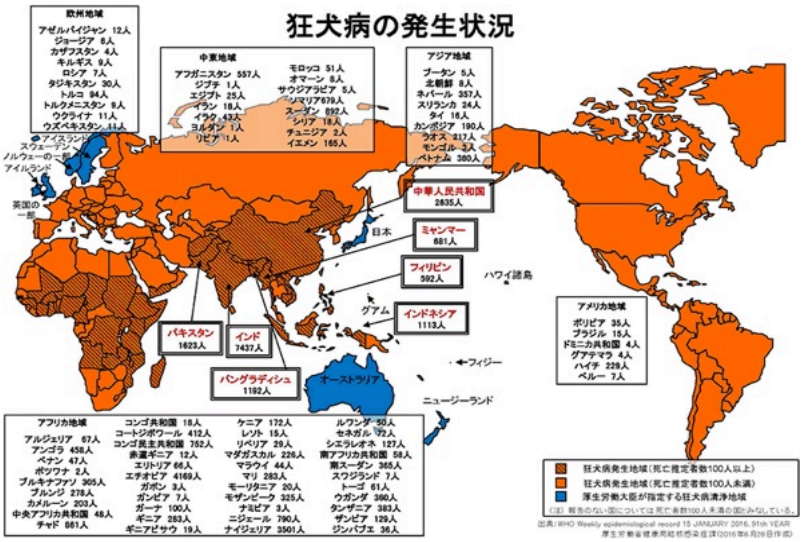
1 Introduntion

I get a notice of the rabies vaccine for my dog every year so I wondered why pet dogs need to be vaccinated every year. Also according to the WHO website, more than 50000 people die every year because of rabies. It is said that if you get rabies,you will definitely die. I want to decrease such people so my research question is How can we overcome rabies?

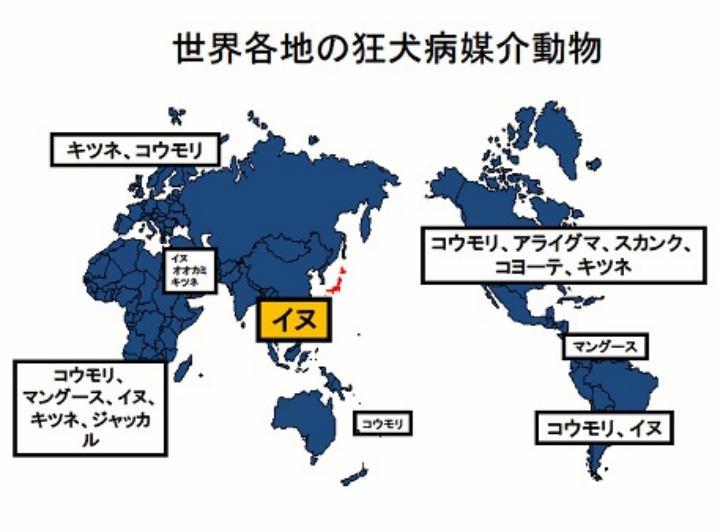
I searched the efforts of some countries that have already overcome rabies on the Internet and came to a conclusion referring to those efforts.

2 Discussion and implications

According to the WHO, Rabies is a serious public health problem in over 150 countries and territories, mainly in Asia and Africa. Dog bites and scratches cause 99% of the human rabies cases, and can be prevented through dog vaccination and bite prevention.Once the virus infects the central nervous system and clinical symptoms appear, rabies is fatal in 100% of cases.



A few countries including Japan have already overcome rabies. However, a lot of countries in Asia and Africa have not overcome it yet because there is not enough effort or policies. Rabies can infect all mammals but I focused on dogs because dogs are the most common vectors for humans in Asia and Africa.



The countries that rabies disappeared had protected and killed stray dogs,killed sick dogs,and made vaccination of pet dogs obligatory. However many countries do not have enough effort. From an animal welfare perspective, I want to avoid killing stray dogs. I made a hypothesis to refer to those countries. My hypothesis is that “if all stray dogs received a vaccine, rabies would disappear.” I found that Bhutan made the effort like my hypothesis. I searched on the internet and refered to Bhutan’s effort.

In Bhutan, all stray dogs were castrated and vaccinated. It took 14 years. Also according to WHO, “Globally it has been shown that control of canine rabies can be achieved with sustained dog vaccination coverage of 70%.” So if all stray dogs received a vaccine, rabies would disappear. My hypothesis was true. However,in the case of Bhutan, it took too long. And this success was thanks to animal charity organizations so if there is no support, it is too

expensive in Africa including developing countries.Also there are not enough vets who can inject.

Therefore, we need a vaccine that is cheaper and easier to administer so I focused on “Oral Vaccine”. Oral vaccines are used in humans to prevent polio and other diseases. Oral vaccines are easier to administer than injectable vaccines so everyone can give vaccines and labor costs can be kept low.

However there are some problems. For example, there is a safety problem. Because vaccines work differently in different animals, there could be a problem if an animal other than a dog eats it. Also past examples of oral rabies vaccines administered to wild animals have used live viruses, which could infect humans when sowing food. However, oral live vaccines are superior to injectable vaccines in terms of efficacy and duration.In addition, dogs have a superior sense of taste compared to other animals, especially sweetness. Other animals, especially carnivores, do not perceive sweetness. Therefore, we thought that if we put a sweet smell on the food, or a smell that only dogs like, only dogs would eat that food.

3 Conclusion

In conclusion, I propose to overcome rabies by giving oral vaccines to all stray dogs. Someone should spread food mixed with oral vaccines with a sweet smell or a smell that dogs like, in areas where there are many stray dogs, and feed it to the dogs.

However, there are still safety issues that we would like to pursue.I would also like to conduct experiments on various species of animals in the wild to determine the smells that stimulate appetite.

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Toward Solving Food Problems

～Utilization of Discarded Foods～

5217 竹内智紀

Abstract

1.Introduction

This research is a continuation of the FEWC research conducted in grades 3-5, and I am conducting this research by taking the previous study to a global scale. I was shocked to read in an article that the global food loss problem is 900 million tons a year, and I am working on food loss in FEWC to break through this situation. This is why I turned my attention to cooking classes. I thought that cooking classes would be a shortcut to reducing food loss, not only because I have confidence with cooking, but also because I can take what I learned home with me. The research method is mainly through the Internet. Since Scandinavia was advanced in food loss prevention when I researched, This study continues to research Scandinavia and actively reflect policies and innovations in my target areas.



The reason I decided to start this research is because I saw an article that said the amount of carbon dioxide emitted from food loss is comparable to that emitted from automobiles. (The article is on the left,
Source: world resources institute)
The cooking area is considered to be the time when we deal with food the most. Therefore, cooking classes seem to be the best place to think about food loss.

The research question for this study is “What can be done to promote the spread of cooking classes that reduce food loss?” By deeply exploring this research question, I believe that we can not only reduce the current food loss, but also educate people to reduce food loss.This study will also like to consider and explore ways to “attract” more customers to come to these cooking classes.

Research the current situation of food loss on the Internet and consider countermeasures. Also, look for issues and consider countermeasures to spread cooking classes around the world. (Mainly for developed countries)

Think about the development of cooking classes suited to each country, and consider management policies and budgets for each.

2.Discussion and Implication

In my research in the third and fourth grades, I investigated how to create cooking classes using substandard vegetables, and how to spread and expand them in Japan and around the world. The following points were learned and considered.Of the 900 million tons of food thrown away in the world, 600 million tons, or two-thirds, is generated by households.

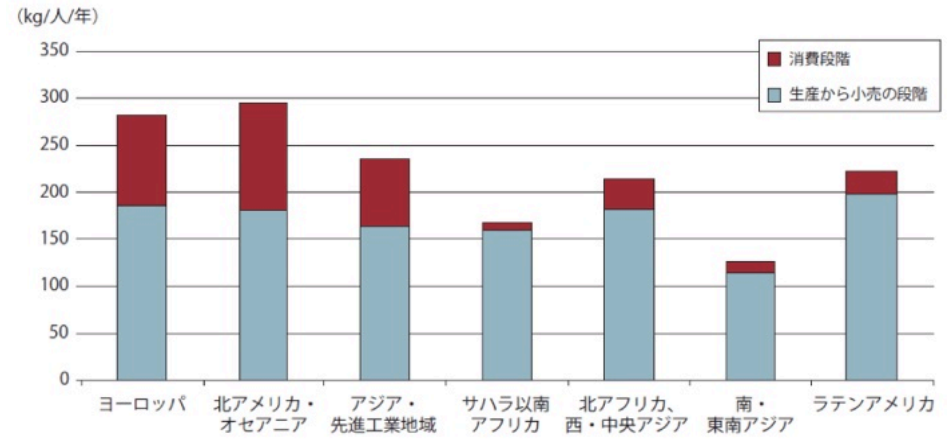
However, it is difficult to order each household to reduce food loss.From this point of view, I thought it would be effective to reduce household food loss in some indirect way.

Focusing on Sweden, some restaurants and cafes offer dishes that use all the ingredients, and some deal only in produce that can no longer be sold because it is out of standard or for other reasons. Cooking classes for adults and children have also been attracting attention recently. In the cooking classes for children, students learn about the environmental impact of greenhouse gasses generated during the production of agricultural products, and how producing more food than needed also puts a burden on the environment. They can learn the importance of actually tasting and smelling the food with their own taste buds, and not just relying on consumption dates. From this example, preventing food loss can be taught through special classes rather than creating a storefront cooking school. A study of easily discarded foodstuffs revealed that vegetables ranked first at 55%, followed by seasonings and oils at 13.8%, and fruits at 11.2%. This situation indicates that although vegetables account for half of the foodstuffs discarded, other foodstuffs also account for many of the waste. Therefore, unlike the study the year before last, I decided to deal with foodstuffs in general, which are easily discarded.

The above is a summary of last year's and the year before last's research, and the issue of how to expand the store remained as a challenge.

First, I participated in a training program in Singapore to learn about innovation. The theme was Innovation with Companies-How to succeed in marketing. I visited SCS Group, a company that mainly helps Japanese companies that aim to expand overseas by providing consulting, accounting, tax, and outsourcing services. They provide consulting, accounting, taxation, and outsourcing services. There, I had a discussion with the employees about what innovation means, and came to a conclusion. I came to the conclusion that innovation is something that takes risk, time, and money, but if it succeeds, it will bring about a major change in society. They also concluded that innovation is something that is hidden in the daily lives of each and every one of us, although we tend to think of something big when we think of innovation. I also learned that in order to bring about innovation, it is important to take a neutral position and have an objective point of view. From these lessons, this study focus on,. how to expand the cooking class using ingredients that would otherwise be discarded.

First, let's look at the expansion regions to be targeted. I have considered Europe and the United States. The reason is that Europe and the U.S. have relatively high food emissions compared to other regions. Also, because of the doggie-bag system, the regulations on “food about to be discarded” are gentler than in countries such as Japan, and I thought that the public would be more accepting. The data include the figure below (“Per capita amount of food loss and waste by region” Source: Center for Promotion of Resource Recycling). In this figure, the left two points are Europe and the U.S., which are the targeting areas. It can be seen that both of them have high per capita food loss generation of 280-300 kg.



Next, data was collected on Europe and the United States. (population, religion, race, food laws)

America	Population: 334.9 million (2023) Religion: Christianity 73 Other 7% (Religion in the U.S. in 2020) No religion: 20% (Religion in the U.S. in 2020 Kiyoko Sato) Race: White 57.8%, Hispanic 18.7%, Black 12.1%, Asian 6%. Other 6.1% (Tokyo Taikan) Food Laws: Food and beverage regulation in the U.S. is under both state and federal oversight
EU	Population: 448.38 million Religion: Christianity Race: generally Caucasian (Latino, Slavic, Germanic) Food Laws: Food Safety Law

3.Conclusion

Although the target countries of the study were broadly defined as Europe and the U.S., we found that food laws differ from state to state in the U.S. and from country to country in the EU. Therefore, we felt that the first thing we need to do in future research is to define the research target in one specific region. Also, since we have not yet been able to think of a method of expansion that would lead to innovation, we would like to think of a method of expansion suitable for that region once we have decided on a region.

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Save the Children in Africa
- Reusing Discarded Parts of Cacao -

5218 Chiba Manaka

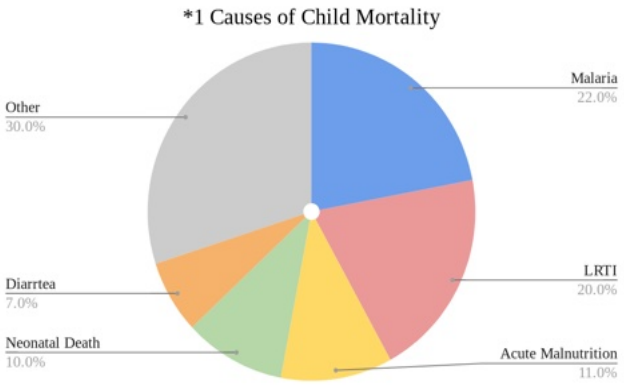
Abstract

In a study conducted last year, I discovered that cacao is effective in disease prevention. However, I learned that there are various problems in cacao farms. Therefore, I set my research question as “How can we save the children on the cacao farms?”, and I came up with a solution to help cacao farmers make more profits. My proposal is to use the shells, which are mainly disposed of, to produce beauty products, tea, and teaching toys of Montessori education. By spreading these things, we can expect not only to increase profits, but also to solve medical and educational problems.

1 Introduction

Many people would think that “Medical care in Africa is not provided enough”. In fact, according to the statistical data published by UNICEF, the number of children who died in Africa in 2021 is more than 5 million. In other words, more than 10 thousands children die per day in Africa. The main reason for those deaths is infectious diseases such as pneumonia and diarrhea. These diseases are treatable if they could receive enough medical care, however, because of the lack of doctors and hospitals, they cannot recover from them and the mortality rate in Africa is still high. Therefore, we can say that the lack of medical care is a serious problem for African people.

So I conducted research about the solution to this problem, and found some studies. According to them, cacao could become an effective medicine because cacao polyphenol can inhibit pneumococcal and cancer growth. Moreover, it maintains immune function. However, as many people know, working conditions in cacao farms in Africa are not good enough. Even little children are forced to work for a long time, and they cannot go to school. In addition, many employees cannot buy enough supplies because of low wages. From this, I set my research question as “How can we save the children on the cacao farms?”, and searched to make their lives better.





2 Discussion and Implications

First, I looked at how cacao is used. According to *meiji*, the Japanese confectionery company, most cacao is currently used as chocolate. So I investigated the chocolate production process and found that it is as follows.

1.Sorting

Poor quality cacaos and garbage are removed from the purchased cacaos, and leave only good quality cacaos.

2.Roasting

Roasting at 210-280℉ to produce the flavor unique to cacao. Microorganisms produced during fermentation are also sterilized.

3.Separation

Cacao is coarsely crushed to separate the cacao nibs (the main ingredient of chocolate) from the shells. The shells, which cause unpleasant flavors, are disposed of and only the nibs are removed.

4.Mixing

Cacao mass (a paste made by grinding cacao nibs) is mixed with sugar, butter and milk powder and kneaded.

5.Tempering and cooling

The temperature of the chocolate is adjusted to make a smooth texture, and the chocolate is cooled to harden.



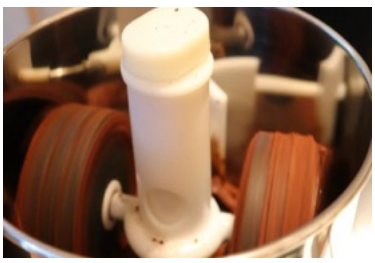
1.Sorting



2.Roasting



3.Separation



4.Mixing



5.Tempering

I focused on the “3.Separation” in this process. This is because although cacao shells have the same effects as cacao nibs, most of them are disposed of. In fact, statistics by *meiji* for 2021 show that as much as 500,000 tons of cacao shells are disposed of annually. Some people are investigating ways to utilize them. However, no effective ways have been found yet. Therefore, I set up the hypothesis that “The reuse of cacao shells is a solution to the problem above”. If we can make effective use of the shells, cacao farmers will be able to make more benefit and their lives will surely be more prosperous.

The main benefits of cacao shells are as follows.

1.Health Benefits

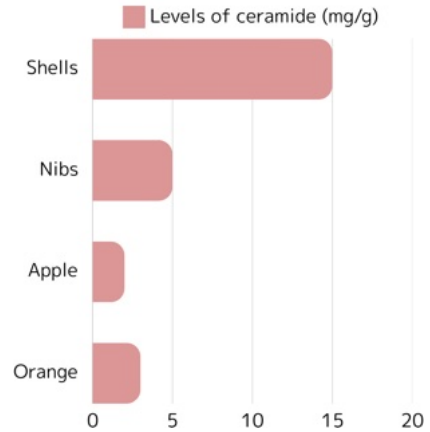
Cacao contains catechins, which are effective against diseases such as diarrhea and pneumonia. Cacao polyphenols also have benefits in preventing arteriosclerosis, lowering blood pressure, and improving allergy symptoms, and they can be used for people in developed countries.

2.Beauty Benefits

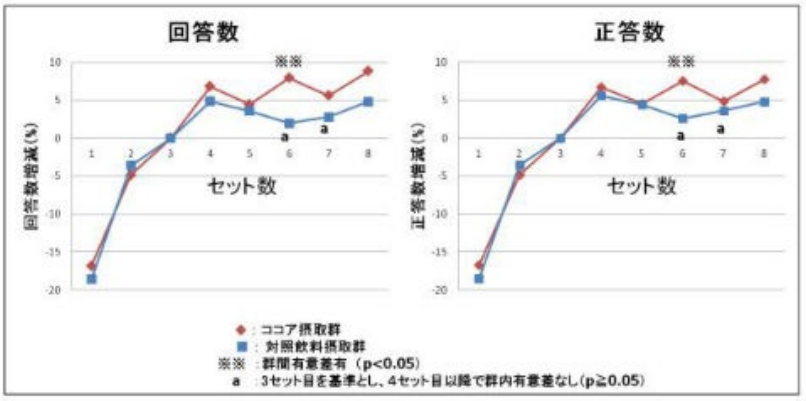
In 2023, *meiji* and *Teikyo University* discovered for the first time in the world that cacao contains high levels of ceramide. Ceramide is a moisturizing component of human skins and is found in various cosmetics. *meiji*’s announcement states that ceramide is abundant in cacao shells. People can replenish ceramide by eating or applying cacao ceramide to their skin. This discovery opens up new possibilities for shells.

3.Improving Concentration

Cacao contains theobromine, which is unique to cacao. This stimulates the human brain and improves concentration and memory. It also stimulates the secretion of serotonin, a hormone that also drips with healing properties.



Level of Ceramide



Cocoa’s study benefits

Based on the above, I will discuss how to utilize it.

(A)For people in developed countries

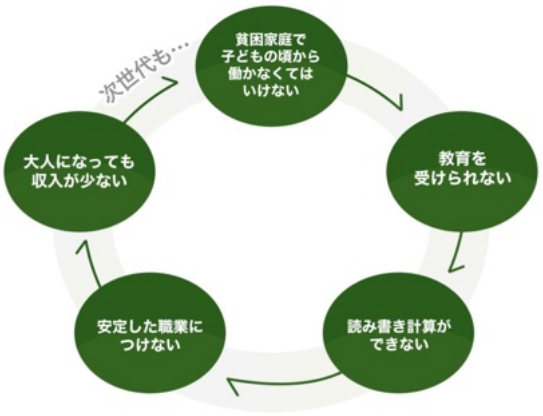
Utilize the “Health Benefits” and “Beauty Benefits”. Specifically, extract from shells to make beauty products and easily drinkable cacao tea. These are used and drunk on a daily basis by people of all ages and genders. Therefore, cacao farmers can make more profits by manufacturing these products and spreading them to various countries

(B)For children

These days, about 2 million children work on cacao farms in Africa. Many of them are unable to attend school due to long working hours and distance from school. In addition, literacy rates among the African population are low. These educational problems cause a negative cycle in which the next generation is also unable to receive enough education. Therefore, I will devise a solution by taking advantage of the “Improving Concentration”. Specifically, using cacao shells as a material for teaching toys in Montessori education. Montessori education is an educational method that uses teaching toys to promote children’s curiosity, autonomy, and understanding of numbers and language. According to some studies, children who receive this education have higher learning ability than others. In other words, by providing this education to African children, they are able to achieve a minimum level of learning even if they are unable to attend school. And when they have the opportunity to learn in the future, they will learn better. In addition, Montessori education is provided in various developed countries, so cacao farmers can make more profits if they sell to those countries. Therefore, it is possible to resolve both educational and economic problems in Africa.



Toys of Montessori Education



Negative cycle

This study suggest that the problems of poverty of cacao farmers in Africa can be solved by manufacturing and spreading the above A and B.

3 Concludion

My proposal is to extract from cacao shells to make beauty products and tea. Then, after extraction, the shells could be used to make Montessori teaching toys. By spreading these to people in developed countries, cacao farmers can make more profits than before and the problem of poverty can be improved. Also, by making effective use of the teaching toys, the educational problems in Africa could be solved. However, there are issues regarding how

to provide teaching toys for Africans and the cost of production, which will be discussed in the future.

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How Can We Increase The Prevalence Of Emergency Food?

Custom-Made Emergency Food Set

5219　Nanoha Tsukuda

Abstract

Background

Demand for emergency food is increasing as more people are displaced by disasters and wars around the world

Significance:

To increase the ratio of emergency rations in the market by improving the level of satisfaction with emergency rations. Also, to increase the efficiency of transportation of relief supplies to disaster-stricken countries by focusing on weight reduction.

Research

Identify issues centered on the Internet and come up with proposals to solve them.

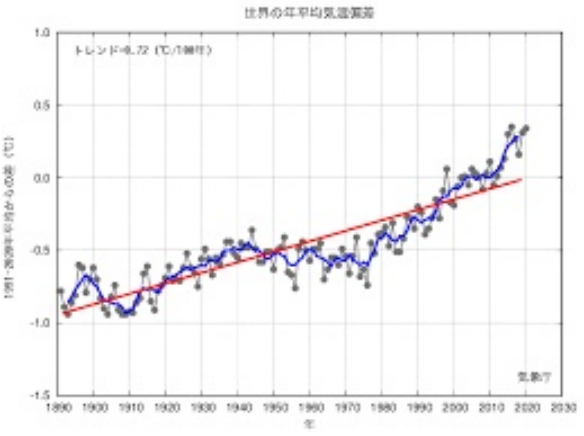
The reason for the low diffusion rate of emergency rations is the lack of specificity of what is needed.

Consideration

In order to eliminate the stagnation in the diffusion rate of emergency food, it is necessary to solve the question of “What should we prepare?

Prospects

Create a new emergency food sales system to brush up emergency food Increase the satisfaction level of customers by allowing them to choose their favorite items from the required types and quantities, and make it easier to create disaster prevention sets to increase the diffusion rate of emergency rations.



2. background of the study

Currently, an increasing number of people around the world are finding it difficult to lead their daily lives due to extreme weather conditions, wars, earthquakes, and other factors.

As global warming and extreme weather events remain unresolved, the number of people unable to lead their daily lives due to natural disasters and wars is expected to continue to increase. Emergency rations are the most necessary for evacuation. However, even in Japan, less than 10% of the population is adequately prepared with emergency rations, and in

東南アジア諸国と日本などの「世界気候リスク・インデックス」（2020 年版）

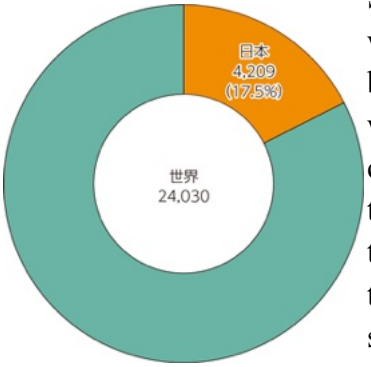
2018 年			1999 ～ 2018 年		
順位	国	ＣＲＩスコア	順位	国	ＣＲＩスコア
1 (36)	日本	5.50	1 (1)	プエルトリコ	6.67
2 (20)	フィリピン	11.17	2 (3)	ミャンマー	10.33
3 (40)	ドイツ	13.83	3 (4)	ハイチ	13.83
4 (7)	マダガスカル	15.83	4 (5)	フィリピン	17.67
5 (14)	インド	18.17	5 (8)	パキスタン	28.83
16 (6)	ベトナム	26.17	6 (9)	ベトナム	29.83
22 (48)	ラオス	35.50	8 (13)	タイ	31.00
38 (115)	カンボジア	47.67	12 (19)	カンボジア	35.33
48 (69)	ミャンマー	53.83	62 (93)	日本	69.33
64 (50)	インドネシア	68.17	77 (69)	インドネシア	76.83
67 (10)	タイ	68.83	114 (116)	マレーシア	103.33
97 (44)	マレーシア	84.83	175 (175)	ブルネイ	169.17
135 (124)	ブルネイ	125.00	180 (180)	シンガポール	172.17
135 (124)	シンガポール	125.00			

※ＣＲＩスコアは（1）死者数、（2）人口10 万人当たりの死者数、（3）経済的損失、（4）経済的損失のＧＤＰに占める割合の各項目について、各国・地域別の順位を付け、その順位に各項目のウェートを掛けて割り出した数値を足して算出。５位以下は東南アジア諸国と日本のみ抜粋、かっこ内の数字は前年の順位　出所：ジャーマンウオッチ

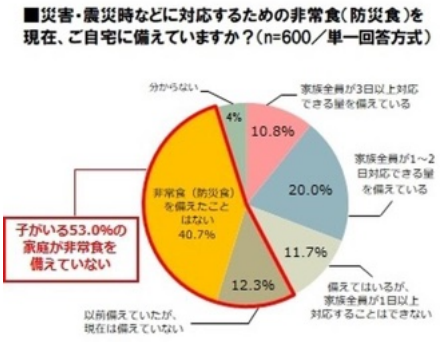
many countries around the world, the concept of emergency rations has not even spread to the first place.
With the increase in the number of natural and population disasters, it is necessary to review the values of emergency food in the world.

3. purpose and significance of the research

Research Question
“What can be done to improve emergency rations and increase their prevalence?”



State the significance of conducting research on the issue and write the hypothesis I have developed. As mentioned in the background of the research, the number of people in the world who need to evacuate is increasing in the world today. Under such circumstances, emergency food is indispensable. However, less than half of the population has access to emergency rations, and there is a problem that many people do not prepare them even though they feel the significance that they are necessary. By solving this problem through this research, we can increase the diffusion rate of emergency rations.
In terms of global connections, as countries are becoming more connected to each other, relief supplies are often sent from other countries to countries where large-scale disasters have occurred. From this perspective, the spread of emergency rations is expected to have a significant impact on the world as a whole.



Mass is an important factor in the transportation of relief supplies from outside of a country. Lightweight is essential to reduce costs and efficiently transport more supplies. In fact, Japan has sent many relief supplies to other countries where natural disasters have occurred.As the number of evacuees increases around the world, the need for it's growing, and it would be of great value to the people of the world if emergency food could be provided not only from Japan, but from anywhere in the world. In addition, since emergency rations have a long shelf life, they are easier to transport than regular food, and this study that the feasibility of global deployment is high enough to be considered.

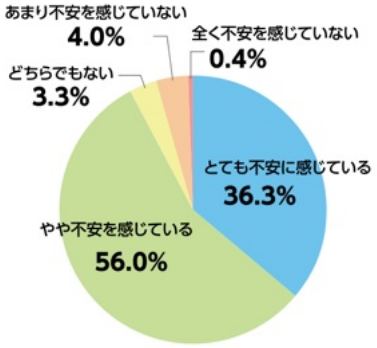
4. research methods
(1) In an issue, research why the issue exists (By Internet)
(2) Think of a solution and gather information that could be used to propose solution

(3)Create a solution or proposal based on the research question.Apply to actual business contests, etc., and consider the feasibility and problems in putting the

solution into practical use.

(4) Find issues in the proposal

5. research results and discussion



First of all, the public is well aware that natural disasters are common in Japan, and in a survey conducted by Panasonic Corporation, more than 90% of respondents indicated that they are concerned about the recent increase in the number of natural disasters.However, an examination of the percentage of people who have emergency rations on hand reveals that although the number is increasing every year, the percentage is only about 50%, indicating that there is a large gap between the percentage of people who are anxious and aware of the danger and the percentage who actually prepare such rations.Emergency rations, the focus of this survey, are ranked second only to drinking water in terms of necessity among disaster prevention kits.

The current situation of so many people not having emergency food on hand is a major social problem in Japan, where natural disasters are inevitable, and that all residents should be prepared.In addition to playing an important role in sustaining life during an emergency, emergency rations can also be expected to reduce the psychological stress of disaster victims during evacuation.

Increasing the availability of emergency food is considered necessary not only to improve the survival rate, but also to improve the quality of life during evacuation.

To solve this problem, this study proposes the production of an emergency food sales system. This system prepares templates of emergency rations according to the number of people and days needed. In a survey conducted by ECONTE Corporation, it was found that many people responded that they did not know what to prepare. Of those who have not prepared emergency rations, more than 70% think it is necessary to do so. We came up with this system because we thought that if there was a system that could clearly indicate “what and how much to prepare,” the emergency rationing rate would increase.The system will be mainly sold on the Internet,

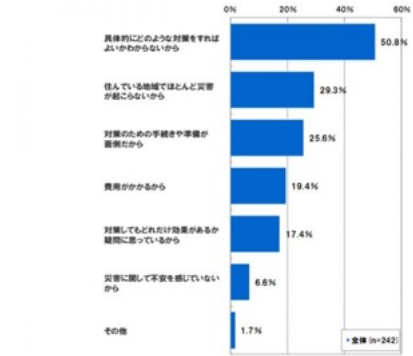




表２「防災用品や生活必需品を備蓄していない理由は何ですか」についての回答

出典：インターワイヤード株式会社が運営するネットリサーチ『DIMSDRIVE』実施のアンケート「防災対策」。調査期間：2016年6月24日～7月11日、DIMSDRIVEモニター4,520人が回答。

The system will build a template of necessary emergency rations, and set the necessary quantities of staple foods, side dishes, and nutritional foods based on the guidelines issued by the government and the opinions of experts.The outline of the template is as follows,The templates are mainly based on “number of days,” “number of people,” “allergies,” “religion,” and so on,On the app, users select the conditions that suit them best,The system then prepares an emergency food template that suits them. The user then selectsThe required amount of food will be displayed, such as fat for staple food, fat for side dishes, fat for nutritional food, fat for snacks, and so on.The user and their family can then select the number of items on the

template from the list of their favorite emergency rations, considering the foods they want to eat and the nutritional balance of their family.Allow users to add items not only by template quantity, but also by piece, to allow for flexibility in meeting detailed needs.The display of weights will be important, so that the total weight of the selected items will always be displayed along with the price, making it easier for users to consider the weight.Pricing should be calculated based on the number of days, number of people, and items selected, and should vary depending on the items selected.Prices are expected to be more expensive than buying directly from the company because of the retail nature of the product, but this will be compensated for by the advantage of including a disaster bag in the set and the ability to purchase all necessary items at once, and by using bulk or direct procurement to achieve lower prices.The company will contract with companies currently selling emergency rations to offer a wide range of products.The company will not be limited to emergency or disaster food, but will also be able to sell snacks that can be stored for long periods of time, as well as long-stored foods recommended by the government.The ordered items will be packed in disaster-prevention bags and delivered directly to the user's home, and the user will be able to prepare for a disaster simply by leaving them at home.

CONSIDERATIONS

To ascertain the feasibility of this proposal, I entered a national business contest to test the viability of this proposal from an economic and business perspective. I sent an outline of my business plan, produced materials, and gave a 5-minute presentation. After that they could attend various lectures on creating new innovations. The result was to remain in the top 70 out of more than 1,500 applications.

In the critique of this proposal, the proposal itself was evaluated as innovative and its greatest merit was its ability to meet a wide range of needs. It was also highly evaluated for its ability to deliver services to a wider range of people more quickly by focusing on Internet sales. At the same time, however, they also found a problem: how to research needs when developing products to meet a wide range of needs. How can we smoothly conclude contracts with companies when cooperation with them is indispensable? These are just a few of the issues that were raised. More in-depth research is required to resolve these issues.

Regarding the issue of needs, we believe that the sales history itself will serve as a source of information on needs. It would also be good if we could start with small private businesses and then gradually contract with larger companies.

If this proposal is actually put to practical use, it will make it possible to comfortably purchase emergency rations from anywhere in the world.

During the company visit to Singapore, we learned that even when selling the same product, they change the taste and product development based on a good understanding of the needs of the country. This is a way to make their products more acceptable in each country without being too particular about taste and other aspects. This concept could be applied to emergency rations as well, and if there are innovations to change the target regions, tastes, and types of food, it would be easier to spread the concept around the world.I thought that it would be necessary to form a partnership with a local company in order to create regional cuisine and flavors characteristic of that status, but I learned at the company that it is better to

first establish a firm foundation in Japan and then expand globally than to expand globally all at once.

6. conclusions and future issues

Conclusion

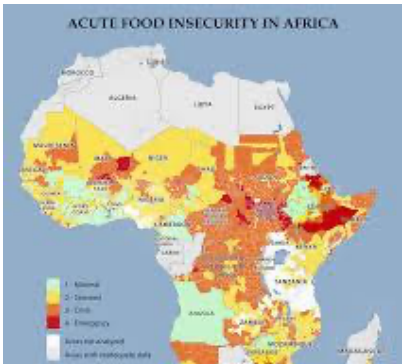
The research question of this study, “What can be done to improve emergency food and increase its popularity?” This study has recognized the issues and disadvantages of what is currently established, and has examined solutions to these problems.

From the discussion and suggestions, it is necessary to establish an emergency food set sales system to improve emergency food and increase its popularity. The feasibility of this proposal has been fully verified, and the contents can actually be proposed to the world.When expanding globally during company visits, it becomes essential to develop products that match the tastes of people in the target countries and regions, without being overly concerned with existing products and tastes. In addition, if global expansion is to be considered, it is necessary to conduct a detailed study of global needs and the availability of products at the present time.

Issues

In my research on emergency food, I also provided some insights into the challenges. I suggest that there is no problem in proceeding in the current direction with regard to needs and contracts. However, two major issues were identified: The first is price. The emergency food sales system offers emergency food from a variety of companies. Since the system acts as an intermediary, prices are expected to be higher than buying directly from the companies. The price should be as low as possible to facilitate the availability of emergency rations that may not be used or needed. The first issue is how to set the price, and the second is how to connect with the rest of the world. The number of natural disasters such as earthquakes is currently increasing worldwide, but the concept of “emergency rations” has not yet spread to many countries in the world. In order to expand and popularize emergency food in these regions, it is first necessary to raise the global awareness of emergency food. In Japan, however, people have already acquired an awareness of disaster preparedness that has been learned and passed down from previous earthquakes and other major natural disasters. For example, Japanese people have been cited as having a problem with emergency rations: “We know that we need them, but we don't know what kind of food we need. However, if we broaden our perspective to the rest of the world, we can see that “what is an emergency ration in the first place? Is emergency rations necessary? From this, we believe that the problem that arises in the proposal of this study is that there is a large gap between the issues in Japan and the world as a whole.

In fact, the need for emergency food in the world today is increasing, albeit in small amounts. This is because there is a great need for emergency food that is nutritious, can be stored for long periods of time, and tastes good. This is especially true for people displaced by extreme weather and earthquake disasters such as those mentioned above, people displaced by war or conflict, and malnourished people in Africa, Southeast Asia, and other



regions. As the emergency food market becomes better known and the benefits of emergency food become better known, it is certain to grow and expand even further than it is today.
The solutions we are currently considering are
○Deliver emergency food sets directly to disaster sites as relief supplies.
○Promote the site worldwide and raise awareness of emergency rations
○Prepare a proposal to increase the spread of emergency rations outside of Japan.
These issues will be the future work of my research.

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Promotion of inclusive education
~Society that does not segregate people with disabilities~

5220 Nieda Sakushi

1.Abstract

The history of welfare is said to have begun with the Elizabethan Poor Law of 1601. Since then, many developments have taken place.However there are many problems related to welfare. Especially Japan and many Asian countries have segregated the disabled from the rest of the society. Each of them had different causes, but I wanted to solve the problem.

When we looked into it, the challenges and solutions were clear. It was found that in countries where people with disabilities are not participating in society, inclusive education is not being provided. And they tend to be particularly common in Asian countries. In other words, my challenge is how to develop inclusive education in Asian countries. To this end, we made comparisons with Europe and interviewed experts and people with disabilities.

First of all, the purpose of education in Japan is to improve academic achievement, while in Italy the emphasis is on the experience of communal living.Asia is high context while Europe is low context. Japanese are comfortable with being the same.

We spoke to a person from the Ministry of Education, Culture, Sports, Science and Technology. He said that inclusive education in Japan is making progress.

Deaf school students would prefer to receive their education in a regular school if possible. Yet, they come here because they cannot get an adequate education in a regular school.

This indicates that there are many problems. Among them, I thought of what I can suggest and what I can put into practice.The first is bringing in support teachers.

The first is to create a system of inclusive education.Depending on the type of disability, we can start that education right now.We will introduce support staff as a way to solve problems related to this.

The second is the simultaneous solution of recognizing inclusive education and resolving teacher shortages. No attention will be paid to an unfamiliar field. We believe that setting up actual model schools is effective.

Finally, there is the method of dissemination of this initiative. I have thought of my own way of communicating.

2.Introduction

Motivation for research

I questioned the fact that I had never been involved with people with disabilities in my life. It is said that about 5% of the population in Japan has a disability, but it is rare to meet them on the streets. And moreover, I have never studied in the same classroom with people with disabilities. ”Why segregate people with disabilities?” ”What is the current situation for people with disabilities now?”

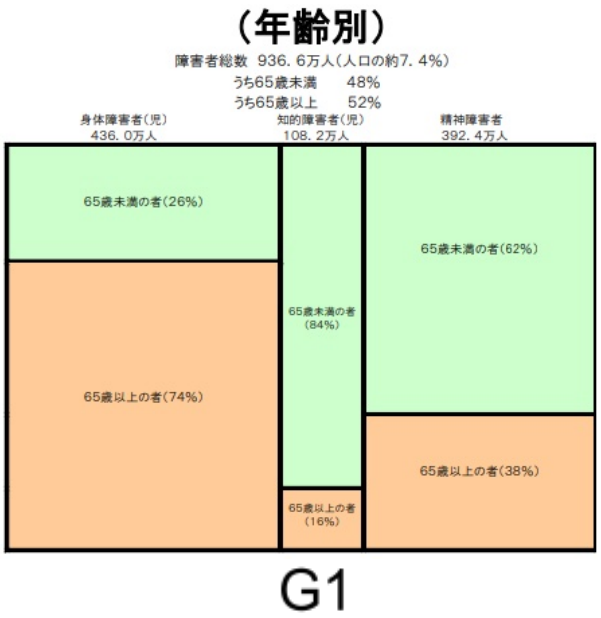
These questions led me to research issues about the disabled.

Pre-research information gathering

Definitions of disability vary and depend on how support is provided but there is no difference anywhere as a person.

To begin, post materials from the UN.

The percentage of people with disabilities worldwide is estimated at 15%.One billion people live with disabilities.However, differences in percentages can be seen from country to country, with 80% of people with disabilities living in developing countries. Percentage of people with disabilities in developed countries tends to be low. 7.4% in Japan have a disability, and the percentage increases with age(G1).



G1

There are six major types of disabilities.

Ⅰ:visually impaired

Research Motivation

I became interested in sign language because of anime.I thought of ways to engage with people with hearing disabilities, such as sign language karuta.I also continued to study sign language.In the course of this life, I have wondered. 'Why aren't there people with disabilities in our schools?' Why don't we see them in our lives?" I was interested in those things.







What I found out from my research

In my research, I found that Asia, among other parts of the world, has not made much progress in supporting people with disabilities. Japan, among others, has been issued a recommendation by the United Nations.

The United Nations has taken issue with Japan's policy of segregating people with disabilities. In Japan, people with mental and developmental disabilities spend much of their time in institutions. Even with other disabilities, educational opportunities are divided among special-needs schools and other institutions. Certainly, in addition to being able to support people with disabilities collectively, people with disabilities can be comfortable. However, the problem is that their lives are defined by the differences they were born with.

This showed me that my question is a challenge and a problem that needs to be solved in the eyes of the world.



research question

What can we do to change a society that segregates people with disabilities?

3.research methods

Internet
Books
Interviews
Public Relations

4.Discussion and implications

①From the United Nations

The UN offered not only recommendations but also solutions. It is the achievement of inclusive education. The solution was found to be to eliminate barriers based on the presence or absence of disabilities from compulsory education.

However, there are problems unique to Asian countries

②The State of the Nation's Progress Toward an Inclusive Society

There is a common educational philosophy in Europe and the U.S., where inclusive practices are progressing.The purpose of compulsory education is to learn to live together, and the first priority is to interact with others.

In Asian countries, compulsory education emphasizes academic skills and teaches skills that can be applied to future career choices.

This shows the difference in educational goals

③Interviews with people with disabilities

All students who were questioned by people with disabilities wanted to be educated in a general school. The reasons given were a longing for a larger group and a desire to have many friends and receive an education. However, they were forced to attend special needs schools because they could not receive an adequate education.

3 **Conclusion**

From this information I came to two conclusions

1.Introduction of support staff

It is difficult to change the educational system. However, in many countries, it is possible to support people with disabilities if the human resources and environment are in place. We believed that it is necessary to create human resources who can provide for children with disabilities, teachers who are in charge of them, and the environment. Human resources in a different position from teachers are needed to realize inclusive education.

2.Exchange between special needs schools and general schools

I thought specific examples of inclusive education were needed. People with disabilities can experience general schools. Schools can know the support they need. Students in the general school will be exposed to disabilities and may become future human resources. I thought it would be a concrete measure.

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Improving the Quality of Teachers in Mexico

Decentralization and the Secondment System

5221 Negishi Kaito

Abstract

In this study, I will be looking into improving the quality of teachers in rural areas of Mexico. There is a large gap in the quality of education between urban and rural areas of Mexico, which I think is a big problem. Also, in Mexico, teachers' salaries are low because money is prioritized for medicine and medical care. Therefore, my first hypothesis is that it would be good for the government to allocate more of its budget to education. The research method was to mainly collect information from the Internet and analyze the current situation based on that material. And then, I came to a conclusion.This study revealed three things. The first is about the current state of the quality of education in Mexico. I found that although the school enrollment rate in Mexico is high, learning achievement remains low. The second is about the structure of Mexico's education system. I found that Mexico's education system is centralized, which prevents teachers from implementing innovations and new initiatives in the field of education. The third is about education in Finland. I found that Finland has a decentralized education system, which leads to a high level of education.The study concluded that Mexico should emulate the education system of Finland, where the central government sets certain standards and then determines budgets and selects teaching materials for each region or school. It would also be a good idea to send teachers from countries and regions with high quality education. This would help to alleviate the shortage of qualified teachers and improve the quality of teachers.

*In this study, "properly trained teachers" is synonymous with "qualified teachers."

* In this study, a different meaning was used for "improve".

-> "Improving" the quality of Mexican teachers means "having the ability to raise the Mexican children's Program for International Student Assessment, PISA test scores into the 30s".

1.Introduction

My purpose of this study is to ensure a sufficient supply of properly trained teachers. My focus is in rural Mexico. The reason why I chose rural Mexico is that Mexico still faces challenges with a large percentage of children not completing their basic education due to economic factors. While urban areas boast relatively well-developed educational systems, rural regions suffer from a lack of infrastructure, qualified teachers, and resources. Moreover, I served as the Mexican ambassador in the Model United Nations, so I am interested in Mexico. I believe that by improving this problem, the gap of quality of education between urban and rural Mexico can be narrowed. I also believe that this research will lead to the achievement of SDGs No.4, “Quality Education”.

I set my research question: How can we ensure a sufficient supply of qualified teachers in rural Mexico? Teacher salaries in Mexico are low. For example, in Mexico it costs 1,000 pesos（approximately 8,000 yen） for 8 hours, whereas in the United States this pay is for 2 hours. If that were the case, they would find other jobs or leave Mexico to work in the United

States. This situation is said to be the fault of the government, which prioritizes spending money on drugs and medical care, so there is no money for education. Because of this, I thought the government should allocate more of its budget to education expenses.

2.Discussion and implications

There are three main findings from this survey. First, about the current state of the quality of education in Mexico. According to UNESCO data, in 2011, Mexico's gross primary education enrollment rate was 104%, net enrollment rate was 96%, and the percentage of children of age who should be attending primary school who are not attending school was 3%. However, while the primary education enrollment rate is approaching 100%, this does not necessarily translate into improved learning outcomes. The OECD conducts a learning achievement survey PISA every three years.This test is aimed at 15-year-old students who have completed compulsory education, and measures not only basic knowledge in the three areas of reading comprehension, mathematics, and science, but also problem-solving ability and the ability to apply knowledge. As shown in the trend in the results (table), there has been no significant improvement in Mexico's low learning achievement levels over the past 10 years. Now that Mexico has achieved a certain level of "quantity" in education, improving the "quality" of education is an important and urgent issue for the future of the country.

Next, I will talk about the structure of Mexico's education system. Mexico's education system is centralized. The central government controls many of the decision-making powers regarding education, and budget allocation, selection of textbooks and teaching materials, and curriculum decisions are concentrated in the central education ministry. This means that teachers are unable to implement innovations or new initiatives in the field of education.

Then, I looked into education in Finland. The reason I chose Finland is because it is said to have good quality education. In fact, it is ranked number one in the OECD's Better Life Index Education rankings.Teacher is a very popular job in Finland. Only 10% of those who want to become homeroom teachers at comprehensive schools pass the selection process when entering a university faculty of education or taking a teacher training course, and 10-50% of those who want to become specialist teachers, depending on the subject. The high level of competition for teaching positions, as well as the guaranteed treatment and social status of teachers, make it possible to secure more suitable personnel for teaching.The background to teachers' social status is the reduction of central government control and the significant increase in teachers' discretionary power, and the state guarantees teachers' abilities. Because teachers have a high social status and there are many applicants, it is possible to "select the most suitable person to be a teacher from among the applicants". It can be said that the elimination of centralization has led to a high level of education.

[table]Mexico's PISA test rankings over time (2009-2022)

	PISA 2009	PISA 2012	PISA 2015	PISA 2018	PISA 2022
読解力	48/65	52/65	55/72	53/79	49/81
数学	48/65	53/65	56/72	61/79	57/81
科学	49/65	55/65	51/72	57/79	57/81

3.Conclusion

The conclusion of this study is that Finland's decentralized education system can be a model for improving the quality of teachers in Mexico. As mentioned above, teachers in Finland have a lot of discretion. This is what leads to a high level of education. Therefore, I thought it would be good to decentralize decision-making power regarding education in Mexico as well. It was thought that by the central government setting minimum standards and then leaving it to each region or school to decide on budgets and select teaching materials, it would lead to high-quality education that was appropriate to the characteristics of the region or school and to improve the abilities of the teachers. I also thought that teachers' motivation would increase because salaries could be adjusted flexibly according to ability. Additionally, I think it would be a good idea to send teachers from countries and regions with high quality education. It would solve the shortage of well-qualified teachers and provide a good stimulus for Mexican teachers.

There are three major issues that need to be considered in the future. The first is to investigate and examine the reasons why the education system in urban areas of Mexico is so developed. The second is to improve teacher quality by improving the treatment of teachers and attracting teachers from abroad and other regions. The third is to consider how to overcome the language barrier when teachers are dispatched from abroad. I would like to investigate these issues further and reach a conclusion.

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The Future of Education Connecting the World

Developing Abilities Through International Exchanges

5222 Hayashi Karen

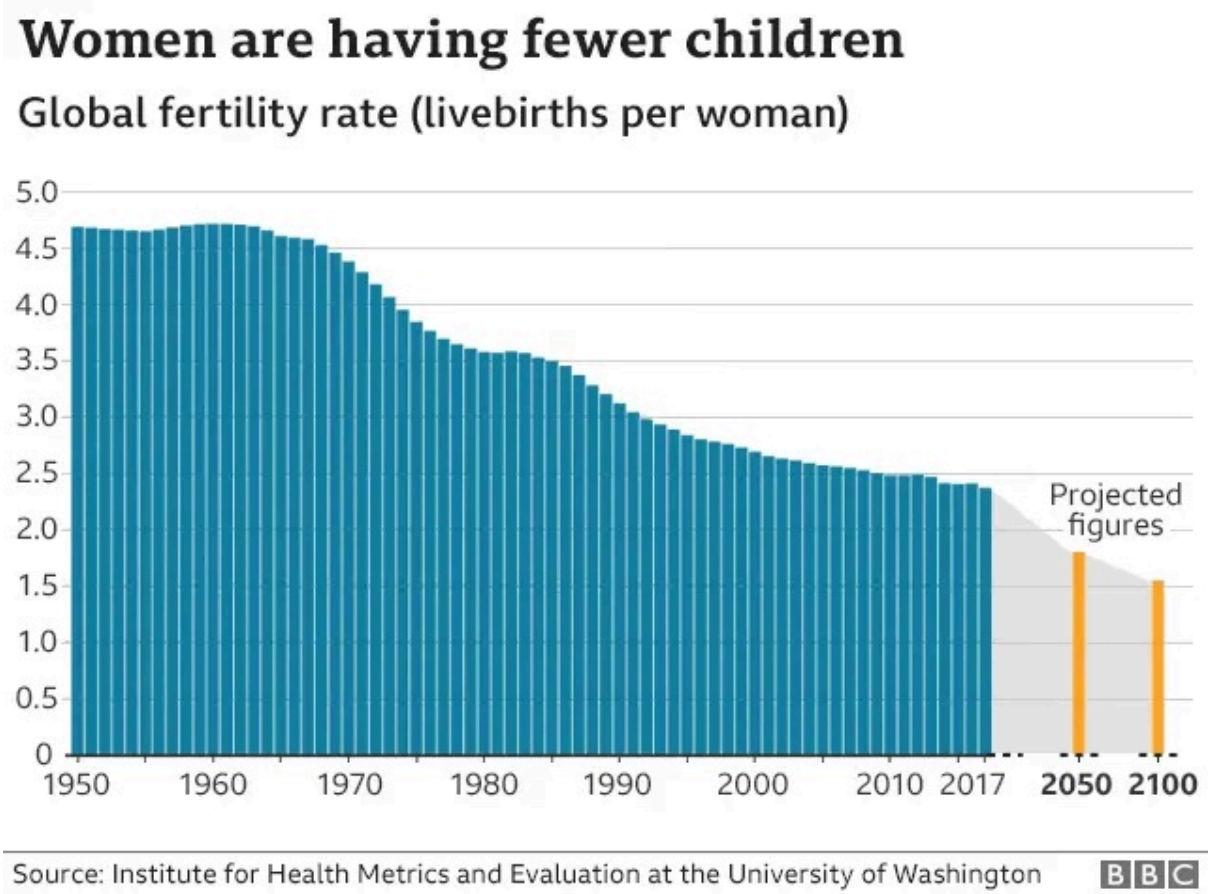
Abstract

In this study, I focus on three points. Communication skill as an important ability, economic and financial education as essential knowledge, and international exchange. Regarding communication skills, one of the major differences between Japanese and foreign education at this time is the absence of drama classes. In this class, students learn to express themselves and practice “living” while having fun. In addition, by incorporating Speech and Discussion time into school life, students will practice communicating their own opinions. Regarding financial education, there are many countries, such as the U.K. and France, where money education is conducted as a system or project by each state, but few countries seem to deal with finance as an educational activity (class) in schools. As a final suggestion, including the above, I believe that it is important to make drama classes compulsory and international exchanges compulsory at the early stage of elementary and junior high school students. Also, a program for communication should be implemented. This program would provide students with a period of about one week to experience school life overseas. Students will be free to choose and schedule their own events, regular classes, and daily life unique to the overseas school they are interested in. The benefits of this program include cross-cultural understanding and self-understanding. Furthermore, money-related education should be promoted in schools. As many states in the U.S. have made economics classes an elective course, students should be able to study it if they wish. One problem is the lack of money and teachers who can implement economic education in schools. To solve this problem, I propose an economic development and education system. People without jobs, such as refugees in developing countries around the world, will be given special economic education for a certain period of time. Those who receive education will be divided into two groups: those who return to their countries to disseminate economic knowledge or those who work as teachers to educate children in developed countries.

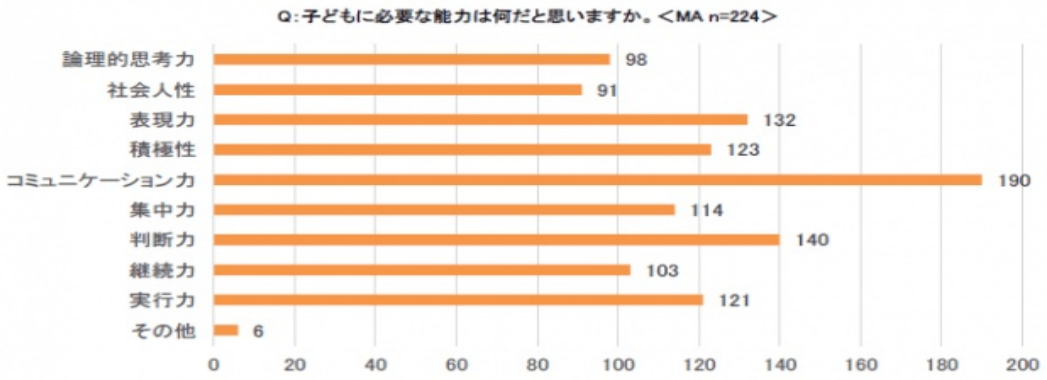
1.Introduction

Nowadays, the decrease in birth rate is considered as a problem around the world. The number of children is decreasing more, more and more children will be needed to grow up to be outstanding adults in this tough environment. This study is for those children. My research question is ‘What can we do to fulfill the education that really improves children’s abilities’. Also, this study mainly focused on the perspective of international exchanges, communication, and financial education. To seek the solutions for this question, I focus on the developed countries and the goal is to find a way to educate students to really improve their skills in those areas.

2.Discussions and implications



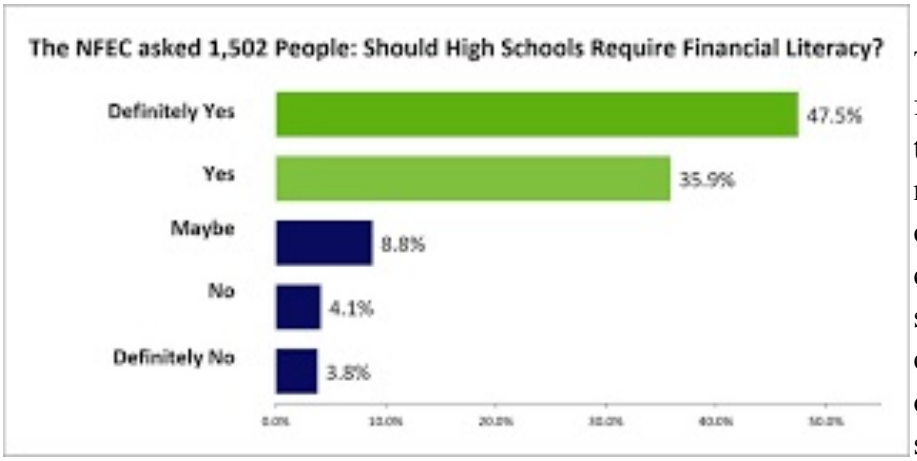
This graph shows the world's total fertility rate, or in other words, the declining birthrate in the world. It indicates that the rate is declining, and we can see that the birth rate will continue to decline. The current situation has social effects on us. For example, the reduction in scales of market and economy, and the decrease in the number of communities. What is more, it will be a huge burden on us, the current children generation in the future. In addition, society is already in need of more talented and global humans from the younger generation. Furthermore, a lot of companies are trying to expand their business overseas in order to capture new markets, and the companies are requiring the right people to do so. So I believe that school education should be used to acquire the skills.



So, what kind of abilities should children acquire?

This Japanese data shows the abilities that parents want their children to master. We can see that Communication skills are needed the most by parents.

Now I think that not only communication education is important but also financial education is important. The chart below shows the need for financial lessons in schools.The NFEC asked “Should high schools require financial literacy?” to 1,502 people. About 83% of the respondents answered yes to the question.There must be the need for financial literacy. I will explain this later.



This time, we will focus on two main things that are necessary to develop children's communication skills.The first is communication with other people. The second is intercultural communication. In Japan, there is no specific education to develop communication skills, but this is often the case in other countries. In American schools, students are often given 10 minutes or more to express their opinions on a free theme question. It is a time for students to simply share their thoughts with the other person. This is already being done in American schools and is the same as SHR time in Japanese schools. The content of the class includes performing rapid speech in various tones, such as angry and sad, acting out a scene from a movie together, and creating and performing a play on their own. Through this class, students learn how to express their emotions through fun and dramatic acting, which leads to communication. In making these classes and hours obligatory, the Courses of Study will need to be revised. The table below is an excerpt from a document such as the guidelines for secondary schools in Victoria, Australia. It shows that a class called “communication” has been made a requirement. In countries such as Japan that do not have this program, we believe it is necessary to implement communication classes, including drama, once a week.

理科（AC） ・科学的な理解 ・人類のたゆまぬ努力としての科学 ・科学的調査スキル	●	●	●	●	●	●	●	●	●	●	●
教科の枠を超えた学習											
コミュニケーション ・読む・眺める・答える ・発表する	○	○	○	○	○	●	● ●	●	● ●	●	● ●
デザイン・創造性・科学技術 ・調査とデザイン ・創造 ・分析と評価	○	○	○	●	● ● ●	●	● ● ●	●	● ● ●	●	● ● ●
ICT ・視覚的思考のための ICT	○	●	●	●	●	●	●	●	●	●	●

Next is “communication with foreign countries,” which will become more important in the future.

Regardless of students' nationalities, we believe that students should acquire the ability to communicate in multiple languages from an early age. I hope that children will not view the idea of speaking with strangers, especially those from overseas, as a frightening experience. I want to eliminate this image of fear at an early stage so that they can actively use English and other languages to communicate with others.
Then, let me discuss financial education. In Japan, of course, there is no specific financial education in schools. Even in foreign countries, there are large differences among countries and states. In the U.S., teaching methods differ, with some states making economic education required, others allowing it as an elective subject, and still others requiring a mandatory test, but it can be said that there is almost no case where even money-related education is not provided. In the case of Japan, the number of those who want to learn about finance is significantly higher among those in their teens and 20s. The need for financial education is increasing. We believe that a system should be established to allow students to choose financial education as a required or elective subject in elementary, junior high, and high schools.

However, this is limited by the lack of staff to educate people about economics and the lack of money to pay for the program. The refugee problem is currently a major issue around the world. Many refugees are suffering from poverty, having lost their jobs due to conflicts, natural disasters, and lack of money. I am considering a system that can save refugees and contribute to solving the world's poverty problems, while providing economic education in various countries.

3.Conclusion
Final Proposal. The objective is to improve the ability to “connect” with people and foreign countries.
(1) Make DRAMA classes mandatory.
Students will learn how to connect with others. Make time to act out scenes from movies and to watch and think about movies. Basically, there are no correct answers, and students can enjoy the class. At this stage, we think it is a good idea to do this once a week as a class.
(2) Revise the curriculum guidelines to make communication classes mandatory.
(3) Implementation of international exchange
They can send videos to each other using a video sharing application called FlipGrid to enjoy conversations, and communicate in other languages by exchanging letters and using Skype, etc.We believe that we should start with Australia, where the time difference is only about 3 hours, the educational system is not so different, and there are a large number of students from Japan studying abroad and staying at schools in Australia. Japanese students can also incorporate this as part of their English education. In countries where the time difference is small, exchanges can take place in real time, and in countries where the time difference is large, this can be done using Flipgrid.This application is, simply put, like Instagram, for video sharing, where videos are taken and posted.(the image below)



The last proposal is also intended to stimulate interest in cross-cultural exchange.
(4) International exchange by experiencing each other's classes in different countries. First, students from each country should experience classes and events in other countries that are not available in their home country, such as theater, as part of their school life for a limited period of time. In doing so, they should use the above-mentioned application, Skype, etc. The schedule of what to experience will be set freely, respecting each student's interests and what he/she wants to do. Within that period of time, English will be used for communication.
(Improvement of common language skills) Through this program, students will benefit from international understanding, improvement of English language skills, improvement of communication skills, and self-understanding. This program should be conducted on a regular basis as a kind of school event, looking for a timing that fits with each school's curriculum (school year) and age range.
(5) Concerning economic and financial education, make it a required course or an elective subject in schools.I am considering an economic “development and education” system in order to solve the problems of lack of manpower and cost. First, those who do not have jobs, such as the refugees, will be sent to a developed country to learn the skills (language) necessary for economic and educational development for a certain period of time. After that, they will be divided into two groups: first, they will return to their home countries to spread the knowledge they have learned, and second, they will remain in developed countries to teach economic education in schools as teachers. I will continue to study the contents, costs, and specific areas to be taught in this system.

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How Can We Solve Problems of Stereotyped Discrimination and Develop Diversity?
To Make a World Rich in Diversity

5224Yuna Fujiwara

1. Abstract

I have been interested in many country's various cultures and people. However racism is still a big problem on our planet and I wanted to improve this issue so I decided to research about it. Actually in 2020, there was a big movement called "Black lives matter". This movement made us think about racism more than before. I researched from the definition of racism to some crisis that has occurred. I have three final proposals for this research. First point is to do assertion training. The second one is to spread movies that influence us a lot on how we think about racism. The third one is how to care about people who experienced discrimination based on racial differences.

2. Introduction

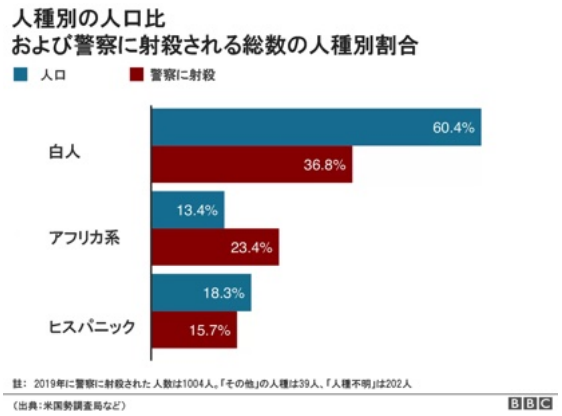
The reason why I wanted to research racism is because my French mother experienced racism in Japan. Her experience did not develop into a big problem but I thought that there would be a lot of racism problems like my mother's experience in our society, and we do not know about it at all. It may be seen as a small incident but it damages the person mentally and we need to be aware of it. And it is also clear that racism is one of the big social issues so I wanted to be part of someone who can make a change in this. The number of ten SDGs aims to reduce inequality among people and countries. I want to take part in realizing this goal.

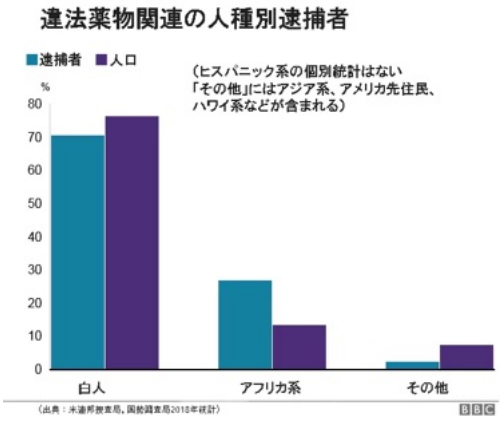
3. Discussion and implications

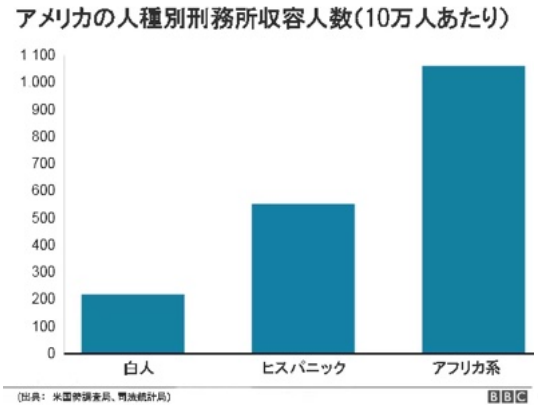
According to my research, I found out that there is a step until discrimination occurs. First, it starts by having a stereotyped mind and then develops into prejudice, and finally discrimination happens. Stereotype is a widely held but fixed and oversimplified image or idea of a particular type of person or thing. We need to make a change in this part to eliminate discrimination. There are several reasons in which discrimination occurs. For example, the appearance, the culture, the way of education and your religion.

Lookism refers to discrimination against a person's appearance or physical characteristics, and was first used in the United States in the 1970s during protests against discrimination on the basis of obesity. According to the BBC's data, the problem of racial discrimination in the U.S. has been revealed in numerical form. According to the ratio of the total number of people shot and killed by the police to the total population by race, African-American citizens are much more likely to be shot and killed by the police than White Americans. Another study found that even though African-Americans and whites have almost identical rates of illegal drug use, African-Americans are arrested at a rate of 750 per 100,000 compared to 350

per 100,000 for white Americans. I thought that discrimination was clearly the cause of the large difference in the number of arrests, even though the illegal drug survey showed no difference in the rates of use between white Americans and African-Americans. For example, according to the American Civil Liberties Union, the percentage of African Americans arrested for marijuana possession was 3.7 times higher than that of whites, but the rate of use was about the same. Another set of data showed that convicted African Americans were five times more likely than whites and nearly twice as likely as Hispanics to be incarcerated in prison; in 2018, African-American citizens accounted for about 13% of the total U.S. population, but nearly 30% of the population in prison. In contrast, whites were more than 60% of the U.S. population, but about 30% of the prison population. This means that for every 100,000 African Americans, more than 1,000 are in prison. As for whites, about 200 per 100,000 are in prison. This situation made me keenly aware of the tremendous impact of discrimination. I became curious about the criteria by which people judge others. I found that visual judgment accounts for more than half (55%) of all judgments. This may be one of the reasons.







(引用資料)

I wondered what kind of initiatives are taken to make a better situation for those issues. By researching, I found that Adidas has announced a new hiring policy that in 2020, that more than 30% of new employees hired in the U.S. will be Black or Latin American. This new hiring policy is the company's response to calls for the elimination of racial discrimination through the Black Lives Matter movement and other initiatives. Adidas also

announced that it plans to donate $20 million over four years to causes that support black people.I found another company that aims to reduce racism in Japan, which is, Kao Corporation. Kao corporation has announced that it will stop selling products labeled “whitening” and change the labeling. Kao is the first company in Japan to remove expressions of whitening, but theU.K.has been actively removing racially discriminatory expressions such as “whitening,” “lightening”.By changing the stereotype that white skin is beautiful, we aim to create a world where everyone can think positively about their natural appearance and skin color.

From those initiatives, I thought that we should be willing to purchase products and invest in companies that are committed to eliminating racial discrimination.





Additionally, I came up with three suggestions. The first of which was to conduct assertion training to develop self-expression. It is to train self-expression through assertion training, because I think it is important to eliminate prejudice against oneself before evaluating others based on false values. I thought that the first step we can take is to keep the four points “describe, express, suggest, and select” in assertion training and work on presentation activities. I would like to set this up as DESS and spread it as the DESS method. This is a method that I would like people to do when having some presentation activities.

The second is to make use of movies. It is clear that film contributes to our empathy, discovery, and education. It can also bring about a change in values and make it possible to create a place where people can see, know, and think. Therefore, I wanted to utilize the power of films to raise awareness by creating a kind of pamphlet that would allow people to think deeply about what kind of discrimination is occurring in the world. In fact, I would like to promote films such as “Green Book”, “Black Justice”, and “Parasite”.

The third is aftercare. The world has been trying to eliminate discrimination, but there is no sign of a solution. Therefore, I believe that it is necessary to enhance care for those who are suffering from discrimination. I would like to establish a consultation service that can be easily accessed by making a phone call. I would like to set up a simple phone number for this consultation service, and it would be nice if it were a phone number that everyone would know, like 110. In addition, the Ministry of Justice's current efforts to protect actual human

rights requires measures to be taken against those who have committed human rights violations and provides legal advice as an example of measures to be taken. Since these assistance programs are one-on-one and aftercare is provided separately for the victim and the assisting party, I would like to propose that the parties concerned should communicate with other people who have suffered the same discrimination in order to adjust the relationship between the parties. In order to create such a place, I propose the opening of a dedicated racial discrimination contact point.

I am glad that I was able to make my own arrangement to an already existing initiative.

4. **Conclusion**

It was found that in order to eliminate discrimination in the world, each of us needs to improve our stereotypes. In this study, as stated in the research question, I studied how to improve the stereotypes. Stereotypes will be passed on to the next generation if our generation changes them as much as possible. To this end, I came up with suggestions that I thought would be good for changing our attitudes. I also considered proposals in the form of support. I believe that this will fundamentally lead to a solution to discrimination.
I would like to deepen our thinking so that I can make better proposals.

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Sustain and improve the efficiency of energy operations on a global scale
―Renewable Energy and Nuclear Power―

5225 Moridaira Shuta

Abstract
Due to the increase in corrective energy consumption caused by the economic development of emerging countries and the unstable international situation caused by the invasion of Ukraine and other factors, energy operations in the world today are in need of a significant shift. Therefore, we will conduct research with the aim of achieving sustainable energy management that will not be depleted in the future.
In addressing energy issues, we will synchronize the expansion of various clean energy technologies with the reduction of fossil fuels and address the specific risks that reducing fossil fuels creates, based on the following principles
(1) Promotion of solar power generation by placing solar panels on rooftops
(2) Introduce nuclear power generation in accordance with national characteristics and disaster conditions
(3) Development of power generation using new energy sources such as hydrogen energy generation
(3) Development of power generation using new energy sources, such as hydrogen energy power generation.

1 Introduction
Currently, global energy consumption continues to increase every year. According to the International Energy Agency, global energy consumption in 2040 is projected to increase about 1.3-fold compared to 2014, with emerging economies accounting for much of that increase. And emerging economies have achieved significant economic development in recent years, and this growth is expected to accelerate in the future. As a result, demand for fossil fuels to support energy-related economies is also expected to increase. However, fossil fuels are, of course, in danger of being depleted.

In addition, Russia's invasion of Ukraine will stop the export of fossil fuels from Russia, and this will cause energy security to become a serious concern in the world.

These circumstances require a major shift in the world's energy management.

2 Discussion and implication
I believe that the following will be important as we move forward in addressing energy issues.

Synchronize the expansion of various clean energy technologies with the reduction of fossil fuel use.
It is currently impossible to stop fossil fuel-based power generation immediately, which would lead to higher fossil fuel prices and energy supply instability.
Addressing the specific risks created by fossil fuel abatement.
Reducing fossil fuel use will hurt both countries that currently rely almost entirely on fossil fuel-based power generation for their electricity supply and countries whose economies depend on fossil fuel exports. Diversification is crucial to reducing those risks and can be achieved by investing in the development and introduction of renewable energy generation, discussed below.

Here, the following are examples of power generation using renewable energy sources that can be easily introduced in emerging countries.

(1) Photovoltaic power generation (solar panels)

As a precondition, renewable energy power generation has the fatal disadvantage of being difficult to supply stably, making it difficult to make it the sole mainstay of power generation. In addition,

hydroelectric power generation, which has a negative impact on the ecosystem, does not count as a renewable energy source.
Solar power generation is the preferred method of power generation to be promoted on this basis.
Regarding solar power generation, on June 24, 2022, the installation of solar panels on newly constructed houses became mandatory in Tokyo. As described above, solar power generation has the feature of being able to be installed on the roofs of houses and buildings, which is considered effective for emerging countries that do not want to halt their economic development.
However, when this announcement was actually made in Tokyo, there were many objections (because the cost of installing the panels would be added to the cost of purchasing the house, which would be borne by the consumer; in reality, however, the calculation showed that the panels could be paid back in about 10 years). (In reality, however, it is calculated that the cost can be recovered in about 10 years.) In order to address these issues and to promote the installation of solar panels in homes that do not originally have them, it is conceivable to offer benefits or to create home purchase plans based on the premise that solar panels will be installed.

(2) Nuclear Power

Nuclear power has the following advantages: it emits no CO2 when generating electricity, its cost is stable, it is relatively inexpensive, and its fuel can be reused and will not be depleted. This is quite attractive for my research. The disadvantages, however, include the emission of radioactive waste, which is difficult to dispose of, and the many safety issues such as the potential for damage to the surrounding area in the event of an accident or terrorist attack.
The nuclear accidents at Chernobyl and the Great East Japan Earthquake are well-known examples.
However, it is expected that safety standards will be met through technological development, along with the introduction of “innovative light water reactors,” “fast reactors,” “accident-resistant fuels,” and other technologies. These will make it possible to cope with unforeseen events such as power outages, core meltdowns, and hydrogen explosions. They can also reduce the amount of radioactive waste.
In addition, the new reactors, called “high-temperature gas reactors,” can produce hydrogen and supply heat energy as well as electricity.
Nuclear power is superior in all of the 3E+S except safety, so I think it is more suitable for emerging and developing countries than for developed countries. However, there are technical issues that need to be addressed in order to operate nuclear power generation there.

(3) Development of new energy sources

The premise is that, in accordance with 3E+S, the energy should have low environmental impact, low cost, and be completed domestically as much as possible.
During the shift from fossil fuel-based power generation, we examined technologies for ammonia co-firing in coal-fired power generation and hydrogen co-firing in natural gas-fired power generation, but concluded that they could not be the main means of power generation because they are costly and unprofitable and do not reduce CO2 emissions to zero.
Therefore, we propose the promotion of power generation using hydrogen energy. The basic principle is the same as that of thermal power generation, replacing the burning of fossil fuels with the burning of hydrogen to convert thermal energy into electricity.
＜Advantages＞
・No CO2 emissions during power generation (only water is produced when hydrogen is burned).
・Can be extracted from a variety of resources (petroleum, fossil fuels, methanol, ethanol, etc.)
⇨The energy security of the world is less affected by the international situation because it can be produced from a wider variety of resources than fossil fuels.
・The amount of electricity generated from renewable energy sources can be converted into hydrogen and stored.

⇨The amount of electricity generated depends on weather and other conditions, which is a weakness of renewable energy.
＜Disadvantages＞
・Danger of explosions (large scale explosions have occurred in South Korea and Norway in 2019)
⇨The risk of explosion is not so high at present.
・The risk of backfires, in which flames from combustors flow backwards, is higher than with fossil fuels. The combustion rate is higher than that of fossil fuels. This can lead to burnout of gas turbine components, which can be very dangerous.
⇨The combustor flame is more likely to flow backwards than fossil fuels.
・Cost is an issue.
Currently, the environment for producing hydrogen energy is not yet ready.
⇨It is possible to solve this problem in the future

3 Conclusions

If we can promote the introduction of these systems, mainly targeting emerging countries, it will enable more sustainable and efficient energy management in emerging countries where energy consumption will continue to increase.
Since the internal conditions differ from country to country and region to region, not all countries and regions can introduce these systems, so the challenge for the future is to first search for the internal conditions and then prepare sub plans that can flexibly respond to them.

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The language learning systems for refugees

～How can we improve educational environment for both adult and children?～

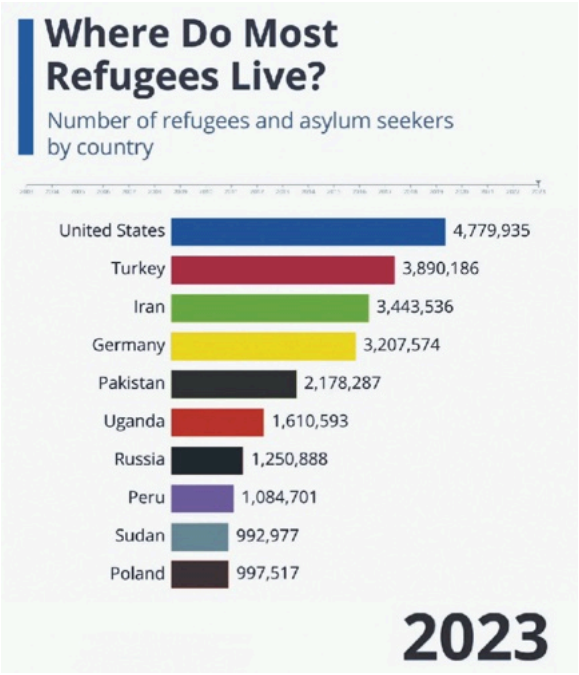
― refugees language refugee camps ―

5226 Yuri Moriyama

1. Abstract

I have been researching immigrants since I was a senior high school student. This year's research theme is "world exploration", so I researched world wide refugees and immigrants for the first time, but after I visited UNHCR last summer, I started to focus on refugees' language learning systems. In refugee camps, people can live minimum lives. However activities outside the refugee camp are so difficult, and the educational activities are also limited by the location of refugee camps. Educational activities and economical activities are difficult, so the independence of refugees is strict and they cannot be independent forever. I think we need to improve the educational environment to change this current situation, continue researching using various internet pages of international organizations and keep talking at the UN. To improve this environment, we need stable primary education for children, improvement of facility shortage and shortage of human resources. I also think that learning the language of the host country would make it easier for the adults to find jobs. However it needs a lot of money, so I suggest the refugee education project that is a sustainable program and needs less money. And more, I believe what we can do is move international organizations by gathering many agreements for the project through social media and the world wide signature sites.

2. Introduction



I kept researching the barrier of languages between foreign residents in Japan since I was a junior high school 2nd grade student. From last year, I decided to focus on the improvement of the language systems for world refugees and immigrants. I found an article about a refugee boy who doesn't live in refugee camps. He is from an Arab country but he lives in Checo as a refugee. According to the article, children have a high capacity for language learning,but the parents do not have enough time to learn languages because they have to work and their parents cannot speak. So he has to help their parents work and he cannot get an education. Because of that, I thought we should improve the educational environment for both adults and children. Last year, I visited UNHCR. Now there are over one hundred million refugees in the world, and one-third of them are children, but there is not a well-featured education. I learned many things about refugee camps and I decided to focus on refugee camps.

3. The purpose and significance of study

There are many people who live in other countries as refugees. Most of them live in refugee camps. In refugee camps, people can get support for necessities of life but there is no good education environment. Primary education is available at least, but that is after 3-6 months past danger, and many children are not able to receive even that due to family circumstances or cultural reasons. In addition, the number of refugees is increasing and there is a lack of teachers and equipment. I want to improve this environment so that more children in refugee camps can receive education.

Furthermore, the adults who do not have any jobs in refugee camps cannot go outside. It is important for the adults to have jobs in order to become independent from the refugee camps. I thought it is necessary to create an environment where the adults can learn the language of the country and make it easier for them to get jobs.

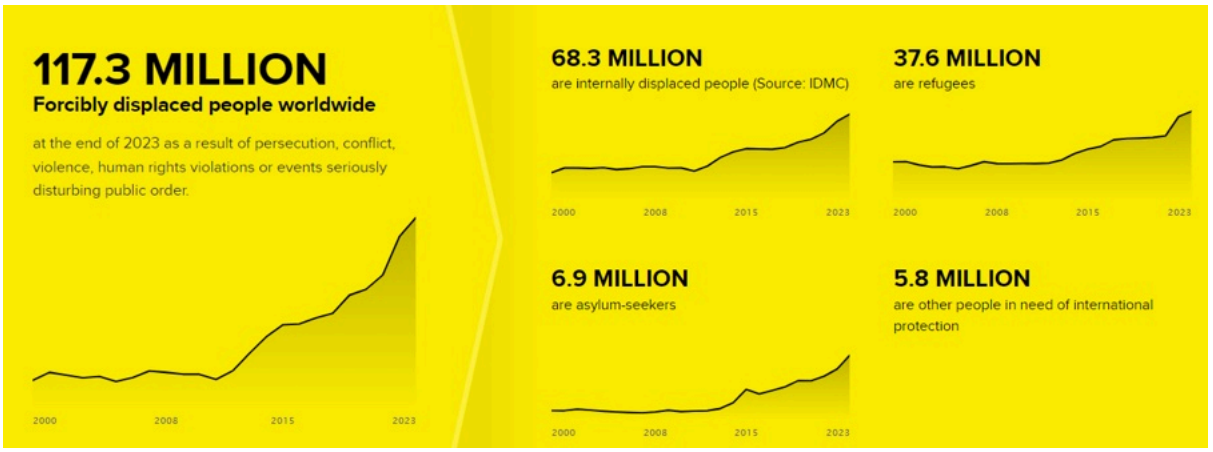
Through this research, I would like to improve the educational environment in refugee camps for both adults and children in refugee camps.

4. The methods of study

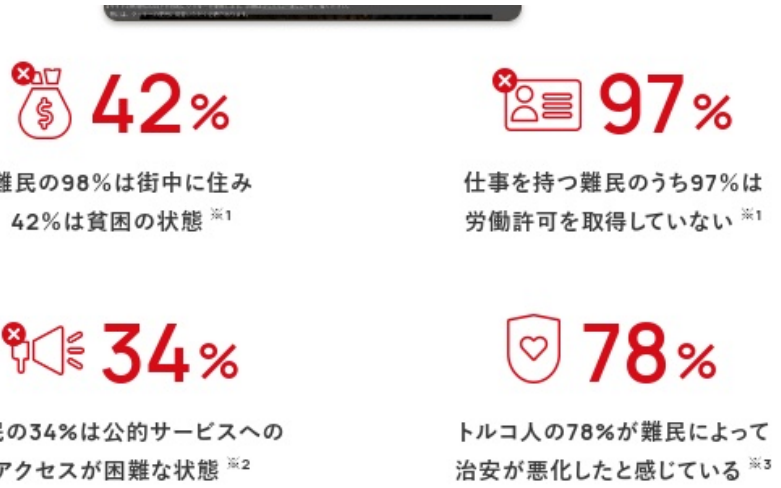
First, using the Internet, I researched the current situation of refugees and what concerns and challenges they are facing in their lives from the UNHCR's homepages and other sites. Next, I researched about refugee camps and referred to the websites of the international organizations which work in refugee camps to know what kind of educational activities they are doing. I also referred to the detailed account which I heard in UNHCR last summer. After that, I researched again about refugee camps, got some advice from my friends, and I propose what kinds of education styles are good for refugees.

5. Discussion nad Implications

My initial focus was on improving the educational environment for immigrants. Some immigrants are deprived of educational opportunities because their children, who understand the language quickly, help adults who don't have time to learn the language of the country they live in. To prevent this, I wanted to create an educational environment for both adults and children. However, last August, I went to Geneva for training and had an opportunity to talk with the staff of UNHCR. There, I was able to hear various stories about refugees. First of all, the number of refugees is currently increasing and has exceeded 100 million. Many of them are children who have lost their parents and they are caught up in a mass refugee crisis and come to other countries as children refugees on boats. Because there are only children, no one notices or cares if they fall into the sea.



Furthermore, these children occupy one-third of all refugees. I was very shocked by these facts. This is what made me want to focus on refugees. I had the opportunity to ask the staff about language learning for refugees. According to what he said, there are educational opportunities in the camps, but they are not that well organized, and the period between learning the country's language and being able to work is six months, and six months is too short. He also said that refugee camps are not easy to leave, and that if they enter, not only their families but also the next generation will remain poor in the refugee camps. In refugee camps, people are provided with life's necessities such as clothing, food, and water. So they can live enough without working. However, there is discrimination against fathers who cannot find jobs and stay at home all the time and they are sometimes not treated as family members. Not only this, but according to research on the Internet, the stress of adults who do not have jobs builds up, and it is not uncommon for them to become violent toward others. As a result, it seems that women who are often exposed to violence often take their children and live in urban areas. However, unlike refugee camps, there is no support in the city center, even if life is difficult. Living in the city is very tough. However, it is said that more than one-third of the world's refugees are called urban refugees who live outside refugee camps. To break this negative spiral situation, I felt it was important to create an educational environment within the refugee camps. I have two proposals, one for children and one for adults.



・Proposal for children

The first priority is to establish a stable primary education for the children. Education will begin about 5 months after the conflict is over and security is guaranteed. 4 hours of study per day will be the standard, and depending on the situation, secondary education and language learning will follow. The age range for this primary education is considered to be from 5 to 18 years old. However, this is only a guideline, and what is important is the will of the individual. I hope that education will make it easier to get a job in the future and help refugees overcome the negative cycle that all the next generation of refugees will also be refugees.





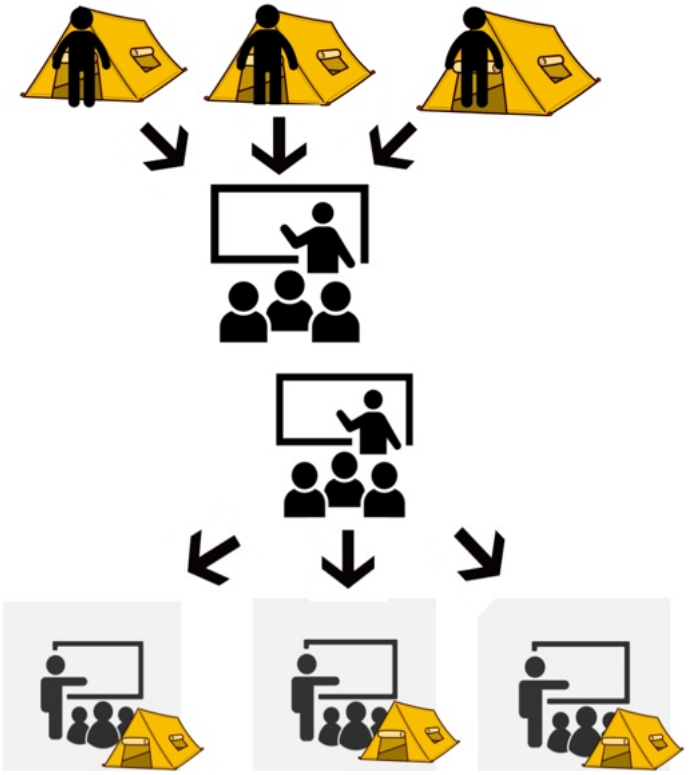
・Proposal for adults

Adults are provided the opportunity to learn the country's language in order to obtain a job. This program also begins about 5 months after security is assured. The target age group is considered to be 16 years old and above, and once they have mastered the language to a certain level, which takes about 2 hours a day, they can obtain a work permit at the employment security office. The job security center is an initiative that is being carried out in Jordan, where it is easier to obtain a work permit, and once one is obtained, it is easier to get in and out of the camp. We thought this system should be incorporated in other refugee camps. Adults having access to jobs would reduce discrimination from their families and violence in the refugee camps, which would lead to a decrease in the number of urban refugees. I also believe that allowing economic activities that are prohibited in refugee camps will lead to independence for each refugee.

There are big challenges in carrying out this proposal. These are the shortage of teaching materials, facilities, teachers, and ensuring the living conditions of teachers coming from around the world. This will require a large amount of funding. However, we consider that large organizations such as the United Nations don't have the money to pay such a large amount. Life in the refugee camps is made possible by donations and contributions from supporters, but the amount of money actually doesn't reach half of the target amount. The number of refugees is increasing year by year and it is difficult to ensure all refugees live. In this situation, the amount of money that can be spent on education is almost nonexistent. Therefore, it is necessary to create an educational environment that saves funds. The most important funding needs in this challenge are in recruiting teachers and ensuring their living conditions. I propose a project that focuses on saving money here.

-Refugee Education Project-

Not everyone in the refugee camps can't speak the language, and not all of them have never been educated. There must be many people who were originally engaged in education. We will select one or two such people from each refugee camp to participate in an educational workshop in a developed country. In this training course, they will learn about education methods in refugee camps for a few months and return to their own refugee camps. After returning to their home countries, these people will take the lead in developing education in cooperation with NGOs and others. These people will be employed by the organization that runs the project and will be paid a salary. As their lives become more fulfilling, other people will try to become teachers, and these people will teach others to become teachers, thereby increasing the number of teachers. I thought that if this became a cycle, the educational environment in the refugee camps would improve. They will also be given the responsibility of bringing back the technology and culture of developed countries when they visit those countries. Although there are still issues to be resolved concerning the lack of teaching materials and facilities, one of the ideas is to distribute whiteboards so that classes can be held anywhere even without teaching materials.



The challenge is not only the lack of facilities and educational materials, but also the resulting lack of funds, which is not improving. Since few people know about the current situation in the refugee camps, the number of people who are willing to donate even a small amount of money is limited. In order to improve this situation, I think it is important to make people aware of this situation through social networking sites. We are also considering the idea of conducting a proof campaign on a large signature site. When a better environment is created, I believe that a cycle will be created: fewer urban refugees, more people living in refugee camps, more people receiving education, more people becoming self-reliant, more people leaving refugee camps, and no more permanent refugees.

6. Conclusion

My research question, how to improve the educational environment for both adults and children, should start with people's awareness of the crisis in this situation in the refugee camps. I would like to conduct a large signature drive to let many people there know about the environment of refugee camps and at the same time appeal to international organizations to improve the educational environment. However, there is still a concern that the number of people who can enter refugee camps will be limited as the number of urban refugees decreases and the number of people living in refugee camps increases. And the educational environment needs to be improved according to the needs of each refugee camp, as the situation differs from place to place. There are still many things we don't know about refugee camps. There are still many things we do not know about refugee camps, and we would like to deepen our research in these areas. There are far more things about refugee camps that are not known until you are in a refugee camp. I hope to be able to actually visit a refugee camp someday.

It is the purpose and necessity of this research to help them have a better life in the refugee camps, but the ideal life for them is to return to their homeland and live a life without war. This is difficult to achieve

no matter how hard I try. That is why I think what we can do is to support them so that they can return to their homeland in a better condition when the time comes.

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Employment for Disabled people

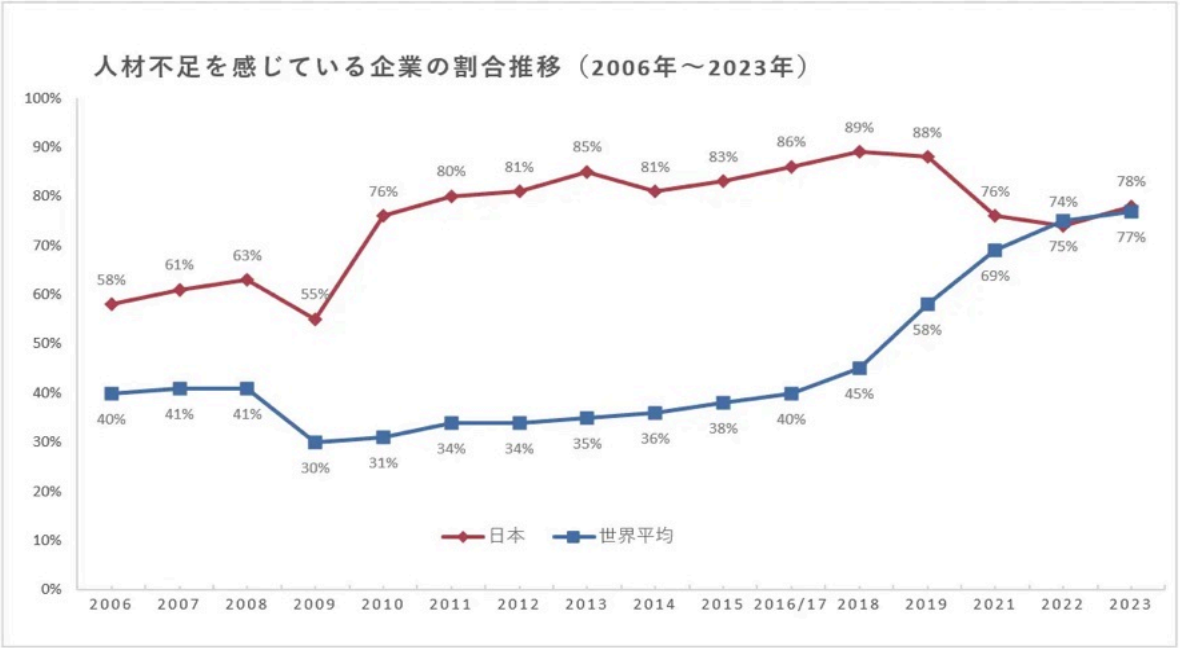
To make better working environment for many people

5227　Yoshizawa Miwako

Abstract

1. Introduction

Recentry, many countries face labor shortages. In the world, more than 75% of companies faced this problem in 2023. Because of labor shortages, economics in some countries may be difficult. On the other hand, there are many disabled people who want their jobs. Workplaces for disabilities will be needed more and more because of the modern society that recognizes diversity. Employment of disabilities helps us to not only resolve labor shortages but also give workplaces for people with disabilities. Also this study will contribute to involving the standard of living. It promotes economic development.



To learn about the current situation, I researched the employment situation of disabled people. Some countries set employment rates of disabilities by law. However, comparing those rates and real employment rates, there are countries that have lower real rates than legal ones. I thought that putting rates by law is not influenced. Then I started to find an effective way to increase the disabled people with their own jobs.

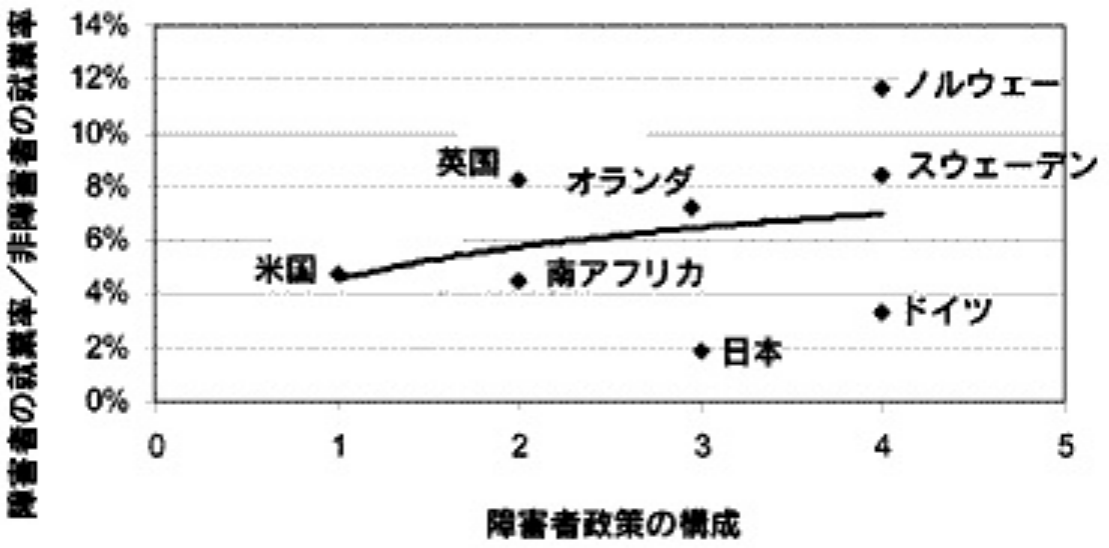
2.Discussion and implications

I found Samhal which is a state-owned enterprise in Sweden. Samhal was founded to prove that disabilities can contribute to society as workers. Samhal has some rules like this,

1, Provides more than 244 million total annual work hours to employed workers with disabilities.

2, More than 5% of employed workers with disabilities value employment outside of Samhull each year.
3, It is okay to hire at least 40% of new workers from priority groups (groups with severe disabilities) each year.
4, It is okay to achieve a minimum of 7% comfort and an Equity-Asset Ratio of 30% or more every year.
5, Every year, more than 10% of the total labor costs are not covered by their own operating profits. (Only up to 90% of total personnel costs will be compensated by the government)

These rules allow Samhal to reach its self-imposed goals every year, but they have some problems. Samhal do not hire unless there is a vacancy. In other words, it is difficult to get a job at Samhal because they do not recruit unless someone quits. Also, since the purpose is to employ people with disabilities who have difficulty finding jobs in the regular labor market, priority is given to people with multiple mental disabilities, and it is extremely unlikely that a person with only a physical disability without a mental disability will be employed. In this way, the number of people who can work at Samhal is limited.



Thanks to Samhal, Sweden has a high rate of employment of disabled people.

3. Conclusion

I suggest three models of companies for people with disabilities like Samhal that have improved these shortcomings.
(1) Companies that have a similar structure to Samhal and employ people with multiple mental disabilities who have difficulty finding employment in the regular

labor market.
(2) Businesses for people with only physical disabilities who have difficulty working in the regular labor market.
(3) Companies for people with disabilities who can find employment in the general labor market with consideration from those around them.

A group of these three companies will be established as state-owned enterprises. The purpose of these divisions is to reduce the number of people who are worried about not being able to find employment due to the severity of their disability. Furthermore, the reason why I do not specify the numerical value of the specific weight classification is because the standards for recognizing people with disabilities differ depending on the country, and I judged that it should not be specified as a model to show to the world. The composition of companies in (1) and (2) is almost the same as Samhal, but because the company in (2) only hires people with physical disabilities, there is a higher possibility that people other than people with multiple mental disabilities will be hired. I thought that would solve the Samhal's problems. Company (3) differs from Samhal in that it mainly engages in the worker dispatch business. The purpose of this company is not to make a profit, but to provide the necessary support for people with disabilities to find employment in private companies. In response to requests from private companies, the company also conducts a business in which people with disabilities visit companies and help create environments that make it easier for people with disabilities to employ them. To present these models, set specific numerical targets according to the situation and current situation of each country, and aim to achieve them. I believe that the establishment of these three state-owned enterprises will make it easier to employ people with disabilities, and will make it possible to employ a wide range of people with disabilities.

There remain doubts as to whether this proposal will actually lead to the promotion of employment of people with disabilities and whether it will be effective. In addition, I believe that an issue is that it is not possible to present a clear proposal due to differences in the circumstances, policies, political systems, and so on. of each country. The proposal lacks concreteness and realism. As a future initiative, I would like to continue to collect information and conduct research in order to aim to resolve these issues and to be able to present concrete numerical target guidelines. In addition, since there are currently countries that have adopted statutory employment rates for people with disabilities, just like Japan, but still have low employment rates for people with disabilities, I would like to continue my research from the perspective of resolving the difficulties of employing people with disabilities within companies.

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How to Reduce Burnout
-Reforming the Way Physicians Work-

5301 Ando Kana

Abstract

Burnout is particularly prevalent among physicians. The purpose of this study is to reduce the occurrence of burnout itself, which is spreading among physicians. Burnout is a concept proposed by Dr. Herbert Freudenberger, an American psychiatrist, in the 1970s, and is also called “burnout. On the other hand, it has been internationally recognized as a mental disorder since 2022, and there is still no clear treatment for burnout. Burnout is a condition in which a person suddenly loses the desire to study or work. A person may have been enthusiastic about work or study before the onset of burnout, but then he or she loses all interest in them and is no longer motivated to do anything. Is this simply the mood of the person or a mental disorder? Until 2022, it had been very ambiguous. However, on January 1, in 2022 , burnout became an official international mental disorder and was listed as a disease in ICD-11. It is now officially treated as a mental disorder among countries that are members of the World Health Organization.

Burnout takes a longer time to recover from. *It takes a long time to recover from burnout.* When a physician suffers from burnout, it affects not only the physician but also the patient. Therefore, it is important to reduce physician burnout. I found that long working hours are one of the causes of physician burnout**,** so I propose to support the introduction of clinic nurses and AI medicine as suggestions to reduce long working hours. These can reduce the burden on physicians.

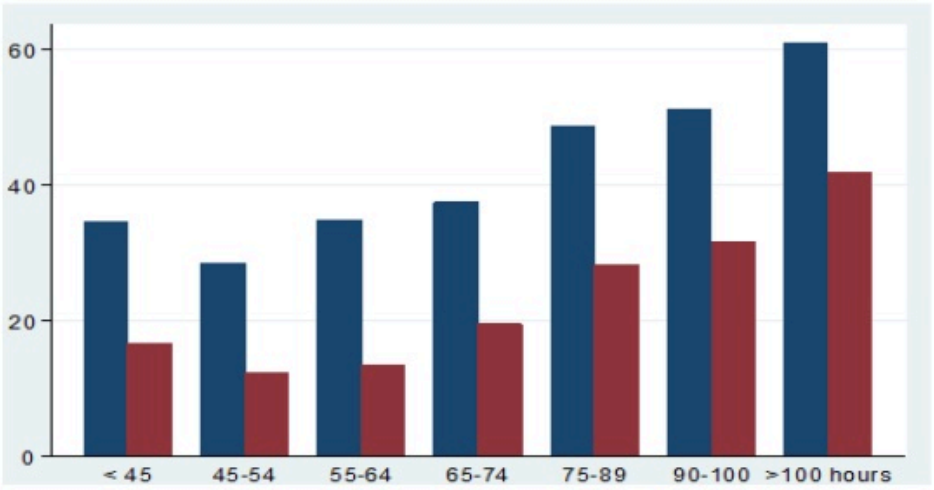
1Introduction

Burnout is a serious situation today. In fact, according to a survey conducted by the American company Gallup in 2018, nearly a quarter of the workforce has experienced burnout, and burnout is particularly widespread among physicians: a review published in Local and Regional Anesthesia in 2020 estimated that one in three physicians experience burnout at any given time. Also, compared to the general population, the rate of burnout among physicians is Studies have shown that the rate is as much as 10% higher. In addition, about 43% of physicians exhibit symptoms of fatigue, weakness, and decreased effectiveness that lead to burnout, according to the study. Other U.S. studies have shown that burnout is widespread among physicians. For example, a work-life balance survey of more than 7,000 physicians in the U.S. last year found that nearly half of physicians were suffering from so-called “burnout. The survey published in the medical journal Archives of Internal Medicine found that more than four out of 10 U.S. physicians were experiencing symptoms of burnout such as being mentally exhausted and depersonalizing patients. Tate Schanafelt of the Mayo Clinic (Rochester, MN), who conducted the study, noted that burnout affects not only the affected physicians but also their patients. He warned that previous studies have shown that physicians suffering from burnout are more likely to make medical errors. In a left survey conducted by M.STAGE of 584 physicians in Japan, approximately 40% of the respondents indicated that they had experienced what they considered to be burnout.The

research question in my study is how to reduce burnout by reforming the way physicians work. The Tokyo Declaration on Work-Life Balance 2019 was also presented at the 7th International Conference on Human-Centered Medicine held in Tokyo by the International Commission for Human-Centered Medicine (ICPCM), an international non-profit organization, in collaboration with the Japan Medical Association. The conference also called for medical associations in each country to take initiatives to improve the WLB of physicians, including residents. Thus, not only in Japan but throughout the world, there is a sense of crisis regarding physician burnout. Burnout has many effects not only at the time of its occurrence but also in later life. Therefore, I believe that it is very significant to reduce it.

２ Discussion and implications

A research team led by Professor Koji Iihara of the Department of Neurosurgery, Graduate School of Medicine, Kyushu University and Director Kunihiro Nishimura of the Department of Preventive Medicine and Epidemiology, National Cardiovascular Center surveyed 2,564 neurosurgeons and neurologists involved in stroke treatment in Japan. The graph below shows that the rate of burnout increases with working hours when working hours are 55 hours or more.



青　燃えつき症候群の割合（%）
赤　重篤な燃えつき症候群の割合（%）
縦軸　燃えつき症候群の割合（%）

（図２）労働時間/週当たりと燃えつき症候群の割合

The survey found that having more holidays and more years of experience were less likely to lead to burnout, while lower quality of life (QOL), overtime calls and a higher number of patients were risks.

Excessive workload and overtime work were also cited as causes of burnout in a survey conducted by the Japan Neurological Society in 2019.

Therefore, improving the long working hours of doctors will directly lead to a reduction in burnout.

In view of the above, I believe that two things should be done to reduce burnout and long working hours among doctors. First, increase the number of nurse practitioners; and second, utilize AI for diagnostic imaging support.

Nurse practitioners (NPs) are nurses who have a master's degree in medicine and practice specific medical tasks. The main difference between nurse practitioners and general nurses is that nurse practitioners may or may not perform medical procedures like doctors. General nurses are engaged in nursing and cannot perform medical tasks like doctors. On the other hand, nurse practitioners are involved with patients in a position closer to doctors and can perform medical acts (specific acts) within certain limits under the instructions and procedures (written instructions) of doctors. This profession has a history of more than 50 years in the USA, and is independent of doctors, performing medical treatment, examinations and prescriptions. In fact, at the Tokyo Medical Centre in Japan, doctors and clinic nurses work as a team to provide treatment. As a result, the medical nurses work more closely with the doctors than the nurses and participate in surgery and tests as assistants. This reduces the burden on doctors. However, there are currently only about 650 certified nurses in Japan. In contrast, there are approximately 1.28 million nurses in Japan. If the number of nurses qualified as certified nurse practitioners could be increased, this would have the effect of improving the long working hours of doctors. The main countries that have introduced the medical nurse system include the USA, the UK, Canada, Australia, Israel and Thailand, and the introduction of the system in many other countries in the future will help improve the long working hours of doctors.

Also, AI-based imaging diagnosis support has the effect of improving the quality of diagnosis while reducing the burden on doctors. In Japan, it was decided in the 2022 revision of medical fees that an ‘additional fee for AI-based imaging diagnosis support’ will be covered by insurance from April. A characteristic of AI used in image diagnosis is that it concentrates on fields where image data is easily collected due to the large number of tests and patients. AI used in diagnostic imaging is based on deep learning, so it is easy to increase accuracy by collecting a large number of images to be trained. Currently, AI is only active in a limited number of fields, but if more fields make use of it, it will help to reform the way doctors work.

3 Conclusion

To reduce burnout among physicians, it is essential to reduce their long working hours. Although there are only a few studies on AI diagnosis, the results show that the accuracy of AI diagnosis is already as good as that of physicians. However, how long it will take for AI to learn to that level of accuracy is still unknown in some fields. Also, although AI can make diagnoses as accurately as physicians, a 2022 survey by the Department of Cardiovascular Medicine at the University of Tokyo Hospital shows that about half of the respondents have concerns about medical AI. Therefore, it is necessary to consider measures to make patients accept AI.

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Medical Care Within Reach

~ Opening the Road to Life~

5302　Ishida Kaichi

Abstract

The reason for setting up this theme is that I have learned about the high infant death rate and the reality that many people are infected with and develop preventable infectious diseases that lead to death in regions with low levels of medical care, such as Africa, and we feel that we must solve this problem. I believe that one of the common causes of countries with low levels of medical care is the inaccessibility of medical facilities. **How can we make it possible for everyone to have access to medical facilities?** We must solve this problem. As for my research motivation, I spent a year researching medical issues in Takasaki City when I was in the first year of junior high school. I am interested in medical and health issues in the wider region.

The research question is "What is needed to eliminate medical and health differences? In Japan, the medical and health gaps are not small. However, when viewed from a global perspective, the problem is very large. The goal of this research is to resolve the global medical and health gaps from a sustainable view point. I researched an organization called UHC (Universal Health Coverage) that is currently working to address the very poor healthcare access environment in emerging countries and rural Africa. Based on my research, I propose the establishment of simple medical hubs in each village or group of villages in areas where access to healthcare is a problem (e.g., emerging countries and rural Africa). These centers would be fully remote facilities without doctors or nurses.

1. Introduction

The reason for setting up this theme is that we have learned about the high infant death rate and the reality that many people are infected with and develop preventable infectious diseases that lead to death in regions with low levels of medical care, such as Africa, and we feel that we must solve this problem. I believe that one of the common reasons for low levels of medical care is the inaccessibility of medical facilities. I believe that a combination of various factors, such as *lack of paved roads and family environment*, are causing the low consultation rate. How can we ensure that all people have access to medical facilities? We must resolve this problem.

As for my motivation for this research, I spent a year researching medical issues in Takasaki City when I was in the first year of junior high school, which sparked my interest in medical and health issues in the wider region.

Research Question:

What is Needed to Eliminate Medical and Health Disparities?

Medical and health gaps in Japan are not small. However, when viewed from a global perspective, the problem is very large. The goal of this research is to resolve the global

medical and health gaps problem from a sustainable view point. In order to do so, it is necessary to first learn about the current medical and health gaps problem.

We will consider how to resolve the problems that need to be resolved, taking into account whether they are sustainable and feasible, so that they can be achieved in the future.

Way to study

1. Gather information from the Internet
2. Identification of issues
3. Identification of relevance to research questions
4. Discussion of specific proposals for the final solution

2.Discussion and Implications

In sub-Saharan Africa, 287 million people (including 64 million women of childbearing age) live where transport time is more than two hours from the nearest hospital. Two-thirds of sub-Saharan countries have failed to achieve the global goal of 80% of people living within two hours of a hospital, and in South Sudan (life expectancy: 59 years), only 22.8% of people meet the standard.

This is a harsh reality, as it is estimated that about half of all deaths in low- and middle-income countries (and one-third of those with physical disabilities) could be avoided if people had immediate access to emergency medical care.(From Access to emergency hospital care provided by the public sector in sub-Saharan Africa in 2015: a geocoded inventory and spatial analysis) (1)

Emerging countries generally have low pavement rates (due to slow economic development), and this is more the case in countries with larger land areas, such as China and India. (From a comparison of total road lengths, densities, and pavement rates in countries around the world) (2)

The above shows that the current environment for access to healthcare in emerging countries and rural Africa is extremely poor. I conclude that the physical access environment is not good. Hence, I researched an organization that is working on UHC (Universal Health Coverage).

”The fact that half the world’s population still lacks access to even basic health services is unacceptable. This situation is avoidable. Fortunately the solution already exists. Universal Health Coverage (UHC) will ensure that everyone has access to the basic health services they need when and where they need them without suffering financial hardship,” said Dr. Tedros Adhanom Ghebreyesus, Director General of WHO. (4)

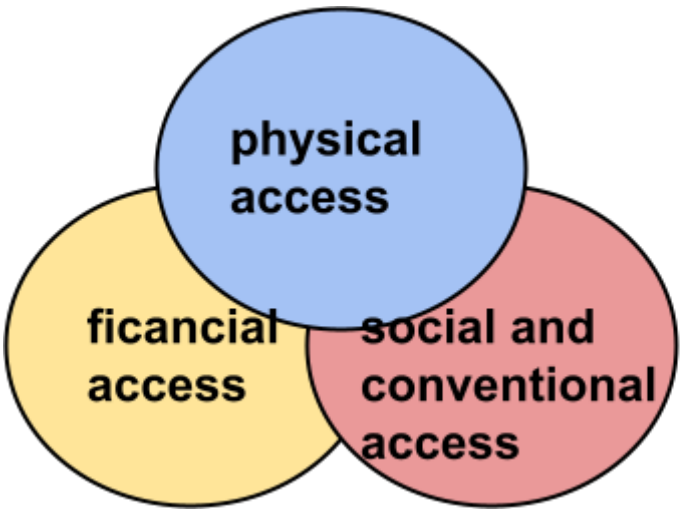
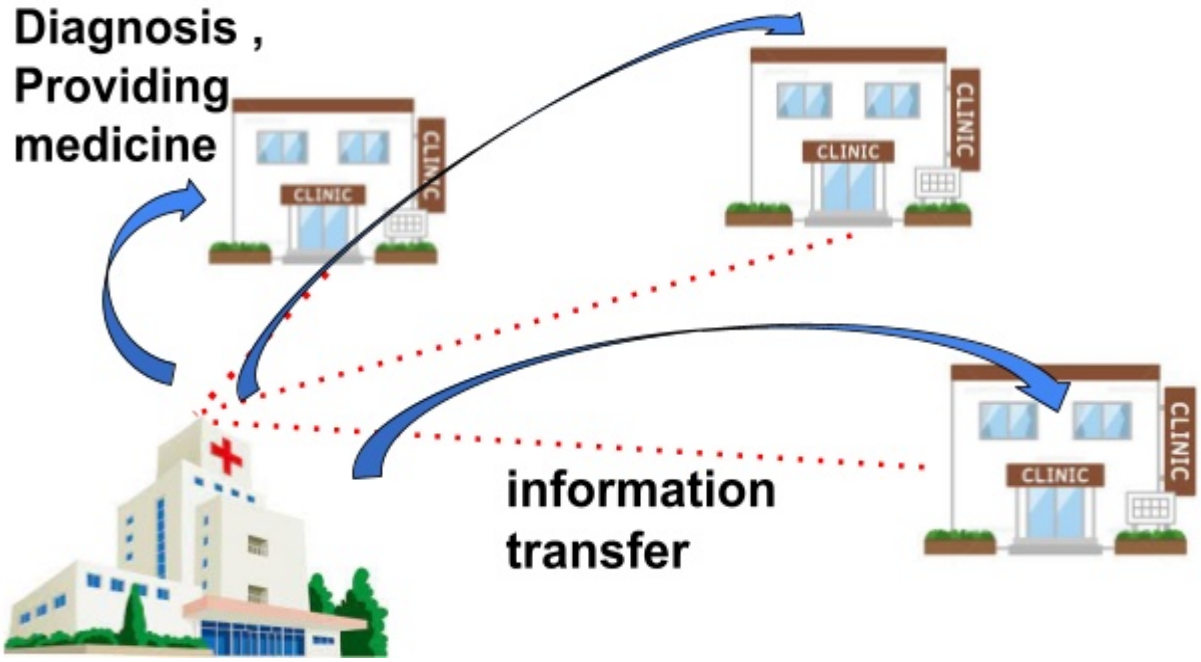


Figure 1

The activities of UHC are considered to be useful in resolving this issue, as UHC regards that the medical access issue can be resolved by simultaneously achieving the three points of view of physical access, economic access, and social and conventional access. As shown in Figure 1, respectively: lack of medical facilities in the neighborhood, lack of necessary medicines and equipment, and lack of nurses and doctors (physical access). High medical co-insurance, high transportation costs, and reduced income associated with illness (economic access). Not knowing the importance of services, lack of family permission, language barriers (social and conventional access). These problems are coincident with the current challenge in emerging countries and rural Africa. Comprehensive solutions are more emphasized.

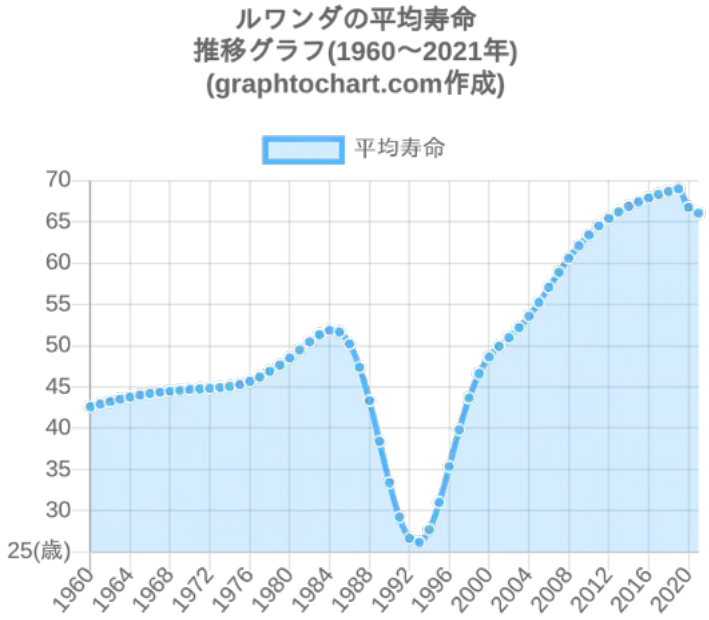
3. Conclusion -How to solve the problems-

Based on the above studies, I suggest the establishment of simple medical centers in each village or group of villages in areas where access to medical care is a problem (e.g., emerging countries and rural Africa). These centers would be completely remote medical facilities without doctors or nurses.



This resolves the physical access issue by locating medical facilities nearby and the economic access issue by reducing the distance it takes to reach a medical facility. In the social and conventional access aspect, the problem of language differences can be addressed using AI or translation applications on the internet.

In addition, I also propose the introduction of a CHW (Community Health Worker) system with the above proposal. The activities of these CHWs are to assign health care workers in the community and realize local production and local supply of health care workers. As an example, Rwanda has been engaged in this activity. Rwanda is located in the Great Lakes region of Central Africa, where lifespan was average for the African continent before the CHW program started. However, since 1995, when CHW was introduced, life span has risen steadily, reaching the late 60s.



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To Improve the Standard of Medical Care in Developing Countries

How to Make the Environments Which Everyone Can Take Medical Care

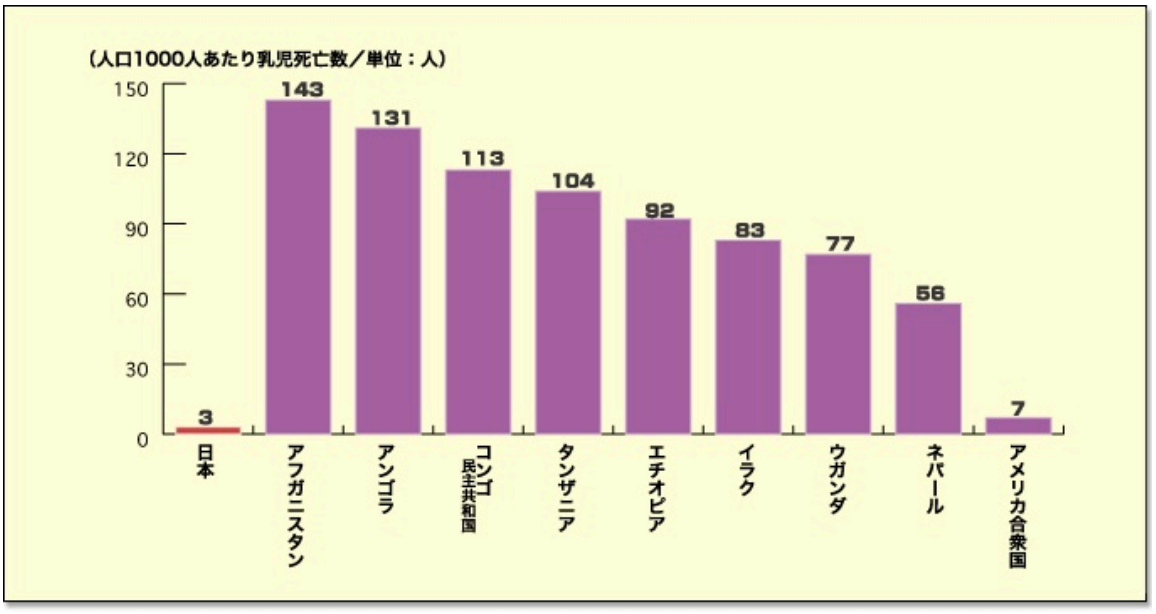
5303 Inui Mako

1.Abstract

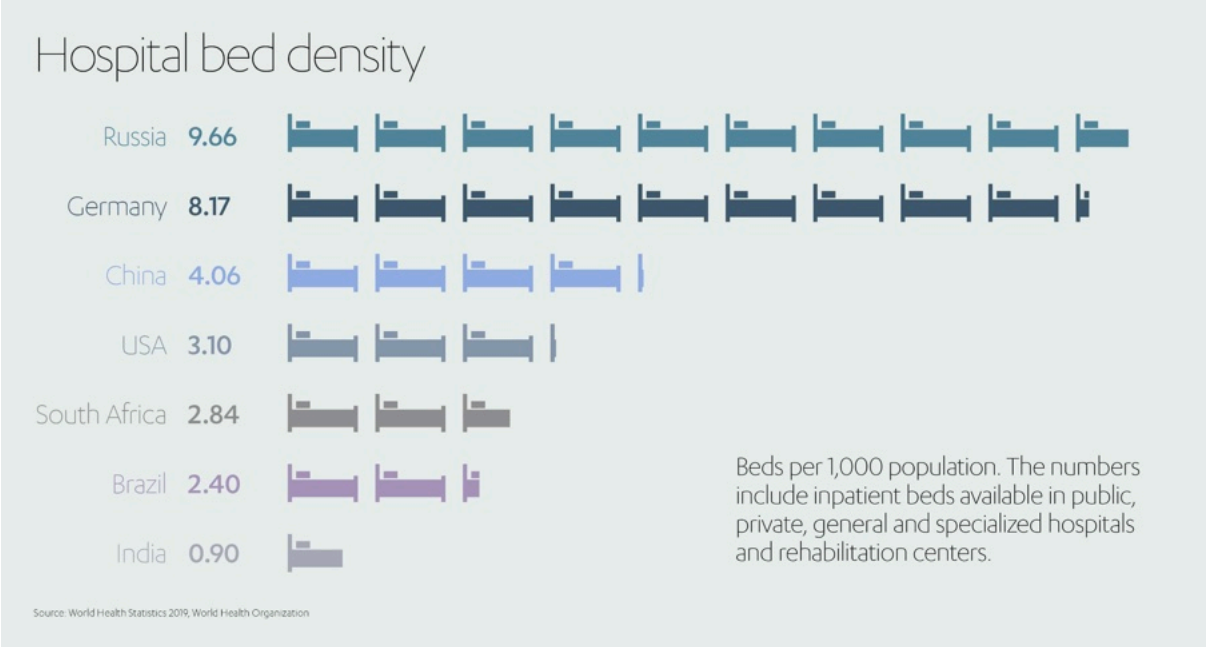
I have learned about regional differences in health care.There were big gaps in the number of newborn deaths and the number of doctors per one thousand population.I was interested in the environment of health care in developing countries.The highest number of infectious diseases is malaria.Through this fact, I focus on ways to improve vaccinations.I propose that vaccine patches are the best ways to improve vaccinations in developing countries.Vaccine patches are designed simply to dissolve liquid medicine into the body.It is easy to vaccinate and they do not require refrigerator for transport.It can lead an increase in population health and economic growth.

2.Introduction

I have learned that many newborn babies die soon after childbirth.The bottom graph shows the number of newborn deaths.Developed countries like Japan and America have less than ten deaths.However, developing countries have more than fifty deaths.There is a big gap in the number of newborn babies deaths. between developing countries and developed countries.

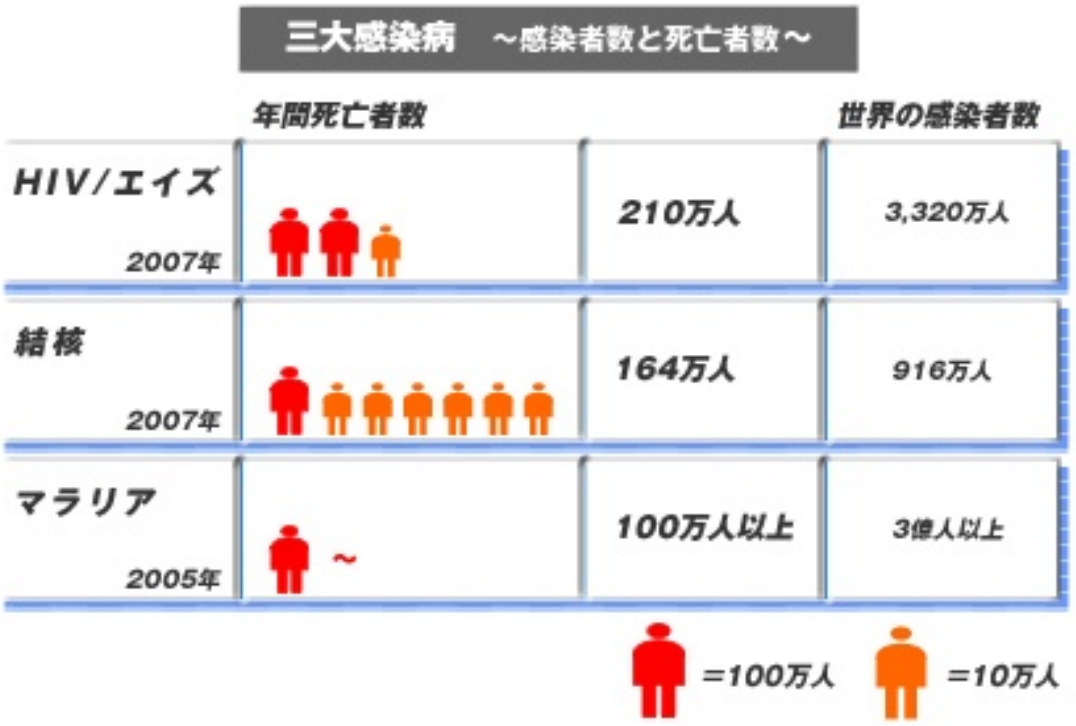


Also, the bottom graph shows the hospital bed density per one thousand population.Russia and Germany have more than eight beds.However, other countries which are often called developing countries have less than five beds.The average of these countries is 2.66.Through this, the average of all countries is about 4.45.There is a big gap between developing countries and developed countries too.It causes patients who require treatment cannot get medical care.It also cause an increase in deaths.



These data show that the standard of medical care in developing countries is low. So,I would like to prepare for an environment with a high quality of health care like developed countries.

3.Discussion and implications

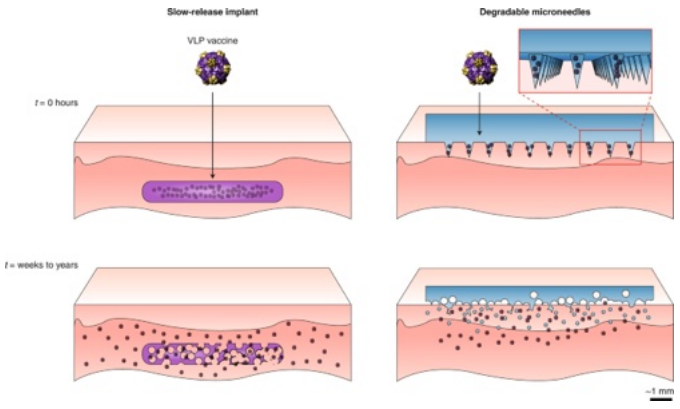


From the above data, the highest number of infectious diseases is malaria.So far, in the world, there are some vaccines against malaria such as R21, Malaron, and Mephaquin.For

example, the R21 vaccine used in advanced countries requires two doses spaced 1 to 4 weeks apart, followed by a booster shot one year later, and it has been shown to prevent about 77% of malaria infections. However, the diffusion rate in developing countries is low because of few medical institutions.However, the reasons for lack of medical institutions are complicated. Therefore, I focus on ways to improve vaccination.At the present time, vaccination with injections is the mainstream.However, it requires healthcare providers and health instruments.To improve vaccination in developing countries, vaccination without those.As the terms to improve vaccination, ease of transport and not affected by the sanitary environment.Ease of transport causes low price transport then developing countries can continue vaccination sustainably.Additionally, the number of children's deaths in increasing due to malaria.This is because children do not have enough immune system against malaria.To reduce children's deaths, the way of vaccination which children can get should be found as soon as possible.
The spread of vaccination makes the health population increase.It causes work forces an increase in the workforce.Then,the economy will grow steadily.

4.Conclusion

I propose vaccine patches will improve vaccination.It does not require refrigeration for transport, so transportation cost will be reduced.It is designed to simply adhere to the skin and deliver the vaccine directly into the body. Also,some types of vaccine patches dissolve into the skin. Currently, vaccine patches are still in the research phase, but some organizations have begun clinical trials, indicating that they may soon be viable.One significant advantage of vaccine patches is that they do not require refrigeration during transport, and they can be applied without the need for trained healthcare professionals, making vaccination much simpler.I anticipate that the benefits of this approach could include a significant reduction in deaths caused by malaria. Improving public health may also lead to increased economic growth.I speculate that a positive cycle will be created by producing vaccines in their own country as the number of deaths from malaria decreases,such as the increase of healthy population, the increase of labor force and the improvement of national strength.I also consider using badges or other means to distinguish between those who have completed vaccination and those who have not.The lack of information on production and which vaccine solutions can be used for vaccine patches is a future challenge.



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Access to Medicines for all over the World

What Can We Do to Eliminate the Medicine Disparity?

5304 Inoue Rihito

1.Abstruct

Since I have been doing research on topics related to health and medicine, and since I am interested in pharmaceuticals, so I decided to do research on the pharmaceutical disparity that is currently a problem in the world. The SDGs fall under No.3. Using the internet, on the research, I will first examine the current status of drug disparities, then examine the causes of drug disparities, and finally consider what can be done to resolve the drug disparities. There are three main outcomes of the research. The first is the current status of the pharmaceutical disparity. Serious disparities were found between high-income countries such as Japan, the U.S, and the U.K. and low-income countries such as those in the African region, and similarly large disparities were found for vaccines against the novel coronavirus that has recently spread. The second is the cause of the pharmaceutical disparity. It was found that the two main causes of drug disparities are a lack of infrastructure and the high price of the drugs themselves. Finally, my conclusion is about what can be done to solve the drug disparity. I conclude this study with three points: improve the transportation infrastructure in the African region, work to reduce the price of medicines as much as possible, and actively participate in activities such as fundraising and collecting plastic bottle caps. My future task is to consider the feasibility of improving infrastructure and reducing the price of medicines, as well as concrete means of doing so, and to consider whether there is anything else we can do closer to home.

2.Introduction

I have continued my research on health and medicine since I was in the second grade of junior high school, so I decided to continue my research this year to solve problems related to health and medicine on a global scale. In addition, since I am particularly interested in pharmacy, I wanted to research problems related to pharmaceuticals in the world and see if there is anything I can do to solve them.

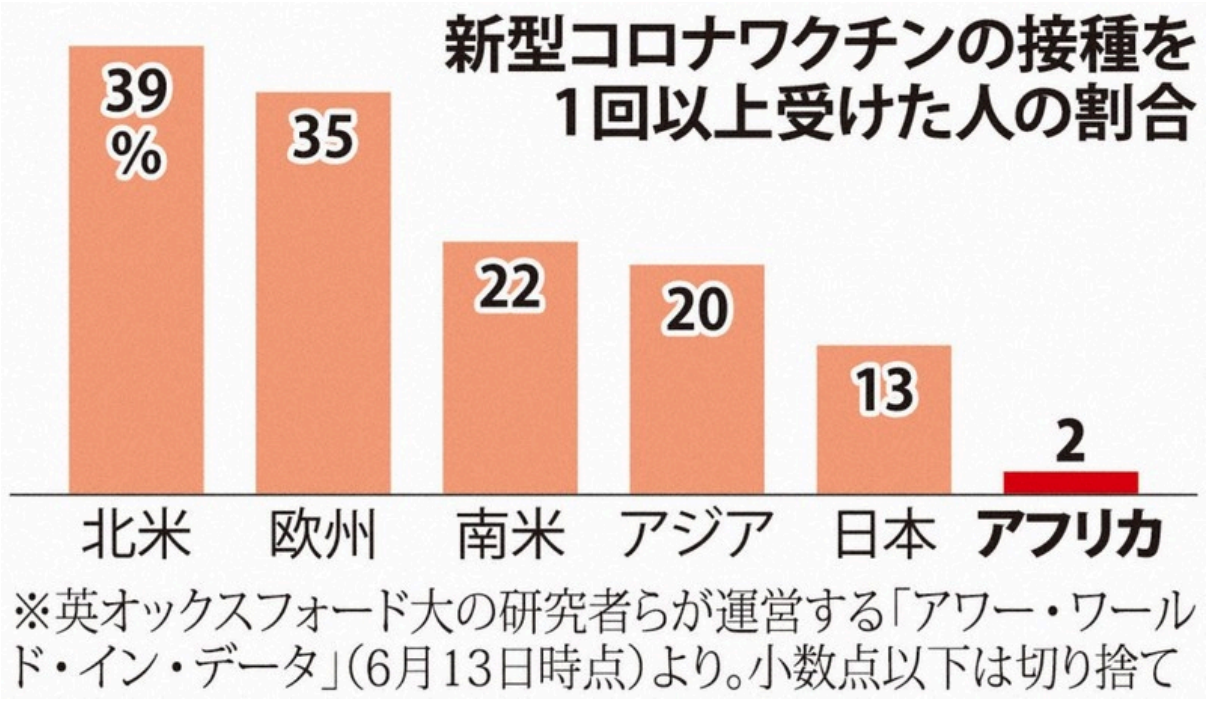
In fact, regarding the vaccine for the new coronavirus that caused a worldwide pandemic from 2020, the WHO's initial goal was to have at least 10% of each country's population vaccinated by September 2021. but as of October of the same year, in high-income countries (developed countries), including the United States, the United Kingdom, and Japan, approximately 60 However, as of October of the same year, in high-income countries (developed countries), including the U.S., U.K., and Japan, approximately 60% of the population had been vaccinated, while in low-income countries (developing countries), including those in Africa, less than 5% had been vaccinated. This gap in medical supplies remains a serious problem today. This is the reason why I decided to conduct research to eliminate the disparity in medicines, in line with my own interests.

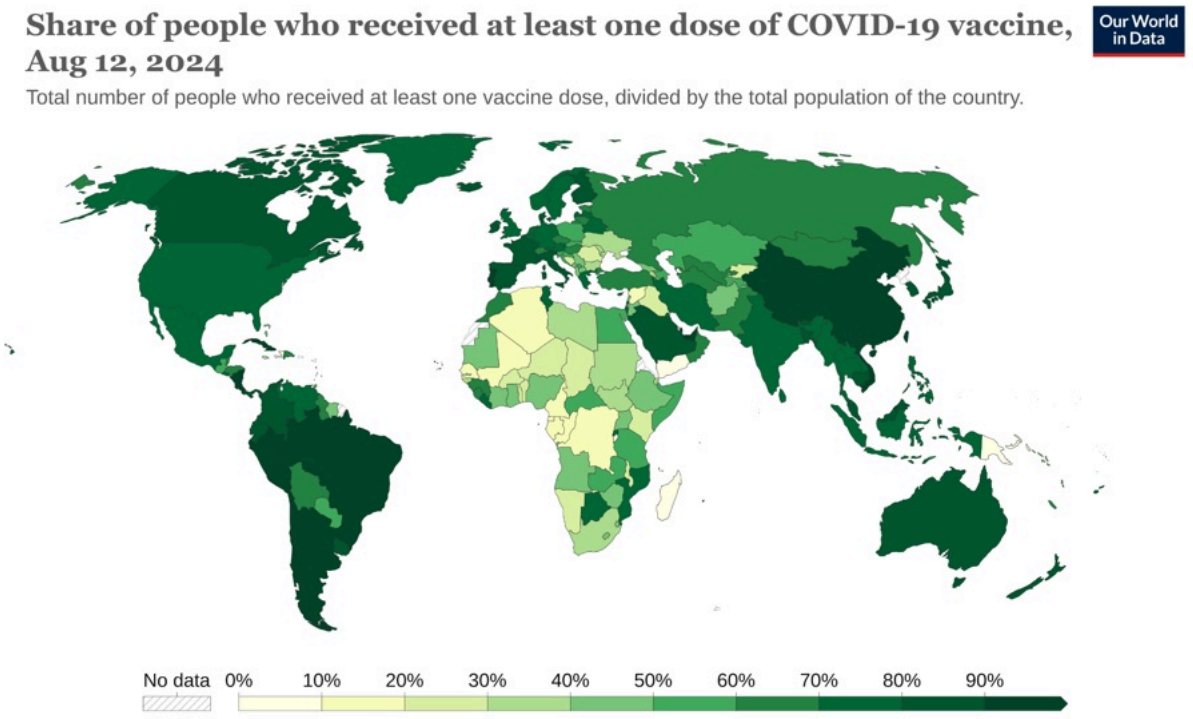
My research question is “What can we do to eliminate the medicine disparity?”,which corresponds to SDG No. 3, “Health and Welfare for All”. First, I will gather information on

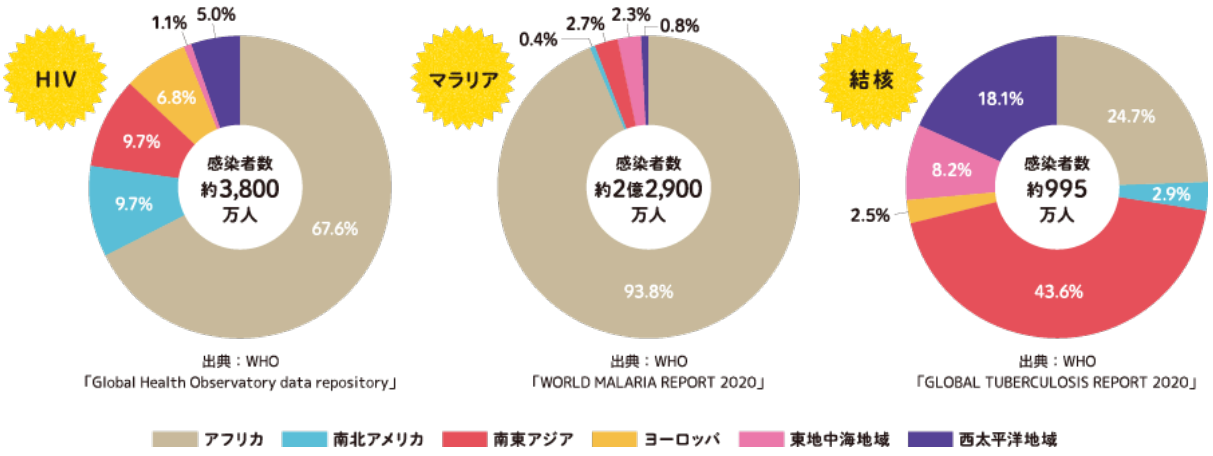
the internet about the current state of global drug disparities. Second, I will investigate the causes of the drug disparity. Finally, I will consider what is needed to solve the disparity in medicines and make a proposal.

3. Discussion and implications

First, regarding the current status of the drug gap, I examined the issue of the global pandemic of novel coronavirus infection (COVID19) that began in 2020. According to the WHO, the goal was to have at least 10% of the population in each country vaccinated against novel coronavirus infection by September 2021. The goal was achieved. However, more than 50 low-income countries, mainly in Africa, have not reached the 10% target and the African region as a whole has (a vaccination rate of only 4.4%, less than half the target. On the other hand, the high-income countries of the United Kingdom, Japan, and the United States have reached high levels of about 66%, 59%, and 56%, respectively (vaccine apartheid) in 2021. Thus, the disparity in pharmaceuticals for even a single coronavirus vaccine is serious, and this problem remains a major social issue to this day. Also, even as of August 2024, the African region has particularly low vaccination coverage. Furthermore, it was found that most of the people infected with HIV, tuberculosis, and malaria The three major infectious diseases are from the African region. With the exception of HIV, many people in Africa are infected with these diseases due to drug disparities, even though they are preventable and treatable with vaccines and other means.







Second, I examined the causes of the drug disparity. There are two main causes. First, I found that lack of infrastructure is a major factor in Africa and other low-income countries. In fact, since most of the railroads and highways in the African continent were built and maintained during the former colonial period, there is a lack of infrastructure maintenance and management, and the condition of many current infrastructures has deteriorated, with some studies showing that the road pavement ratio is 9%. These current conditions make it difficult to import medicines, and the inability to manufacture medicines domestically has led to a disparity in medicines, according to the report. In addition, the very high cost of pharmaceuticals has proven to be a sore point for low-income countries. Pharmaceuticals cost

a huge amount of money to manufacture and transport For example, it costs as much as 11 days of household income for one child in Uganda to receive treatment for malaria. Furthermore, studies have shown that the high price of medicines will probably cause more than 1.1 million deaths in the U.S. by 2030. The study found that many people in low-income countries and even in high-income countries suffer from the high prices of medicines.

4. Conclusion

I would make three recommendations in answer to the research question. I hope that these could help people suffering from the disparity of medicines.

The first is to develop Africa's transportation infrastructure. In Africa today, it is difficult to transport people from ports and other coastal areas to inland areas, so a plan called the Africa Corridor Initiative is being implemented to connect all African countries by road. Thus, I believe that the first and most important step is to develop a transportation infrastructure that allows people to move freely throughout the African region.

The second is to reduce the price of pharmaceuticals as much as possible. A company called Japan Management Co., Ltd. offers a service called pharmaceutical cost reduction consulting. I believe that if such efforts are extended to Japan and other developed countries where pharmaceutical manufacturing is thriving, the price of pharmaceuticals is reduced, even if only slightly, it will help to eliminate or reduce the problems caused by high pharmaceutical prices.

Finally, we should actively participate in fundraising and other charity activities. Since the above two points are very large-scale efforts, I thought that we could raise awareness of the pharmaceutical gap and cooperate in vaccine donations by actively participating in fundraising activities such as those conducted by UNICEF and other organizations and collecting plastic bottle caps as the most familiar activities we can do. I thought that we could help raise awareness of the pharmaceutical gap and donate vaccines.

These three points are the conclusions of the research question.My future task is to think about concrete ways to improve infrastructure and reduce the price of medicines. Then, I will verify whether it is feasible and consider whether there are other things we can do in our daily lives.

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The Bad Impact of Smartphones
~ To Improve Our Academic Ability ~

5305 Iwamatsu Yoshiki

1. Research Abstracts

The negative effects of smartphones seem to be mentioned everywhere. I have heard that the average smartphone use by Japanese junior and senior high school students is about 5 hours a day, and I became interested in whether it has a negative impact on students' studies, so I decided on this topic. The goal of this research is to reduce the time spent using smartphones to control the negative effects and thereby prevent the decline in academic performance. I conducted my research mainly using the Internet as my research method, and also referring to the book “Insta-Brain.” As a result of my research, I found that smartphone use causes tremendous damage to the brain and definitely has a negative impact on academic ability. Therefore, I believe that the use of smartphones needs to be restricted, and I propose that the best method is for parents to restrict their children's use of smartphones.

2. Research Background

Today, 16 years after Steve Jobs introduced the iPhone in 2007, about half of the world's population and 80% of people in developed countries own a smartphone. Now that smartphones have become commonplace, many problems have emerged as a result. First, according to U.S. data, the average screen time in developed countries today is a surprisingly high 7 hours a day. Also, investigating the smartphone usage time of junior and senior high school students, who are young people, I found that junior high school students spent over 4.5 hours a day on their smartphones and high school students spent 5.5 hours a day.

3. Research Purpose and Significance

The research question is “What is the impact of smartphones on academic performance and what are the solutions?” The most important reason for this research is to stop the increase in the use of smartphones and SNS, which is currently a global problem. In developed countries, smartphones have already become widespread and are a serious problem, so this research could include these countries, and developing countries where smartphones have not yet become widespread could also be the target of this research. It may rather be said that developing countries are in a more advantageous situation than developed countries. Because it is easier to take measures in advance if the use of smartphones has not yet become widespread, and we can prevent the growth of populations such as smartphone addicts before they become. In addition, now that I have heard many people say that there is a relation between smartphone use and declining academic ability, I am personally interested in whether this is true, and I am going to focus on academic ability in terms of connecting self-interests and FEWC, which is my school’s program like a comprehensive learning period. I think that this will help human development proceed more smoothly and effectively by raising academic ability worldwide.

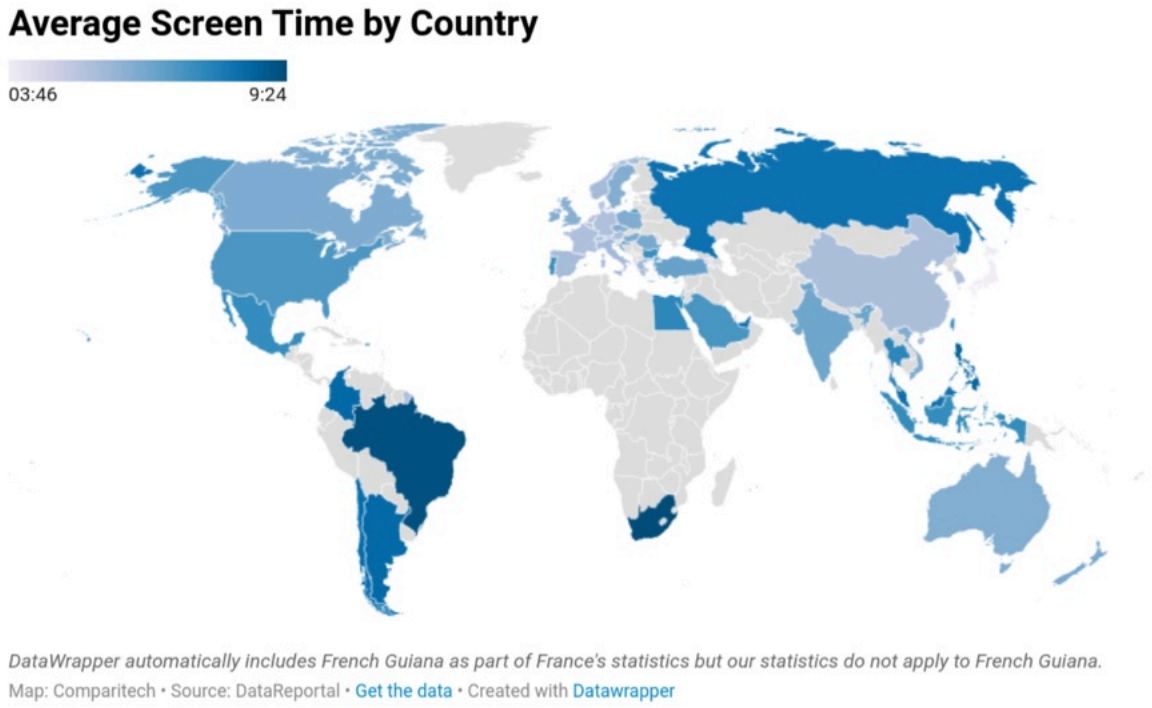
4. Research Methods

I mainly used the Internet and books to do my research. First, I reseached the current state of smartphone use in the world and then examined the impact of smartphone use. At this point, I focused on the relation with academic ability. I primarily studied the book “Insta-Brain,” authored by Swedish psychiatrist Anders Hansen, or “Sumaho Nou” in Japanese. I examined the impact of smartphones on academic performance in depth, and looked for scientific evidence to determine whether smartphones have a positive or negative effect on academic ability. Then, based on the scientific evidence, I will consider how to have a better relationship with smartphones in order to improve academic performance, and summarize the results in my own way to make a proposal.

5. Research Results and Considerations

First, looking into the global smartphone prevalence rate currently, I found that it is about 70% in the world. A closer look reveals that in developed countries such as Japan, the penetration rate is over 90%, while in developing countries such as in Africa, the rate is only 50% or 60%.

Next, I looked at the amount of time people spend on their smartphones each day. I found that according to some U.S. statistics, people spend an average of seven hours a day looking at our screens. Of that time, about half (3.5 hours) is spent on mobile devices such as smartphones, and the other half is spent on computers such as PCs. Furthermore, as a result of the increased time spent at home due to the COVID-19, the amount of time spent on smartphones has also increased dramatically.



As for the main topic, the relationship between smartphones and academic achievement, I found that there is a negative correlation between the time spent using smartphones and academic ability. Specifically, according to a study conducted by Tohoku University on 6th grade elementary school students, if a student uses a smartphone for more than 3 hours a day, no matter how much they study, their academic performance is below average. In other

words, their deviation score is below 50. Another study shows that one hour of smartphone use can result in three hours of study being wasted. Examining the effects of smartphone use on the brain, I found that smartphone use causes a delay in brain development. In particular, the results of a study of sixth-grade students in Tohoku showed that those who used smartphones almost every day for three years had almost no development in the temporal lobe, the center of memory. The volume of gray matter in the cerebrum should originally increase by about 50CC in roughly 3 years, but it seems that the volume increase becomes zero. This is especially apparent in children whose brains are prone to change, and furthermore, not only is development delayed, but the brain also becomes atrophied.

Then, I researched the principle of adverse effects on the brain. Today, there are many opportunities to watch videos, etc. on smartphones and other devices. As a result, the enormous amount of information entering the brain makes it impossible for the brain to keep up with the processing. Finally it results in a decline in brain function, which may lead to a state of “brain overwork,” and it leads to a decline in information processing capacity and other problems. In addition, “switching” can also cause poor concentration and other problems. “Switching” is a phenomenon in which ‘when you are concentrating on something, an interference comes in and you start doing something else,’ repeated over and over again, resulting in an extremely short time to concentrate on one thing.

According to the book “Insta-Brain,” smartphones are highly addictive and “smartphones are the latest drug.” Today, smartphones and computers bring us new information, and every click releases dopamine. In addition, dopamine is released more in uncertain situations where we might get new information. This is why we are tempted to pick up our phones when we hear the ringing of a chat or an e-mail, thinking that it might be an important message. Among them, social networking sites such as Facebook strongly stimulate the reward system, saying that there may be important information updates, and the desire for approval is also satisfied by responses such as “likes” to posts, which increases dependence on them.

The results of these studies show that smartphone use has a tremendous negative impact on academic achievement. Of course, there are good uses of smartphones, such as watching videos for learning, but there is no doubt that the negative effects are greater. In addition, I found it is difficult for children to limit the use of smartphones by their own will because of the high dependency on smartphones. Therefore, my proposal is to require parents to restrict their children's smartphone use. Smartphone use at an early age, when the brain is greatly affected, is very dangerous. I thought it would be difficult to restrict smartphone use by children who are still inexperienced and unable to manage themselves well. Therefore, I believe it is necessary for parents to restrict their children's use of smartphones. A specific method would be to require parental control when signing up for a smartphone contract, and to collect statistics from each local government on the status of each family, and to globally govern whether everyone is using their smartphones appropriately. As for what age to limit, I believe the best age to limit is up to high school students. College students leave their parents' homes and become adults on their own, but elementary and junior high school students are still very young and have difficulty exercising self-control. High school students are in a delicate position, but the average daily smartphone use by high school students is about 5 hours, and my own experience has led me to think that high school students need to be restricted as well. I believe that by providing appropriate restrictions and education regarding smartphone use from an early age, children will be able to use smartphones appropriately even as adults. I also believe that if parents limit and are aware of their children's smartphone usage, parents themselves will become

more aware of their own smartphone usage, and everyone will be able to use smartphones appropriately.

6. Conclusion and Future Issues

I have found that the use of smartphones definitely has a negative effect on academic performance. It is clear that it has a significant negative impact on us, not only on our academic performance, as it causes delays in brain development and even atrophy. As a solution, I propose that parents restrict their children's use of smartphones. I believe that by restricting the use of smartphones, we will prevent a decline in academic ability and produce excellent human resources who will pave the way for the future of humanity and the earth. Further challenges are how to deal with the opposition from the children that will surely arise, and the degree of restriction.

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The Way to Decrease the Number of Stray Dogs
～To change stray dogs to regional dogs～

5306 Umino Koyuki

1.Abstract

In recent years, rabies and bites have occurred due to the large number of stray dogs in the world. There are still about 15,000 stray dogs in Japan, but no measures have been taken to reduce their numbers. In addition, many stray dogs are killed even if they are sheltered in shelters. For these reasons, I decided to research about the way to decrease the number of stray dogs and change them to regional dogs. Regional dogs mentioned here are dogs that are kept in the community, as opposed to stray dogs.

To decrease the number of stray dogs, I referred to the similar measures for stray cats called TNR. It means trap, neuter, and return. We should research how many dogs there are before trapping, and protect them in shelter at first instead of returning them.

To change them into regional dogs, we should protect them by three steps: shelter, school, and region. I thought it would not be accepted easily by residents, so we should start this plan from regions like Phuket or Berlin, where I seem to be likely to accept it.

Also, future research will focus on the ways to raise funds and measures for people with allergies.

2.Introduction

I found a newspaper article about the pet boom in France during the Corona epidemic. The article said that after the corona epidemic subsided, the number of people abandoning their pets increased as they became busier.

I also researched stray dogs and found an article that said that in countries such as Thailand, there are hundreds of stray dogs in the streets and people are still dying from rabies. I had thought that this problem was unrelated in Japan because we do not see many stray dogs. However, according to the Japanese Ministry of the Environment, there were about 15,000 stray dogs in Japan in 2020. Even recently, many dogs were found abandoned in Tokushima Prefecture. Problems associated with the presence of stray dogs include the possibility of people being bitten and contracting rabies.

For this reason, I felt that although not widely known, the problems caused by stray dogs are serious, so I decided on this theme to think if there is a way to solve the problems caused by dogs.

	picked up dogs	returned dog	estimated number of stray dogs
2018	35535	11338	20471
2019	32555	10814	18441
2020	27635	9468	15471

I decided to conduct my research with the goal of helping people and dogs live safely together in society.

Therefore, I set the research question for this study as how we can prevent stray dogs from breeding and turn them into regional dogs. Regional dogs mentioned here are dogs that are kept in the community, as opposed to stray dogs.

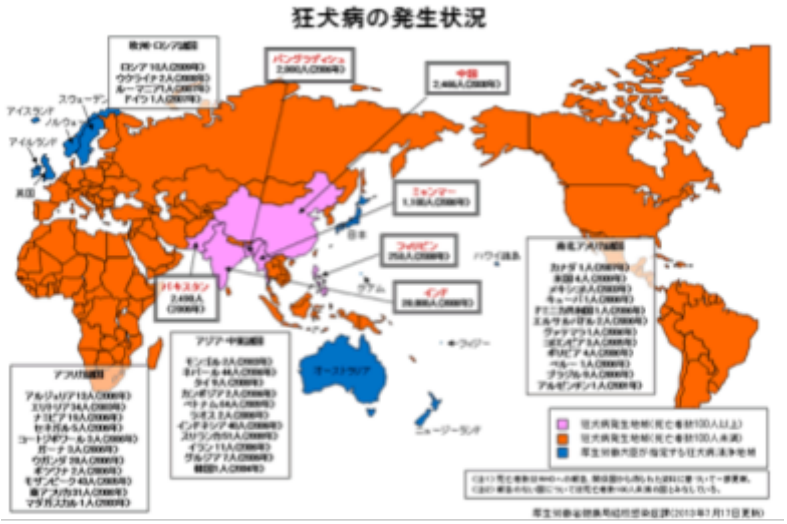


図1　狂犬病の発生状況（青以外は狂犬病が確認された地域）

Preventing the breeding of stray dogs is directly linked to reducing the number of stray dogs, and it also has benefits for people, such as reducing the risk of rabies.The good points are not only for humans, but for dogs. The benefits include cancer prevention and an increased likelihood of living longer by 23-26% for females and 14-18% for males. According to one study, spaying reduces the risk of developing mammary tumors in dogs, and even if they do develop them, they live longer than dogs that have not had the surgery:(Sorenmo, Shofer, Goldschmidt, 2008) Another benefit is that it improves the possibility of coexistence between humans and dogs by reducing aggression and softening their personalities. In Japan, big stray dogs are less likely than smaller dogs to be taken in due to their character or ages, even if they are protected, and 10% of them are killed.
Therefore, I thought that by becoming a regional dog owned by a town, rather than a dog owned by one family, the burden on people would be reduced and the lives of dogs could be cherished.

The purpose of the study is to come up with a proposal that can accomplish this research question. By doing this research, the number of stray dogs will decrease and people can coexist with these dogs. Also I noted that while the number of spayed cats is increasing and activities are spreading, there are still no regional dogs, and fewer local governments offer subsidies for spaying than for cats. This is probably due to the fact that even if stray dogs are spayed and turned into little dogs, they are at greater risk than cats of biting or scratching, and they also require more work than cats, as they must be given annual rabies shots. However, stray dogs are a greater danger to people than stray cats, so I believe that it is more important to reduce the number of stray dogs. Therefore, I decided to conduct my research based on the hypothesis that the number of regional dogs can be increased if the problem is eliminated. The relevant SDGs are number 11 and 15.

	rescued	adopted	killed
dogs	24102	12,508	540
cats	34805	15700	7407

3.Discussion and implications

First, I considered how to prevent stray dogs from breeding, referring to the “TNR” activity, which is a measure to prevent stray cats from breeding. TNR means trap, neuter, and return. First catching stray dogs and then performing surgery on them, and finally, returning to the place where they were. In the case of stray cats, they are captured one by one when people get requests from residents. However, it is not effective for stray dogs because they can breed easier and walk wider than cats. Therefore, I think it can be more effective by investigating how many dogs there are in advance and spaying at once. Also, after spaying the cats, they are cut their ear and return to the place where they were. I think we need to cut stray dogs’ ear to distinguish them from the dogs that have not spayed yet. However, if dogs are returned immediately to where they were, it will be difficult to inject all dogs each year. Also, humans and dogs might be afraid of each other. Therefore, I thought it would be best not to immediately return them to where they were.

Second, I considered what we should do after dogs’ spaying. In order to turn stray dogs into regional dogs, dogs need to be accustomed to people and the community. Also people need to be accustomed to dogs. Then, I made three steps to change them into regional dogs. The steps are shelter, school, and region.

First of all, we should train them at shelters. Dogs can get basic discipline and they can be accustomed to people. Subsequently, they should be protected at schools. They can familiarize themselves with people of various ages. I focused on schools because I thought that many schools have animals and would be more likely to accept them from an aspect of education. I also thought it met my other requirements due to its size and number of students. Finally, they should be protected by regions. The area should be one that the dogs are familiar with through previous walks to reduce the stress caused by the move. The location of the shelter depends on the community, but I think we should start by keeping the dogs tethered for safety. Also, if dogs are not tethered, there should be signage to prevent accidents.

The main activities performed at the school and in the community are walking, feeding, brushing, and injections. Bathing is recommended to reduce fleas and ticks, but some dirt can be removed by brushing if the burden is heavy. I also think that the burden is too much for one person to take care of, so it needs to be shared. Furthermore, it should be recorded so that it is not impossible to tell if an injection was given. I would like to call this project “TNP” that means trap, neuter, and protect.

The problems with this proposal are that it costs a lot of money and requires a lot of people to help. I also wondered if we could solve these problems.

First, I researched how to raise money. At a shelter in Germany called Tierheim, all costs are covered by donations and membership fees. Members can get free advice on animal care and receive calendars and other goodies in exchange for paying money. Other shelters may also receive fees for events and cafes where they can interact with the animals. In addition, some people have recently been crowdfunding to raise money for animal conservation activities. Therefore, I thought that there are many ways to raise money if one is creative. On the other hand, if many people do the same thing, the amount of money collected

for each would be less. Also, the way to reduce the amount of money needed would be to have dogs eat locally grown substandard vegetables and reduce the use of pet food.

Second, I researched how to increase the people to help. If a dog barks or bites, people may feel that the dog is a scary animal. Therefore, I think they need to be well trained. However, I believe that forcing individuals who are allergic or dislike dogs to cooperate is not a good idea.

Based on these challenges, I believe that a successful example could spread to other areas. Therefore, I considered areas that would be easy to put into practice. The first area is Phuket Island in Thailand. In that area, it is not illegal to return dogs after surgery. It is also less of a burden because it is subsidized by a conservation organization called Soydog and by the government. Also, the religion in Thailand is Buddhism, which makes it less likely that dogs will be killed. The second area is Berlin in Germany. There are facilities called dog schools in the area, which are considered easy to train dogs. In addition, laws regarding animal welfare are in place. Therefore, we thought that there people might not have much resistance that dogs walk freely in the area.

4.Conclusion

First, preventing the breeding of stray dogs can be solved by following the example of TNR for cats and performing sterilization on a wide range of dogs at once.

Second, when it comes to turning stray dogs into community dogs, I believe it will be easier for people to be adopted through three steps: shelters, schools, and the community.

Finally, we should spread it from areas where residents are likely to accept them.
I suggest the above three points.

Also, future research will focus on the ways to raise funds and measures for people with allergies.

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Fighting Hunger

Technical Support and Labor Force Participation

5307　Otake Yukito

Abstract

In recent years, one in ten people around the world is starving. The overwhelming majority of the hungry population is in developing countries, and we believe that this is due to the climatic zones in which many of them live. The climate zones tend to be tropical and arid, making it difficult to grow crops. Japan provides development cooperation, or ODA, which is Government-funded aid and cooperation to developing countries and other countries, with the aim of fostering future business partners and increasing overseas orders.

Many companies around the world are complaining of a shortage of workers, and it is a universal problem. I am continuing my research based on the initiatives being undertaken in Japan, with the hope of creating mutually beneficial initiatives between developing and developed countries.

Introduction

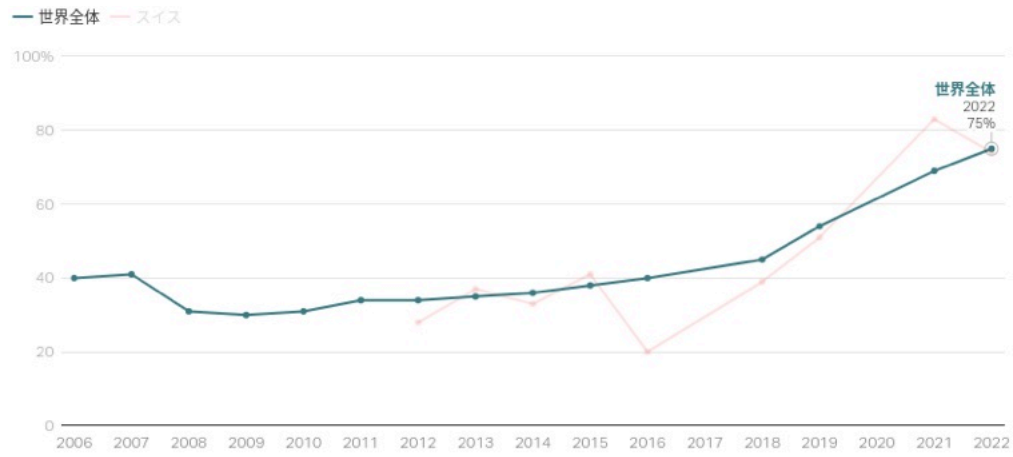
In recent years, about one in ten people in the world are said to be hungry. Not all of them are evenly distributed around the world, but they are concentrated in developing countries and countries in conflict. This is why I started this research to see if there is anything that can be done from developed countries to developing countries.

I set the research question as “What can we do between developed and developing countries to end hunger in developing countries?” with the objective of providing some assistance to developing countries from developed countries, which are thriving and free from war, so that the environment of developing countries can be brought closer to that of developed countries.

Methods are as follows. Making suggestions→Finding countries which do small versions of my suggestions→Considering the way that the suggestions become global scale. Also considering ways to resolve or mitigate any disadvantages in the plan.

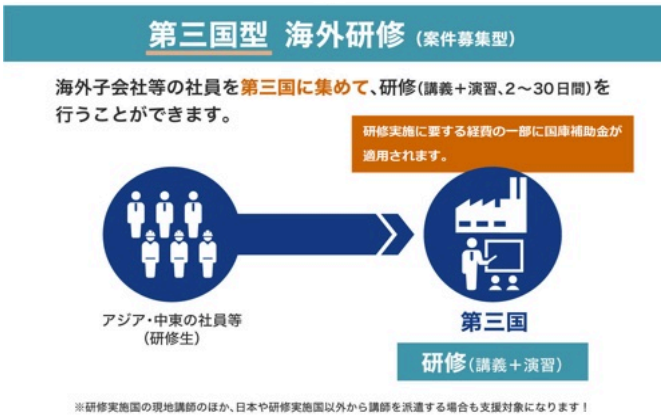
Discussion and implications

In an international survey, the annual percentage of companies reporting difficulty in hiring the necessary skills indicated that approximately 75% of companies will have a labor shortage in 2022.



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From this information,I build one suggestion. It is that Country A provides technological assistance to Country B.Country A is a developed country. They have the technology but lack the labor force. Country B is a developing country. They have a large population, but lack technology and struggle to make a living.This suggestion is worldwide technological training. Country B that has a lot of people sends people to CountryA. People in Country A give their skills to people from Country B. Also, people from Country B work at Country A for a few years and bring back technology for their own country.The technology here is mainly food breeding. Many of the regions where developing countries are distributed are in tropical or arid zones, where the characteristics of the land make it difficult to grow crops,so it is difficult for people in developing countries to get their food to live. Also, the people being sent are not from different countries, but rather several regions put together and the most competent and applicants from each block are sent. The reason for inviting the most applicants is to avoid causing ethical problems that could result in them being treated as a labor force. When I looked for a plan similar to this one, I found that Japan was bringing in people from Asia in the form of technical training, and I will sublimate this plan.



https://www.aots.jp/hrd/technology-transfer/receiving/

Then,I found one problem.This plan is a long term project and developed countries cannot help developing countries immediately,so A short-term plan was needed. These projects include a soup kitchen, building a water purification plant, and infrastructure development.

What is needed here is funding. However, it is difficult to collect money from developing countries.Thus, I came up with a system in which developed countries provide financing to developing countries. The system is [UNIDS]（Unided Nation intermediate debt system）. Under this arrangement, a developed country provides financing to a developing country and repays the financed amount 1.5 to 2 times after the developing country has achieved a certain level of affluence. In addition, in order to prevent international problems from developing countries, a clear deadline is set and the United Nations acts as an intermediary.

Conclusion

There will be two types of relationships between developed and developing countries: long-term and short-term projects.Long-term projects provide technical training and generate benefits for developed countries in the form of improved labor shortages. Also, developing countries will benefit from the acquisition of technology.
The next step is to flesh out how these projects will be administered.

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自分が先進国にいるということ

Toward Advanced Agriculture

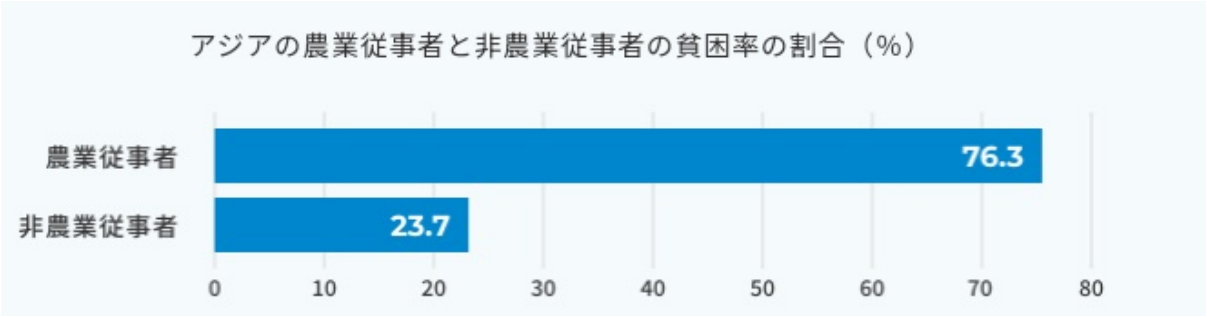
— Agriculture Food Cooperative —

5308 Soichiro Ogashiwa

1. **Research summary**

My research topic is Toward Advanced Agriculture.
First is about the significance of my research. Currently, in Southeast Asia, many people are engaged in primary industry, especially in Nepal, where more than half of the people are engaged in this industry. However, its share of GDP is not large. This means that production is not efficient.
So, I investigated what kind of efforts are being made to solve this problem. As a result, I found that there is a lot of technical assistance being offered. Therefore, this research aimed to create a mutual-help group.
Therefore, I set the research question as “how to increase agricultural production?”
To achieve this, I thought it would be a good idea to focus on Danish agriculture. Denmark is a land of low fertility and poor soil, but through agricultural education and the establishment of agricultural cooperatives, it has improved the competitiveness of its dairy products and become one of the largest producers of dairy products in Europe.
I will introduce features of this agricultural cooperative.
The first advantage of this cooperative is the access to agricultural guidance. The know-how of many producers has been accumulated in this system, so people will be able to get the right advice for their problems.
The second advantage is that the agricultural cooperative will buy the products you produce. This will allow us to spend more time with our animals and vegetables and improve the quality of the crops.
Next, to think more concretely about this proposal, I researched the current state of agriculture in Southeast Asia. I found that there are two major issues: first, the areas with irrigation and other facilities are limited so they are directly affected by the weather. Because of this reason, crops cannot be harvested consistently. Moreover, this problem will be related to the instability of farmers’ income. Second, farmers are not well educated. Second, farmers are not well educated because there is no opportunity for them to learn about agriculture. The low productivity is due to it.
Next, examine the proposal. First, I believe that introducing an agricultural cooperative system to improve agriculture in Southeast Asia would have some effect. This is because they can follow up with each other to cover the lack of agricultural knowledge, which is one of the issues of agriculture in Southeast Asia. However, I think improvements are needed to solve problems such as lack of irrigation facilities.
Based on this, make a proposal. It is to create a COMPREHENSIVE COOPERATIVE. This is a larger agricultural cooperative that includes the functions of the current agricultural cooperatives. By including a construction for building irrigation facilities, and will be able to unify all the agricultural activities that have been conducted separately before. Furthermore, by having farmers take the initiative, it will be possible to conduct construction work that is suited to the actual conditions in the field. Also, the larger scale of the project will make the business more stable and more trusted by banks and make it easier to obtain loans and other financial support.

2. **motive**



Currently, in Southeast Asia, many people are engaged in primary industry, especially in Nepal, where more than half of the people are engaged in this industry. However, its share of GDP is not large. This means that production is not efficient.

3. **Purpose of research**

I investigated what kind of efforts are being made to solve this problem. As a result, I found that there is a lot of technical assistance being offered.,For example, data analysis, pesticide spraying using drones, sharing of agricultural machinery, and supply of human resources.Therefore, this research aimed to create a mutual-help group.
I set the research question as “how to increase agricultural production?”

4. **Research method**

I will collect information using the Internet. If I can't get enough information on the internet, ask the institution that is actually doing the research by email. Also, refer to MML books.

5. **Research results**

To solve this problem, I thought it would be a good idea to focus on Danish agriculture. Denmark is a land of low fertility and poor soil, but through agricultural education and the establishment of agricultural cooperatives, it has improved the competitiveness of its dairy products and become one of the largest producers of dairy products in Europe.
I would like to introduce features of this agricultural cooperative.
The first is the access to agricultural guidance. The know-how of many producers has been accumulated in this system, so they will be able to get the right advice for their problems.
The second is that the agricultural cooperative will buy the products you produce. This will allow us to spend more time with our animals and vegetables and improve the quality of the crops.
Next, to think more concretely about this proposal, I researched the current state of agriculture in Southeast Asia. As a result, I found that there are two major issues: first, the areas with irrigation and other facilities are limited so they are directly affected by the weather, and it makes farmers' income unstable. Second, farmers are not well educated. Second, farmers are not well educated, and there is no opportunity for them to learn, so productivity remains low as a result.
Next, examine the proposal. First, I believe that introducing an agricultural cooperative

system to improve agriculture in Southeast Asia would have some effect. This is because they can follow up with each other to cover the lack of agricultural knowledge, which is one of the issues of agriculture in Southeast Asia. However, I think improvements are needed to solve problems such as lack of irrigation facilities.

6. **Conclusion/future challenges**

Based on the result, I would like to make a proposal. It is to create a COMPREHENSIVE COOPERATIVE. This is a larger agricultural cooperative that includes the functions of the current agricultural cooperatives. By including a construction for building irrigation facilities, and will be able to unify all the agricultural activities that have been conducted separately before. Furthermore, by having farmers take the initiative, it will be possible to conduct construction work that is suited to the actual conditions in the field. Also, the larger scale of the project will make the business more stable and more trusted by banks and make it easier to obtain loans and other financial support.

Finally, write about the future and problems. In the future, think more concretely about comprehensive cooperatives. I would also like to learn more about the local culture and consider more suitable forms of organization.

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パーム油の小規模農家と守るボルネオの森

Prevention of Lifestyle-related Diseases by Oral Health

~How to Keep oral health with less water~

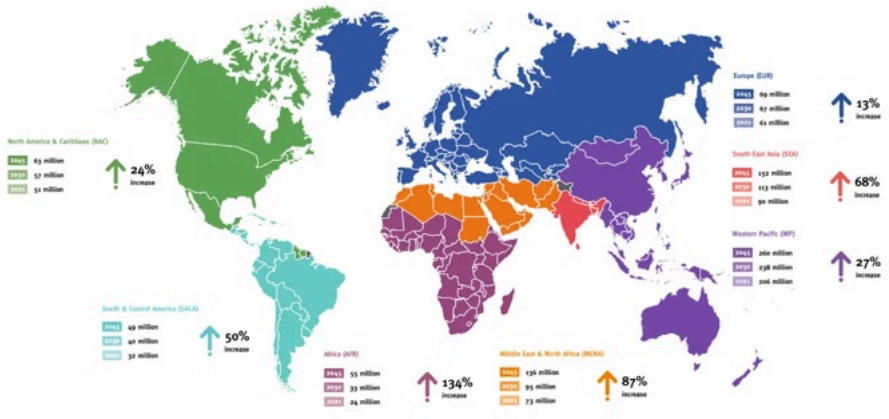
5309 Katsuyama Maiko

Abstract

The number of people who have lifestyle-related diseases, especially diabetes, is rapidly increasing in Southeast Asia. This disease not only leads to other illnesses like strokes but also hinders economic development and lowers the quality of life.In my study, I researched “How should people in developing countries keep their oral health?”It is said that keeping oral health is related to diabetes. People in developing countries often need to protect their teeth by themselves because some doctors there do not know what is the best treatment for each patient's teeth. Therefore,I consider that chewing Xylitol gum is one of the best ways to maintain oral health and prevent diabetes because they do not need water and time to clean teeth. It is necessary to put eating the gum into their custom, but 100% Xylitol gum is too expensive to have after every meal. Therefore, I am going to consider the way to provide the gums cheaper.

Introduction

These days, the lifestyle and social environment in developing countries are changing rapidly. In particular, the number of people with diabetes is increasing in Southeast Asia. According to the International Diabetes Federation, it is estimated that by 2045, 700 million people will have the disease worldwide. Diabetes is likely not only to become factors of various kinds of other diseases but also hinders economic development. There are two types of diabetes but I chose to focus on type 2 diabetes in my research because 90% of all diabetes is type 2 diabetes. In addition, the condition can be delayed or prevented in many cases. My research question is “How should people in developing countries maintain their oral health?” It is well-known that oral health is deeply related to diabetes, so it is one of the effective ways to prevent diabetes. Moreover, some developing countries face a shortage of doctors, thus it is important for people who live in such countries to take dental self-care before seeking medical attention.



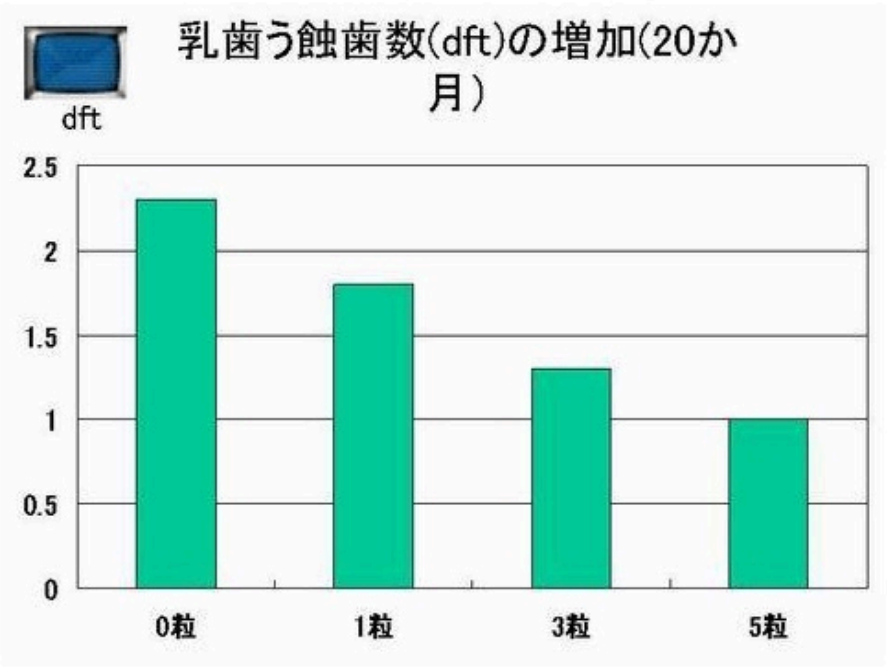
Discussion＆Implication

First of all, I researched why we can prevent diabetes by keeping oral health. The Japanese Ministry of Health, Labour and Welfare states that periodontal disease is one of the complications of diabetes. When patients who have both diabetes and periodontal disease treat either, the other disease showed the sign of being better, hence periodontal disease and diabetes are said to be related diseases.It mentioned the relation between diabetes and oral diseases such as candidiasis, taste and other neurosensory disorders, dental caries, and periodontal disease so that the factor of type 2 diabetes that patients take high calorie food contained much carbohydrate are similer to some oral diabetes.Based on this information, I estimated that oral health helps to stop the increase of lifestyle-related diseases. Also, oral health is closely tied to quality of life because chewing and speaking are essential for enjoying daily life. It is called OHRQol (oral health related quality of life).(Oral Health-related Quality of Life: What, Why, How,and Future Implications)

I wondered why the number of people with diabetes is increasing in developing countries. The reason is that standards of living in developing countries are improving these days. They become able to eat foods containing a lot of carbohydrates, lipids and sugar. As a result, the risk of oral diseases is inclining, then they become oral diseases. However, there is no good medical system, so they take bad treatment like only pulling out. Their oral health will be worse than before. It is important for them to keep their teeth clean before getting diseases.

In Singapore,I learned it is important for innovation in medicine to find ideas around us,and take actions so that we make a difference.We should focus on ”Social contribution”. My hypothesis is that Xylitol gum is one of the good ways to prevent oral diseases. Xylitol gum is used especially in Sweden to protect teeth. The country is known as the Kingdom of dental care because the number of people who lost their teeth is very small. They eat Xylitol gum after eating and keep their teeth clean.One reason is that it is very easy to use. It is important for oral health to clean teeth as soon as possible. For another, they do not need to use water. It may be necessary to care for their teeth with less water. WHO mentions that in South Asia, where oral diseases are on the rise, the water infrastructure is underdeveloped. It is hard to access water soon after finishing eating in order to brush their teeth.Therefore, gum is a good way for them. Moreover,the effectiveness is recognized.This graph shows how

much the number of teeth decayed will increase, chewing . According to the graph below,the more Xylitol gum people eat in a day, the more you reduce the risk of oral diseases.However, there is one problem which I have to solve. 100% Xylitol gum is too expensive to take every day because their income has not been high yet. It costs ¥1,026 for 1 bottle / 1 month.



Conclusion

The most important thing is to make oral care their daily habits,but if it costs high,they would not want to keep doing it.Gum is not great for people in developing countries because it uses a lot of money. I need to think about the cost for oral care.In conclusion,it is important to supply oral care with less water and low cost in order to make it their daily habits.I should suggest the way they can put it into their lifecycle.

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Oral Health-related Quality of Life: What, Why, How, and Future Implications

Ensuring Quality Education Worldwide

～Utilizing Origami～

— Education　Origami　Developing Country —

17th gen　5310　Kogure Haruki

１．Abstract

There are various challenges regarding children's education around the world, but this time, the focus will be on improving the "quality of education." Origami is said to foster critical thinking, imagination, spatial awareness, and communication skills. This research will explore whether origami is effective in ensuring and enhancing the quality of education. Furthermore, it will examine examples of origami being introduced in educational settings and investigate its potential for implementation in developing countries.

２．Background of the Research

In SDG Goal 4, "Quality Education for All" is set as a goal, highlighting the fact that many children around the world are unable to access education. According to UNESCO (2021), about 67 million children cannot attend elementary school, approximately 57 million cannot attend middle school, and around 121 million are unable to attend high school. Additionally, in Africa, the quality of education is a concern because adults educating children as teachers may not always have sufficient knowledge or skills.

I thought that improving these situations and fostering more people who can play active roles globally might help solve the many issues the world is facing. This time, I will focus my research on the "quality of education."

In this context, I wondered if origami, one of Japan's traditional pastimes, could be utilized. Origami is said to develop critical thinking, imagination, spatial awareness, and communication skills. Furthermore, using origami could also help spread Japanese culture.

３．Purpose and Meaning of the Research

In this study, I aim to clarify "what is needed to utilize origami in educational settings." I believe that incorporating origami, which has educational benefits as mentioned earlier, can foster the critical thinking skills currently in demand and contribute to improving the quality of education.

I will examine actual examples of how origami is used in educational settings, as well as the efforts and effects seen in those cases. If I find any shortcomings for its introduction in developing countries, I will consider possible solutions to address them.

４．Method of the Research

To understand what is needed to use origami in educational settings, I will conduct the following research on the Internet.

Investigation Ⅰ　I will research what is needed to ensure and improve the quality of education and examine the effectiveness of origami in achieving this.

Investigation Ⅱ　I will research whether there are examples of origami being used in educational settings and find out what specific activities are done there and what effects are seen.

Investigatoin Ⅲ　To introduce origami in developing countries, I will study the differences between the educational settings in Investigation Ⅱ and those in the target country.

５．Results of the Research and Consideration

▸ Results of the Research

▸ About Investigation Ⅰ　（ｉ）What is necessary to ensure and improve the quality of education?

This study was conducted with reference to “What is International Quality Assurance in Education?” by the Osaka University Institute for Future Initiatives (大阪大学未来戦略機構　「国際的な教育の質保証とはなにか」). This paper introduces the internationally expanding efforts to enhance and ensure the quality of education, which have emerged in response to the massification of higher education and globalization, particularly in university education and labor markets, using examples from initiatives in Europe.

The following is a passage explaining “competence,” an indicator of educational quality in Europe, quoted from “What is International Quality Assurance in Education?” (「国際的な教育の質保証とはなにか」)

……まず，欧州における質保証の仕組みを特徴付ける「コンピテンス」について紹介する。……

『欧州教育制度のチューニング』[1]によれば，コンピテンスとは，知識，理解，技能，能力

が有機的に結合したものであり，教育プログラムを履修した総合的な成果として学習者が獲得するものとされている。コンピテンスを導入することの意義は，教員主体の「何を教えるか」を決めるインプット型から，学生主体に「何を学ぶか」を定めるアウトプット型のカリキュラムを構築することにある。また，コンピテンスには専門分野に関わる知識だけでなく，全ての学生が獲得すべき能力，いわゆる汎用性の高いスキルも含まれる。すなわち，近年，大学は社会から学生の研究能力の向上だけでなく，将来の雇用機会の拡大につながるようなスキルを習得させることが期待されるようになっているが，そのような学習プログラムの構築を目指す上で，専門性と汎用性を兼ね備えた指標であるコンピテンスは有効である。
……

In Europe, the Tuning Program has been implemented to ensure the quality of education while respecting the educational traditions of each country. This program aims to secure commonality in higher education based on competences and the credit transfer system. Competences are divided into “generic competences” and “subject-specific competences.” In the European Tuning Program, “generic competences” are highly emphasized as they are crucial for students’ careers after graduation. The definition of “generic competences” is described as follows.

一般的コンピテンス
分析・統合する能力，自主的に学習する能力，リーダーシップ，協力・コミュニケーション能力，一般的な知識などを指し，特定の専門分野だけでなく，様々な状況下で役立つ資質のこと

大阪大学未来戦略機構　「国際的な教育の質保証とはなにか」

▸ About Investigation I　（ii）Education effect of origami

・Playing while thinking about what the next shape or the final form will look like, or what colors to combine, helps develop imagination.

・By looking at the complex diagrams in an origami book and figuring out how to fold to achieve the final shape while keeping the whole picture in mind, critical thinking skills can be developed.

・By repeatedly creating three-dimensional objects from flat paper, one can learn to connect two-dimensional and three-dimensional shapes, which helps develop spatial awareness.

・Origami, which can be enjoyed by people of all ages, provides opportunities for communication and helps develop communication skills.

So far, I have researched the Tuning Project, an initiative aimed at ensuring the quality of education in Europe, and the competencies emphasized within it. This has shown that critical thinking and communication skills are essential for ensuring the quality of education globally. Since playing with origami can develop critical thinking, imagination, spatial awareness, and communication skills, introducing origami into education can be considered an effective method for ensuring the quality of education.

▸ About **Investigation Ⅱ**

From the Kaminokawa Town Official Website:

ORIGAMI's Hometown Kaminokawa Project

1. Purpose of the Project

Kamisukawa Town is the birthplace of Akira Yoshizawa, a global pioneer of creative origami, and his family has kindly donated numerous works to the town.

As a step towards realizing the town's 7th Comprehensive Plan, this project aims to make effective use of these collections, deepen understanding of the achievements of this great local pioneer, and promote the development of Kamisukawa while passing on the world-class Japanese culture of ORIGAMI into the future.

2. School education policy

（1）Understanding of Akira Yoshizawa's great achievements

（2）Understanding of the origami culture

（3）Preserving origami culture for the future

（4）Raising awareness of our town as the "hometown of ORIGAMI"

3. Specific initiatives

（1）Promoting understanding of Akira Yoshizawa

→ Positioning in annual teaching plan (pdf 287 KB)

（2）Spreading and preserving ORIGAMI culture

→ Participating in school work exhibitions, ORIGAMI festivals, etc. (pdf 295 KB)

（3）Promoting social contribution activities using ORIGAMI

→ Utilizing integrated learning time (pdf 368 KB)

From Positioning in annual teaching plan (pdf 287 KB):

授業の中で折紙を活用することで，先生方からは子供の「集中力が高まった」「想像

力が広がった」などのお話をいただいているところです。中には，一人でジオラマを作ったり，創作折り紙を自分で開発するなど「色彩感覚豊か」に「空間を把握する力」に広がりを見せていることが感じられます。

It has been observed that over the course of six years of systematically studying origami and deepening knowledge and understanding, participants have experienced an increase in imagination, concentration, and spatial awareness.

▸ About <u>InvestigationⅢ</u>

Introducing origami into education requires a certain level of infrastructure and facilities. If these are not in place, preparations must begin with building them. Therefore, I searched for a country that meets two conditions: (1) having relatively well-developed public infrastructure and (2) having room for improvement in the quality of education. The country I identified was Mexico.

ⅰ）The Progress of Mexico

・GDP*1：12th in the world
・1992　The North American Free Trade Agreement (NAFTA) was signed.
・1993　Joined the Asia-Pacific Economic Cooperation (APEC).
・1994　Joined the Organisation for Economic Co-operation and Development (OECD).

＊1　The nominal GDP forecast in US dollars, based on the World Economic Outlook released by the IMF in October 2023.

Mexico's GDP has been rising since around 1990 to 2000, and according to the nominal GDP forecast in US dollars from the IMF World Economic Outlook released in October 2023, it ranks 12th in the world. Additionally, Mexico joined the OECD, often referred to as the "club of advanced economies," in 1994, marking steady progress toward becoming a developed country. Based on this, it can be concluded that public infrastructure development in Mexico is well-advanced. ―― (1)

ⅱ）Education in Mexico

〈 DATA 〉

・The OECD Education Ranking.*2　40th ／ 41st place
・OECD Learning Achievement*3 Ranking.*4　37th ／ 39th place

＊2　As of June 2022, the data covers 41 countries: 38 OECD member countries plus Russia, Brazil, and South Africa.

＊3　The results of the OECD Programme for International Student Assessment (PISA) measure the "reading literacy," "mathematical literacy," and "scientific literacy" of 15-year-olds.

＊4　As of June 2022.

〈 Voices of Those Who Visited 〉 Ⅰ

- Teachers are late or absent.
- Teachers dismissed for unexcused absences file lawsuits against the school.
- Even for extracurricular activities, it is the teachers, not the students, who are late for the meeting time.
- Teachers tolerate students eating and drinking during class and cannot reprimand them because they themselves eat and drink in class.
- During class, they are exchanging messages on their phone that are unrelated to the lesson.
- Demanding bribes from parents to falsify student report cards.
- In the kindergarten, a teacher has long nails and wears nail polish, prioritizing personal hobbies and fashion over the safety of the children. There is a fundamental lack of awareness about safety.

The above is from SOCIEDAD INTERCULTUAL「メキシコ人を理解する　−現地教育事情を通して−（２）」.

〈 Voices of Those Who Visited 〉 Ⅱ

- The students are diligently focusing on their studies. When there are visitors in the classroom during lessons, at any middle school, the students pause their lessons, stand up, and greet the visitors as a sign of respect.

  While introducing it in this way, the following description was also noted:

  Regarding teaching methods and lesson content, there are many instances of repetitive tasks, such as one-sided instruction by the teacher and copying from textbooks into notebooks. Compared to the education standards in public schools in Japan, there is still considerable room for improvement.

The above is from 「メキシコの学校訪問レポート」　岡山市立吉備中学校　教諭　藤枝茂雄.

While there are extreme cases in the 〈 Voices of Those Who Visited 〉 and the reliability is unclear, it can be inferred from the 〈 DATA 〉 that in terms of education, Mexico is still a country with remaining challenges.　—— (2)

Based on the points ⅰ) and ⅱ) above, Mexico was focused on as a country where (1) the development of public facilities seems to be progressing, but (2) the quality of education is still not very high.

▸ Consideration

Amid a global movement to ensure the quality of education, skills such as the ability to analyze and integrate information, self-directed learning, leadership, and cooperation and communication are becoming increasingly important. These skills can be effectively developed through group origami activities. Additionally, there are already examples of origami being introduced in educational settings, and they appear to show certain positive effects.

As Mexico progresses toward becoming a developed country and increases its influence globally, it is believed that public facilities, including educational infrastructure, have been steadily improved. However, challenges remain in terms of educational quality. Introducing origami into the education system could potentially contribute to improving the quality of education in Mexico.

6. Conclusion and Challenges for the future

▸ Conclusion

While considering cultural differences, promote the introduction of origami in Mexico and expand origami education worldwide.

▸ Challenges for the future

Origami is a foreign cultural element for many countries, and it is uncertain whether it can be easily incorporated into their educational systems.

As globalization progresses, I feel that the form of education has changed, especially after the COVID-19 pandemic. In such circumstances, there are various issues related to education worldwide. While this research focused on the quality of education, there are regions where addressing issues such as infrastructure development, hunger, poverty, and conflicts is a prerequisite.

I aim to take a broader perspective and work towards improving the global standard of education.

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Digital device and literacy rate

Education by digital device

5311 Kobayashi Mikoto

Abstract

1.Intoroduction

◯The background and objectives in this research

In last year's research, I found an article about a project to assist workers in Kenya with digital devices and systems.There is an article from the United Nations that says the widespread use of digital devices will go a long way toward solving world poverty and achieving the SDGs.These made me consider connecting my previous research on teleworking to remote teaching in Africa. In addition, it is essential to operate information and communication equipment in order to conduct remote classes.These were the research questions and objectives of this study.

RQ:How can we increase the literacy rate along with the diffusion rate of information and communication equipment, etc.?

Objectives:To increase the General education literacy rate and to make it easy for Africans to use digital devices.

◯Prior study

My main intention was to find a previous study that related literacy rates to the diffusion of information and communication devices.I found a study conducted in Uganda that experimented with remote learning applications.

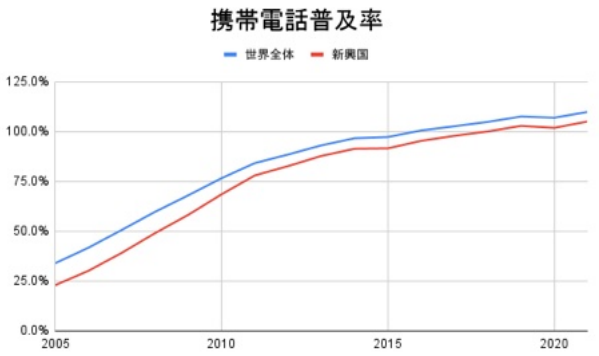
“Evaluation of a system to mediate learning applications from a distance for developing countries.”○Rintaro Doi, Keigo Yabuki, Dominic Bagenda, Kaoru Kaku (Future University Hakodate)

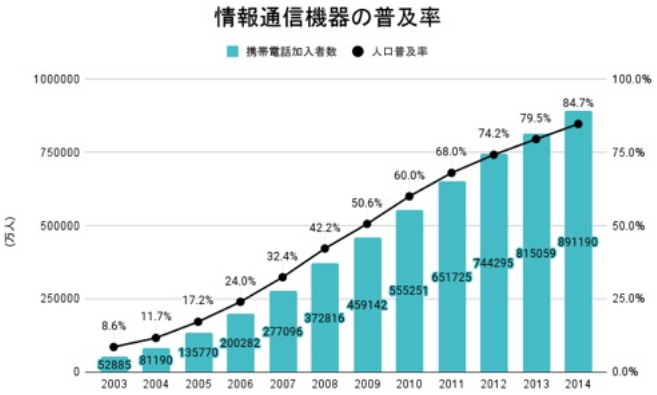
In this study, the research on the items related to the creation of a learning application about the water cycle, the results of the study showed that putting the creator's face on the application and displaying the results for long-term learning would solve the problems of the previous studies conducted at the same university: “long-term introduction” and “inability to observe how the application is being used”. The results showed that this study could solve the problems of previous research conducted at the university: “long-term adoption” and “poor observation of application use.If we do remote education, use praise function and the ability to record results had an impact on academic performance and mental state. It connects to studying easy and making a custom in Africa. Another study about the relationship between literacy rate and information device penetration from the Japanese government showed the fact, that In the world, the higher literacy rate, the higher digital penetration rates.

◯How to research and validate

Using the Internet, I will collect data, which shows the digital device diffusion rate and actual policies implemented in each country. I thought it was difficult to make comparisons with other countries, so I picked a country with relatively high digital device penetration and literacy rates within Africa and researched its educational policies.Other articles that seemed relevant were examined on a case-by-case basis.

2.Discussion and implications





◯About the penetration rate of information and communication equipment
According to the International Telecommunication Union, there is not much difference in cell phone penetration rates between emerging countries and the global average. However, as the graph shows, the penetration rate exceeds 100% when one person owns two or more smartphones, which suggests that the penetration rate may vary significantly depending on the level of development within different regions of Africa.According to a graph on the penetration of information and communication devices in Africa based on Japanese government data, the population penetration rate increased from 8.6% to 84.7% from 2003 to 2014, and the number of cell phone subscribers itself has also increased. These indicate that cell phone penetration is increasing throughout the world. In particular, Africa has seen a steady increase over the past few years. This can be attributed to the “mobile revolution” that is currently taking place in Africa.
◯Literacy Rate
Regarding the increase in literacy rates, which was the objective of this survey, the current literacy rate in Africa is approximately 50~60% except in the area around the Republic of South Africa. However, in sub-Saharan Africa, the Congo, and other regions, there are many areas where the literacy rate is below 50% or 35%.

3.Conclusion

◯Suggestion
・Target.
People in Africa excluding conflict areas (any age)
・About the business
To enable the use of information and communication devices by pulling them from countries where radio waves are available to other countries. There, inexpensive smartphones or tablets

are lent out and used for learning with designated applications. Outsource these projects to companies with large amounts of capital and the ability to invest heavily in new projects. The company would pay for the server, application development, etc., and prepare a high quality product, and then generate revenue by adding advertisements, premiums, and other features to the application. The goal is for one person to complete the curriculum in one year. The language of instruction will be English, and the subject matter is yet to be determined.
In conclusion, these proposals will not necessarily increase the literacy rate in all countries, but they will force an increase in the penetration of information and communication devices, and with the literacy rate, they will be able to protect people's lives in the form of employment and keep them out of poverty.

◯Future Research Issues

There are issues to be resolved both in terms of learning and technical skills.

(1) Regarding educational opportunities

In order to raise the literacy rate, it is essential for students to be able to see a screen. Therefore, it is necessary to start by raising the literacy rate in countries that are somewhat developed. (The children must not be sent to work long distances or for long hours.) Or, a pseudo-educational organization must be set up in which leaders gather people together and have them take classes all at once in their spare time. This is the most difficult issue in this study.

(2) Period

Based on the results of previous studies, it is important to record the results over a long period of time, and we will use the return institution as the place where the results are finally returned when they reach 100%. Since the level of proficiency varies from person to person, a method should be devised to take this into consideration.

(3) About the application

The basic idea is to have the students learn the language they use in their daily lives, but since ethnic languages are difficult to understand, only well-known African languages and English will be used. The most important priority is to create an application that displays the results of previous studies, motivates students to continue learning, and gives them a sense of the meaning of education and the significance of receiving it.
I would like to consider technologies and applications that can solve these problems.

4.Reference

A Circle of Hearts Connected by Letters

5312 Komiyama Haru

Abstract

I started this research because I am interested in education-related matters and wanted to explore educational issues. The issue I focused on was the low literacy rate in Africa. I examined what practices in such regions could help increase literacy rates. I gathered information mainly through articles and the Internet. I researched countries that have implemented policies to improve literacy in the past. The policy I focused on this time was Bookstart in the United Kingdom. Bookstart is a program where children are given a set of picture books and a fun experience of opening a book at the health checkup of a 0-year-old child. Through this policy, the U.K. has improved its literacy rate. Therefore, I believe that the low literacy rate in Africa can be improved if Bookstart is implemented. In my future research, I would like to explore the challenges of actually implementing this policy, financial solutions, etc., and I would also like to consider activities such as distributing puzzles, etc., in addition to the picture books.

1. Introduction

I began this research because I wanted to study educational issues, which interested me the most among several potential research topics. Among these issues, I focused on the low literacy rate in Africa. According to State of the World's Children 2021, the global average literacy rate for 15-24 year olds is 91% for males and 93% for females. African countries are far below the average, with the lowest rates at 48% for males and 29% for females. An investigation into the reasons for these large differences revealed the existence of a negative cycle. The negative cycle is: (1) many children cannot go to school (because they have to work), (2) they grow up unable to read and write, (3) their income is unstable, (4) children are born in this environment, and (5) the cycle goes back to (1). I was thinking of other ideas because it is practically impossible to provide financial support, and I thought that habits that can be developed in young children can lead to improvement of this problem, so I came up with the research question, “What habits are needed to improve literacy rates in areas where the learning environment is not well-developed? ”

2. Discussion and implications

To begin, I examined practices that could be implemented in small children. I looked at policies in other countries, considering that the best policies were those that had been implemented in the past under similar circumstances and had been successful. I focused on a policy called Bookstart in the United Kingdom. Bookstart is a program where children receive a set of picture books and enjoy opening them during health checkups for 0-year-olds and other occasions. Bookstart began in 1992 in Birmingham, England. At the time, the United Kingdom was rapidly becoming a multi-ethnic society, and Birmingham, the second

largest city in the country, had a large number of immigrants, and the declining literacy rate was becoming a social problem. In addition, the divorce rate was rising, and measures were needed to support various types of parents, such as parents raising children alone and young teenage couples. Against this backdrop, Bookstart was born with the aim of providing all babies with an equal opportunity to encounter language and letters, regardless of ethnic or socioeconomic differences or personal interests. This policy succeeded in improving literacy rates in the United Kingdom. In addition, a study written in the article “Effects of Bookstart Experience on Children's Lifestyle, Reading Environment, etc.” found that the Bookstart experience in infancy increased reading habits and decreased gaming habits in the first grade of elementary school. The study also showed that the experience of book-starting with parents and children in infancy increased the frequency of library use by parents (Figure 8) and the frequency of reading to children by parents (Figure 11). The effect that I focused on the most was the last one, the effect of increasing the frequency of parents reading to their children. This effect is the “habit” that is the pillar of my research. If reading to children becomes a habit, it will certainly lead to an increase in the literacy rate because children will be exposed to the written word from an early age. In addition, the results of increasing the habit of reading and decreasing the habit of playing games also show that the positive impact of Bookstart is significant. Based on the above, I propose that Bookstart improve literacy rates in Africa.

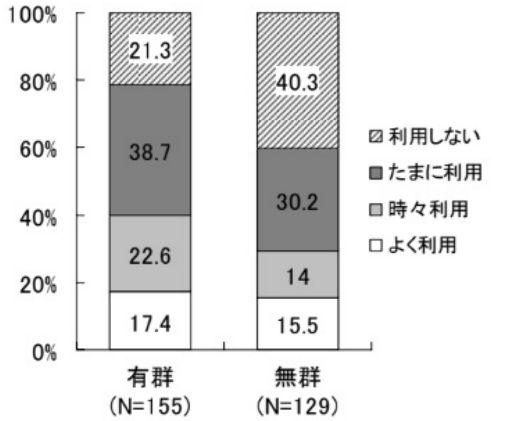


図8　保護者の図書館利用の頻度のブックスタート有無による比較

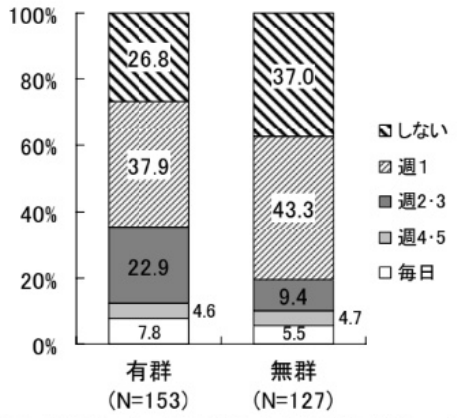


図11　保護者による読み聞かせの週当たり頻度のブックスタート有無による比較

3. Conclusion

As discussed in the Results and Discussion of the study, we believed that book-starting should be used to improve literacy in Africa. The first issue is funding. Of course, the policy would cost a great deal of money. However, African countries, many of which are developing countries, cannot afford such a large amount of money. Therefore, we looked into the countries where book-starting is taking place in today's society, and it became clear that it is also taking place in Japan. The cost of Bookstart currently taking place in Japan (NPO) is supplemented by the use of tax payments from hometowns, the use of financial resources from social welfare councils, grants from this prefecture, and subsidies from other sources.

Since such money is not available in Africa, I have come up with my own ideas: First is the case where the national government implements a policy of book-starting. In such a case, I thought of a way for the government to borrow money. This means that the government spends money for young people who have a future. In the second case, the government may provide funds from taxpayers' money, but only if there is still a budget left over. The second issue is the picture book itself. A picture book must be a picture book that can be read in every culture. The third issue is language. There are as many as 2,000 languages spoken in Africa. Therefore, when narrowing down the languages of picture books, it is necessary to unify them with English and French, which are commonly used as second languages in Africa. However, if we order books in English and French, it is a tough line to draw if the adults around the African children can read them. In this case, an environment in which adults are taught simple English would also be necessary. However, this would also create various financial and other problems. My future task is to consider solutions to these three problems from various perspectives, to further improve the completeness of Bookstart, and to consider activities to distribute not only books but also puzzles and other items together.

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Effects of Bookstart on Children’s Lifestyle and Reading Environment

Bioethics and Cause of Death Investigation
Sharing of Postmortem Imaging Techniques

5313 Kanon Saito

Abstract

The goal of this research is to consider the recognition for autosies with bioethics. In this study, I sought the answer for my research question: “What should be done to promote investigation of cause of death even in countries where are not open to autopsies because of bioethics?”. With 4 principles of bioethics, I made hypothesis① and hypothesis②. Hypothesis① is “From the viewpoint of respect for autonomy, it can be considered that the issue is not to reflect the willpower of the deceased the postmortem investigation of the cause of death. Therefore, the indication of intention to determine the cause of death after death is effective in resolving this issue.” Hypothesis② is “From the viewpoint of non-maleficence, it can be considered that the issue is the perception that postmortem autopsies for the purpose of determining the cause of death are harmful is deeply rooted. Therefore, it is effective to expand methods such as postmortem imaging diagnosis that do not hurt in order to resolve the issue.” As a result of our discussion, we concluded that it would be difficult and impractical to make recommendations that would significantly change the current situation for both hypotheses① and ②, because further in-depth research is needed on the combination of personal factors such as individual will and social factors such as laws, and the scope of the research is limited to Japan. Therefore, we concluded that “It is necessary to discuss postmortem imaging and other technologies that are less invasive to the body from the perspective of the bereaved family and the wishes of the deceased in a global forum for technology and knowledge sharing. I decided to leave it at that. However, respect for the wishes of the individual and the bereaved family and non-invasive cause of death are important factors in demonstrating to the public the need for cause of death determination, and I hope that active discussions will be held in the future. I intend to continue my investigation.

1.Introduction

Cause of death investigation means to clarify the cause, estimated date and time, and the place of death using an autopsy and postmortem imaging. This investigation is very important for public health, the protection of the rights of the dead, preventing missed crimes and false charges, and handling objective evidence in court cases. However, there is a gap of autopsy rates for the investigation in the world. (Study Group on the System for Investigating the Cause of Death, which Contributes to the Prevention of Overlooking Criminal Deaths, 2011)

I thought it is because people in some countries and areas have negative impressions for cause of death investigation from thinking of bioethics. So, I researched my anticipation with 3 parts of surveys.

The goal of this research is to consider the recognition for autopsies with bioethics. In this study, I sought the answer for my research question: “What should be done to promote

investigation of cause of death even in countries that are not open to autopsies because of bioethics?”

海外調査対象国における法医解剖等の現状

	目　的 （副次的効果）	異状死体の解剖率	費用負担	解剖決定権
アメリカ合衆国 （ワシントン州・キング郡）	死因究明 （公衆衛生）	12.5%	郡	ＭＥ
英　国 （ｲﾝｸﾞﾗﾝﾄﾞ＆ｳｪｰﾙｽﾞ）	死因究明 （公共安全） （公衆衛生）	45.8%	地方自治体	コロナー
ドイツ （ﾊﾝﾌﾞﾙｸ州）	犯罪死見逃し防止 （公衆衛生）	19.3%	国・州	裁判官
スウェーデン	司法手続 （犯罪死見逃し防止）	89.1%	国	警察署長 （検察官） （裁判官）
フィンランド	死因究明 （犯罪死見逃し防止） （公衆衛生）	78.2% （ﾍﾙｼﾝｷ市）	国	警察署長
オーストラリア （ﾋﾞｸﾄﾘｱ州）	死因究明 （公共安全） （公衆衛生）	53.5%	州	コロナー
（参考）日本	司法手続 ---------- 公衆衛生	11.2%	国 ---------- 地方自治体	裁判官 ---------- 監察医等

2.Discussion and implications

Survey①

First of all, I set the 4 principles of bioethics as the standard of bioethics in my research because bioethics is difficult to define and has a lot of aspects.

The principles are proposed by Tom Lamar Beauchamp and James Franklin Childress.

1. principle of respect for autonomy

2. principle of non-maleficence
3. principle of beneficence
4. principle of justice

From these elements, I guessed the principle of respect for autonomy and of non-maleficence connect my research question strongly, so I made 2 hypotheses from them.

Hypothesis① : From the viewpoint of respect for autonomy, it can be considered that the issue is not to reflect the willpower of the deceased in the postmortem investigation of the cause of death. Therefore, the indication of intention to determine the cause of death after death is effective in resolving this issue.

Hypothesis② : From the viewpoint of non-maleficence, it can be considered that the issue is the understanding that post mortem autopsies for the purpose of determining the cause of death are harmful is deeply rooted. Therefore, it is effective to expand methods such as postmortem imaging diagnosis that do not hurt in order to resolve the issue.

Survey②

First, I researched the law to mention the investigation under Japan. In Japan, there is a rule called autopsy regulations.

Article 6
In conducting an autopsy, the following matters shall be closely examined
(i) Name, age, residence and sex of the mutilated body
(ii) Location, posture, wounds and other mutations and characteristics of the mutilated body
(iii) Clothing, personal effects, and articles left behind
(iv) Surrounding topography and conditions of things
(v) Presumed date, time and place of death
(vi) Cause of death (in particular, whether or not it was caused by a criminal act)
(vii) The murder weapon and other objects suspected of having been used in a criminal act
(viii) With regard to a corpse suspected to have committed suicide, the cause and method of the suicide, the presence or absence of any instigator or aider, and if there is a suicide note, its authenticity
(ix) If there is a suspicion of death by poisoning, the symptoms, the type of poison, and the circumstances that led to the poisoning.
(2) When it is necessary in conducting the investigation set forth in the preceding paragraph, the opinions of an attending physician shall be sought, the householder, relatives, neighbors, the finder, and other persons concerned shall be questioned about necessary matters, and the physiognomy, general shape, distinctive body parts, clothing and other distinctive personal effects shall be photographed and recorded, and fingerprints shall be taken, etc.

According to article 6.6 of the Coroner's Regulations, in japan, people have been to investigate their cause of death in addition to the name, age, and sex of them at the time of autopsy if they have an unnatural death. We can understand easily that it is difficult to avoid an autopsy even if there were **t**he will of the individual and the bereaved family because of it.

Next, I examine Japan Organ Transplant Network's indication of intention for organ donation because it has a common point with indication on cause of death. There are three ways to express one's will to donate organs.

1. Indication of intention though the internet
2. Filling in donor card
3. Filling in the declaration of intent field on health insurance card, driver's license, and my number card

In addition, there are three options to choose when you show your intention for organ transplant.

1. In the event that competent medical authority declares me **either brain dead or cardiac dead**, I hereby agree to donate my organs for transplantation purposes.
2. In the event that competent medical authority declares me **cardiac dead**, I hereby agree to donate my organs for transplantation purposes.
3. I will not donate any organs.

From the above, I made my suggestion① from my hypothesis①.

Suggestion① : Country should allow people to express their willingness for autopsy to determine the cause of death based on below perspectives.

1. I fully cooperate with the autopsy to determine the cause of death.
2. I will cooperate with the autopsy to determine the cause of death, but only for specific parts of the body.
3. I wish to avoid autopsies to determine the cause of death as much as possible. I prefer less invasive methods.

If people choose 1, they can express their will to cooperate with the autopsy actively. It means forensic scientists can hold an autopsy of them. If they choose 2, they can express their will to cooperate with the autopsy partly. It means the scientists can only dissect parts of the body that they have given us permission to do so. If they choose 3, they can express their will to ask the scientists to investigate their cause of death with non-invasive examinations.

However, this suggestion has one serious flaw. It is that people have to investigate the cause of death because of the Coroner's Regulations. If this suggestion becomes reality, we would have some troubles such as an increased number of missed crimes and emergence of new crime forms.

Therefore, although we have written down recommendation①, we believe that it cannot contribute to solving the issue, so I eliminated this suggestion.

Survey③

In some areas, people have an option of non-maleficence investigations. For example, forensic scientists in Greater Manchester, UK, use MRI, which is a non-invasive way to investigate the cause of death. The reason is that many people there is muslim and jewish and they want to avoid autopsis because of their religious reason. According to the Autopsy Imaging Society's "The State of Postmortem Imaging in the United Kingdom," the following is stated.

> The British government is planning to allow bereaved families, who are reluctant to have a traditional autopsy for religious or other reasons, to opt for a whole-body MRI instead of an autopsy. Some people (including Muslims and Jewish believers) are reluctant to have invasive autopsies, so the Greater Manchester borough is trying to allow coroners to use MRI machines instead of autopsies. According to a Department of Justice announcement, the system will be expanded throughout the United Kingdom by the end of 2010, but this is contingent on a new autopsy bill passing through the British Parliament. Under the new system, coroners will be able to decide whether to perform an autopsy or a full-body MRI, taking into account the beliefs and feelings of the bereaved family. The coroner will decide on a case-by-case basis whether a whole-body MRI is the appropriate method for determining cause of death and its indications.
>
> Attorney General Brigitte Prentice noted that The loss of a loved one is extremely difficult for any bereaved family to bear. The invasion of an autopsy on a deceased person exacerbates grief and anguish, especially when it goes against a survivor's faith or beliefs. We are happy to hear the views of the bereaved families and propose a new system. The coroner will be allowed to consider the wishes of the family and their beliefs, and will be able to perform a full-body MRI instead of an invasive autopsy. Under the new system, the autopsy itself will also be performed more quickly, allowing for earlier burial or cremation in response to religious requests." Secretary Prentiss is scheduled to visit Rockadale Hospital (Greater Manchester borough), where the MRI machine is located, to discuss the planned changes with religious leaders. A Department of Justice spokesperson noted the following. 'Determining whether a crime has been committed and the cause of death for that purpose will take precedence, but in non-criminal cases the new system will be flexible. The changes in the system will apply to and benefit all survivors."
>
> These trials have already been started by coroner Jennifer Laming in the cities of Salford and Bolton, which have a large Jewish and Muslim population in the area. The coroner is obliged to determine the cause of death, and if she decides that an autopsy is necessary, the family cannot currently refuse it.

Postmortem imaging may be important for those who hesitate invasive autopsies for religious reasons. This is evidence that the reason for rejection of the autopsy is that it is contrary to the "non-maleficence" point of view. Another characteristic of the system of investigation is that there are two options: autopsy and MRI. However, as in Japan, if the coroner determines that an autopsy is necessary to clarify the cause of death, the bereaved family has to accept it. As discussed in Survey 2, I can infer that it is currently impossible that the law and the will of the bereaved family and the person himself/herself can coexist.

I would also like to mention "Autopsy Imaging (Ai)," which is the most mainstream postmortem imaging method currently used in Japan.

"Ai (Autopsy Imaging) Application Guidelines" published by the Autopsy Imaging Society of Japan describes Ai as follows.

> Autopsy imaging (Ai) is an examination method that uses CT, MRI, and other diagnostic imaging equipment to examine a corpse to determine the cause of death, and is essential for realizing the "right to know" of the bereaved family and society regarding cause of death.

Ai can be briefly described as "the use of diagnostic imaging devices such as CT and MRI to determine the cause of death at the time of death. However, this sentence alone does not capture the detailed image of "whether diagnostic imaging can be a substitute for a partial autopsy, or whether diagnostic imaging is only a supplementary material for autopsy.

Therefore, referring to the "Statement of Purpose of the Autopsy Imaging Society," it is defined as follows.

> Autopsies have been valued for their high contribution to the advancement of medicine, but in recent years, the autopsy rate has declined significantly worldwide, and this trend is worrisome because it is directly related to the decline in the quality of medical care.
>
> Autopsy imaging (Ai) is a possible solution to this problem. Autopsy imaging is a new examination concept that combines postmortem imaging (PMI) and autopsy information to establish a standard for diagnosis at time of death and to enhance medical and social information on patients at the time of death.
>
> If autopsy imaging can be presented as one of the options for examination at the time of death, it will enable the acquisition of information at the time of death and increase the number of detailed autopsies based on this information. The ability to obtain objective images at the time of death is highly useful as justice-related information. In addition, it is useful for residents to be introduced to autopsy in accordance with the change in the physician training system, where autopsy CPC is now mandatory.
>
> Many fear that the introduction of autopsy imaging will reduce the number of conventional autopsies. However, autopsy imaging is a concept that combines PMI with conventional

> autopsies to improve the quality of both pathology and imaging diagnosis, and autopsy consent is easier to obtain in cases where problems are identified by autopsy imaging, Autopsy imaging is not in competition with conventional autopsy, but is a cooperative and complementary examination.

From the content of the statement of purpose, Ai could be classified as a position that provides support for autopsies by using images obtained through the use of CT, MRI, and other equipment. From the document, we can also read the concern about the decrease in the dissection rate, and it was confirmed that the Ai is expected to increase the dissection rate.

In addition, there is a technique for postmortem imaging that is in a sense the opposite of Ai's position as an autopsy aid. Virtopsy is a term coined from “virtual” and “autopsy,” and it is a simulated autopsy in which a 3D cadaver is reconstructed on a screen based on postmortem images. The differences between virtopsy and Ai are described as follows.

> The focus of the symposium was Virtopsy. According to the proponents, a group from the University of Bern, virtopsy is an attempt to obtain 3D images by postmortem imaging limited to CT and MRI, and to use them as a substitute for autopsy. I was asked to present an analogous concept, Ai, which is being developed in Japan, and which translates directly to “autopsy image. Ai and virtopsy are similar in basic concept and purpose, but there are differences. virtopsy is limited to CT and MRI and focuses on virtual cadaver reconstruction through postmortem image development. In other words, the emphasis is on diagnostic imaging. In contrast, Ai aims to establish new diagnostic criteria by incorporating postmortem imaging into pathological diagnosis. In other words, the center of gravity is the autopsy. At this stage, Ai encompasses virtopsy; while virtopsy is limited to MRI and CT, Ai stipulates the use of applicable imaging tests. Virtopsy is an evolution of postmortem imaging (PMI). Ai represents a paradigm shift in the concept of testing by merging autopsy and postmortem imaging.

It can be read that Virtopsy focuses on reconstructing a virtual corpse on the screen, while Ai focuses on the autopsy, and that the postmortem image is only one auxiliary means. It is also implied that Virtopsy aims to replace the autopsy, and this is another difference from Ai, which plays the role of facilitating autopsy.

The question that arises here is why Ai has developed in Japan. As mentioned earlier, Ai is a form of examination that emphasizes the examination, or dissection, of the body. The main purpose of Ai is to make autopsies more accurate and to improve the autopsy rate, and less invasive use of the corpse does not seem to be the central idea.

> For bereaved families, especially those who have faced unexpected violent bereavement such as crimes, the bodies of their loved ones are the deceased themselves, and they are highly resistant to having their bodies autopsied (Shin, 2009; Konishi, 2001). The feelings of the bereaved that they absolutely hate the idea of being cruelly killed and then mutilated are often described in memoirs (Association of Victims of the Sarin Attack on the Subway,

2004; Hongo, 2003; Sakai and Sakai, 2004; Shiraiwa and Karasawa, 2018; Yamashita, 2015).

In the 1985 Japan Airlines plane crash, many bereaved families were forced to face the harsh reality of facing the passengers and crew aboard the aircraft that crashed into the mountainside. This is because the remaining victims, excluding the 177 complete bodies among the 520 dead, were housed as more than 2,000 partial bodies with severed heads, torsos, and limbs ("The Japan Airlines Flight 123 Accident and Activities of the Medical Association," Editorial Committee, 1986). Investigators and medical personnel have reported on the families searching for at least a fragment of their parent's or child's body among these countless mutilated bodies (Iizuka, 2014, 2015; Tsunoda, 1986; Kasori, 1986, etc.).

Because of the possibility of a criminal case, a judicial autopsy was conducted in this case as well. However, it was impossible to autopsy all of the victims, and the exceptional measure of autopsying only a portion of the victims caused the responsible officers to worry about the issue of which family members would be asked to perform the autopsy. Iizuka (2015), a former Gunma Prefectural Police officer in charge of identification, went around to the bereaved families with the thought, "I hate this with all my heart," and as he expected, many of them vehemently rejected his request. In the end, the families of four crew members (the captain, co-pilot, flight engineer, and assistant purser) and one passenger gave their consent, but when they saw the wives and fathers of the crew members quietly persuading their children, who were crying and objecting, they surmised that they really did not want to have an autopsy (Iizuka, 2015 Iizuka, 2015).

Survivors strongly dislike the idea that the body of a deceased person whose life was taken suddenly, intentionally or accidentally, is damaged or roughly handled even after death. Such reactions are not limited to this case, but are found universally. For the bereaved family members, the body of a deceased person still carries the deceased's spirit, even if it is objectively lifeless. This is symbolized by the bereaved family's words, "The body is not a thing" and "Even if it is dead (to us), it is still alive" (Asahi Shimbun, 1998; Kawahara, 1999; Masunaga, 2015).

From this data, we can read that the families of the bereaved are extremely averse to having autopsies, or to put it another way, to have their bodies mutilated after death. I believe this is especially true in Japan, where a unique view of life and death, deeply connected with the history of the country, is widely held.

In Japan today, unlike other countries, autopsies are performed by medical examiners at the request of the police, and are therefore strongly considered as evidence to build a case for a crime. Therefore, I feel that the family members of the deceased and the deceased body are given less consideration than in other forensically advanced countries. However, there is concern that excessive consideration may lead to serious losses, such as missed crimes.

Therefore, with regard to hypothesis (2), if the cause of death is investigated only by non-invasive methods such as postmortem imaging, there is a risk of missing a crime or being falsely accused. Therefore, it is not effective to develop and share such technologies.

However, it would be a good idea to hold symposiums and other events to share the technologies that each country is researching in order to promote globalization. In my opinion, it would be desirable to include bioethics and the viewpoints of bereaved families in such discussions.

3.Conclusion

I worked on the question, "What should be done to promote investigation of cause of death even in countries that are not open to autopsies because of bioethics?"I conclude that "It is necessary to discuss postmortem imaging and other technologies that are relatively less invasive to the body from the perspective of the bereaved family and the wishes of the deceased in a global forum for technology and knowledge sharing. The report concludes. As the case of the Greater Manchester borough in the United Kingdom shows, areas that cannot be compensated for by autopsy alone are beginning to be exposed. Therefore, research on this type of technology is becoming essential in many countries. However, after considering the cause of death from the perspective of the four principles of bioethics, focusing on the two points of "respect for autonomy" and "no harm," it seems that the issues facing cause of death investigations have become clear. One is the difficulty of reconciling the "will" of the deceased and his/her bereaved family with the "laws" enacted to maintain public safety. This can be seen as a combination of personal and social factors. Suppose that only personal factors such as will are considered important. In this case, if the bereaved family does not wish to have an autopsy, or if there is a statement in the will of the deceased refusing to have an autopsy, no autopsy will be performed even if a crime is suspected. At this time, there are concerns about an increase in the number of crimes due to missed crimes, an increase in the number of false convictions, and the emergence of new crime forms such as "having the person write a will in which he or she wishes to avoid an autopsy, and then killing him or her. We will continue to explore the coexistence of personal and social factors.

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Aiming to achieve UHC

Nurturing doctors in Tanzania

5314　Shitara Rio

1.Abstract

UHC is defined as “a state in which all people have access to appropriate preventive, therapeutic, rehabilitative, and other health care services at a cost they can afford to pay. ” Currently, medical costs in Africa are increasing every year for a variety of reasons.However,establishing an insurance system in Africa is challenging due to the lack of necessary medical infrastructure and financial resources.Therefore people often face high costs to receive treatment. To address this issue,I began by focusing on building the medical infrastructure needed to support an insurance system.There are many different types of medical infrastructure, but this time I focused on doctors.Through my research,I discovered that Tanzania is one of the countries with the fewest doctors in the world.Therefore,the goal of this project is to increase the number of students enrolled in medical schools in Tanzania by proposing a scholarships system to reduce the burden on tuition.This proposed scholarship system would include tuition waivers for students who achieve high scores on entrance examinations. The scholarship funds would come from developed countries facing a doctor shortage.After graduation, recipients would work as doctors in the supporting countries for a set period,and afterward,they would return to work in their home country.However,this system has several challenges,including the lengths of time recipients work abroad,language barriers,the amount of scholarships funding required,and the overall speed of implementation. These points need further improvement, and aim to address them in future work.

2.Introduction

As of 2015, about 300,000 pregnant women and 6 million children under 5 years of age were estimated to have died, and one in four of the world's children is considered short of height due to malnutrition.
And while deaths from the world's three major infectious diseases - AIDS, tuberculosis, malaria, or other infectious diseases - are declining, 9.5 million people still die annually, and 38 million die from non- infectious diseases.Other reports indicate that 46 million people suffer from dementia as a result of aging, and one in 10 people worldwide suffer from depression and anxiety as a result of mental illness.Under these circumstances, medical expenses are increasing year by year in Africa.I also found an article that says that a survey of countries with access to healthcare in Africa (not including countries too poor to have access to health care) revealed that 30% of the countries sold their assets or borrowed from others to cover the cost of health care.So,I believe that creating a society in which everyone can receive medical care at a small out-of-pocket expense will support people's health.
The research question is “How can we improve the medical standard in Africa?” As mentioned earlier, the significance of the research is that it will lead to the creation of a

society that will improve the level of healthcare, establish an insurance system, and reduce healthcare expenditures, which are increasing every year.
I did my research mainly through internet information and articles.

3.Discussion and implications

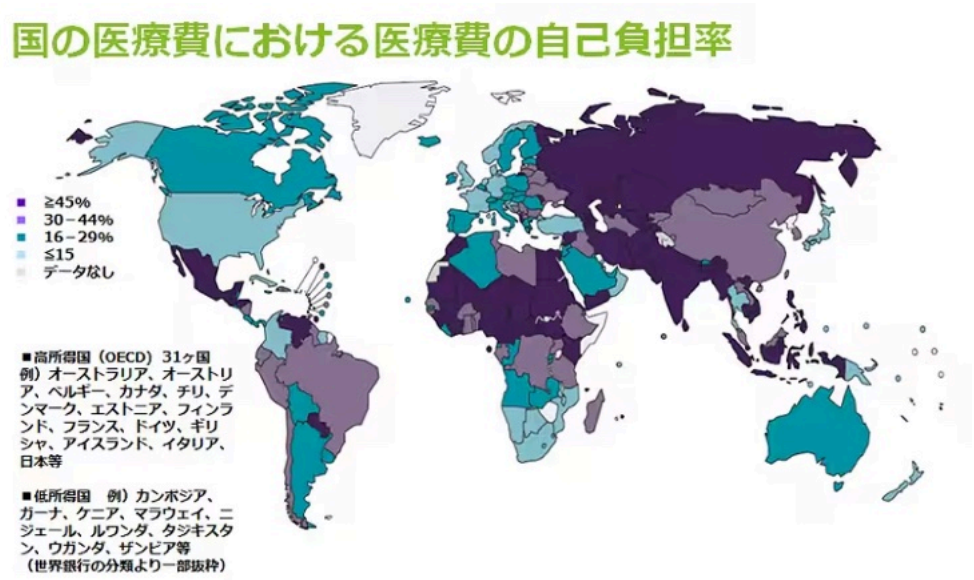
First, as mentioned in the background, as of 2015, about 300,000 pregnant women and 6 million children under 5 years of age were estimated to have died in Africa, and one in four of the world's children is considered underdeveloped due to malnutrition.
Other reports indicate that 46 million people suffer from dementia due to the aging of the population, and one in ten people worldwide suffer from depression or anxiety disorders, and medical expenditures are increasing every year.
While Japan and other developed countries have insurance systems that allow people to receive treatment free of charge or with a small co-payment, many developing countries do not have such systems in place.
Then I researched why Japan could achieve the national insurance system and found two reasons.

1.After the world war Ⅱ ,Japanese government had some financial resources left over, which could be used for the operation of community insurance.

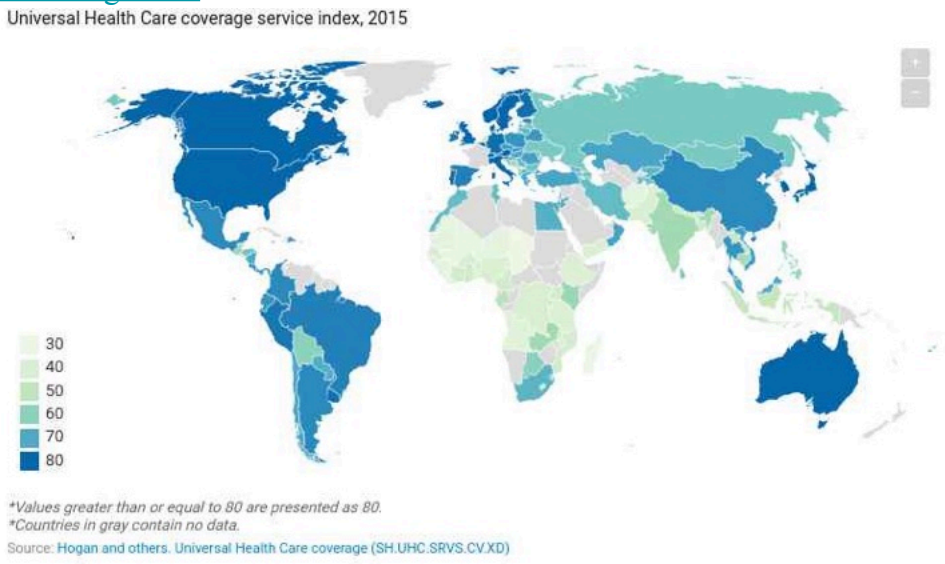
2.There were a small number of hospitals, doctors, and other medical institutions.

Since many developing countries do not have the financial resources or infrastructure, I thought that we had to start by securing such resources.
Specifically, medical infrastructure can be divided into the following categories:
national-level systems such as medical insurance systems,services such as diagnosis, treatment, and prevention provided to patients and other individuals, people who are in charge of medical technology, and goods and systems such as medical equipment and medicines.
Here, I focused on the people who are responsible for medical technology, physicians, in the medical infrastructure.
This is because there is a growing shortage of doctors around the world, and nothing can be done without people who can provide medical care.
I looked up the country with the lowest number of doctors in the world and found that Tanzania only has 0.37 doctors per 10,000 people.Therefore, I considered ways to produce doctors in Tanzania.
First, I researched the process of becoming a doctor in Japan, and found that after completing compulsory education and high school education, one must enter the medical department of a medical school, and after graduating from the university, one can become a full status doctor

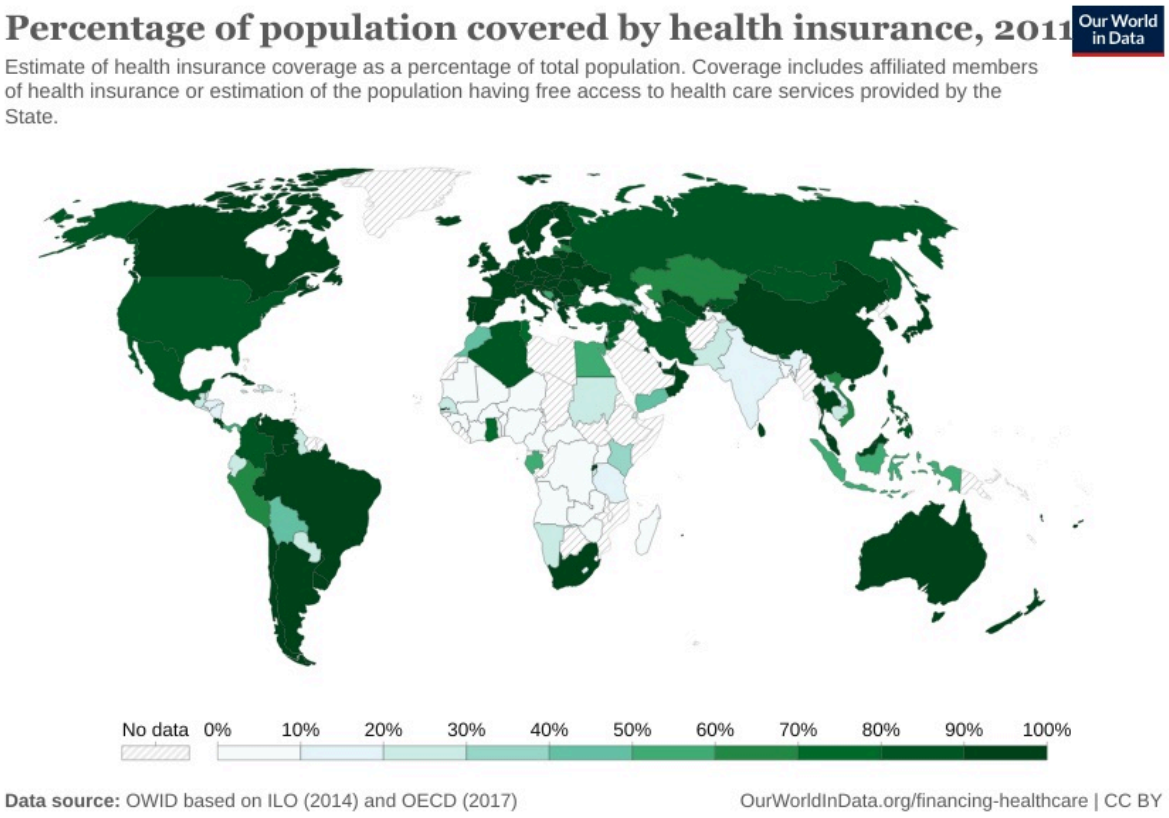
after two years of clinical training. Furthermore, it takes three to six years after that to qualify as a medical specialist.
In other words, it takes more than 10 years after graduating from high school, and at the earliest, one's career is established at the age of about 29.
At first, I thought that establishing a medical vocational school for doctors, like a beauty school or a nursing school, would help train doctors in a shorter period of time, but after a thorough investigation, I realized that medical school is a highly specialized department in the first place, and a proper length of time to become a doctor who is involved in human life. Also, there were some medical vocational schools in japan before and during world war Ⅱ, but considering the quality of doctors,they were abolished and change into today's medical school. So, I figured it was irresponsible to establish medical vocational schools. After going back to the basics and considering ways to train Tanzanian doctors, it was decided to focus on increasing enrollment in Tanzania's medical schools.
In Tanzania, primary education became free under the Free Education Policy in 2001, and the primary education enrollment rate has increased significantly.The data also show that between 2015 and 2018, the primary education enrollment rate increased by 17% and the secondary education enrollment rate increased by 23%. However, the university enrollment rate is only 5%, and thus I thought that increasing the university enrollment rate would lead to the development of physicians. A survey of the reasons for the low college enrollment rate revealed that the burden of tuition fees, labor, early marriage, and gender discrimination were included, but all of these reasons might be connected to the lack of sufficient living expenses and tuition fees.It was also found that primary education enrolment in Tanzania is over 98%, but as one progresses to secondary, tertiary and university, enrolment rates are lower. Therefore, I would like to propose the development of a scholarship system for students who wish to enter medical school in Tanzania, with the help of other countries.
As it is difficult for the Tanzanian Government to raise the scholarship money with its own finances, it would be better to request tuition fee support from developed countries that suffer from a shortage of doctors and have the financial resources to do so, and instead enroll students as scholarship students who use the money and become doctors and work as doctors in that country for a certain period after graduation and then work as doctors in Tanzania after completing the period of time. After completing this period, the students would then work as doctors in Tanzania.The United States, Japan, South Korea, New Zealand, the United Kingdom, Canada, and China are some of the developed countries with a shortage of doctors. Once the scholarship scheme is completed, tuition fees will become less of a concern, leading to higher enrolments and an increase in the number of doctors.And this would be the first step towards establishing an insurance system.



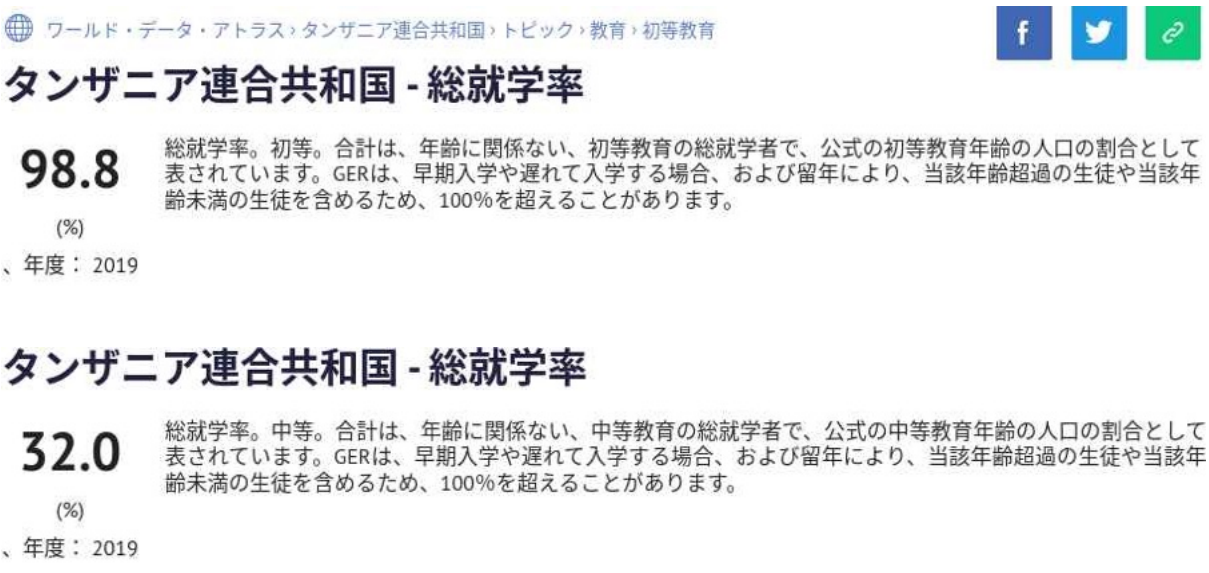
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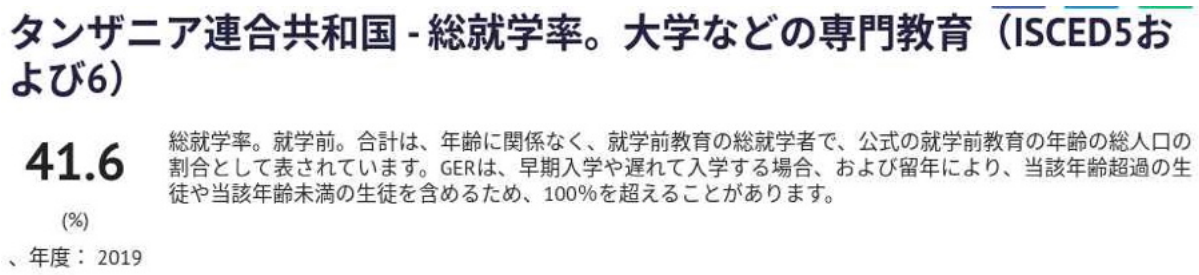


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4.Conclusion

It was revealed that medical infrastructure and financial resources are necessary to establish the insurance system.To achieve this, I decided to make scholarships for medical students to make it easy to go to university. The scholarship system is that request for money to developed country that is suffering from a doctor shortage,and the recipients work as the contemporary doctor in the country for several years after graduation.After complete the period,they could work as doctors in Tanzania.The problems with this system are the length of time to work as a temporary doctor, language issues, the amount of scholarship money, and the speed of the process.Furthermore, there are problems in terms of building other facilities and ensuring financial resources, as even if there are more doctors, doctors cannot work well if other health care infrastructure is not in place.I would like to solve those concerns.

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Another Way of Using Ash

~Can We Use Ash as a Neutralizer?~

ID 5315 Shimoyama Hiroto

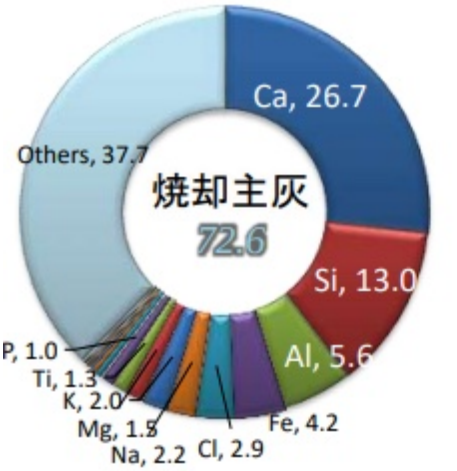
Abstract

Not only Japan but also any countries on the earth have the problem of how to finally dispose of our trush. The amount of world's garbage is increasing, but the land is limited. We need to consider the problem seriously, and take measures to decrease the amount of landfill. In conclusion, I suggest another way of using ash, which is the idea that we use ash as a neutralizer. Recently, the area damaged by acid rain is spreading because of the growing population rapidly and developing city especially in Asia. I focused on the components of ash produced by thermal power generation which show strong alkaline that can neutralize acid soil. The ash also contains harmful materials such as Arsenic and heavy metal, but I thought we would be able to remove them by using a Physical Separation Collection Machine. Moreover, by government checking, ash's neutralizer became more safe.

1 Introduction

Waste disposal is increasing year by year in the world. It's growing rapidly, and we need to recognize that as an issue of concern. For example, according to the Ministry of the Environment, all the landfills in Japan will be full and will stop accepting waste for landfills. Therefore, I thought about whether the ashes being landfilled could be used effectively, and started this study.

2 Discussion and implications



The graph on the left shows the composition breakdown of incineration ash. Incineration main ash is the ash that is produced when garbage is burned. (Ashes that are buried by thermal power generation.) As in the case of the flowering grandfather who sprinkled ashes on trees, these ashes, called "grass and tree ashes," are actually sold as fertilizer. Water-soluble calcium, which accounts for the largest proportion of this incinerated main ash, is alkaline with a pH of about 10 to 12. This is about the same pH as the slaked lime currently in use. However, because it is ash from burning garbage, it is harmful to the human body and contains substances that can lead to environmental destruction. Arsenic and heavy metals are substances that absolutely must be removed when used as fertilizer. But is it possible to remove only certain components from the ash?



Look at the picture on the left. This is called a "Physical Separation Collection Machine". This is a device, popular mainly in Europe, designed to extract precious metals from incineration ash. This system uses

a mesh of a certain size like a sieve to extract precious metals. By changing the size of this mesh, it is possible to remove toxic substances such as heavy metals. One might think that it would be possible to extract only the necessary substances without doing so, but calcium hydroxide is so small that it would be extremely difficult to extract.

3 Conclusion



In this study, ash could be used as a neutralizer. But there are still many problems to be overcome before it can be put to practical use. Calcium hydroxide is one of them, the main component of incinerated main ash, which is very soluble in water and easily released naturally. Therefore, it is necessary to wrap the fields with mulch vinyl to prevent the alkaline water from spreading more than necessary (see figure on the right). I am also wondering if it is possible to solidify the calcium hydroxide into a jelly-like substance. Other safety assurances will be required, as the handling of ashes is strictly regulated by law. Since this neutralizer will be marketed to farmers, I would like to consider better ideas, paying attention to safety, convenience, and ease of distribution.

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To solve the problem of hunger
~Reduce world hunger with “Food Tech” ~

5316 Sugimori Yume

Abstract

Many people in the world are suffering from hunger. This study asks the question, "How can food tech technology be used to help solve hunger?" to clarify the following. Many small-scale farmers have been greatly affected by the recent warming of the climate which has resulted from the continuous sunshine and climate change. In addition, food tech has the most hopeful potential to solve the problem of hunger. "I believe that developing technologies for long-term food preservation and creating crops that can grow even in countries with poor weather conditions are especially important."
Hunger will not be solved unless farmers in developing countries, who account for the majority of farmers in the world, are able to produce enough food on their own without relying on aid. Therefore, it is necessary for developed countries to pass on their technology to developing countries as well. However, it requires a huge amount of money to develop and disseminate the technology. Therefore, I believe it is necessary to first activate the market and gather funds. First, I will raise awareness of cultured meat and entomophagy created in the field of food tech production and development, and expand the size of the market to create funds for development. Then, these funds can be used to develop technologies like cryopreservation and spread them to countries facing severe hunger. In the future, I would like to consider specific methods for spreading the technology.

1. Introduction

According to the United Nations,828 million people in the world are suffering from hunger. This number is equivalent to one in nine of the population. To begin with, hunger is defined as a state of inadequate intake of energy necessary to maintain a minimum weight that is reasonable for one's height and to engage in light activities (WFP). Therefore, starvation increases the risk of death. Those most affected by hunger are the poor living in developing countries, especially the growing children. Malnutrition is responsible for about one-half of all under-five deaths worldwide (Hunger Free World), and many children die from hunger. In addition, 709.6 million people live in extreme poverty (less than US$1.90 per day), about half of them children, 356 million (UNICEF, 2021), who consider it impossible to buy food satisfactorily. This study asks, “How can food tech technology be used to help solve hunger?” I found the study of Jenny Tian, Brian Bryksa, and Rickey Y Yada,”Feeding the world into the future – food and nutrition security: the role of food science and technology”. This paper said that the demand for animal protein will increase in the future. There is a continuous need to innovate and advance current technology, and to do this consumer attitudes and acceptance are very important. Then, one of the technologies we should improve is alternative protein sources. I want to clarify the way to spread technology like alternative protein sources in this study.

Food tech is a technology about food. I will use this word to describe technology all at once. Food tech can create alternative meats and other products that can be used to produce more food. We also believed that by developing transportation technology, food could be distributed to impoverished areas, making food more accessible.

2. Discussion and implications

First, we looked at countries with high hunger. We found that the countries with the most hungry populations are distributed mostly in Africa and Asia. One major reason is that Africa is mostly small farmers. Their incomes are highly unstable due to the recent warming of the climate, which is greatly affected by the continuous sunshine and climate change. This income insecurity, in addition to making food security difficult, is also associated with problems such as lack of access to education. In Asia, food security and supply systems have not kept pace with explosive population growth. Take India as an example. India's population is growing rapidly. In addition, water scarcity is also a social problem in India, which affects agricultural crops. These factors indicate that one of the reasons is that crops cannot grow due to climate change and water shortages. Another reason is that many of these areas are experiencing conflict and civil wars, which can cause people to lose their homes and access to food.

Next, we looked into food tech. According to the Ministry of Agriculture, Forestry and Fisheries, food tech refers to “new technologies in the food sector that link production to processing, distribution, and consumption, as well as business models that utilize these technologies. In other words, it refers to technology that develops food products or discovers cooking methods in completely new ways by making full use of the latest technology. Food tech is used in the fields of production and development, cooking, retail, and food and beverage. Examples include cultured meat and insect foods, 3D printers and cooking robots that support food preparation, the development of refrigeration technology, and mobile ordering. The greatest benefit created by food tech is its potential to solve a variety of food-related problems. There are food tech tools that can diagnose whether food is damaged. This technology could reduce the risk of consuming spoiled food and prevent food poisoning. Foodtech is also developing packaging materials that can be safely stored for long periods of time. In addition to reducing damage, the goal is to reduce the possibility of foreign substances being introduced into the food in any way. This is expected to result in a high level of food safety. Other benefits include the ability to make dishes that are suitable for vegetarians, and a solution to the shortage of human resources. And one of the most promising possibilities is to solve the problem of hunger. Foodtech is also developing and researching ways to preserve food for longer periods of time. While many people in the world suffer from hunger due to food shortages, the reality is that a large amount of food is constantly being discarded in developed countries. Long-term preservation of foodstuffs through foodtech has the potential to even out the food balance on a global scale.

On the other hand, the disadvantage is that food tech is expensive. For example, it costs money for electricity to produce light to replace sunlight and water to replace rainwater. Also, a lot of money is allocated for food development. Therefore, a major challenge is the lack of development.

The development of this technology is very much about innovation. Innovation means ‘developing new technologies’ to ‘solve world problems’. It is important to think about what the world really needs now and make it happen. We need to think of ways, through innovation, to solve the world's problem of hunger.

I believe that in order to deliver food to more countries, the technologies in food tech for long-term storage and development of food that can grow even in countries with bad weather are particularly important. Another reason for countries with high rates of hunger is that crops cannot grow due to climate change and water shortages. Therefore, I believe that new food should be developed and made available to be grown in countries where it is needed. In addition, a lot of food is being wasted in developed countries, and food is not being distributed to developing countries. Therefore, I thought that by developing and spreading the technology of long-term preservation, we could make it easier to distribute food throughout the world. However, it takes a huge amount of money to develop and disseminate this technology. Therefore, we believe it is necessary to first activate the market and gather funds. First, we will raise awareness of cultured meat and entomophagy created in the field of food tech production and development, and expand the size of the market to generate funds for development. Then, we thought it would be a good idea to use the funds to develop technologies such as cryopreservation and spread them to countries where there is a lot of hunger.

3. Conclusion

From these studies I would like to make some suggestions. In order to utilize food tech technology to solve hunger, we need to develop and spread more technology such as refrigeration, and alternative resources. The funds needed to do this, for example, should be used to raise awareness of the new food products and to expand the size of the market by getting more people to buy them. The profits generated from this should be used to develop new technologies and to provide technical assistance to countries that need it.
In the future, I would like to think about specific methods of how to spread the technology and how to link the profits generated to development.

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To Eliminate Wars

Research Question：Can Nuclear Weapons Be Used for World Peace?

— Nuclear Ditterance Wars Peace —

5317 Suzuki Aoi

1.Abstract

Nuclear weapons are regarded as a symbol of evil throughout the world, but is this really so? Retention of nuclear weapons is expected to serve as a deterrent. In fact, nuclear weapons were probably one of the reasons that war did not break out during the Cold War. Nuclear weapons are not only a product of evil, but also an aspect that can contribute to world peace. While it is difficult to completely eliminate nuclear weapons from the world, it would be good if we could use nuclear weapons as a clue to world peace.

2.Introduction

In February 2022, Russia began an invasion of Ukraine. Though NATO-related issues are said to be a factor in Russia's decision to invade Ukraine, other factors are said to include the fact that Ukraine did not possess nuclear weapons. Some argue that Russia decided to launch the invasion in the belief that it would soon be able to defeat Ukraine because Ukraine had a low military.

Basically, people regard nuclear weapons as a bad thing that should be abolished. However, nuclear weapons also have positive aspects, such as deterrence. If we can put these positive aspects to good use, there will be a little less war in our world.

I would like to think of ways to use nuclear weapons not just for the use of force, but to protect ourselves and move toward world peace beyond that.

3.Purpose and meaning of this research

Research Question：Can nuclear weapons be used for world peace?

Purpose

In today's international community, the possession of nuclear weapons is often seen as a bad thing. Certainly, Japan suffered tremendous damage from nuclear weapons in World War II, and there is a growing movement for nuclear abolition in the world. However, can we necessarily say that nuclear weapons are evil? It is extremely difficult to completely eliminate nuclear weapons from the world. So I want to think about the useful uses of nuclear weapons in order to say that nuclear weapons are not necessarily evil, and there are aspects of them which lead to world peace.

4.Research methods

Using the Internet and articles, the students will research each country's views on nuclear weapons and how they deal with them, and consider the pros and cons of retaining nuclear weapons.

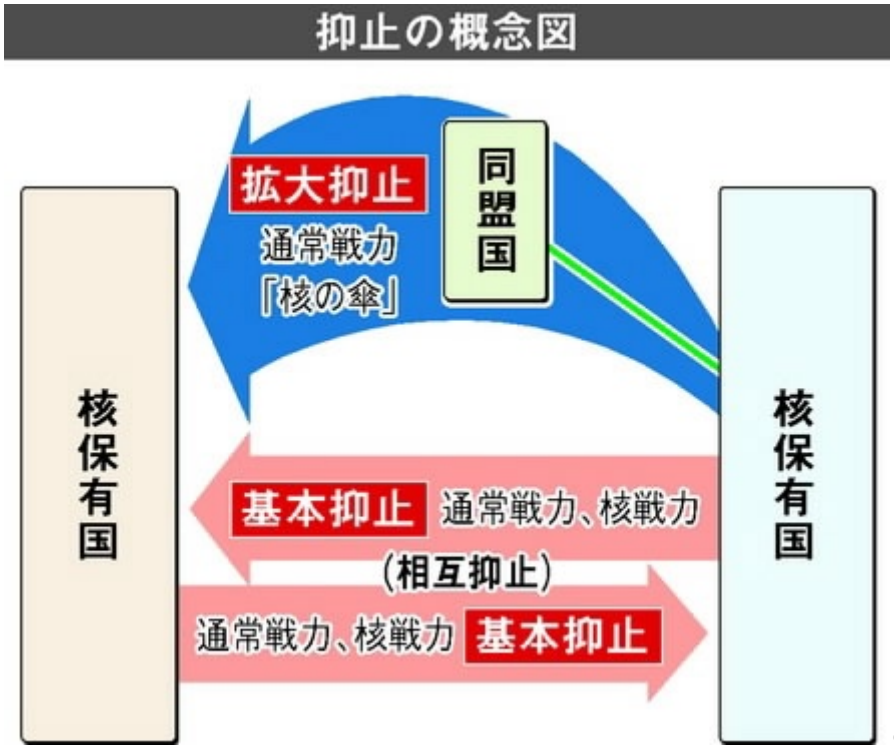
5.Discussion and Implication

I have been researching whether we should retain nuclear weapons as a deterrent and, if so, how they should be used.

First, my conclusion at this stage on the question of whether nuclear weapons should be retained is that we should retain them. There are some reasons. First, tensions in the international community have become more serious in recent years. It is fresh in our minds that Russia

launched its invasion of Ukraine in February 2022. Conflicts are still raging not only between Russia and Ukraine, but also in various parts of the world. There are basically two means of resolving such conflicts and wars. The first is to eliminate weapons. It is a perfectly reasonable opinion that peace will come naturally when the whole world gets rid of weapons and renounces war. This principle can be seen in Article 9 of the Constitution of Japan. Of course, we should aim for this state as ideal, but this is not so easy. As examples, think of countries such as China, North Korea, and Russia. Can we imagine that these countries would easily give up their weapons? Because of this, this way is ideal but it is quite difficult to implement in practice. So another means is possible. That is to use a powerful military force as a deterrent. Basically, war is not waged when it is expected to bring tremendous retaliation. This would be natural considering the national interest and support from the public. Therefore, war may be able to be prevented by retaining the mighty military power of nuclear weapons. In fact, some have suggested that the aforementioned invasion of Ukraine may have been caused in part by the fact that Ukraine did not have nuclear weapons.

However, a common objection raised when such an opinion is that if countries begin to retain nuclear weapons, it will lead to an endless arms race. There seems little need to be concerned about this. This is because such views are based on the assumption that if the other country has military power, its own country has to have more military power. To begin with, this premise is questionable. First, if the other country has military power, there is no need for own country to have more military power. This is because if the other country were to invade your country, the country would have to confront not only your own country but also your country's neighbors. In such a situation, the country cannot devote all of its military power against your country. Therefore, it can be said that own country does not need to have a military force greater than that



of the other country. Given this, it is hard to believe that just because all countries have begun to have nuclear weapons, this will lead to an endless arms race. Therefore, we believe that it may be worth considering the possibility of each country having nuclear weapons.

There are also those who argue that the countries which don't have nuclear weapons should be protected by treaties with nuclear weapon states, as shown in the above chart. This is the so-called “nuclear umbrella” situation. However, since they are in the position of being protected by the nuclear powers, they tend to do the bidding of the nuclear powers. Therefore, in order to be truly independent and peaceful, it would still be preferable for each country to retain its own nuclear weapons rather than be placed under the umbrella of a major power.

6.Conclusion

As noted above, there are merits for each country to retain its own nuclear weapons, but of course there are problems we must consider.

The first is the environmental impact of nuclear weapons retention. It is well known that the use of nuclear weapons has a very large environmental impact, but I would like to investigate whether just holding them has an environmental impact.

The second is about the security aspect of holding nuclear weapons. Basically, nuclear weapons will not be used easily because they will be managed by a proper state. However, this does not eliminate the fear of retaining nuclear weapons, considering what would happen if a state were to be hijacked by terrorists or other such groups.

Therefore, I would like to focus mainly on the above two from now on.

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How to Get Rid of Stress of People Around the World

Habit of Reading as relaxation

5318 Takagishi Satoshi

1. Abstract

These days, the stress that people are subjected to on a daily basis along with economic development has become an issue. Thus, I believe that making reading a habit is effective in reducing stress, so I researched with the aim of considering approaches to create a habit of reading books. I think that reading is not only a source of knowledge, but also a way to calm the mind. With these motives in mind, I decided to conduct research on the above topic.

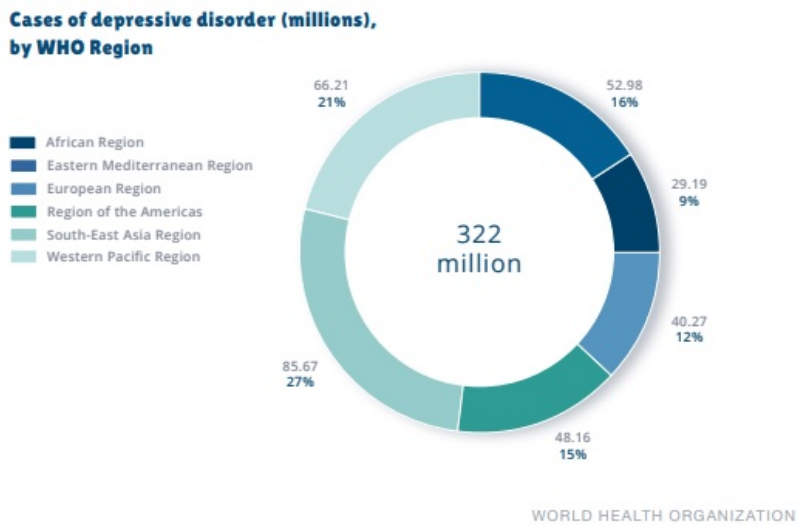
The research question for this study is “How can we get people to read regardless of their environment?

My conclusion to the research question is the use of e-books as a means of generating interest in reading. Now, many people, including those in developing countries, are now using smartphones. I believe that reading using electronic devices such as smartphones will encourage more people to enjoy reading. By using a form of book rental based on a point system and providing numerous ways to obtain those points for free, we believe that this could provide an element of active learning and at the same time trigger more people's interest in the subject.

The challenge for the future is to think of ways to promote reading in paper form.

2. Introduction

Now, we spend days with some stress because of individual reasons. Excessive stress is too bad to break our bodys and minds. The stress caused by modern society is a big social issue. So, I wanted to think about how we can solve this problem.



[Figure 1] Cases of depressive disorder (millions),by WHO Region
(from Depression and Other Common Mental Disorders Global Health Estimates by WHO)

Recently, many people suffer from depression around the world. According to a graph made by WHO (Figure 1), the number of patients with depression in the world was more than 320,000,000 people in 2017 before the COVID-19 pandemic. Also, we have been affected by the COVID-19 pandemic now, so it is said that 5% of adults in the world have depression by WHO. Why One of the causes of a lot of matal illness, including depression, is stress caused by environmental fators. If we can reduce people's stress, we can curb the social problem of an increase in mental illness.

3. Purpose and meaning of this research

The research question for this study is “How can we get people to read regardless of their own environment?” The purpose of this research is related to SDGs “3 Good Health and Well-being” and “4 Quality Education” . In Japan, it appears that young people are reading less and it is important how to read books in the busyness of modern people, but from a global perspective, there are countries where reading is very active. Therefore, we would like to conduct our research taking into consideration the reading environment and situation in each country.

Reading has the advantage of building vocabulary, communication skills, and the ability to think and imagine, along with a relaxing effect. People will also learn how to live and broaden their horizons by reading books. If we could create an environment in the world where more people could read and use reading as a way for people to do this on their own and calm down, it would not only increase literacy rates but also help prevent mental illness, which is spreading worldwide, and would be effective for both developed and developing countries. From this point of view, I consider that it is effective to promote reading more widely in the world.

4. Research methods

Using the Internet to collect data to support the idea that reading reduces stress.

The next step is to research how to get people interested in reading by finding out if reading is being done through such means.

Based on the research to this point, we will consider reading promotion initiatives that can accomplish the research question.

5. Discussion and Implication

First, I looked for evidence that reading has a stress-reducing effect. That's where I found bibliotherapy. Bibliotherapy, as the name implies, is the use of reading to deal with mental illness. This would be the rationale for reading's effect on stress recovery, as it has been shown to be effective for depression and other stress-related conditions. Focusing on a book can help many people relax. In addition, there are many other benefits to people from reading besides stress reduction. For example, it is believed to increase communication skills, thinking skills, and imagination. From these facts, I am convinced that reading has a positive effect on people. In the United Kingdom, this therapy is actually being used, and since June 2013, books have been prescribed to depressed patients with the official approval of the British government. This shows that reading is considered effective against stress.

In recent years, we have found data showing that more people are using electronic devices to read. According to the Nikkei, sales from paper books have declined 8% from 2011 to 2015. In contrast, e-books have grown 2.5 times over the same period. In addition, emerging economies such as the BRIC countries and Turkey appear to be among the top countries in terms of growth in e-book sales.
In addition, an article on a reading workshop in Cambodia shows that reading is effective for reading comprehension and literacy in developing and emerging countries. Cambodia is famous for losing a lot of intellectuals in the Pol Pot genocide in 1970s. This thing made bad effects on the level of education in Cambodia. It seems that active learning and sharing opinions about books with each other increases reading comprehension and interest in books.
Next, when I examined the rate of electronic device use (smartphone penetration) in Africa, where there are many developing countries, I found that only one in three people uses a smartphone. Although I think this is less than in developed countries such as Japan, I was surprised that it was more than I expected.
Based on these findings, I suggest that e-books are an effective way to promote reading and that incorporating an active learning component will lead to more effective conclusions to the research questions.

6. Conclusion

My conclusion to the research question is the use of e-books. Electronic devices such as smartphones and PCs are now used in many countries. I suggest that the use of e-books can be an effective way to reach people in developed countries who are too busy to read books, as well as people in developing countries who cannot read.
The difficulty lies in serving people in developing countries. This is because of the problem of literacy rates. This could be done by providing picture books and language study materials. This would help some people learn and reduce stress.
The next idea is to rent books on a point system. However, I think that by creating points that can be earned for registering, points earned for time spent, and points earned for submitting reviews, reading will become more active. In particular, by earning points for posting reviews, people would be able to share their opinions and impressions with others and choose books based on what other users have to say. I think that if these things are done, it will be a conclusion to the research question.
For future issues, I would like to think about reading through paper media and using local libraries to promote reading.

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Reduce the Number of Victims of Human Trafficking

～How can we grasp the situation of human trafficking exactlly～

― forced labor aggriever working condition ―

5319 Takata Yuki

1. Abstract

Human traffic is one of the serious problems in the world. Although human traffic is international serious plobrem, there are no accurate date about the number of victims and clues how transport perpetrators. Also, It is one of the cases that victims do not realize that they are victims of human traffic. For these current situation, I think it is most magnificent to grasp of situation and decided to research about this problem.

There are a lot of purposes of human traffic so I focused on forced labor. Recently, in some cases, although they seem to be legitimate organizations, they actually obtain laborers illegally especially from foreign countries and make them work in a bad environment. According to the human trafficking report by the U.S. department of state, these conducts are also involved in human trafficking.

From these situations, I thought we need to be clear which companies obtain labors legally and how people working there came. Also, we suggest a solution not to obtain laborers illegally for these companies.

2. Introduction

Although human trafficking is a world problem, it is difficult to solve because we cannot grasp the number of victims accurately. Also, recently, it is said that there are skilfull vehicles which both the victims and people around them do not realize who are the victims of human trafficking.

3. Purpose and meaning of this research

First, it is important to grasp detailed information about human trafficking to solve this problem. If we can understand the situation, we will be able to connect that to solve it. In this research, I focus on forced labor because there are a lot of purposes of human trafficking.

4. Research methods

Research about current situations, activities, and forced labor, and think how we can improve these problems.

5. Discution and Implication

(Causeing)

It is said that there are three prime causes of human trafficking such as poverty, bad education infrastructure,and low state of females. In Africa there are a lot of victims.



poverty the number of victims

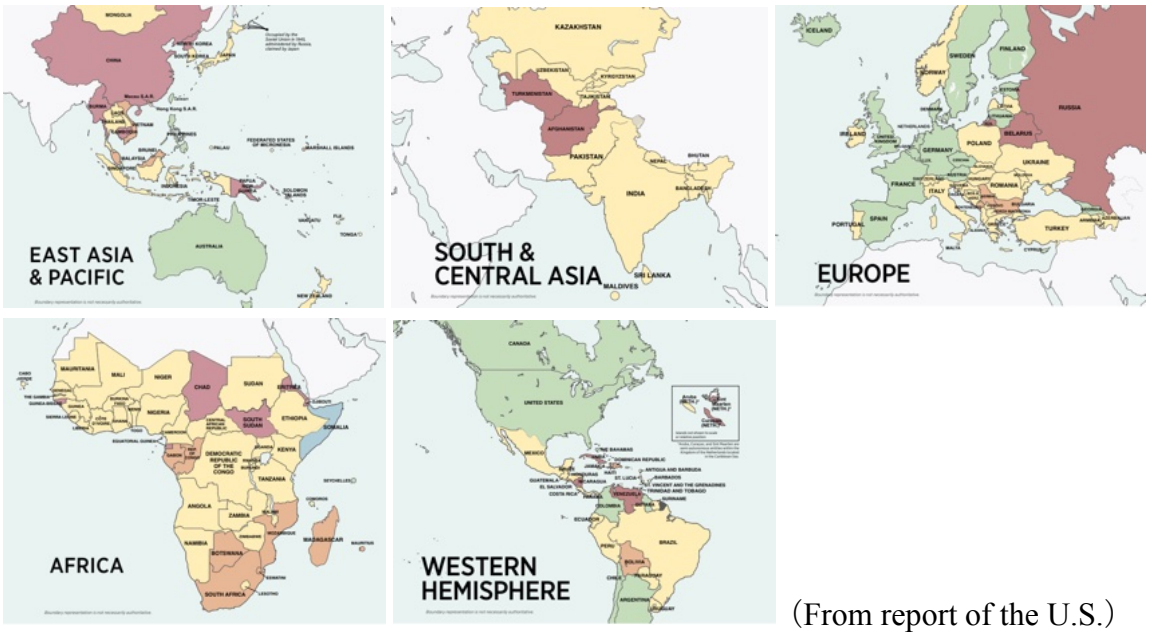
(Current Activities)

Today, there are some organizations tackling human trafficking such as enlightening activities, taking care of victims after they are protected, planning volunteer activities everyone can join, and so on.

（Current Situation）

We cannot understand the number of victims. It is because that there are some border which are not checked. For examlpe, the border between Nepal and India is famous as ‘’Open Border’’. It means that people can back and force freely. Actually, some girls living in poverty in Nepal are sold in India beyond open border. However, recently, both countries' policies and organizations have taken action to prevent human trafficking there.

Also, the number of companies which are organizations for foreigners from developing countries to learn techniques on the face, but they force foreigners to work in a bad environment. That also happened in Japan. According to the report ’’Annual Report on Global Human Trafficking 2023’’ by the U.S. state department, the Japanese ‘’Technical internship system’’ is also regarded as a part of human trafficking. In this report, there are four stages, and Japan stays in the second stage. We have to improve these circumstances.



（From report of the U.S.）

According to these maps that indicate how many people are damaged by human trafficking, most of the victims are in China, Russia, Bangradish, North Korea. These countries are known as countries which hide the truth.

（Forced Labor）

There are two types of victims. Some of them were brought to work forcibly, others were tricked into being brought to work. In either case, it is unclear how they came to be forced to work. We thought we should find a way to identify companies that do not meet the labor requirements and to clarify whether the foreign workers there came through legitimate

channels. In considering how to do this, we further focused on labor exploitation in developed countries. In Japan, we are investigating whether labor laws are being met, but as the U.S. The State Department report points out, in reality labor is being exploited, so we need to make the investigation meaningful.

Human trafficking for the purpose of forced labor
Victims Factors → poor / lack of enough education
⇒They cannot make the right decision, and even if they could, they may have no choice that they can live freely.
Aggriever Factors → Inability to pay labor costs / environment that allows human trafficking
⇒We should keep labor costs as low as possible. The focus may be on the poor who have to work even if the conditions are bad.

It is necessary to eliminate factors on the aggriever's side, not on the victim's side. (Think in Japan for now, and also consider improvements that can be applied to other countries.)
What about the victims? → (For now, there are a lot of organizations that care for victims so I thought we do not need to consider it.)

6. **Conclusion**

In order to accurately visualize the current situation of human trafficking, it is necessary to clarify the purpose why foreigners in each country are there. I suggest the following three proposals.
-Rank companies according to their labor status.
In the case of forced labor, it is believed that many victims are forced to work in companies that do not meet labor standards, so it is necessary to first clarify which companies are applicable.
-Create communities
In order to prevent forced labor even if companies that are regarded to have no problems in the labor standards, several companies should get together and create a community. We thought that an environment where each company could share information that includes labor conditions in the community and improve each other's situation by complementing each other would lead to a solution to the problem.
-Visualization of the production process using SNS, HP, and product tags
Using SNS and websites, consumers can know where, how, what, and by whom the products are made, and create an environment where the working conditions must be improved through public scrutiny. (There are also issues such as how much of this information should be open to consumers.)

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Enough Water for everyone in the world

~ To solve the growing problem of water shortage ~

– South Afrika　water shortage　seawater –

5320 Takahashi Naoto

1 . Research Abstracts

I started this research in order to solve the problem of water shortage, a problem that is currently becoming more serious in many parts of the world. Water shortage problems have three main causes: increased water usage due to population growth and industrial development, climate change, and the destruction of water sources due to development. I focused on seawater. It is said that the amount of water available for human use is only about 0.75% of the water on the earth, of which seawater accounts for about 97.5%. There are several ways to use seawater.

The first way to use seawater is to convert it into freshwater. There are two methods for converting seawater into freshwater: evaporation and reverse osmosis. In addition, the use of nuclear energy and crowdfunding can solve various problems associated with these methods.

The second way to use seawater is to use it for toilet flushing. Although pipes and other equipment would need to be changed to materials that do not rust in seawater, it would save about 113 billion liters of water per day, based on the assumption that people around the world use toilets in Japan.

These methods are mainly done by governments and large corporations, not by us. However, if each of us makes a conscious effort to conserve water, even if only a little, it will certainly lead to slowing down the problem of water shortages.

2. Research Background

While Japanese people use about 250 liters of water per day, the amount of water available in Cape Town is about one-fifth, or about 50 liters per day, forcing people to live with less water use, such as not being able to flush a toilet or use a shower for less than three minutes. This is not limited to Cape Town; similar problems of water shortages are found in many other places. I began this research because I wondered how people around the world could have access to water, the most important element for survival.

3. Purpose and Significance of Research

The goal is to solve the problem of water shortages, which is becoming more serious around the world, and this research will form the minimum foundation for development.

4. Research methods

Research online to find out how to make seawater desalinated, and raise the costs and problems. Ask questions about the problems to companies that actually desalinate seawater, and receive advice on what is needed to use the system overseas. Based on the advice, consider the lowest-cost desalination method possible, and think about how to collect fees to make it possible.

5. Research Result and Discussion

There are three main causes for the growing problem of water shortages: increased water usage due to population growth and industrial development, climate change, and the destruction of water sources due to development. First, population growth and industrial development are expected to increase the population by about 2 billion to 9.7 billion by 2050, just 26 years from now, and water consumption is expected to increase accordingly. In addition, industrial water consumption is also expected to increase dramatically as industries develop rapidly in developed countries and developing countries in the future. In terms of climate change, the increase in greenhouse gasses in the atmosphere due to industrial development will lead to global warming, causing problems such as droughts and desertification.

The last cause of water source destruction is deforestation. While forested mountains have a large capacity to store water, non-forested mountains have almost no such capacity, and most of the rain that falls on non-forested mountains flows over the surface, leaving only a small amount of groundwater available for use. The problem of water shortages is worsening due to these causes, and it requires prompt improvement and resolution because water shortages not only limit livelihood and cause the spread of disease, but can also lead to conflicts.



aquasphere

I therefore turned my attention to seawater. While freshwater available to humans accounts for only 0.75% of the water on the earth, seawater accounts for 97.5%. This means that if we can harness seawater, we will be able to solve the problem of water shortages. There are several possible ways to utilize seawater, the first of which is to convert seawater into freshwater.

There are two methods for desalinating seawater: evaporation and reverse osmosis. However, both methods have their disadvantages: the evaporation method consumes a large amount of energy, which leads to environmental destruction, while the reverse osmosis method requires special equipment, which is expensive to construct. The first method to solve these disadvantages is to use nuclear energy. Nuclear power can produce a large amount of energy semi-permanently and with less burden on the environment, thus solving the demerit

of the evaporation method that leads to environmental destruction. However, there is a problem that it could lead to a major accident, as was the case with the Great East Japan Earthquake.

The next approach is to utilize crowdfunding. By asking people in developed countries to support the cost of capital investment, the disadvantage of the high cost of constructing facilities for the reverse osmosis method can be solved. However, this method has the problem that if only a few people invest in the project, not only will the plan fail, but it may also end up in the red.

The second method is to use seawater for toilet flushing. Although it is necessary to change pipes and other equipment to materials that do not rust easily in seawater, if we assume that people around the world use toilets in Japan, we can save about 113 billion liters of water per day, which can be used for other purposes.

However, both of the two methods just mentioned are led by governments and large corporations. This does not mean that the actions of each and every one of us are completely meaningless. It is important to keep in mind that the problem of water shortage, which is difficult to be aware of in Japan where water resources are abundant, has become a serious problem all over the world, and it is important to be conscious of saving water in our daily lives by frequently turning off the water and using water-saving products, even if only a little.

6.Conclusion and Future Issues

We would like to conduct further research on how to gather people for crowdfunding and how exactly to make toilet water seawater in inland areas.

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Risks Related to Umbrellas
～What to Do to Make a Safe Umbrella～
― umbrella bag near miss ―

5321 Nakajima Daisuke

1. Research summary

I chose this theme because I became interested in it after researching the topic of horizontal umbrella holding and wondering why it was reported so prominently in the media. First, I researched the damage caused by holding umbrellas horizontally, the difference between long umbrellas and folding umbrellas, products that prevent holding umbrellas horizontally, and reasons for holding umbrellas horizontally on the Internet. According to the questionnaire, 40% of the subjects had experienced damage from holding umbrellas horizontally, suggesting that damage occurs in many places that are not visible to the public. The reason for holding umbrellas horizontally is that they do not hit the ground, making it easier to walk and preventing the ground from being scraped, and because the load on the arms is 1.5 times less than usual, making them easier to hold. Therefore, I have thought of tools and umbrellas that do not allow the umbrella to hit the ground and allow both arms to be extended. Therefore, I propose a tool that can be attached to a bag or briefcase to hold an umbrella, and an umbrella that is easy to hold.

2. Research background

Umbrellas are used by both children and adults, and are a necessity on rainy days. Such umbrellas have somewhat dangerous parts, such as the stone tip and dew point. The topic of discussion about these was the holding of umbrellas by the side. You may have heard of this at least once. I thought, " Even if a person were to hold an umbrella horizontally, wouldn't it only hit his or her foot or so?" I had always underestimated the danger of umbrellas. Therefore, I chose this theme because I questioned the large media coverage and researched and became interested in horizontal holding.

3. Purpose and Significance of the Study

The easiest way to stop carrying umbrellas horizontally is to use folding umbrellas. However, it is not realistic to replace all umbrellas with folding umbrellas. The purpose of this research is to create a product that will reduce the damage caused by holding umbrellas horizontally and make the world a better place to live, and to appeal to people who hold umbrellas horizontally.

4. research methods

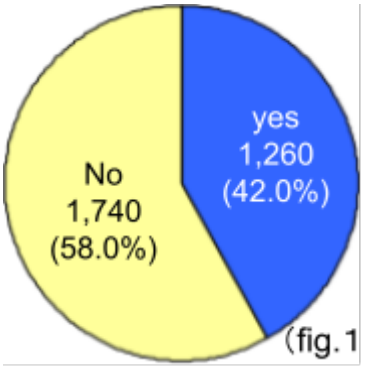
First, I will conduct research on the Internet to examine the damage caused by umbrellas held horizontally, the differences between long and folding umbrellas, products that prevent holding horizontally, and the reasons why umbrellas are held horizontally. Next, the direction of efforts to improve side-holding will be determined, and research will be conducted accordingly.

5. research results and discussion

The first part of the study looked at why some parts of the umbrella cause it to be held horizontally.According to the umbrella manufacturer's website, the tip of the umbrella is called the stone butt and is described in this way:"The role of the umbrella's stone butt is to poke the ground when it is closed and carried. Without a stone butt, you always have to carry

it in the air. If you accidentally poke the ground, the fabric is damaged... That's why we use stone butts. That's why folding umbrellas don't have a "stone butt."
In other words, it serves to protect the fabric when the umbrella touches the ground. Therefore, this part cannot be removed, and it seems unlikely that removing it will reduce the damage caused by side-holding.

Next, I investigated how many people have had problems with umbrellas being held horizontally. According to the Department of Consumer Affairs, Bureau of Consumer Affairs, Tokyo Metropolitan Government, about 40% of 1286 out of 3000 respondents (1286 out of 3000) answered that they had experienced a near-miss or harm when they were carrying (folding) umbrellas outside of rainfall. (Figure 1)



(fig.1)

Specifically,
"Some people walking in front of me were moving their umbrellas with their arms, even though the station was crowded. (It felt as if they were thrusting the tip of the umbrella behind them instead of letting it hang down.)" (18-year-old female)
"I almost got poked by someone who was holding the umbrella horizontally and swinging it back and forth as he walked.
(37-year-old man)
"On a crowded train, an umbrella I was holding horizontally hit me in the side and cracked my ribs.
(52-year-old woman), etc.
However, there is no news of any lawsuits or other problems related to accidents or troubles caused by holding umbrellas horizontally. This suggests that victims of umbrella carrying tend to cry themselves to sleep, and that the damage occurs in many cases out of sight of the public.

I believe that there are three ways to stop people from carrying umbrellas horizontally. The first is to warn people about it; the second is to create tools that will encourage people to stop carrying umbrellas horizontally; and the third is to stop people from carrying umbrellas on the side of the road. The third is to make the streets so that it is impossible for people to carry umbrellas horizontally. The warning has already been given. Since it is not practical to change the road, I decided to conduct research with the policy of creating a tool that would make people stop holding umbrellas horizontally.

First, I looked into why people hold umbrellas horizontally. According to one article.
"Because if you walk around with it like a pick, the bottom gets scraped off" (a housewife in her 50s)
"Maybe it's because they are more open-minded" (a business-like man in his 50s).
"If it's in a bag, it's easier to keep it in place. Besides, it is easier to walk than to hold it vertically because it doesn't hit the ground" (a male office worker in his 40s).
From the above, it is clear that carrying an umbrella horizontally
-prevents the umbrella from being scraped on the ground,
-fits better, and
-makes it easier to walk without bumping into the ground, etc.
Let me discuss these points.

According to one article, the average height of Japanese people is 170.9 cm for adult males and 157.8 cm for adult females.
Neck length is 11 cm for male adults and 9.4 cm for female adults.
Arm length is 73.5 cm for male adults and 67.34 cm for female adults.

Face length is 23.1 cm for male adults and 21.8 cm for female adults.
Finally, the recommended total length of an umbrella is 83 cm for an adult male and 82 cm for an adult female.
From this, height - (face + neck + arms + umbrella) gives -19.5 for men and -22,74 for women.
This indicates that most people cannot hold an umbrella with their arms extended when it is closed.

Next, I looked at the correct way to hold an umbrella.According to Mitsubishi Electric Corporation
According to Mitsubishi Electric, the correct way to hold an umbrella is to “grasp the handle, place the umbrella tip down, and hold it close to your body,” as shown in Figure 2. It is natural that holding the object with the arms bent in this way for a long period of time is tiring.

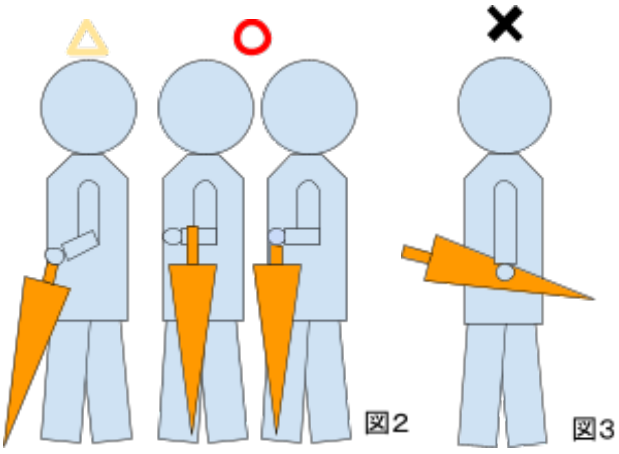
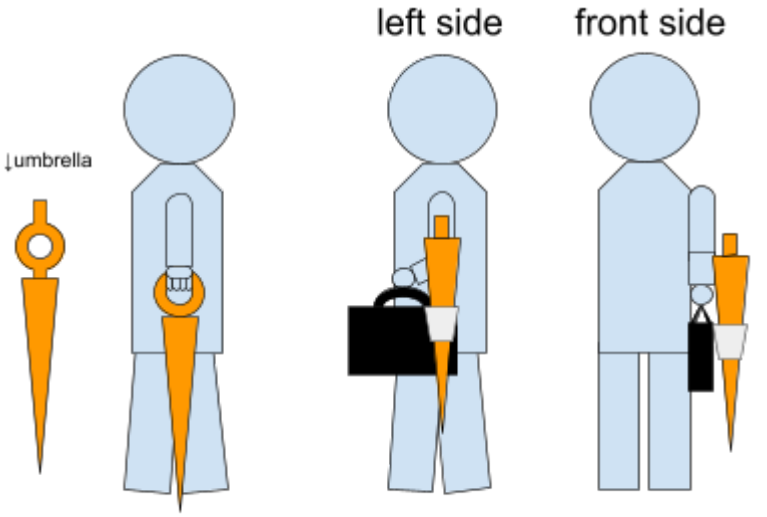

図2

図3

On the other hand, holding an umbrella horizontally, as shown in Figure 3, is easier because the arm can be held outstretched.It is also easier to walk without bumping into the ground and is less likely to be scraped there as well. And even if the umbrella could be held with arms extended without holding it horizontally, the centrifugal force applied when swinging the arms would be 1,5 times greater than that of holding it horizontally, assuming that the center of gravity of the umbrella is approximately half the distance of the total length and that the arms and umbrella are the same length. If the length of the umbrella is longer than this, the centrifugal force will also increase, so the centrifugal force applied is more than 1.5 times greater.Therefore, from the viewpoint of ease of use, holding the umbrella horizontally is very good. I believe that these are the reasons for holding it horizontally. Therefore, our proposal is to create tools and umbrellas that make it easier to carry an umbrella than to hold it horizontally.
The conditions for this proposal are,
-The umbrella does not hit the ground.
-The umbrella can extend both arms.
-The shape of the proposal should be such that it is easy to hold the umbrella.
There are two types of proposals: one is to provide support when holding an umbrella, and the other is to attach it to something that you already have in your possession.I would like to develop a proposal based on these conditions.

6. conclusions and future issues

Based on the above, I propose an umbrella storage device that can be attached to a bag or briefcase, and an umbrella that is easy to carry (Figure 4). Future issues to be addressed are to make the umbrella storage device an anti-theft device, to make it unbreakable even if water from the umbrella gets on it, to make it easy to attach to many bags, and to prevent water from the umbrella from getting on the bag. An easy-to-handle umbrella should not interfere with the opening and closing of the umbrella, should not get in the way when hooking the umbrella handle, and should have a small increase in volume when the umbrella is closed.



(figs.4)

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Reduce the burden on teachers

5322 Koga Nakada

1. Abstract

I found on the Internet that one of the complaints of researchers is that there is not enough time for research. It seems that researchers' time is being taken up by teaching classes. Taking this situation into account, I set a research question below. The question is how to reduce the burden on teachers. I think that by introducing AI, various tasks for teachers will be done by AI, and teachers will be able to concentrate on their research as researchers. Therefore, the answer to the research question is the introduction of AI.

2. Introduction

My dream is to be a professor, so I am conscious about educational problems. When I searched the Internet for complaints from university researchers, I found that the problem was a lack of research time. The reason for this problem is not only that it takes time to teach classes, but also that time must be spent on “work for work” such as preparing materials for classes and reserving class venues. I wondered if there was a way to reduce this burden as school personnel and allow them to devote as much time as possible on research.

3. Purposes and meaning of this research

The question of this research is, "What is the method to reduce the burden on teachers?"
The significance of this research is that by reducing the burden on teachers, researchers can devote more time to research, and better research results can be expected.
So, how can we reduce the burden on teachers? Here is the hypothesis.
University classes often show the entrance to academic studies, so creating a class template in one year for classes with set phrases will drastically reduce the effort and time required to teach the class from the next year. Also, it would be better to leave the management of the Internet-related system to someone else, which can function as a tool of distributing announcements and grades to students. It would also be a good idea for that person to manage the room where daily classes are held.

4. The way to do this research

I searched the Internet.

5. Research results and discussion

According to page 47 of Reference 3, the reason why university faculty members were unable to secure enough research time is that as the number of subjects they were responsible for increased, they had to spend more time preparing for classes.
I think that this could be a great benefit in the long run if each university created a template for each subject. The document also states that several hours of administrative work are required to cover travel expenses of several thousand yen. The solution would be to have other administrative staff take over the task. In this sense, the hypothesis seemed to be on target. (Possibility is another matter.)
Furthermore, by deepening the idea of delegating this task, I came to the conclusion that the person entrusted with the delegation does not necessarily have to be a human. I thought that it would be a good idea to introduce AI technology, which is being introduced in companies, into the educational field. In fact, according to Reference 2, the introduction of AI has eliminated the burden of automatic grading of exams, delegating to exam supervision, and roll calls. It is also convenient that AI will be used to create handouts for classes. This will allow for a lot more time to be devoted to research. It is desirable to clearly define the desired effect and purpose before investing in the introduction of AI, but the purpose is clear, as the aim is to reduce the burden on teachers by having AI handle time-consuming tasks related to education that can be entrusted to AI, and in that respect there is no problem with introducing AI.

6. Conclusion and future challenges

The answer to the research question we set is the introduction of AI.
In the future, I will also consider the issue of research expenses, which is one of the complaints of researchers.

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Aiming to Improve the Marine Environment

5323 Yuiko Nakoji

1. Abstracts

We are surrounded by many plastic products. However, such plastic products, fishing lines, and various other things are flowing into the ocean and damaging fish. The process of these items entering the ocean is that we humans throw them away in towns and city centers, and the wind carries them into rivers, and they end up in the ocean. This trash is not only in the area where it was discarded, but also drifts to other countries, damaging the beauty of nature. It is said that there will be more garbage in the ocean than fish by 2050. In addition to plastic products, aluminum cans, steel cans, and glass bottles take many years to decompose in the ocean. Aluminum cans are said to take 200 years to decompose, and glass bottles 1 million years. In other words, garbage remains in the ocean longer than our lifetimes. Of course, during that time, it has a negative impact on marine life.

To solve this problem, I would like to suggest two things. The first is to adopt a “deposit system” in countries around the world. This system has already been adopted in a number of European countries, and I believe it will not be long before it becomes a reality. The second is an initiative that each individual can take.

2. Introduction

We are surrounded by a lot of plastic products in our daily lives. However, these plastics and fishing lines hurt sea creatures in the ocean. Moreover, microplastics, which are plastic products that have been reduced to as small as 5mm in size, are eaten by sea creatures and the creatures take damage from them. It is said that in 2050, the amount of garbage in the ocean would be more than that of sea fish. In addition to plastic products, aluminum cans, steel cans, and glass bottles take many years to decompose in the natural world of the ocean. Aluminum cans are said to take 200 years to decompose, and glass bottles 1 million years.

There are two objectives of this research. The first is to reduce the amount of plastic garbage which flows into the sea. As I mentioned above, the plastic products discharged from our daily lives are transported to the ocean, resulting in the accumulation of large amounts of plastic waste in the ocean and degrading the environment. Moreover, sea creatures and sea birds are damaged by plastic garbage. Then, I think it is important to reduce the amount of discharge. The second is o reduce the amount of plastic garbage which flows into the sethat can decompose naturally in the ocean. However, I found only paper, biomass plastics, and biodegradable plastic at the present time, so I would like to research other materials for the remaining period.

The ways of this research are to use the Internet, Google Scholar, and based on them. Not only those, reading newspapers, watching the news, and reading books relating to plastics. I

would also like to ask questions of people who are doing similar research at universities and other institutions. I used biomass plastics as an example above, I would like to find other materials that are not known to society. This research is global scale, so I'm keen to incorporate good ideas around the world.

3. Discussion and implications

For this study, we decided to focus on two main areas: 1) considering alternative materials for plastics, and 2) creating an environment that facilitates recycling and reuse. When we searched for a better way, we found a material called "biomass plastic". The first advantage of biomass plastics is the possibility of reducing the use of fossil fuels. Compared to plastics produced with fossil fuels, which have been pointed out to be in danger of depletion, biomass plastics are produced with organic resources that can be generated from plant-derived plastic materials. Therefore, it is expected to reduce the use of depletable resources such as fossil fuels. Furthermore, biomass plastics with biodegradable functions absorb carbon dioxide through photosynthesis of plants used as raw materials. After the biodegradable plastic finishes its role, it is decomposed by microorganisms in the natural environment. The end result is carbon dioxide and water, thus contributing to carbon neutrality. Furthermore, the greatest advantage of biodegradable plastics is that they are biodegradable in a short period of time and have a low environmental impact. On the other hand, one of the disadvantages of biomass plastics is that they are mainly manufactured from biomass-derived sugars, fats, and oils. Typical raw materials include sugarcane, corn, and cassava, and in some cases edible parts are used. From the perspective of procuring sustainable raw materials, there is a concern that the amount of raw materials themselves may become insufficient. In addition, biomass plastics have the disadvantage of being more expensive to produce than fossil resources due to the efficiency of raw material procurement and the characteristics of the manufacturing process, resulting in higher product prices. When comparing the unit costs of conventional and biomass plastics, they found that biomass polyethylene is about three times more expensive and biomass polyethylene terephthalate is about 1.5 times more expensive. After that, I found an article which introduced German policy. In Germany, bottles containing mineral water, beer, etc. are collected at supermarkets and used over and over again. At that time, the price of the bottle is added to the price of the product, and it is a "deposit system" where you get the money back when you return the bottle. Furthermore, vegetables and eggs are not packaged and are sold individually.
I thought these policies are good for the environment, and I can utilize them in my research. Another measure to prevent littering was to place trash cans that match the landscape. For example, to place white and light blue trash cans along the beach sight, so that the trash can function without spoiling the scenery.

4. Conclusion

In conclusion, I would like to suggest two things. As mentioned above, the first is to adopt a "deposit system" in countries around the world. However, it may be difficult to do that in

developing countries, so I would like to suggest this as an initiative primarily in developed countries. This system has already been adopted in a number of European countries, and I believe it will not be long before it becomes a reality. The only issue is the cost. the second is an initiative that each individual can take. That is, never litter. If we did not throw garbage on the streets, ocean litter would not be created, and this would result in efforts to prevent ocean pollution. It is difficult to adopt a fine system like Singapore, but individual cooperation is essential.

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Supermarkets in Germany

Let's reduce the percentage of vacant houses to less than 10%
~How to make use of vacant houses around the world~

5324　Nishio Asumi

Abstract

My research theme is “Let’s reduce the percentage of vacant houses to less than 10%” and my research question is “How to make use of vacant houses around the world”. I decided to do this research for two reasons. The first reason is that I have been researching vacant houses since I was 14 years old. The second reason is that I realized that there are seven countries where the percentage of vacant houses is more than 10%. So I set up the hypothesis that if the place was usable by a variety of people, they would use the vacant house. My research shows that in other countries, vacant houses are being reduced using flipper businesses, dormitories, and shared housing. All three have two things in common: first, they do not cost money, and second, they come in a variety of formats. I thought that these three alone would be sufficient. However, the vacancy rate has not changed. This means that there are things that need to be improved. Therefore, I propose to remake them into places where travelers can stay. This is because countries with a vacancy rate of 10% and higher tend to see an increase in the number of tourists. In addition, the cost of staying there will be cheaper because flipper businesses, dormitories, and shared houses will be used to build places to stay. Cheaper prices will make it easier for tourists to travel, and the number of tourists going to the location is also expected to increase further.

There are two issues to be solved in the future. The first is how to confront the disadvantages of that conclusion. The second is to consider different target audiences.

1 Introduction

I decided to do this research for two reasons. The first reason is that I have been researching vacant houses since I was 14 years old.The second reason is that I realized that there are seven countries that have percentages of vacant houses that are more than 10%. I would like to discuss the previous research ①. I researched the percentage of vacant houses in the world. From the first rank, the countries are Japan, Cyprus, Hungary, the United States, Finland, Chile, and Slovenia. The seven countries that I just mentioned have a vacancy rate of more than 10%.Next, I would like to discuss the previous research ②. In Japan, we have a vacant house bank. This is a system to provide information on vacant house properties by posting them in public relations magazines and websites. For example, many old private house cafes and children's cafeterias have been created using this information.

ランキング	国名	空き家率（%）
1位	日本	13.55
2位	キプロス	12.48
3位	ハンガリー	12.35
4位	アメリカ	11.13
5位	フィンランド	10.73
6位	チリ	10.72
7位	スロベニア	10.53
8位	オーストラリア	9.84
9位	アイルランド	9.15
10位	カナダ	8.70

2 Discussion and implications

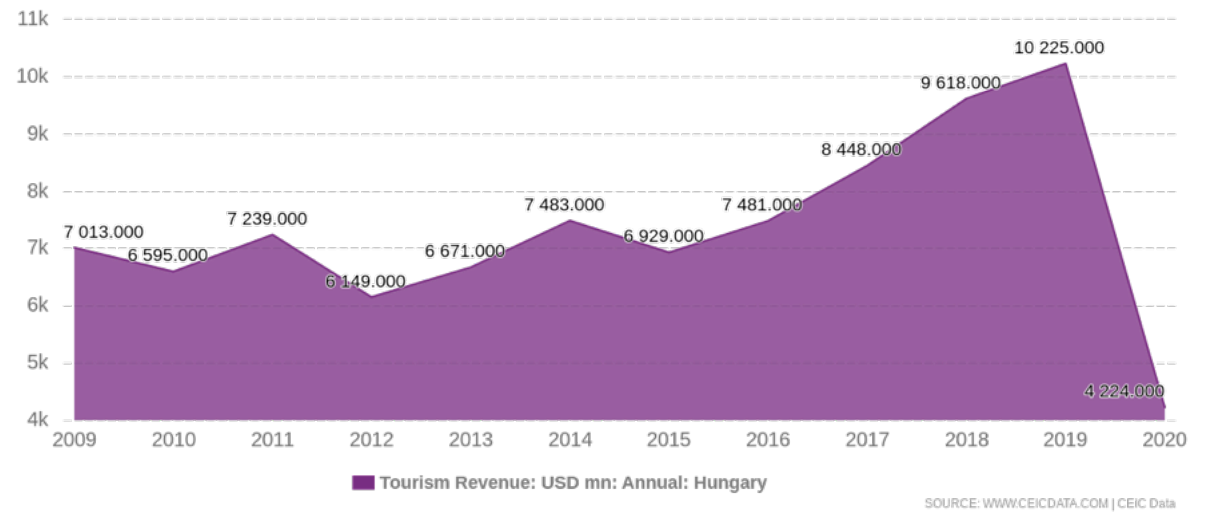
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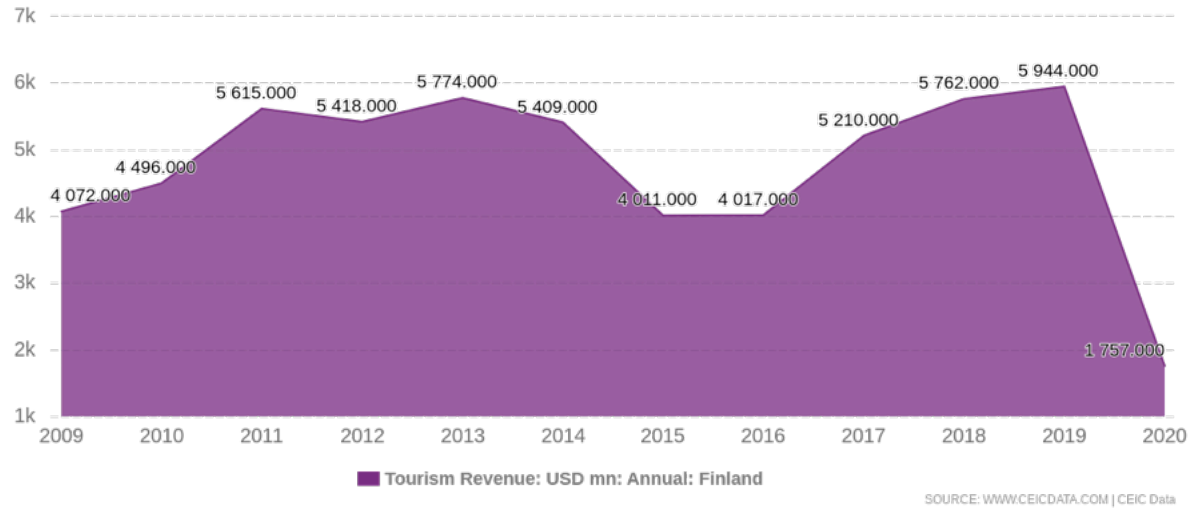
3 Conclusion

Therefore, I propose to remake them into places where travelers can stay. This is because countries with a vacancy rate of 10% and higher tend to see an increase in the number of tourists. In addition, the cost of staying there will be cheaper because flipper businesses, dormitories, and shared houses will be used to build places to stay. Cheaper prices will make it easier for tourists to travel, and the number of tourists going to the location is also expected to increase further.
There are two issues to be solved in the future. The first is how to confront the disadvantages of that conclusion. If we are going to use the three methods of dealing with vacant houses, we have to establish rules because we will have to face a lot of problems.

The second is to consider different target audiences. By thinking beyond the tourist market, we can increase the use of vacant houses and further reduce the vacancy rate.







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The value of waste to scavengers and a consideration of waste management in developing countries

-How should we support scavengers' lives?-

ID 5325 Name Kohana Nonaka

Abstract

My research topic focuses on the lives of scavengers in developing countries.

There are people who live on garbage heaps in developing countries, collecting garbage and eating the food they pick up. People in this situation are called scavengers. The lives of scavengers present numerous challenges that need to be solved from the perspective of the SDGs. I broadened my perspective from the perspective of food loss last year, so I decided to focus my research in terms of food.

My research discovered that the food culture of picking up discarded food and re-cooking it and the fact that many children smoke paint thinner to drown their hunger are problems.

To solve the above problems, I considered rationing and thinner control, but came to the conclusion that this would not solve the problem fundamentally. Therefore, as the next phase of my research, I decided to come up with a proposal to stabilize the income of the scavengers and support their livelihood.

(1) Establish a consulting company to help each scavenger find self-employment where he/she can make use of his/her abilities. Encourage employment and stable income other than garbage collection.

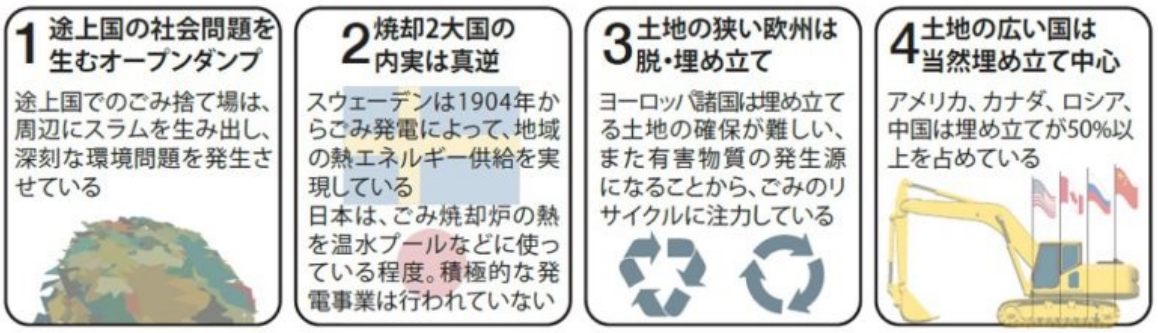
(2) Collaborate with scavengers to raise awareness of food loss. Encourage citizens (wealthy people, etc.) to reduce food loss so that the mountains of garbage will not be amplified any further.

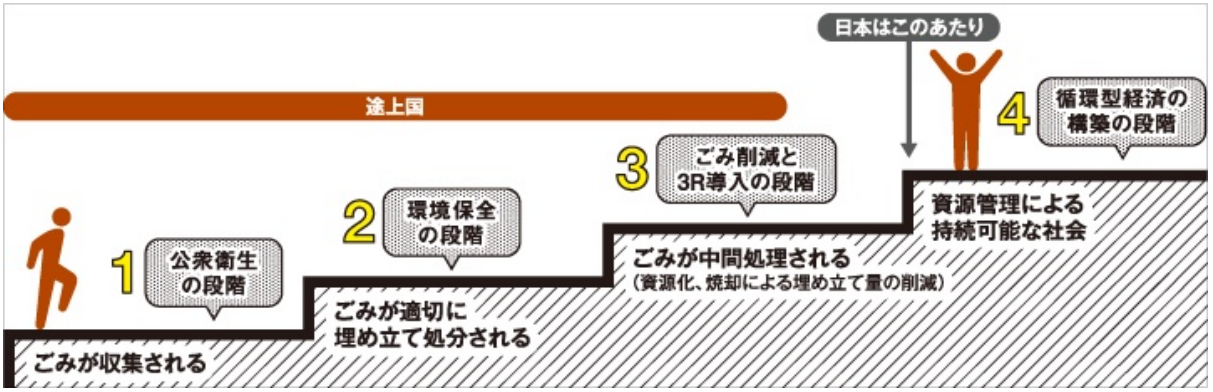
(3)Connect scavengers to the lack of employees in the world,such as Scavenger✕ traditional industry program. This will also stimulate small and medium-sized businesses and self-employed stores in foreign countries.

(4)Introduce a waste analysis program.The scavengers will find out what is selling in their country and how much they are selling, based on the garbage they collect, and this will help them understand the consumption trends of the people. This information is then sold to companies.

1 Introduction

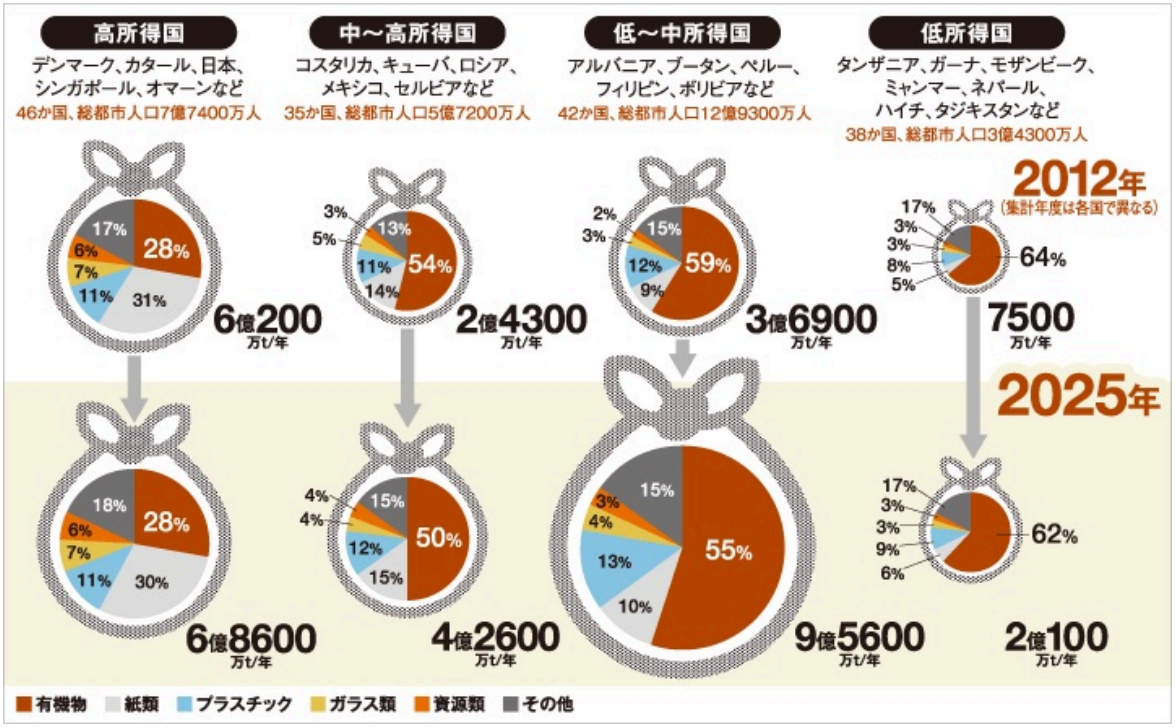
Japan can be said to be one of the countries where waste management technology and disposal systems are well-organized and well managed. However, many developing countries have yet to establish effective waste disposal systems. There are significant differences in the progress of waste management between developed and developing countries as follows, as illustrated in Figures 1 and 2 below.





The living environment of the scavenger I am studying is a situation where only step 1 of Figure 2 has been implemented. Although garbage is collected, it is not buried in the ground and it is simply piled up on a plastic sheet on the ground, causing soil contamination and air pollution from the smoke of garbage fired by sunlight, which is equivalent to treating the earth as a garbage dump.

Furthermore, some of these developing countries that do not have waste management processes have population explosion. As shown in Figure 3, low- to middle-income countries are facing a significant increase in waste volume. I think the reason is the rapid increase in population. In short, the total volume of waste is increasing in countries that do not have waste management processes in place or the funds to put them in place. The lack of technology and awareness of waste management in developing countries, where an explosive increase in waste is expected, is an issue that must be resolved in order to reduce waste and waste disposal with an awareness of environmental conservation.
Since I was in the second grade of junior high school, I have been studying food loss. As I researched food loss and waste management around the world, I learned about the poor waste management in developing countries and the food loss that never seems to decrease, and I decided to research to change the lives of people living in waste heaps, which have complex social problems. Figure3↓



2 Discussion and implications

(1) The goals and meaning
My primary research question is

“What can we do to make life better for scavengers before we eliminate the trash heap?”

The significance of my research on the subject that I believe is that it will bring us much closer to achieving SDGs 1, 2, 3, 11, 12, 14, and 15.

I then set up hypotheses about the problems faced by the scavengers.

Hypothesis 1) Poverty makes it difficult to access food, so they pick up and eat food that is not clean and hygienic.

Hypothesis 2) Many people suffer from diseases due to malnutrition
.
Hypothesis 3) Goods are not provided up with the demand for daily necessities such as clothes and shoes.consideration

(2)How to research
1) Find out about the life of a scavenger.
2) Make a hypothesis about what kind of problems there are.
3) Research books and the Internet to see if the hypothesis is true
4) Think of a solution based on the problems found.
5) Check if the proposal is feasible.
6) Learn about innovations necessary to create jobs for scavengers through fieldwork.

(3)Result and consideration

【Why were scavenger created?】

Scavengers are people who make a living by picking up trash, some of whom have moved to trash heaps and some of whom have had their original land turned into trash heaps. In developing countries such as the Philippines, there are few garbage collection facilities managed by the government, and contractors collect garbage and leave it on garbage heaps. When a land owner turns a land into a garbage heap without permission that the people who used to live there have, Scavengers have to learn how to live in the garbage heap to survive. The reason why they still live in a poor environment is that they have jobs there. They pick up things that can be sold from the garbage trucks that come by every day. Then they sell them to buyers. For example, plastic is worth 10 yen per kilogram, plastic bottles are worth 30 yen per kilogram, and even paper is worth about 10 yen per kilogram. This is a very large income for the poor in the Philippines, and while day jobs such as manual labor do not provide a stable income, scavengers on the trash heap can expect a certain income by picking up trash. In exchange for this income, however, scavengers take a big risk by living on the trash heap.

【What I Have Learned from Previous Studies】

”Informal recycling at final waste disposal sites” From Sasaki,Tokyo university

"If we want to reduce poverty, we should help scavengers to secure their safety, raise their income, and reduce their health risks, rather than making them suffer...”

It said that solutions are needed to support the current livelihood of scavengers

as soon as possible rather than to remove the trash heap. I

"Myth: All scavengers are poor within poverty.

(disproof) The above myth applies only when exploitation and other forms of exploitation are being done.”

This means that not all scavengers are poor, and that some scavengers earn more than the average income by selling expensive trash.

“Elucidation of the Actual Condition of Waste Management in the Philippines and Recommendations for Waste Policy” From *Ishida & Kataya*

“The older the age group, the less they understand the meaning of the 3Rs...”

”The services provided by waste management companies are not sufficient...

“...The service by disposal companies is not sufficient...Each household disposes of their own waste, and there is a lot of garbage outside...The hygiene problem is serious because of the bad smell...Collection methods that suit local road conditions are necessary...”.

This shows the need for localized solutions.

【Problems with scavengers】

(1) Suffering from poverty.

There were differences in interpretation that appear thickly depending on the literature. Some scientists say that scavengers can get higher income by selling garbage on the trash heap than physical labor, while others said that they really want a stable job. Whichever idea they have, people living on garbage mountains are poorer than people living in cities, and we believe that living on garbage mountains is a condition that should be stopped as soon as possible.

(2) Health hazards are occurring because people are living in unsanitary garbage heaps.

Garbage left outside is heated by sunlight, causing a chemical reaction that produces toxic smoke. The mountain in the Philippines which has this toxic smoke was named Smoky Mountain. In addition, people can be injured by stepping on sharp garbage or scalpels from medical waste on barefoot.

(3) Recooking, spreading pagpag and alice.

Some of the scavengers are in the business of separating garbage. Others look for saleable items in the trash heap and collect them, separating them into those that could be eaten by humans and those for pig feed. In some cases, they make a living by washing and reheating them to make food, which they sell to other scavengers. Garbage in developing countries is not separated and some leftovers are found with hair and other things, but they are forced to eat them for a hard life.

(4) Deterioration of security, trash heaps turned into slums

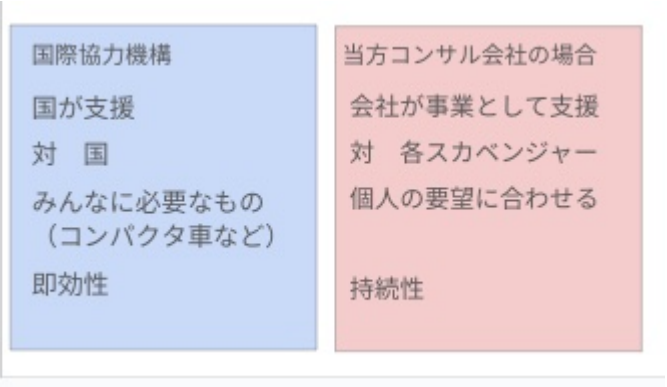
Expensive garbage often makes scavengers fight. For hunger, children fill their stomachs by smoking tire rubber and other thinner. Although they feel temporarily satisfied, the side effects may interrupt them from eating a vital meal.

I considered rationing and thinner control, but they don't eliminate the cause of the problem. Therefore, as a second step in my research, I decided to come up with a proposal that would make the scavengers' income stable and support their living.

As mentioned above, they can earn a lot of money by selling expensive garbage, but they sometimes don't get available garbage due to the government's elimination of garbage piles. So, I thought that we need a system that can work sustainably.

【proposal】

(1) Founding a consulting company
We will facilitate self-employment where each scavenger can make use of his/her abilities. The objective is to encourage the realization of jobs and stable income instead of garbage collection.



This chart shows that there are differences between this consulting company and ODA.

The Power of Music Treatments the Dependence
~How Can We Treatment the Dependence for Everyone in the World~
— Dependence Music Brain —

17th ID 5326 Name Hanazawa Aoi

1. Summary of the Research

My Research's objective is decreasing the number of dependencies. In Japan, more than 130,000 people visit hospitals for treatment, and approximately 60% of those individuals are arrested for drug-related offenses. Because of the figures, it is meaningful to reduce the number of dependencies and it makes society safer. The way of research is to research the mechanism of music therapy, addictions, and the impact of music on the brain. As a result of research, listening to music including lyrics reduces dopamine [hedonic substance] and stimulates the brain where we inoculate with narcotics. I'm sure that listening to music is similar to the mechanism of addiction for our brain. I conclude that listening to music as a first treatment for addiction is effective. Future tasks are resolving individual differences and the community of patients.

2. Background of the Research

In Japan, there are about 120,000 alcohol addiction patients, 10,000 drug addiction patients [including illegal and not illegal], and 3,000 gambling addiction patients are treated. Moreover, it is said that the number of people who were suspected of gambling addiction in their life is about 3,200,000, and alcohol is about 1,090,000. This date shows dependence is a familiar issue in our society. In addition, around 60% of all drug abusers have been re-arrested for the same offense. Many abusers can't overcome addiction despite not using drugs for a long time.

Then, I believe music is effective for abusers' treatment as a first step. As mentioned above, only a few patients can receive treatment in Japan because of the small number of hospitals and worrying about public image. It is easy for them to receive treatment by music in their house. The dopamine is produced while we are listening to music, so it is similar to the mechanism of addiction for our brain. I advocate listening to music is effective for abusers to receive treatment as a first step.

3. Objective and Meaning of the Research

Research Questions
~How Can We Treat the Dependence for Everyone in the World~
The purpose of research is to reduce the number of addiction patients by music and contribute to public safety. As mentioned in the Background of Research, there are many abusers in Japan and the rate of not receiving treatment is high. In the case of illegal drugs, sellers are often associated with antisocial organizations, and fees become a source of funding for antisocial organizations. In the case of gambling and alcohol addiction, these issues often lead to domestic violence and abuse. Some of the parents have family members who have the same addictions. Potentially increasing the number of addicts in the next generation. From the above, decreasing the number of addiction patients can improve the safety of society so it is worth researching. Today, we can treat alcohol addiction with medicines but it specializes only for alcohol addiction. It is difficult to treat only medicine.

4. How to Research

I researched treatises on the effect of music for the brain and the terms. I researched a lot of data from many kinds of view [patient's point of view and their family's point of view] to realize what to prevent.

5. Result and Consideration of the Research

First, I will explain about the mechanism of addiction. Addiction can be classified into two types. One of them is depending on substances such as alcohol and nicotine in smoking. The other is depending on actions such as shopping and gambling. Both have the same impacts on the brains, when they get substance and act, dopamine, also known as the 'happy hormone' is released. Dopamin is temporarily released, gradually decreasing. That is no problem for a healthy person, but others are depressed when they keep getting substance and acting. They will want much substance and act to get stronger stimuli. Abusers want stronger dopamin.

Next, I will explain about the effect of music on the brain. Listening to music produces dopamine, the same as addiction, stimulates parasympathetic nerves and listeners feel relaxed. Additionally, music stimulates the prefrontal lobe of the brain, much like the ingestion of drugs. Music also releases dopamine when the listener sympathizes with the lyrics.

From the above, I conclude getting substances, engaging in certain actions, and listening to music are similar in that they release dopamine in the brain. Today, there are medicines for only alcoholism, but they are expensive and they can not treat everyone because of identity differences. On the other hand, music has a lot of genres, easy to match one's favorite and free. Music is superior to other ways to treat. There are 214 hospitals for treating addiction, and there is sometimes only one hospital in the countryside. People in the city can get treatment easily but people in the countryside can not do that. Many elderly care facilities in Japan provide time for all residents to come together to enjoy exercises and songs. Since enjoying music is linked to the prevention of dementia progression, I believe that music has the power to improve healthy brain function. The goal is to suppress the desire for exposure to addictive substances by listening to music and to reduce the frequency of such exposure.

Based on the above, we believe that listening to music can provide an opportunity to overcome addiction. The rationale is the effect of music on the brain as described in the research results. Although it is difficult to cure addiction completely, we believe that listening to music can have some positive effects, and can provide an opportunity to think positively about treatment for addiction and about participation in the community. As for specific examples of the use of music therapy, one example is to listen to music when one is tempted to touch the addictive substance at home to quell the cravings.

6. Conclusion and Future Tasks

The study concludes that listening to music releases the same substances in the brain that are released when the brain is exposed to addictive substances and causes, such as narcotics, and is effective in treating addiction. Listening to music provoke dopamine and other rewarding substances in the brain. In order to cure addiction, counseling with a doctor and participation in a community are necessary. However, if the person is not willing to do so, it will not lead to treatment. If listening to music quenches cravings and triggers a person to go for counseling, etc., the goal of the study will be achieved.

Future challenges include the fact that this is not a theoretical study, and that there is a large difference between individuals. Since it is difficult to put it into practice by oneself, a solution is undecided.

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Spread the BOUSAI to the World
What is an effective application use to promote public helping?
What is the effective way to promote mutual helping?

5327 Haruka Fukuda

Abstract
Because of the effects of global warming, the number of natural disasters occurring in the world has increased.According to WHO, the number has increased about five- times in the last 50 years until 2021. One of the major causes of disaster is flooding. What can we do to reduce the damage?
In order to reduce damage from flooding, it is essential to collaborate with “public help” (government actions), “self-help” (individual actions), and “ community help” (local community actions). It is important to share information quickly when floods are likely to occur, and for communities to work together to repair levees and evacuate people.
I propose an application called “BOUSAI” as a way of sharing the information.This application will not only provide disaster information quickly in cooperation with local governments, but will also allow citizens to post information like a social networking service. In addition, in order to raise daily awareness of disaster prevention, the app will send out information related to disaster prevention on a regular basis, such as information on measures that are appropriate for the area and on checking evacuation routes.My goal is to make this available anywhere in the world, but first I focused on Asia, where many disasters occur. Also, by cooperating with local governments, we can get people to register their addresses and names to help prevent false information and at the same time, make it easier to check their safety. I believe that by having information not only from the national and local governments, but also from citizens raising current information, it will be easier to get help, and more timely information will be available, which will also speed up the start of the evacuation process.

1 Introduction
The Noto Peninsula earthquake happened on the first day of the year 2024. I was watching the situation on SNS. I thought it was very convenient as information was shared quickly and used for rescue requests, but I found false information and double information. I also found some inconvenient points, such as information being spread and circulated even after a rescue had been carried out. I thought that if the information sharing between rescue teams such as fire departments and citizens living in the area ,it would be easier and easier to know and understand, more people could be rescued.In addition, I felt that if we could share the situation about necessary supplies, such as what people are requesting and, conversely, what is in enough supply, it would make it easier for people in the damaged area to receive the necessary support from people in other prefectures.
Therefore, I propose an application that can solve this problem.

Similar applications already exist, such as Yahoo Disaster Prevention Alert, Tokyo Metropolitan Government Disaster Prevention App, and LINE. However, most of these apps are just for gathering information and cannot send out any information from the user's side. It is not possible to share information with the local community and just wait for public help from the local government.
The application I propose will allow local citizens to share such information. It will also make it possible for people who are not in the area to view the information by searching or registering, and make it easier for people to provide support or get information even if they are on a trip and suddenly arrive in the area.
The research method is to give advantages and demerits of the apps and social networking sites I have referred to and how they have been useful in times of disaster, and to consider how they can be improved with what I have proposed. There is no single application, but most of the options I would like to include in my proposed application are combinations of already existing ones (incremental innovation), so I will analyze each one of them to see how useful it would be for disaster prevention.

2 Discussion and implications
First, I analyzed how convenient and effective such existing services would be in a disaster situation.

LINE
Advantages
・connection to the telephone line, just as with an Internet connection.
・Just tap and check for safety in case of a disaster.
・If you register your area on LINE, you can receive information about disasters in that area through LINE Talk.
・It is possible to send location information to family members, etc.

It was developed based on the experience of the East Japan Earthquake, and is a very good tool for disaster prevention. However, it requires settings and a certain amount of operation to get information about disasters and to send location information. Therefore, here are some of its disadvantages.

disadvantage
・Awareness of functions that can be used in case of disaster is low.
・To get the information, you need to set up a subscription.
・There are several steps to send about location sharing as well.
・Not as good as Twitter for real-time information collection, such as understanding the local situation.
・People may not know that the request is coming from the LINE, so they may make a double request.

Therefore, I think it is important to make the application easy to use and to spread the use of the application by making the operation as simple as possible.
Also, we need to devise ways to share information with the community and government so that information can be gathered more quickly and not only among family members and those who know their contact information, but also so that the community and government can get a more detailed picture of the situation in the community as a whole.

X
Advantages
・You can transmit information in real time in short sentences.
・Information can be easily transmitted from a mobile phone.

At the time of the East Japan Earthquake, when smartphones were not yet widely used, Twitter at that time was actually being used for communication purposes.

Because of its significant advantages at the time, after the East Japan Earthquake, Twitter was actively used to transmit and spread important information such as rescue and evacuation, attracting even more attention.In response, local governments and administrative agencies have also begun to use Twitter by way of sending out information in the case of a disaster. And based on this experience, the city of Mito in Ibaraki Prefecture used Twitter to help with the severe flooding that occurred in Mito City, Ibaraki Prefecture, in 2019 caused by a typhoon that flooded the city's river.. Twitter was used to quickly share evacuation information, check on damage, and even request rescuers. In fact, there were cases where residents who had been left behind were rescued as a result of Twitter posts.

On the other hand, there are some disadvantages specific for social networking sites

disadvantage
・It is difficult to completely erase what has been transmitted once.
・Spread over a long period of time.
・Sometimes posts are sent out that are rumor- and worry-inducing.

During the 2019 disaster, the fact that the postings remained up even after the rescue was over led to numerous calls from people who saw them and were forced to respond to the calls.
Another problem is false information. Rescue requests with fake addresses and names, and even fakes that animals escaped from zoos due to the earthquake, are sometimes posted. Such things were also very common in the recent Noto Peninsula earthquake.
The causes for this are the increase in the number of SNS users and the profitability of SNS. Simply because more people are using social networking sites, the number of posts increases, and the number of fake information increases with it. This is because some people satisfy their need for approval by having their posts viewed, liked, and spread by many people. In addition, X and Instagram have been making profits in recent years.

This is a way to earn money by getting a large number of views, and is becoming more and more popular these days, as people can earn money just by being spread around without their permission.
I also think that anonymity is a problem.
X is a system that allows users to create an account by registering an e-mail address, so it is possible to have as many accounts as you want as you create e-mail addresses. This also makes it possible to create a new account and send out messages even after the account has been stopped.
The key to creating an application will be how to reduce false information while taking advantage of SNS's ability to transmit information in real time and share it with many people, and how to make rescue requests without repetition.

Yahoo! Disaster Prevention Alert
Advantages
・Forecasts of heavy rainfall are notified in advance.
・Information on evacuation sites is also given, so you can be prepared in case of an emergency.
・You will be reassured when the warning is lifted.

disadvantage
・If you are registered even outside of your current location, you will receive a notice if there is an earthquake or fire there, and you will get a loud alarm.
・Information on vaccines in Omicron share is delivered repeatedly and notices are sent out, focusing on information that the municipality wants to show you, not information that you want to see.
・Not only natural disasters, but also local fires in distant areas are notified, and it takes a long time to see the necessary information.
・even if you live in an inland area, you will receive warnings about tsunami information. Notices even from outside the registered area.

I also checked an application that provides only disaster prevention information about Tokyo in order to see if a region-specific application for each municipality would be better.

Tokyo Disaster Prevention App
Advantages
・Various maps, such as flood risk and local hazards, can be easily seen and changed on a one-screen.
・There are quizzes and simulations to raise awareness of disaster prevention on a daily basis.
・This app is easy to see because it only contains the necessary information for the region it is focused on.
・There is a Tokyo Metropolitan Disaster Assumption, which allows you to see what kind of damage can be expected in the case of a serious disaster.

disadvantage

・people tried once with family members to see if location information could really be contacted during normal times, but it was too heavy and the system was stopped.
・Information is slow. Sometimes it was delayed for an hour.

I summarized what I learned from analyzing the application and what I think needs to be improved and important.
・Information sharing throughout the community
・No duplicate requests for help
・Eliminate false information
・Providing fast and correct information
・Make it easy to see information about where you are.
・Check on the safety of familiar people.

So far, I have simply summarized the characteristics of each application because I wanted to know about its unique characteristics.
From now on, I will also investigate what is actually being demanded.

According to a survey by Spectee Corporation about the “ Problems in the Disaster Prevention and Response of Governments,” which was conducted among those involved in disaster prevention and response in local governments, the following are the main problems faced in case of a disaster.
・First response is not quick enough.
・It is difficult to grasp the ever-changing situation.
・It is difficult to confirm the correctness of information.
・How to quickly convey information
So, it seems that speed and correctness of information is really important.
In addition, the survey shows that local governments are not only waiting to hear from the relevant ministries and government departments, but are also getting information from social networking sites.
Therefore, this shows that SNS is very good for transmitting information in case of disasters.
I also believe that being able to understand one's surroundings can prevent delayed evacuation.
In fact, delayed evacuation is a very big problem, and many people tend not to start evacuating even though there is a call for them to do so.
In fact, 90% of the deaths during the East Japan Earthquake were drowning, which was caused by delayed evacuation. The tsunami occurred 30 minutes after the earthquake, so there was still time to escape.
why did it happen?
According to a report by the Miyagi Prefecture fire department, people assume that they will not die and that they will be fine, and this is also transmitted to other people by their behavior, etc., leading to a group delay in escaping.
This is said to be due to a “normality bias” that prevents people from immediately judging that the situation is abnormal, and a “majority sympathy bias” that makes people think it is

safe to take the same action while seeking the movements of those around them when they are in trouble.
I was fine before, so I will be fine this time, too. This is a light-hearted attitude that can lead to death. Also, many people think that their houses are safe because they have recently been built to resist earthquakes and other disasters.
Some people are not familiar with evacuation warnings, and it is necessary to raise their awareness on a daily basis by getting knowledge about disaster prevention. In addition, by taking advantage of the majority sympathy bias, we can prevent people from delaying their escape by making it possible for people to know what is going on at evacuation centers, and by informing them that there are people evacuating so that they might think about evacuating as well, and by encouraging the entire community to do the same.

I have discussed the existing ones so far, but here I will suggest a better application.
Each and every social networking site has of course its advantages, but it always contains disadvantages.
The goal is to create an application that takes advantage of these advantages while covering the disadvantages.
The characteristics of the application I propose are these.
(1) Not only municipalities, but also citizens can share information.
(2) In cooperation with municipalities, the app can be used to register addresses and names when registering residents.
(3) Grouping of family members and other familiar people to confirm their safety and location.
(4) Information can be shared with fire departments and other local governments.

First, about (1), I thought that information from citizens who actually live in the area is essential for quick information sharing by taking advantage of the merits of SNS. I also thought that knowing what people around you were doing could be helpful. However, the problem that arises at this point is the posting of false information. And the solution to this is (2).
The idea is to cooperate with the municipality and register the name and address in the application. Of course, the information will not be made public, but by registering it, the municipality will be able to easily find out who posted it. I thought that this would reduce the number of false information.The submitter's identity is always exposed to the municipality, and clearly separating information from the municipality and from citizens on the page would help to reduce confusion about the information, not to mention the transmission of false information.
At the same time, I believe it will help to check for safety.
Next, about (3). This is one of the advantages of LINE. It would be very convenient to register family members and familiar people around you on a daily basis and have a system that allows you to confirm their safety with a single tap, just like LINE. By sharing location information with people in that group, their location can also be known.
And if they need help, they can request rescue. This corresponds to point (4). Until now, rescue requests were made on SNS or by phone, but as mentioned before, while information

could be shared quickly, it was not efficient because of duplication of information and the time required to respond. Therefore, I thought it would be a good idea to have a system to collect all the information in one place and share it with the fire department. The location information and current situation are input and posted by the person or family members. This application would then compile the information. The app also checks to see if the same request has been made, preventing duplication. Once the rescue is complete, the fire department can remove the person from the list and notify the public that the rescue is complete. This would solve the problem.
The app's AI can prevent false information by comparing it with location information and judging whether the address is actually there, and since it is done by AI, it can also help to reduce labor shortage.
And, of course, transmit information on disaster prevention on a daily basis . Also, residents should be notified regularly about evacuation sites to raise their awareness of disaster preparedness. In addition, if residents are able to communicate about disaster preparedness, it would be possible to share information that is specific to their age group and the characteristics of their community.
Another advantage is to make the necessary actions as simple as possible, and registration is done at the government office so that even older people who are not used to using smartphones can use them easily.
And this application is based on “disaster prevention” in disaster-prone Japan, which I believe we can be proud of in the world. I aim to spread this concept of disaster prevention to the world, especially in Asia, where disasters are more common.

Conclusion
In order to spread disaster prevention and to reduce the number of disaster sufferers by making it possible to respond quickly to disasters, I propose a new app called “BOUSAI”. This app takes advantage of the existing apps while adding new features, and constitutes an incremental innovation.
In addition to the advantages of SNS, such as quick information sharing, easy safety confirmation on LINE, and provision of information by the government of other services, what I propose is to cooperate with municipalities to have people register their addresses and names in the app to prevent false information and make safety confirmation easier. Moreover, in cooperation with fire departments, the app will share rescue requests compiled by the app to ensure smooth rescue and prevent duplication of rescue requests.
In addition, to raise awareness of disaster preparedness and prepare for disasters by transmitting information about disaster preparedness on a regular basis. I believe that Japan can be a great reference for this disaster prevention knowledge, and I would like to share it with the world. The problem here is whether or not we can actually create something like this. It may be possible if the project is limited to a certain region in Japan, but if it is to be expanded to the rest of the world, the key point will be how to cooperate with local governments. Another concern is whether a single application can handle such a large amount of information, and whether it will be down or slow.
It would be good if we could actually create a model and test it, but I do not have the technology to do so, so I need to think about how to test it even in that situation.

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New ways to utilize visual culture
〜What is the influence of video on cross-cultural exchange?

- Visual culture Intercultural exchange Usage -

5328 Haruto Miyazaki

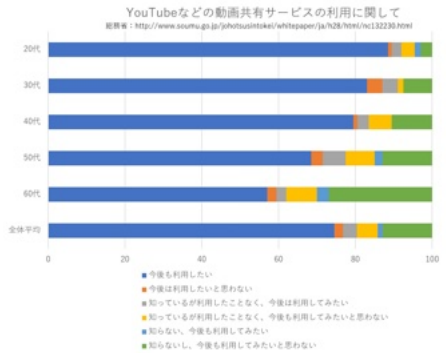
1. Abstract

According to a 2018 Ministry of Internal Affairs and Communications survey report, an average of 74.5% of all generations after age 20 already use and would like to continue to use video sharing services such as YouTube, indicating that video use is higher among younger generations, with nearly 60% of people in their 60s also using video. These results indicate that video is becoming more and more familiar to all generations, and is having more or less of an impact on them. In addition, since video has many advantages and there are many examples of advertisements that utilize these advantages, we have been conducting research with the idea that video may have an effect on events that are considered problems in the world. As a result of our research, we found that the history of images is long and that there are many advantages to using images. However, because images themselves are becoming more widespread, problems such as information disparity and security are also occurring.
We found many examples of cross-cultural exchanges that actually used video.
In the future, we would like to investigate whether there are any effective ways to utilize the latest video technology, such as simulated experiences.

2. Introduction

The motivation for my research is that I am interested in images, which I use on a regular basis, and since I studied the effects of images when I was in junior high school, I wanted to deepen my understanding of this topic and think about what I can do to make the world a better place. I also thought that images have a great influence on the world because they are so familiar to us today and everyone uses them. I am also interested in the current situation in developing countries and what kind of visual culture exists in the world, despite the fact that it is very familiar in Japan.

I chose this theme partly because there are many advantages to using video.
Since information comes not only from the sense of sight but also from the sense of hearing, images can be made clearer, more easily conveyed, and more memorable. It is said that one minute of video can convey the equivalent of 1.8 million characters of written information. If well designed, it is expected to have a great impact, generate a lot of profit, and create an atmosphere that is highly sought after. For example, in the case of a luxury hotel, if the clientele is in their 50s or 60s, the video can be more easily accepted by making the screen transition more relaxed and making each scene a little longer.



In addition, a survey by the Ministry of Internal Affairs and Communications on video sharing services such as Youtube shows that the younger generation has a higher rate of video use, with nearly 60% of people in their 60s also using video. It is expected that more people of a wider range of generations will use these services in the future. Thus, it can be said that video is a familiar presence for many people in Japan today.

Furthermore, the history of images is long, and the oldest film is said to be "A Scene in the Garden at Roundhay," shot on October 14, 1888 by French inventor Louis Le Prance with a camera he invented himself. I thought it was easy to be familiar with the history of images because of its long history and the many films that have been made and produced around the world.
In addition, there are many types of videos, such as interview videos, drama videos, and documentary videos that can convey the actual voices of users and company employees regarding commercial products. Therefore, they can be used in a way that suits the situation.

As mentioned above, we believe that images can be used for cross-cultural exchange and cross-cultural education, and that they have a great influence because they are familiar and easy to use. Therefore, we would like to consider what kind of new ways to use images to solve the world's problems, taking into account the current situation in developing countries.

3. Purpose and meaning of this research

Research Question: What influence do images have on cross-cultural exchange?
The purpose of the research is to learn about the culture of images from around the world and to consider how we can use this information to solve problems such as deepening cross-cultural exchange. We believe that by conducting this research, we will be able to find ways to resolve these issues.

4.Research Methods

Primarily uses Internet searches

5. Discussion and Implication

First, I was curious as to why images have become so familiar to us, as mentioned in the background of my research, and investigated the advantages of images. The research revealed that video has many advantages: it is said that one minute of video has the power to convey information equivalent to 1.8 million characters, and since the average reading speed of Japanese people is said to be about 600 characters per minute, it can be said that video has a great deal of information. It also has the advantages of conveying impressions more clearly, conveying emotions properly, conveying the atmosphere of a place or a person, being intuitive and understandable to anyone, easily conveying complexities and subtle nuances, easily creating a sense of familiarity, and making videos tailored to the subject. Other advantages include the fact that videos combine visual and audio elements to evoke emotion and empathy, are good for memory retention due to increased comprehension, and can be easily shared and distributed via the Internet. Among these, we believe that videos can be easily understood by people who do not share a common language, and can convey a universal message across different cultures and language spheres, from the point of view that anyone can intuitively understand and create videos that are tailored to the target audience. In addition, subtitles on videos can be used to introduce people to different cultures, which may lead to better understanding of different cultures. In

addition, the following points can be made about the ability of video to be tailored to the target audience.

In recent years, with the increase in online information gathering and shopping, videos and images introducing products and services are important content for both BtoB and BtoC marketing. Introducing products and services through video can show subtle functions that cannot be conveyed through text and images alone, and can also help customers visualize actual scenes in which they are using the product, thereby promoting purchasing.

When using videos about apps and games, video & images can be used to convey the appeal, functions, and ease of use of apps and games in a realistic manner, using a wide range of expression methods, from CG and animation to live-action videos in the style of TV programs featuring celebrities.

In recent years, there has been a marked increase in the number of situations where advertising videos are distributed not only through TV commercials, but also through video distribution sites such as Youtube and Vimeo, company websites and blogs, train monitors and station platform transportation advertisements, and digital signage and large displays on street corners. We can produce advertising videos that "improve recognition" and "increase sales" with a variety of plans and creativity tailored to the characteristics of the product and the target audience.

In 1832, the Belgian mathematician Joseph Plateau invented the phenakistiscope, a rotating disk on which a series of pictures were drawn. In 1877, Emile Reynaud, a French inventor and professor of natural science, invented the heliosinegraph, in which slits were made in a disc separate from the picture so that a moving picture could be seen without the use of a mirror, and the zoetrope, in which a cylinder with a picture inside could be rotated and viewed through slits (thin slits) between the pictures (invented in 1834 by In 1882, Emile Reynaud again improved the praxinoscope and developed the projection method, in which the image is projected onto a screen. In 1888, he produced Théâtre Optique, which showed films with perforations. The Théâtre Optique was so well received that 500,000 people were said to have attended its screenings in Paris until 1900.

In 1893, Thomas Edison presented the kinetoscope, also known as the "peep show," at the Chicago World's Fair. The kinetoscope was not a projection-type device, but it allowed viewers to see an image similar to a movie using photographs, rather than the picture-based movies (animation) that had been available until then. Also developed was the kinetograph, a photographic (projection) device; in 1895, the French brothers Auguste and Louis Lumière developed the cinématograph, a motion picture based on photographs that projected images on a screen. Edison's kinetoscope was still a "moving picture," but this was the first one that could be called a motion picture; on March 19, they shot the world's first live-action film, "Exit the Factory." On December 28 of that year (now considered the birthday of cinema), the Lumière brothers went into the business of making money by showing cinematographs at the Grand Café in Paris. Around 1914, illustrator John Randolph Bray developed cell animation, in which pictures drawn on transparent plastic film are superimposed and moved.

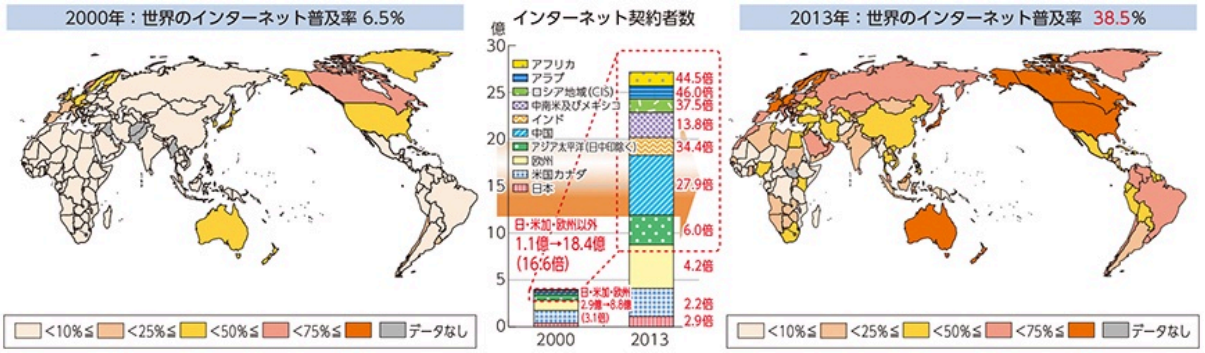
In Japan, the oldest surviving Japanese film was made in 1899 at the Kabuki-za Theater in conjunction with a performance of "Momijigari" by Danjuro Ichikawa IX and Kikugoro Onoe V. It is the oldest surviving Japanese film. The first movie theater in Japan was the Asakusa Denki Kan, which was built in Asakusa in 1903. Although the screening of movies itself had begun in 1896, at that time, the main activity was mobile screening, and there were no permanent movie theaters that only showed movies until the "Asakusa Denki Kan" was built.

Referring to the animation aspect, "A Trip to the Moon," written and directed by Georges Méliès of France and released in 1902, is said to be the world's first science fiction film, in which a man goes to the moon in a cannon and meets moon people on the lunar surface. Unlike previous visual works, this film is said to have been very groundbreaking in that it had multiple scenes and a story that ran throughout the entire film, and it has left its mark in the history of cinema. From this "trip to the moon world," the editing process of just "piecing together" was over, and editing for direction began.

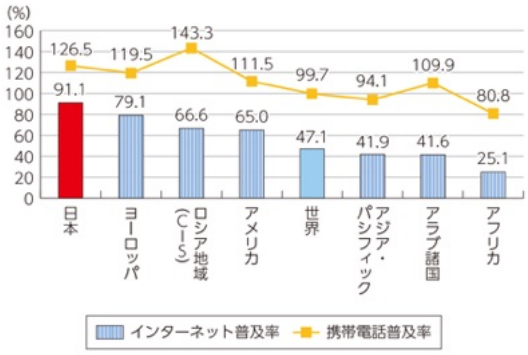
The world's first purely animated film is considered to be "Fantasmagorie" (1908, original title: Fantasmagorie), produced by French artist Emile Cole. The first animated film in Japan was a

short animated film titled "Dekobo shin-kaicho: Imosuke boar hunt no maki" (1917), and after Disney's first full-color film, "Flowers and Trees," was released in 1932, color animated shorts were produced in the United States before World War II. In 1937, Disney produced its first full-length color animated feature, Snow White. Later, in 1953, animated films began to be broadcast on television, and in 1963, "Astro Boy," an animated film that is still talked about with great enthusiasm today, appeared. Mushi Productions, founded by Osamu Tezuka, produced Japan's first full-scale animated television series "Astro Boy" and the accompanying feature-length animated film "Astro Boy: Brave Man of the Universe" (1964).
With the appearance of "Astro Boy," the basic form of TV animation, "a half-hour program broadcast once a week," was established.

In addition, we looked into whether there are any problems occurring in the world regarding video. We found that there are digital deviations (information gaps) in the world. We also found that there are two types of information gaps: one within a country and the other between developing and developed countries.



In terms of Internet penetration, the number of Internet subscribers has increased since 2000, including in developing countries, and the penetration rate is very high, but still low at 38.5 percent in 2013.



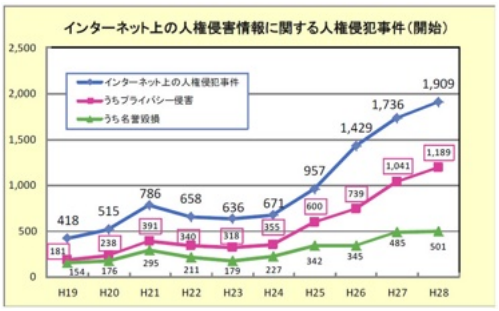
注：日本の値は2015年

The graph on the left shows more clearly the differences in Internet penetration rates by country. As the Internet spreads, WI-FI is being developed in public facilities, public transportation, stores, and other places. For example, in Kenya, a bus operator and Safaricom, a local telecommunications company, collaborated to provide free WI-FI on the "Matatu" shared-ride bus service and on trains departing from Delhi in India. Other examples include a 2014 ITU study showing that of the world's population of 7.2 billion, 40% use the Internet and 60% do not, with the percentage of Internet users in developed countries at 78% and in developing countries at 32%. Europe has the highest percentage of Internet users by region at 75%. Next is the U.S. conflict at 65%, followed by the Commonwealth of Independent States at 56%, Middle East countries at 41%, Asia-Pacific at 32%, and Africa at 19%, according to data from the Ministry of Internal Affairs and Communications in 2017. 80.9% of individuals in Japan use the Internet. Of that, more than 90% for each age group from 13 to 59 years old. However, from the age of 65, the rate is below 70%. The Internet usage rate by annual household income in Japan is over 80% for households with annual incomes of 4 million yen or more. However, 74.1% of those earning between 2 and 4 million yen and 54.2% of those earning less than 2 million yen are found to be using the Internet.
These digital deviations can lead to widening educational, economic, and social disparities, danger from delayed response to emergencies, risk of crime due to lack of IT literacy, isolation of the elderly, and inability to respond to international ideas and competition. In addition, it is often the case that one's opinions are amplified and reinforced by continuing to see and hear similar opinions in the Internet's echo chamber, a narrow community that is like an "echo chamber"

where opinions identical to one's own are returned from all directions, and by a lack of information, etc. This can lead to the belief in the information one wants to believe and the exclusion of different ideas. This can lead to a "finder bubble," a phenomenon in which Internet content optimized for the writer based on past user information is displayed and similar information and branches are duplicated, creating an information gap due to a lack of information.

To address these issues, students will need to devise their own Internet settings, be able to look objectively at the information they know, and be able to compare many pieces of information. In addition, there are international organizations that address poverty and social injustice as organizations that actually deliver videos to developing countries and conduct educational activities using videos and images, such as Action Aid, which disseminates videos related to issues such as agriculture, gender equality, and human rights, and Digital Opportunities for the Promotion of Equal Opportunity. and disseminates information via the Internet; the Web Foundation, a program that provides educational laptops to children and offers educational opportunities to children in remote and under-resourced areas through the use of video and interactive materials; One Laptop per Child (OLPC), which provides educational opportunities for children in remote and under-resourced areas through the use of video and interactive materials. There is also the World Theater Project, which brings films to areas without movie theaters.

Furthermore, digital privacy and security are issues related to video. With the spread of video sharing and streaming services via the Internet, digital privacy and security issues are becoming more apparent. There is an increasing risk of personal video being illegally obtained and leaked, and of privacy violations occurring. In Japan, the number of cases of human rights violations on the Internet is also increasing year by year.



Besides, in terms of illegal distribution of digital content, illegal copying, illegal streaming, illegal downloading of movies and TV programs online, etc. This can result in losses for producers and rights holders and affect content production. As a solution to these problems, I believe it is essential to reduce the information gap. Possible economic measures include legal regulation by the government, technological measures to prevent illegal copying, and raising awareness of the illegality of digital content distribution to educate people to use legitimate content.

The documentary series "Human" by Yann Arthus-Bertrand, a photographer and filmmaker from Reims, focuses on people from different parts of the world and presents the stories of people from different cultures and backgrounds through images. The series focuses on people from all over the world, presenting the stories of people from different cultures and backgrounds. The series explores the common humanity that transcends cultural differences through interviews filmed in various languages and universal human themes. Geography Now!" is a geography and culture-focused YouTube channel that focuses on a single country each episode, explaining its culture, history, food, traditions, and more through video. The channel promotes cross-cultural exchange by covering different countries and introducing different cultures to people around the world.

International film festivals bring together films from many different countries. These festivals screen films produced in different cultures and languages, providing viewers with an opportunity to be introduced to and deepen their understanding of different cultures.

There are platforms and communities that promote cross-cultural exchange online. For example, platforms such as "Couchsurfing" and "Meetup" provide opportunities for people from different cultures to gather and interact.



There was also a video-based educational activity, "Tobacco

Harms Health: Video Commercial Contest," sponsored by the Japan Anti-Tobacco Association (NPO), which used VR to provide safety education and awareness of the prevention of walking on the phone.

I propose the following as a method of multicultural exchange using video.
The first is to create documentaries that utilize illustrations and realistic videos that are accessible to all. We believe that by using video, the life and traditions of different cultures can be introduced in a way that is easy to understand and transcends language barriers. In addition, the ability to include real voices in the video will make the exchange more relatable. This will provide an opportunity to learn different languages in an enjoyable way and to have a correct understanding of them.
Next, since there have been many awareness-raising campaigns using visual images in our research, we think it would be a good idea to create a project to make a film that transcends national boundaries. We believe that a joint project will produce different and more interesting ideas. In addition, these films I believe that will be a good opportunity to expand my knowledge.delivering to children in developing countries
Furthermore, it would be beneficial if the government and others would proactively create an environment where different cultures can be shared through the Internet and advertisements for them can be seen in a natural way. In addition, we believe that more events featuring international works in the future will increase public interest.
In , since it is now possible to have a virtual experience using video images, people from developing countries who are unable to visit in person may be able to visit different cultures and places and interact with different cultures. Conversely, people in developed countries can have a chance to learn about the current situation in developing countries in real lifeaddition. In order to put this into practice, we believe it is necessary to cooperate with organizations that support developing countries, as we have done with the World Theater Project mentioned earlier, by transporting equipment that can perform virtual reality (VR).
In addition, the paper will be referenced.
The Effects of Film Appreciation on Improving the Students' Intercultural Communication Competence
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according to (someone)
As defined by William B. Gudykunst (2007): "Intercultural communication competence is the knowledge, motivation, and skills to interact effectively and appropriately with people of different cultures" (p. 192).
It includes the knowledge, motivation, and skills to interact effectively and appropriately with people of different cultures" (p. 192).
The advantages of using film for cross-cultural education include the following
Film appreciation is an important means to help improve students' comprehensive ability of vision, hearing, speaking and writing. stimulate students' interest in learning, achieve context-orient teaching and incorporate language
It provides a possibility for the students to conduct study to their own interest and characteristics.
Jane Sherman(2003) summarize 6 advantages of using authentic video in language teaching with explanations for each, which is also fit for film appreciation lesson for film is no doubt one of a kind of authentic video.
For its own sake: people want access to the English language world.
For comprehension of the spoken language: video brings us all kinds of voices in all kinds of situations, with full contextual back-up.
As a language model: authentic video provides a vast up-to-date linguistic resource of accents, vocabulary, grammar and syntax, and all kinds of discourse, which shows us language in most of its uses and contexts-something neither course book nor classroom can do.
For culture: video is a window on English-language culture.

As a stimulus or input: video can be used for discussions, for writing assignments, as input for projects or the study of other subjects.
As a moving picture book: video gives access to things, places, people, events and behavior, regardless of the language used, and is worth thousands of picture dictionaries and magazines.
We can see that it is difficult to fulfill this range of functions except by living in an English-speaking country- an opportunity that most learners do not have. Film helps to substitute for this experience; it brings the English-language world to the learners. Jane Sherman's summary also lets us better understand why film appreciation is a good tool to improve intercultural communication competence. As mentioned in the previous chapter, the best way to cultivate intercultural communication competence is to incorporate language teaching and culture teaching. Film is this kind of authentic video that can combine these two aspects. Film is this kind of authentic video that can combine these two aspects.
However, the following issues are raised separately for teachers and students.
For teachers
On mindset. due to the characteristics of the profession as a teacher, experience plays an important role in teaching;.
However, it is experience that often hinders the application of new teaching ideas and educational techniques. teaching for many years and they are used to traditional teaching methods, they may feel
And some teachers may have resistance for they think there is no need to spend a lot of money and energy to learn the same knowledge that traditional teaching method can offer. And some teachers may have resistance for they think there is no need to spend a lot of money and energy to learn the same knowledge that traditional teaching method can offer.
will affect their enthusiasm of using multimedia, thereby affecting the range of the application of it, as a result, the advantages of using multimedia in teaching cannot be truly reflected. teaching cannot be truly reflected.
The multimedia class is characterized by various kinds of multimedia, which requires a reasonable and timely combination by the teachers. Some teachers may have no idea about what to do when facing
These multimedia, and therefore they cannot use them effectively, which will fail to optimize the effect of multimedia.
Due to the traditional teaching forms and teaching methods, some teachers regard film appreciation lesson as an Due to the traditional teaching forms and teaching methods, some teachers regard film appreciation lesson as an adjunct to traditional teaching, and they do not deep study the teaching methods of film appreciation lesson, not to mention to appropriately select multimedia and accurately implement, thus impossible
to jump out of the routine of the traditional teaching methods.
For the students
Students are the core of the classroom, and film appreciation will finally be applied to the students, thus the attitude of the students on film appreciation lesson will directly affect the outcome. The attitudes of the students can be generally divided into two kinds. The first is that the students are interested in film appreciation and benefit from it, thus they will accept it consciously. The first is that the students are interested in film appreciation and benefit from it, thus they will accept it consciously.
In addition,
The Use of Films as an Innovative Way to Enhance
Language Learning and Cultural Understanding According to Johanna W. Istantn, by watching films, not only are the students' understandings of the target culture enhanced, but also their interest in other fields of the target culture nurtured. Groves quoted Dickinson Thorold (1964, p. 12) on his result of his experiment, "It was only while exploring the extent of cinema that we found students discussing the range of interests, historical, philosophical, linguistic, psychological, sociological, geographical, architectural aspects that could be found in one So, in other words, film is also an instrument for research.
In addition, according to "Enjoying Singapore" (2006), Singapore has the highest movie-going
On average, Singaporeans go to movies eight times a year.

Watching films among Singaporeans may indicate that films would be a good avenue for teaching CULTURE.
It is stated.

From these considerations, I believe that the use of video is a very effective means of communication.

6. conclusions and future issues

Because images have a long history and have advantages such as being easily relatable, they are now very familiar to many people. On the other hand, however, problems such as information disparity and privacy have emerged. In this context, we believe that the use of video is a very effective means to have correct knowledge about different cultures and not to deny others.
In the future, we would like to investigate the development of visual technologies such as Computer Graphics, Special Effects, Visual Effects, Holography, Virtual Production, Virtual Reality, etc., and how they can be effectively used for cross-cultural exchange, Virtual Reality and other technologies are also developing, and we would like to study them to see if they can be effectively utilized for cross-cultural exchange.

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The Use of Films as an Innovative Way to Enhance
Language Learning and Cultural Understanding Johanna W. Istantn
The Effects of Film Appreciation on Improving the Students' Intercultural Communication Competence

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Countermeasures of the Alien Species

How to take measures between countries

5329 Meguro Yuki

Abstract

There is a problem with alien species in the world, also Japan too. They are carrying out countermeasures of alien species, and I considered the solutions to focus relationships between the countries. As a result of the research, I gave an example of the countermeasure that we take measure the alien species to divide the kind of the alien species, and they share the information, technology, and so on. We can proceed with measures more efficiently.

1 Introduction

In Japan, there is a problem that the ecosystem is broken by alien species like the world. Alien species impact the environment and human livelihood are increasing. This is a result of the changing global environment. In this research, I investigate countermeasures of the alien species between the countries.In the world, a lot of scientists are warning about the current situation, and the danger and countermeasures of the alien species are being researched. However, countermeasures between the countries have not found yet. Therefore, this research aims to find the countermeasures. It will become efficient and effective way. I research to get the information on the internet and some papers.

2 Discussion and implication

Countermeasures between countries are necessary for us to reduce the impact. I started the research that focused on the alien species that settled the countries. Until now almost all of the countries carried out the countermeasures that can be done by only our own country. Also, support for the countermeasures are mainly financial aid. So, I thought about the support for the countermeasures of the alien species. And as an example technology, engineering, devices for the countermeasures, capital, collaborative works are listed as supports for the countermeasures. Filtration equipment for ballast water treatment is an example of the devices. This can process small creatures that get into the ballast water in ships and prevent to bring in alien species. Technology and engineering can be used in the same way as the devices. However,if we want to boost the effects of countermeasures, cooperations between countries is necessary. Countermeasures between countries have some merits. First, it solves the problem of alien species. We can use more information, equipment, and so on from other countries. Therefore, the activities that eradicate alien species become effective and smooth. Second, it becomes a chance to ramp up relationships with other countries. We can do activities with other countries through countermeasures. We may make more familiar relationships with other countries.

3 Conclusion

I suggest the next method that is the countermeasure with other countries. First, we divide the alien species that resemble their ecology and the environment of habitat. Second,

when a country succeeds in eradicating the alien species in the bound, the country makes public about the activities and policies that the country carries out. Third, every country that has such an alien species apply and carry out the activities, and aim to eradicate alien species. For example, of the alien species, nutria that have settled down in Japan, mouths that have settled down in Australia are listed. They have some common points that there are four seasons in the place that they have settled down and both places are islands. The countermeasure have some advantages. First, we can get a lot of information about countermeasures of alien species. We may be able to do the countermeasure effectively and smoothly by applying them. Second, we can do more detailed countermeasures. We separate alien species into some groups that are ecology, environment, and so on. We can explore more good countermeasures for the specific alien species. However, there are some issues. First, we must think about relationships with other countries. I think that we would carry out the activity with countries in the same group is better if we want to do that smoothly. For example, the EU, APEC, and so on. Virtually, the countries that I listed in my paper, Japan, Australia, belong to APEC. Second, there is a possibility that developing countries can't participate in the activity because they have enough money to do so. I want to make sure to collect money from crowdfunding and donating. And I think calculating almost all funds from national assets is better because crowdfunding and donating are uncertain.

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Improvement of Leftover Medicine Problem

Using Brown Bag Activity

5330 Mori Wakana

Abstract

I learned that in Japan, the amount of "leftover medicine" - medicines received from hospitals but left at home because people forgot to take them - is 50 billion yen a year. I began this research in order to find some way to solve this problem and make meaningful use of the money that are wasting now. I used the internet to collect information. In this research, I suggest a medicine health checkup system. A medicine health checkup system is made of brown bag movement - Put all medicines you have at home in a brown bag and take them to a pharmacy. Pharmacists will check the leftover medicines - and annual health checkup. I expected that some of the leftover medicine that can be reduced will lead reduction of costs in national medical expenses. Moreover, with the support of the public, money earned from this activity can be donated to developing countries. I believe that solving problems in developed countries will lead to support for developing countries. Therefore, the world will be a better place with the help of this system. However, there are two things I have to consider more. First, for people who don't take health checkups, how do they join the brown bag movement? Second, how to get supporters to use Japan's medical saved budget to help other countries?

1 Introduction

Leftover medicines are medicines received from hospitals but left at home because people forgot to take them. Leftover medicines is one of the social issues for safety drug use and medical costs. According to the Ministry of Health, Labour and Welfare, the amount of waste that occurs annually is 50 billion yen. According to Nipponchozai, half of people who responded to the survey have leftover medicines. I also have a lot of leftover medicines at home, so I was interested in this issue. I began my research because I thought we should reduce leftover medicines and use money which was wasted in a more meaningful way.

We can reduce up to 50 billion yen of wasted money by reducing leftover medicines. Also, if leftover medicines decrease, it will prevent people from taking the wrong medicines or taking expired medicine. Therefore more and more people can stay healthy. Like this, there are a lot of advantages to reducing leftover medicines.

I used the internet to collect these information.

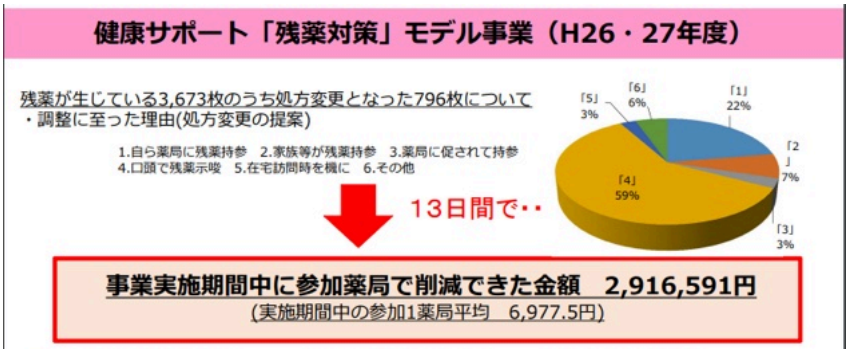
・The current situation of the leftover medicine problem
・Previous movements
・Problem of movements
・What is the most serious and need support problem in developing countries?

2 Discussion and implications

My research question is “How can we do to reduce leftover medicine and help solve other medical problems?”There are some religions that did movements to reduce leftover medicines.

First movement is the Project to prevent leftover medicine in Saitama, in 2014. In this project, pharmacists visited patients’ home and checked the status of their medicine. After that, pharmacists provided careful instructions on how to take the drug correctly.They did this examination with 150 patients whose average age was 78.6 years. They have chronic disease and medication histories for more than one year. As a result, all patients had leftover medicines. However, by this project, about 5000 yen of leftover medicines were reduced per one patient. Overall, they could reduce about 950000 yen of leftover medicines within two and half months.

Second activity is a model project to prevent leftover medicines in Nagano, in 2014. In this project, they checked prescriptions and if there were too many drugs, they consulted about how to change them. 418 pharmacies were joined and as a result,about 2900000 yen of medicines were reduced within 13 days.



From these results, I found that we can reduce a lot of costs by reducing leftover medicines. Most of the patients had leftover medicine, so the more patients we checked, the more leftover medicine we could find and reduce.These projects succeeded in reducing wasted medicine. However, there are some problems.Few participants, too small scale, expensive personnel costs, and taking a long time.

Therefore, I found other ways to reduce leftover medicines instead of visiting patients' homes, and learned about the "brown bag campaign".Brown bag project started in America. In this activity, patients bring their own medications to the pharmacy so that pharmacists can check their medication status and check for drug interactions.

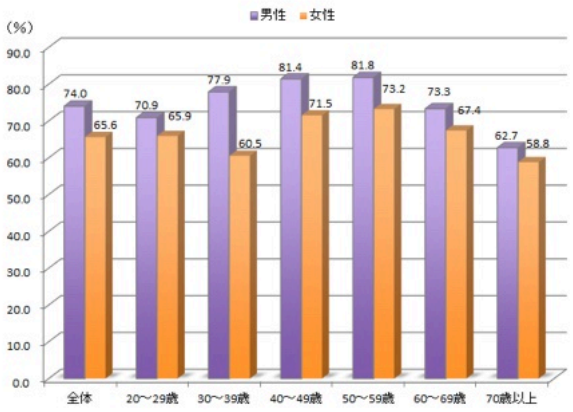
I thought about giving brown bags to patients who visit pharmacies and asking them to bring their medicine with them the next time they visit the pharmacy.

If we do that, it would be easier to monitor leftover medication and provide medication guidance for patients. The advantage of this is can expand the scale of research, and can reduce cost and time. In the previous case which brown bags were used, they could check one patient per 15 minutes, so reducing the time it took was achieved. However, only 15.8% of patients brought their leftover medication from their house, so it couldn’t achieve the target of expanding the scale of research.

For these things, I suggest making a “Drug health check” system. The structure of this system is like this. First, on the day of the health check, patients bring medicines in their house to the place of the health check. Then, before patients do a health check, they will hand wasted medicine with a brown bag to pharmacists. Pharmacists check patients’ medicine and analyze surplus medicines. After a health check, patients will go private room to get

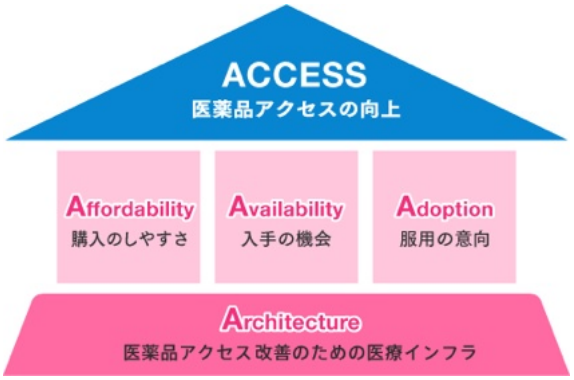
medication guidance from pharmacists. By doing so, more people than now can contribute to reducing wasted medicine. According to the Ministry of Health, Labour and Welfare, Over the age of 20, 74.0% of men and 65.6% of women take the health check.

For people who don't usually go to hospitals, the health check is one of the precious opportunities to go to medical facilities. If they can get checking of leftover medicines and the health check at the same time, more and more people may take part in brown bag activity. It will lead to a big reduction in leftover medicine costs.



While developed countries like Japan have too much medicine, many people in developing countries can't receive enough medicine. In order to distribute medicines to such people, there are methods such as sending medicines directly. However, compared to providing temporary support, I thought that it is more important to create an environment where they can improve medical supplies by themselves. Therefore, I thought that to support the problem of access to medicines is the most effective thing. The problem of access to medicines is serious because necessary medicines and medical services are not distributed to people who need them because of the poverty and lack of medical systems.

By reducing the amount of leftover medicines, some of the premiums and public funds [money that the government is managing, which occupy about 90% of the national health care funding] will be saved. I want to suggest that using the money to help developing countries for making better access to medicines. According to Eisai, developing medical infrastructure is important for the problem of access to medicines. For this, I thought that to improve medical distribution, it is necessary to build roads and roadbeds, and set electricity for transporting medicines.



However, the national health care fee is money collected as the promise to spend it for the benefit of the people living in the country. So, the money saved as a result of improving the leftover medicines problem should be returned to the people. In order to use this money to support other countries, it is necessary to get many people's agreements for this. However, I couldn't come up with any ideas for how to solve this problem. Even so, it is worth making an effort to contribute to raising the level of distribution of medicines in the world.

3 Conclusion

Conclusion of this research is as follows.
① I suggest to make a "Drug health check" system.
The structure of this system is like this.

First, on the day of the health check, patients bring medicines in their house to the place of the health check.
Then, before patients do a health check, they will hand wasted medicine with a brown bag to pharmacists.
Pharmacists check patients' medicine and analyze surplus medicines.
After a health check, patients will go to a private room to get medication guidance from pharmacists.
For people who don't usually go to hospitals, the health check is one of the precious opportunities to go to medical facilities. If they can get checking of leftover medicines and the health check at the same time, more and more people may take part in brown bag activity. It will lead a big reduction in leftover medicine costs.
[Purpose: to check the status of leftover medications, reduce costs, and provide guidance about medication]
[Significance: reduces personal expenses for medications, leads to proper use of medications]
② ① will reduce national health care premiums and public expenditures [money managing by the government]. This money should be used to improve access to medicines in developing countries.
Future issue is that in order to use saved money[saved by reducing leftover medicines] to support other countries, how to get many people's agreements for this.

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A Moral Lesson in Elementary School

To grow children who can tell worries

ID5331　Yoshikawa Aoi

1.Abstract

My research's purpose is to decrease the suicide rate. The reason why my research focus in elementary school is people's character make until 10 years old and young people's suicide rate tend to increase. Besides, many elementary schools in the world have lessons that students learn morals. Therefore, I suggest a way of moral lessons in elementary school. Also, I want to make a model school in Finland and start training to spread the moral lesson. It is that students make the moral lesson with their teacher. For example, students decide the theme which they learn in the lesson and they share their opinion with their teacher. I hope that students think positively about telling their opinions after they take this lesson.

2.Discussion and implications

According to the research for WHO, the number of the suicide is about 80 thousand. It tends to decrease when I compare now to 2000. However, 1.4% of those who died chose suicide. Some people can feel that 1.4% is small number, but it is a big problem that 80 thousand people are dying by suicide.The suicide rate of adults has been considered a problem before. Now, the increasing suicide rate of teenagers is considered a problem.

I wondered what I can tackle to decrease suicide rate, and I have researched this theme 5 years ago. This year, the target of my research is people of the world,so I resarched how elementary school teachers can improve their classroom environment.Also, it have conditions that the answer can use over the world and this aim is decreasing suicide rate. I have two reasons why I chose this theme. First, I want to be a teacher in the future. If I suggest ways to resolve the problem, I wonder that my research's target should be elementary school students. That's because I will reconsider this research in the future when I become a teacher. Second, it is late that targets are junior high school students and high school students while teenager suicide rate is increasing. Many children who graduate from elementary school have puberty. It is difficult to think about some problems with them. Also, I think that it will not influence to talk with adults when I am a teenager. But what about elementary school students, especially, is their age 8 or 9 ? They have their knowledge forever which they learn when they begin to be able to communicate easily with adults and friends. However, forcing students to be aware of this throughout their school life is a burden on both students and teachers. In Japan, the excessive workload of elementary school teachers is also seen as a problem. With this in mind, we thought it would be a good idea to use "moral education" classes. In Japan, "moral education" became an official subject in 2018. And not only in Japan, but also in other countries such as China and France, classes that are equivalent to moral education are being held. If it is an initiative within the classroom, it is not difficult to create a manual, so it is also advantageous in terms of spreading it around the world. Also, I focused on moral education. In Japan, "moral" classes became an official school subject in 2018, and in many countries around the world have the class about teaching moral. Therefore, I considered moral classes that foster children's thinking in moral education

around the world. In this research, “suicide” refers to death after being driven into a corner.

In this study, we believed that one of the reasons for the increased suicide rate was the inability to ask for help from those around them. We believed that the reason for the resistance to asking for help was due to low self-affirmation when speaking up. Therefore, we conducted this research with the aim of creating a class that would increase students' sense of self-affirmation and their positive attitude toward speaking up for themselves, tailored to their individual needs.

3.Conclusion

First, the global suicide rate was examined: according to the WHO, the number of suicides decreased from 880,000 to 800,000 between 2000 and 2010. The breakdown shows the highest suicide rate among adult males. However, the suicide rate among teenagers is on the rise. Reasons for young people to consider suicide include poor academic performance, low self-esteem due to relationships, and the influence of the Internet. Since this study aims to improve this situation through elementary school classes, we would like to consider countermeasures against the decline in self-affirmation. In this study, self-affirmation was viewed as an individual's personality. Generally, it is said that an individual's basic personality is created by the age of 10. In Japan, this is usually in the fourth or fifth grade of elementary school. Self-affirmation is a feeling of “being needed” or “being loved” that leads to an increase in self-esteem.

This is the reason for the increase in self-esteem. Based on the above, we referred to elementary schools in Finland. According to the website of the Ministry of Foreign Affairs of Japan, Finnish elementary schools are making various efforts with the goal of “drawing out the maximum potential of each student. I thought that the improvement of self-affirmation might lead to the development of children who can give an SOS. This is because I believe that improving self-affirmation helps them to ask for help. My proposal from this point on is to create a moral class with children in which they can speak up for themselves by improving their self-affirmation in order to nurture children who can give out SOS. For example, teachers can put themselves in the same position as the children and encourage them to speak up, or they can decide the theme of the class together. In addition, in order to create such classes, a space for teachers to discuss with each other should be provided. However, as we could not find any schools that are doing these things on the Internet, we also propose the creation of a model school, and we believe that the spread of these ideas would be more realistic if UNESCO and other educational organizations around the world were to cooperate. However, this proposal is not realistic because we need information on moral education outside of Japan, the cost of creating and promoting model schools, and whether we can obtain the cooperation of UNESCO. We would like to find solutions to these problems in the future.

In response to the research question, “What should be done to create an environment in primary education to nurture children who can give SOS? It would be good if UNESCO and other educational organizations that are active in the world could cooperate in its dissemination. The future issues to be addressed are concrete examples of lesson creation, the cost of building model schools, and the realistic cooperation that can be obtained.

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Theme Progress Toward a sustainable society

Realization of Self-Sufficient Power Generation

5332　Yoshida Toshio

Abstract
The energy crisis has become an issue in recent years. I am interested in solving this problem from the perspective of power generation. Therefore, I focused on the latest generation of electricity. That is Magnus-type wind power generation and power generation by pressure. By combining the two, we will be able to solve the problem efficiently and at the same time solve other problems such as noise problem.

Introduction
Today, we live by using energy resources such as oil, natural gas, and coal. We have benefited from the use of energy resources because they enable us to move things efficiently. This has been the case since the Industrial Revolution in England. However, while energy resources are convenient, they also pose various problems.

For example, there is the issue of remaining life. These energy resources are often originally the carcasses of ancient organisms that have been transformed over time. In other words, they are finite.
As mentioned above, we have been using these resources for a long time during the Industrial Revolution. And now we are running out of these resources. The remaining life of natural gas is said to be 50 years, and the remaining life of coal is said to be 50 years.

There are other problems in terms of global warming. When these resources are used, they emit carbon dioxide and other greenhouse gasses. Greenhouse gasses prevent the Earth's heat from escaping into space, raising the average global temperature. This is changing the Earth's environment and causing problems such as rising sea levels.

I would like to promote new resources to replace the current energy resources to solve these problems. My goal is to create a sustainable society so that the next generation can also enjoy the benefits we are receiving today.

Propose of research
Electricity is one of the most closely related forms of energy to people, and we would like to start by solving the electricity problem. There are many types of power generation, such as thermal and nuclear power, but these have environmental and safety problems. Therefore, we would like to explore new power generation methods that have never existed before.

In this article, we will investigate the advantages and disadvantages of the following two methods of power generation.
1. Magnus-type wind power generation
2. piezoelectric element

These power generation methods are inferior to the current power generation methods in terms of cost and power production. I would like to complement the disadvantages of the new power generation in this year's research, with the goal of solving energy problems through the new power generation.

Discussion and Implication

As part of my previous research, I investigated new power generation that is currently being conducted and discussed new methods of power generation based on this research. I would like to discuss two power generation methods that emerged.

1. Piezoelectric devices

A piezoelectric element is a device that converts applied pressure into electric power, which can be used to generate electricity when installed in various locations. Floor power generation and sound power generation make use of piezoelectric elements. Floor power generation literally means that piezoelectric elements are placed in the floor, and power is generated by the pressure exerted on the floor when people pass by. This has actually been done at Tokyo Station, where a single person passing by can charge enough electricity to light a miniature light bulb for a few seconds. This may not sound like much, but the number of people passing through an urban area is tremendous, and in fact, Shinjuku Station alone can charge enough electricity to run an electric car for several hours. Sound power generation is the application of piezoelectric elements to sound, and converts sound vibrations into electricity. However, the vibrations caused by sound are very weak, so it is not expected to generate a large amount of electricity.

2. About Magnus-type wind turbines

A normal wind turbine has blades, and electricity can be generated by turning the blades. Magnus-type wind turbines, however, do not require blades and can generate electricity using only a support pole. This is because it uses the Coriolis force generated when the wind hits the strut. Since there are no blades, there is no noise pollution and no bird strike, so it is a win-win situation.

Among these, I paid particular attention to Magnus wind turbines and piezoelectric power generation. The reasons for this are the appeal of the Magnus wind turbine as a solution to non-energy problems and the compatibility of Magnus wind turbines and piezoelectric elements.

I believe that Magnus-type wind power generation combining these two types of power generation will help solve energy problems. As mentioned above, Magnus wind turbines generate electricity by using the force generated when they hit a support pole. In other words, it is obvious that the poles are subject to pressure from the wind. Therefore, by installing piezoelectric elements on the poles themselves, the pressure is converted into electricity. Although the wind pressure may be a small amount, recently devices have been developed to amplify the pressure applied to the piezoelectric element, and since the Coriolis force from the wind itself has enough power to turn a huge pillar, a considerable amount of electricity can be expected to be generated. This will enable the generation of more electricity than conventional Magnus-type wind turbines and has the potential to solve various problems (e.g., noise pollution) at the same time, so there is no doubt that this power generation is a good solution to energy problems.

I went to MHI for a visit to an innovation company and asked the vice president to explain to me what is necessary for innovation. According to him, the key to innovation is to take on challenges without fear of failure. The Magnus wind turbine has yet to be put to practical use, but taking on challenges without fear of failure will be the first step toward innovation.
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I focused on self-sufficiency in electric power for the realization of a sustainable society. If this can be realized, we don't have to rely on fire, water, and nuclear power generation.These ways lead to problems such as global warming and environmental destruction. To realize this self-sufficient power generation, I focused my attention on piezoelectric elements. This is a piezoelectric element. If pressure is added to this element, it can generate electricity. This element is actually used in Tokyo Station. By installing the piezoelectric element on the floor of Tokyo Station, the pressure by people stepping on the element is changed into electricity. It can generate 10w of electricity in one step and they generate1,400kw per day. At Tokyo Station, that electricity is used for powering ticket gates and vending machines .

So I wonder if this can be achieved at the Chuo secondary school. We consume about 35w per lamp. We use electricity for 8 hours a day and there are 18 lamps in the classroom. Therefore, we use 18140 kJ of electricity per day in one classroom. I assumed that if all students here make one round trip up the school stairs, we can generate 150 kJ of electricity. This is equivalent to 0.1 class. To generate electricity for all classrooms, each student has to make 300 round trips.It is extremely hard. Then ,what if install the piezo element on the north wall of the school building.Then we can generate 18700 kJ of electricity per day.This is more than 18140 kJ for one class

So I wondered what if apply the system to the world. Look at this map. This map shows the areas where electricity supply is not sufficient. This map shows the lack of electricity supply especially in Africa. This is a map of Africa. From this, I can see that these areas (areas such as Kenya) are not supplied with electricity. Next, look at this map. This map shows where the wind is blowing strongly. I found that Kenya where electricity is not supplied and the wind is strong. In an electricity inadequate area in Kenya, the wind power is 6-7 m/s and the power consumption is 70 wh per household. So, if we assume 10 hours of active per a day and we build Chuo secondary school in Kenya, we can provide for 26700 households. Then we can

increase their quality of life. Even if there is no infrastructure, we only need to build a building with piezoelectric elements. Therefore, it is easy to utilize in developing countries.

To reduce the number of people dying from heart disease
~ To eliminate the causes of heart disease~

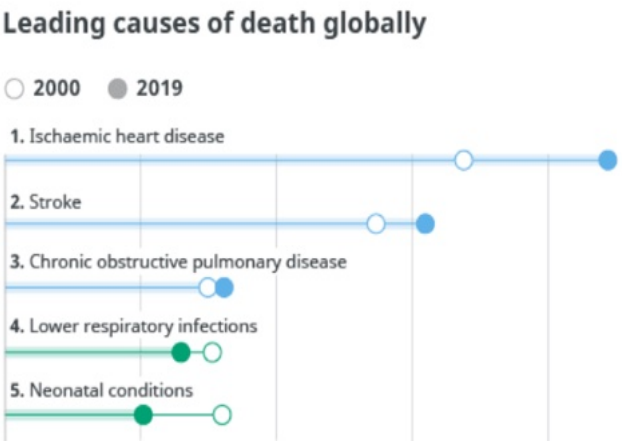
5401　Ena Akutsu

Abstract

In the 21st century, the top cause of death in the world today is ischemic heart disease. To reduce the incidence of this heart disease is to raise the standard of living of society, and the purpose of this study is to improve the causes of this heart disease. To achieve this objective, I studied myocardial infarction(心筋梗塞), the main cause of heart disease, with the aim to eliminate the cause of atherosclerosis(動脈硬化). As a result, I was able to find that the incidence of heart disease is high, especially in Europe, and to reach the conclusion that the cause of heart disease is related to dietary habits, so I concluded that we should improve eating habits. It is necessary to consider the food texture, strong flavors and easy-to-eat dishes that Western Europeans are concerned about when improving their diets. This will lead to primary prevention of heart disease.

1. Introduction

Heart disease has been the cause of death since the 21st century. (It is said that one out of every 100 people in the country has heart disease.) The incidence of this heart disease is increasing every year, and the number of deaths is also increasing: in 2019, about 90,000 people died. Heart disease mainly affects the elderly. The countries with the highest rates of heart disease are European countries, which is believed that Westerners often eat staple foods high in cholesterol and it promotes atherosclerosis, the cause of heart disease.



Purpose

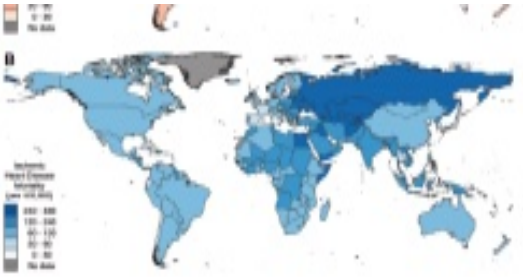
The goal of this study is to eliminate the causes of heart disease in order to reduce the number of people dying from it. This study is also valuable in that it will reduce the mortality rate, extend healthy life span, and improve the quality of life of the elderly. This research relates to Goal 3 of the SDGs,Good Health and Well-Being. This research will mainly pursue what causes heart disease and how to improve it.

Method of study

1) Explore the causes of heart disease ⇒ Food habits have an impact.

2) Investigate the dietary habits of people with high rates of heart disease, especially in Europe.

3) Consider how to improve their diet and
4) Show proposals, results, and
issues.

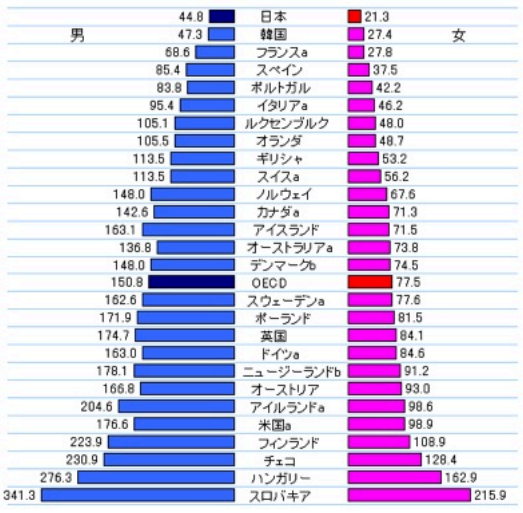


2.Discussion and implications

Heart disease has been the leading cause of human mortality since the 21st century and has become a social problem. Europe has the highest prevalence of heart diseaseIn 2019, heart disease will affect about 9 million people worldwide, and the number is increasing every year.The most common age group affected by heart disease is the elderly. The causes of heart disease are arteriosclerosis, the formation of blood clots in blood vessels that reduce blood flow, smoking, aging, obesity, and lack of exercise. The main cause of atherosclerosis is an excessive increase in bad cholesterol called LDL cholesterol.Foods high in cholesterol are shown in the figure on the right.This shows that foods such as eggs and meat, which are high in cholesterol, and Western European food, are a reason for the high incidence of heart disease in Europe.In the past, as a way to combat excessive salt intake, which is one of the causes of heart disease and high blood pressure in the United Kingdom, a campaign to reduce the amount of salt contained in bread, a staple food in the country, was undertaken in cooperation with bread-processing companies to reduce the amount of salt in the population. As a result, the campaign was successful, and there are examples of successful reductions in the nation's salt intake. (前例あればかく)



虚血性心疾患死亡率(2002年)－OECD諸国



(注)a 2001年 b 2000年。原資料はWTO死因データベース(2005年3月)。図は女の昇順。
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3.Conclusion

The main causes of heart disease were smoking, aging, lack of exercise, and unbalanced eating habits (high cholesterol and high salt intake). I found that the cause was the high cholesterol content in Western food such as eggs and meat. I focused on this issue about how to improve their eating habits, developed a dish with low cholesterol, and proposed that Westerners eat it. First, the recipe for the dish was completed, it would be necessary to determine the personnel and methods needed to conduct the project, such as how to get Westerners to eat the developed dish and who would conduct the project. Also, I think this

study is an innovation in the act of globality, which is to support other countries rather than abandoning the problems of our own country.

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Save Children From Conflicts

Stable Life for Children

5402 Adachi Mizuki

1.Abstract

My research is about preventing conflicts. Conflicts are mostly caused by ethnic and religious issues. These causes are complex. In Japan, most people attend school and have access to compulsory education, but it is said that around 124 million children worldwide are unable to go to school or receive an education. In particular, the situation regarding access to education is worsening in developing countries, prompting organizations worldwide to engage in support activities. Education is essential for fostering continuous economic development.However, solving the causes of conflicts is difficult, so I thought of methods of indirectly engaging with the issue in another way.

2.Introduction

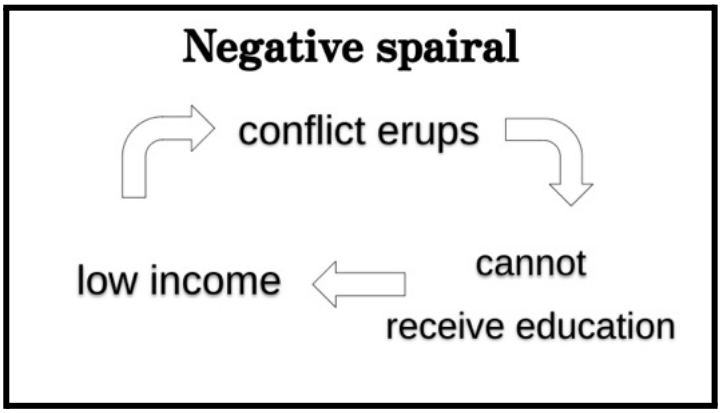
When I was in junior high school, I saw pictures of children in refugee camps and I wondered how we could save refugee children. Also, I researched education levels in Africa.In particular, in developing countries, many children are unable to receive an education due to the effects of conflict, and in conflict zones, children are often targeted. Moreover, the notion of sending children to the front lines to fight has become entrenched. I felt compelled to change this after seeing the current state of education in Africa.

3.Purpose and meaning of this research

My research question : How to save children in conflict zones.

I believe that education and poverty are the causes of conflict. When people do not get an education, their income becomes unstable, and those who cannot bear a life of poverty may start conflicts. Therefore, I have established the following three goals.

Purpose:
1 To stabilize of public security
2 To Raising of education standards
3 To establish a boarding school



Reason:
1)One of the causes of conflicts is poverty. When people are unable to receive an education, their incomes become unstable, leading to poor

living conditions. This can result in conflicts arising from the frustrations of those living in poverty.

2)By raising the level of education, more people will be able to get stable employment.Having a stable job gives people a sense of security.

3)UNICEF says that reasons for not going to school include poverty, child labor, and distance from schools. Therefore, I thought we could solve these problems by building a boarding school.

4.Reserch Methods

First, we will use the Internet to research the types of conflicts, their causes, and the current situation in conflict-affected areas of Africa. Then, the research will be related to SDGs 4 and 11. (4. Quality Education 11. Creating cities and Communities)

5.Discussion and Implication



＜Reason of conflict＞

Conflict is often defined as “war” between two nations or between two different armed groups. There are many causes of conflict, but the main causes are religious, ethnic, and cultural differences, as well as dissatisfaction with the current government, which may lead to rebellion.

＜Conflict-affected areas of Africa.＞

I focused my research on Ghana, which is considered relatively safe in West Africa, because it's a relatively safe part of Africa. We felt it was essential for children to be in a safe community in order to receive an education. Ghana was the first African country to gain independence from colonial rule in 1957. Located in western Africa, the country is divided into three vegetation zones: coastal savanna, forest belt, and northern dry savanna. Of Ghana's population of approximately 28 million, children and youth make up the majority. Most people live in rural areas and engage in agriculture. The economy is dependent on agriculture, mining, and other primary commodities, and is unstable and susceptible to international market prices and natural disasters that can cause crop failures. For example,gold, petroleum, and cocoa beansIn Ghana, awareness of children's rights is low and problems such as sexual and physical abuse, human trafficking and child labor are frequent. In addition, parental understanding of the importance of education is low. According to the Ministry of Foreign Affairs, the enrollment rate for primary education in Ghana is 80%, but there is still a need to improve basic education.

The Ministry of Foreign Affairs also says that literacy rates are low in northern Ghana, and there is a lot of child labor.

6.Conclusion

My conclusion is, once again, to create a school with a dormitory system. There are two reasons. Firstly, because it solves the problem of children who are too far away from school to attend. They will not have to travel from home. Second, child labor is a frequent occurrence in Ghana. Therefore, by entering a dormitory, they can focus on their studies instead of laboring.

I am also thinking about teaching them about industry. Because gold can be extracted in Ghana, the gold processing industry is thriving. By doing so, child labor will be reduced, Ghana will become a more prosperous country, and people will be able to lead stable lives. Future challenges include funding and deciding the right age for students.

ガーナの主要鉱物生産量

年	1997	1998	1999	2000	2001	2002est.
金（kg）	54,446	74,352	81,496	76,552	72,857	69,000
ダイヤモンド（ct）	829,523	805,742	684,033	878,011	1,170,00	
ボーキサイト（t）	536,723	341,121	355,2623	503,825	0	715,000
マンガン（t）	384,443	384,173	611,500	895,339	849,003	
					813,300	

資料：Raw Materials Group & World Metal Statistics

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Buildable houses in developing countries

What kind of house is inexpensive and safe?

5403 Isobe Minami

Abstract

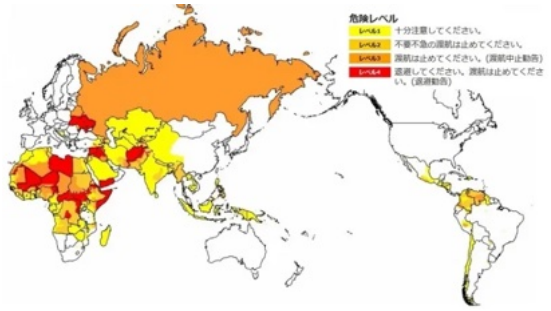
According to Habitat for Humanity, about one-eighth of the world's population currently lives without adequate houses. Therefore, in order to enhance living space in developing countries where people live in poverty, I set the objective of this research to create houses with low cost and simple structures, but with high safety that can protect them from wind, rain and crime. We consulted studies from companies and universities for specific building methods and global conditions. By Block is safe and inexpensive because it does not cost much for raw materials and requires little labor for construction. Regarding the plastic, we divided the area into two regions: one where countries can obtain drifting and the other where countries import from developed countries. ByFusion technology makes it possible to build inexpensive and safe houses, but the initial cost to realize the system is very high. Securing funds for this is a future issue.

1 Introduction

My research question is “What kind of house is cheap and safe?” . I focused this research on the Sub-Saharan and South African regions.

In order to improve living spaces in developing countries where people live in poverty, houses need to be low-cost, simple in construction, and safe enough to protect them from wind, rain and crime. I will pursue what kind of house is suitable and what kind of house can be spread in developing countries.

I will refer to these two regions as the “target areas”. I chose to focus my research on housing issues in developing countries and these two regions for the following reasons. According to Habitat for Humanity, a volunteer building organization, about one-eighth of the world's population currently lives without adequate houses due to poverty. And many of those people live in “target areas.”



https://worldsegg.com/crime-world/

And this is a map created by the Ministry of Foreign Affairs of Japan showing the level of danger in each country. From this, we can read that the danger level in the “target areas” is very high.

Houses can play a role of a shelter for protection and improve the quality of life, which leads to motivation for work and child parenting. I also believe that housing plays a significant role in providing people with a sense of spiritual security. Therefore, I believe that the spread of houses will lead to an increase in national power in the long run. I also believe that this will lead to the achievement of SDG 11, “Sustainable Cities and Communities.”
These are the reasons why I chose to focus on the “target areas” and set this theme.

2 Discussion and implications

There are two main issues in my research.One is the type of house and the other is how to procure materials for construction.

Firstly, I explored the type of house that adapts to “target areas”. Prior research includes the volunteer work of Habitat for Humanity. They build houses, schools, and other buildings in developing countries like the “target areas”. The houses they build are made of clay and bricks derived from the soil. They are very inexpensive, but they take a long time to build and require a lot of labor. We would like to find more appropriate houses for developing countries.

I looked into By Brock, a plastic processing technology developed by the American company By Fusion, which uses steam to compress plastic into rectangular blocks. The size is 40.64 x 20.32 x 20.32 centimeters and the weight is 9.97 kilograms. Fusion's technology, the micro-diversion platform, can process all types of post-industrial plastics without cleaning, even if they are unsorted and contaminated, and there are no sanitation problems. Currently, it is used in developed countries for park benches, furniture such as chairs, and building walls, and so on. There are advantages to a house made of ByBlock. I quoted this from By Fusion.

ⅰ)Save money

ByBlocks are easy-to-use, require less labor and speeds up construction, reducing your overall costs.

ⅱ)Build faster

Days, Not Weeks. Build walls faster with ByBlock. No mortar, no drying time, just rapid construction.

ⅲ)No breakage

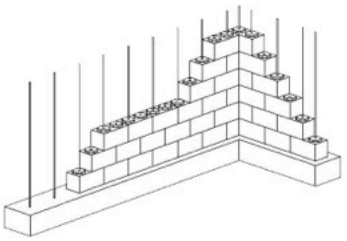
ByBlock's durability resists cracking and crumbling, reducing waste and contributing to a cleaner job site.

ⅳ)Sustainable

A sustainable alternative to CMU, made with 83% less CO_2, less waste, and can be reused.

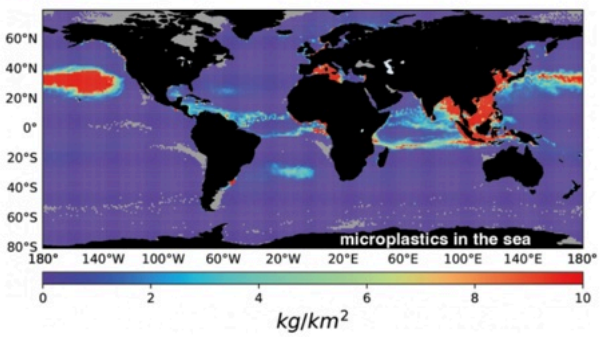
Also, to add to advantage ii), the process of assembling By Block is very simple. First, we laid a concrete or other foundation. Then, we erected rods and inserted By Blocks into it. In fact, when we build a house in this way in the “target areas” , the foundation can be made of concrete from soil, which is currently used for construction in developing countries. Although there are no examples in developing countries, if we can secure plastic materials and machinery to produce By Block, it would be possible to realize sustainable construction in developing countries at a low cost because there would be no raw materials or construction costs.





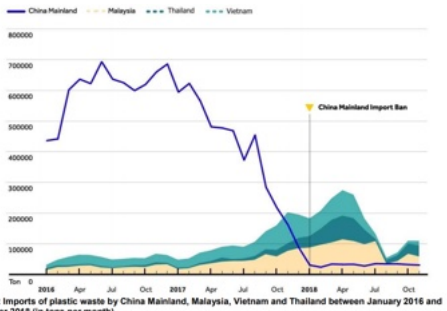
pictures by by fusion hp
https://www.byfusion.com/wp-content/uploads/2022/04/BYFUSION_ByBlock_Build_Instructions_v2.1.pdf

I found a study that examined the plastic problem in targeted countries.
According to WWF, 78% of the plastic produced today is abandoned to nature, and the amount of plastic generated continues to increase.

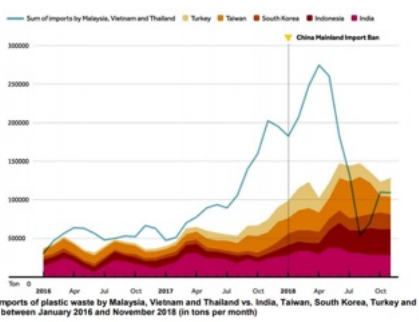


https://www.sciencedirect.com/science/article/pii/S0048969722010270?via%3Dihub

This is a map created by Kyushu University based on a simulation showing the amount of drifted microplastics and plastics between the 1960s and 2022, on a weight basis. It shows that most of the plastic debris drifted to South Asia, Southeast Asia, and southern East Asia. In addition, it exists as drifting trash in the waters around the Hawaiian Islands and the Midway Islands and in the waters around the Sea of Japan, depending on ocean currents. In other words, the South Asian region, one of the “target areas”, can obtain plastic from drifting garbage. Next, we investigated the securing of plastics in the sub-Saharan Africa region. According to a simulation by Kyushu University, it is not possible to obtain plastics from drifting garbage in the Sub-Saharan Africa region, so it is necessary to obtain plastics in other ways. Therefore, we focused on plastic waste that has not been abandoned at sea. Before 2017, developed countries exported untreated waste plastic to China because of the ASEAN Free Trade Agreement's lack of tariffs and low transportation costs. China recycled the imported plastic waste and used it as new plastic. However, in 2017, China amended the Basel Convention Annex and banned the import of waste plastic.



Graph 2: Imports of plastic waste by China Mainland, Malaysia, Vietnam and Thailand between January 2016 and November 2018 (in tons per month)



Graph 3: Imports of plastic waste by Malaysia, Vietnam and Thailand vs. India, Taiwan, South Korea, Turkey and Indonesia between January 2016 and November 2018 (in tons per month)

https://www.amita-oshiete.jp/qa/entry/015383.php
This shows the amount of plastic imports from China and other countries before and after China's inclusion restrictions, as compiled by Greenpeace USA: Since 2017, China's imports have plummeted, and in their place, Thailand, Malaysia, and Vietnam's imports have surged. As a result, environmental pollution became an issue in those three countries and they started to restrict imports, as did China. Therefore, imports from India and Taiwan have increased in recent years. In short, against the backdrop of import restrictions by the Chinese government, developed countries are no longer satisfied with the export of plastic waste, and developing countries are facing environmental pollution problems due to unsatisfactory waste plastic processing technology. Therefore, instead of pushing such waste to developing countries that do not have the technology, we wondered if we could export it to sub-Saharan Africa and use it as building material. By doing so, countries would no longer have to worry about where plastic waste should go, and developing countries would be able to build houses at a lower cost of materials.

3 Conclusion

Based on the above research, we decided to divide the developing countries under study into two patterns.



https://www.byfusion.com/wp-content/uploads/2022/04/BYFUSION_ByBlock_Build_Instructions_v2.1.pdf
The first is in the South Asian region, where plastic can be obtained from drifting garbage. They can obtain plastic at low cost without importation or collection. In these areas, we installed machines in these areas.

There are three types of By Block generation machines, which are used depending on the size and shape. The first is a machine that can be used to generate plastic bottles, which requires capital to install, but in the long run the cost is not high.

The second is in sub-Saharan Africa, where it is not possible to collect materials from drifting plastic. They import waste plastic from developed countries.The By Fusion platform is designed to be connected to the sorting line, thus reducing transportation costs. In this case, it is more cost-effective to generate in developed countries than to install machinery in developing countries.

In addition, we would like to utilize volunteer organizations that build abroad, such as Project Abroad and Habitat for Humanity, to build the By Block houses.

As for future challenges, the price of the “Industrial Blocker,” which can process more than 90 tons per month, is high at $1.3 million (about ¥149.39 million), but considering the cost of processing non-recyclable plastics in the U.S. I believe it is an investment for the future. However, since the realization of this project will be expensive, it is necessary to secure the initial cost to introduce the machines in developing countries and to set up a system to export the machines to developing countries after their introduction in developed countries. In the sub-Saharan African region, plastics are imported from developed countries, and the initial thought was that the developed countries would bear the cost, since they have the advantage of being able to take back plastics that have no place to go. In addition, this study focused on “buildings,” one of the elements of the living environment, but we would like to work on the improvement of the “water environment” in future studies.

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Eliminate Information Gap

How to eliminate the information gap in developing countries and developed countries?

5404 Umino Ririko

Abstract

Information gap is becoming a large problem in both developing countries and developed countries. In developing countries, the information gap between people who can use the Internet and others occurs because of poverty and low literacy rates. To solve this problem, we should make more places to work and ways to use phones for people who cannot read letters. In developed countries, the information gap between people who can distinguish fake news and others occurs because of a shortage of media literacy. Fake news sometimes leads to big accidents. So The education system to practice distinguishing fake news and correct news is necessary to solve.

Introduction

In our society, “information gap” harms some people. Penetration rate of information devices is low in developing countries, so people in such countries cannot get information and it puts them in danger. On the other hand, people in developed countries consider fake news as a problem. Therefore, I research how to eliminate the information gap from two perspectives: developing countries and developed countries.

According to Peoples Friendship University in Russia, there is a large relationship between economic development and mobile penetration, so I will make a new way to increase mobile penetration of developing countries in this research.

Also, according to Google survey, 50% of people in developed countries cannot distinguish between fake news and correct news because of lack of education about information, so I considerd about improvement of education.

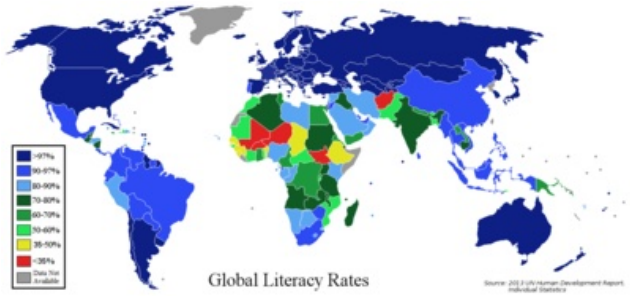
I used the Internet to find a lot of information and compared them.

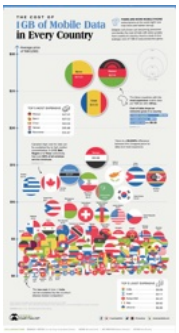
Discussion and Implications

I. Developing countries,especially Africa

Why is the Internet penetration late in developing countries so low? I found three reasons. First, in more than half of African countries, the average monthly income is less than 200 dollars, so it is difficult to buy smartphones because almost all smartphones which are sold in Africa are nearly 100 dollars. Second, communication fees in Africa are so expensive compared to other areas. It is about 10 dollars more expensive per GB. Therefore, we should make a way to earn more money in developing countries.

In addition, the literacy rate is 45~85 percent, so many people cannot use the Internet.





II. Developed countries

I researched which country is strong against fake news and what efforts are being made in such countries. According to a research survey of media literacy index by OPEN SOCIETY INSTITUTE SOFLA, mainly nordic countries are resistant to fake news. These countries distribute computers to students at school. In these countries, classes are offered in schools where students can learn media literacy through hands-on experience. For example, in Finland, an organization called Faktabaari developed a digital toolkit to combat fake news for children and local schools use this toolkit in classes.

Expanded Media Literacy Index (MLI) 2022			
Country	Expanded MLI 2022 Scores	Expanded MLI 2022 Ranking	Extended MLI 2022 Clusters
Finland	75	1	1
Norway	73	2	1
Denmark	73	3	1
Estonia	71	4	1
Ireland	70	5	1
Sweden	70	6	1
Canada	***68***	***7***	***1***
Switzerland	67	8	1
Netherlands	65	9	1
Australia	***63***	***10***	***1***

Conclusion

I. Developing countries

To make more money to buy mobile phones, we should make more places to work. I suggest a rare metal recycling business used in smartphones. By this business, local people can earn money and mobile phone companies can make products with low money. This has a precedent of an automobile recycling project in Africa by Kaiho Sangyo Corporation.

Also, I propose improving the voice reading function to make it easy for everyone to use the Internet.

II. Developed countries

To improve people's media literacy, we need to distribute computers for students and make more opportunities to use media information. Also students need to face the fake news

problem by learning in class. Not only Finn but also people in other countries can use the media education game Faktabaari.

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Safe hands washing for people in the world

Toward the Spread of Simple Hand-Washing Facilities and the Institution of Hand-Washing Education

5405　Endo Honoka

1. Abstract

2,Introduction

I researched problems in the school lunches for students who have allergies three years ago . I have been interested in public health since then. So in this research about the world, I'd like to make suggestions to solve problems on public health. In my research this year, I focus on washing their hands because I think it is the easiest means to protect their health by themselves, people in developing countries. Especially in a lot of problems about public health, washing hands is said to make it a habit due to the Coronavirus pandemic.

These following are some of the factors that prevent the popularization of washing hands in developing countries.

1st, lack of clean water

2nd, lack of soaps

3rd, no custom to wash their hands using soaps

I'll research to make propositions based on these three points in my research, and make a research question, "What can we do to provide safe water and teach how to wash hands?"

Then, I show the visions of my research about each point.

In the absence of clean water, I thought water service systems need to be spreaded. However, it is difficult because it takes a huge amount of money and time throughout developing countries. Therefore, clean water must be available even in areas without running water, so I set a goal, popularization of simple filtration systems for disaster and outdoor use because anyone can carry them and easily produce clean water.

About the second topic, lack of soaps, I consider an environment in which soap is stably available is important. This will require not only material support but also self-sufficiency in soap. In our research, we found that in some parts of Africa, there is a soap called "black soap," which is made of vegetable oil and banana lye. I will research the self-sufficiency of black soap.

To make a custom of washing hands,it is also necessary to get children in this custom through health education about hand washing at school.I'd like to research what UNICEF and other organizations are doing to promote handwashing, and to first understand the current situation by researching the status of water supply in primary schools in each region.

I find nessesary points and I make suggestions finally.

3,Discussion and implications

I consider the three items mentioned above.

1st, lack of clean water

I researched simple water filtration systems and found some types already sold on the Internet. If the water is filtered down to the bacteria and made clean enough to drink, the market price is 1,000 yen for the cheapest one, and several millions yen for the most expensive one.

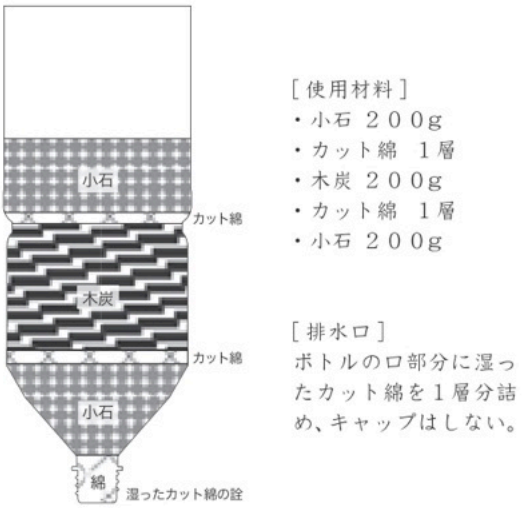


Picture No.1 SAKUTTO water filtration

I found this water filtration easy to use and carry, “SAKUTTO water filtration” (4.5 x 13 x 16 cm; 50 g, ¥3,980),but it is too expensive to donate in large quantities.

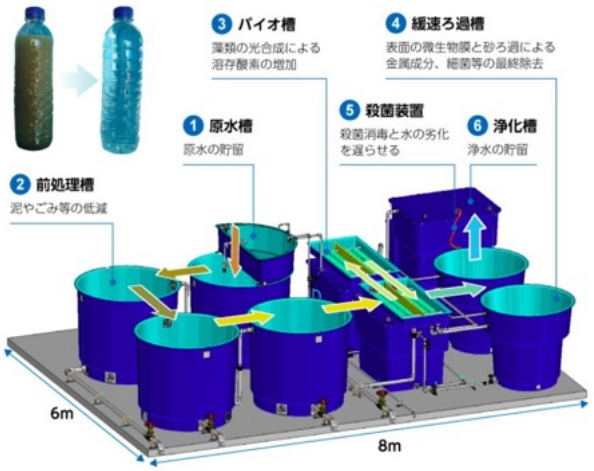
As a solution other than donating filtration equipment, I also thought about making their own filtration equipment locally. According to Beppu and Beppu Junior College, they have researched how to make simple filtration equipment using materials suitable for filtration. And finally they said the filtration equipment shown below was found to be the most suitable. The filtered water can be used as drinking water by further boiling and sanitizing it.

However, it has some issues to be solved: whether plastic bottles and so on for materials of the filtration system can be arrived at locally or not, and to need to prepare water for washing materials, which need to be clean. I thought I could solve these problems by regularly washing them with water filtrations using the water filtration shown in Picture No.1.



Picture No.2 How to make simple water filtration

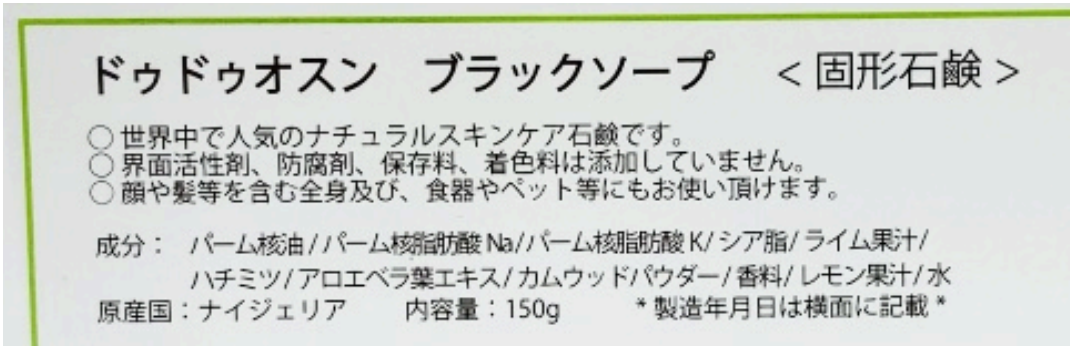
In addition to building their own filtration equipment, we also considered the possibility of installing filtration systems that could be used together by residents in the area. For this issue, we are considering the use of a slow filtration system. (Picture 3)
Slow filtration is a filtration system that kills and sanitizes dirty water by using small stones with microbes on their surfaces to filter it after allowing water contaminants to set up. The advantage of this filtration method is that it is low-cost and does not require much cleaning. Yamada Electric is installing this equipment in Africa, where 42 units are now in use. Because they are much larger than the simple filtration systems and require mounting, I am considering setting them up in public facilities.



Picture No.3 Slow filtration system

2nd, I consider the lack of soaps.
We will consider self-sufficiency in soap as our final goal.
To make soap, we needFats, oils, or fatty acids (animal or vegetable)Alkaline ingredients, and water. The issue here is the alkaline component. Caustic soda, sodium hydroxide are generally used, but it is a very dangerous substance, and it is difficult for the common people to use it in large quantities. For example,in Japan, caustic soda is classified as a dangerous chemical and cannot be purchased by the general public without special procedures at local drugstores, and we must take special steps to dispose of it.

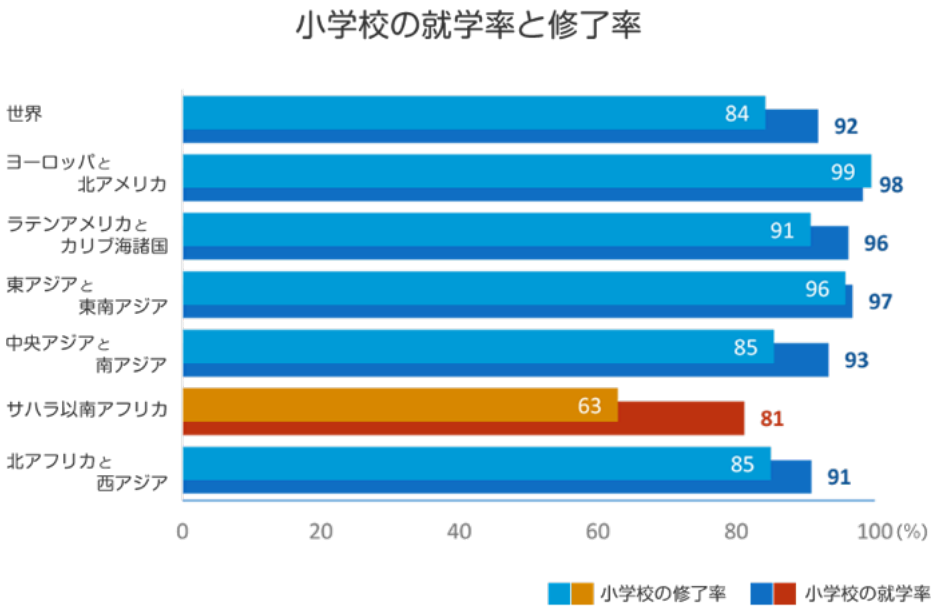
So I researched the possibility of making soap with ingredients locally found, instead of chemicals that are too dangerous to use, and found a soap called “Black Soap”. The one I found by the mail service included oil ingredients of palm core oil and shea fat, and alkaline ingredients of camwood powder and ashes of cacao pots (the rugby-ball shaped fruit of cacao).



No.4 ingredients of black soaps

One of the challenges for black soap is the way to get the material. Palm kernel oil and shea fat are used in the above black soap, but these are currently mostly farmed on plantations. Plantation cultivation causes environmental damage due to the use of land and labor problems such as child labor. In addition, black soap is in high demand overseas due to its ingredients, and most of it is exported.
In terms of issues of palm oil, I would like to consider ways to produce soap without building additional plantations in the future. Since cacao butter and coconut oil can be substituted for palm oil as the fat component of soap, we thought it would be possible to manufacture soap without deforestation as much as possible in the future by producing black soap on plantations that are already in place in Africa.

3rd, no custom to wash their hands using soaps.
At first, I considered trying to teach about hand washing in the curriculum at the school, the subject of health in Japan. However, according to Picture 4, school enrollment rates in African countries are particularly low compared to other regions. In sub-Saharan Africa in particular, school enrollment and elementary school completion rates are very low.Therefore, we thought that simply educating children in schools would not be enough to spread the concept. Therefore, it is necessary to improve school enrollment and completion rates or to provide handwashing education in communities except schools.



Picture 4 Elementary School Enrollment and Completion Rates

4, conclusion

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Establishment of a Hospital Specializing in Eating Disorders and Free Cafeteria

～Toward the Simultaneous Solution of Medical Issues and Poverty Problems～

― Foodloss Eating Diseader Kids Cafeteria ―

5406 Oshima Yuno

1. **Abstract**

My proposal is establishing a hospital specializing in eating disorders.
This hospital handles individual commitment regarding food and lifestyle which is specific to eating disorders. People who have eating disorders have a strong commitment to food. There are many cases of rejecting treatment by fear of increasing weight. Therefore, treatment of handling individual commitment which people who have eating disorders have effective to accept medical treatment.
If the hospital handles individual commitment, they are concerned about foodloss. It is possible to produce more prepared ingredients than used ingredients. Therefore, my proposal is to open a cafeteria which uses prepared ingredients. This cafeteria fulfills the role of a kid's cafeteria, but it is possible to use adults, so it is named “free cafeteria”. The Staff of this cafeteria tell visitors how to make the recipe. There are not expensive ingredients at the hospital by estimate. For this reason, the ingredients used there can be gotten easier than expensive ingredients for poverty. Therefore, offering the recipe helps visitors to live from now on.

2. **Introduction**

I started this research because I contracted an eating disorder. When I was in the hospital, I consulted a registered dietitian, and I asked them to change many things about foods matching my commitment. However, there were many things which they were not able to change by not the treatment but convenience of the hospital. At that time, I thought I wanted to change like this. After I was discharged, I saw the posting by people who have eating disorders on the social networking service. There were many people who thought like me, and I thought, “If the hospital is like that, many people will cross to care.”
When I worked out the details, I thought treatment of handling individual commitment is concerned about foodloss. I researched a kid’s cafeteria during the period of integrated study, so I came to my mind of a free cafeteria.
I asked the research question, “How can we solve both the medical problem and the poverty problem at the same time?”
This research connects the resolve of eating disorders in Japan. Mainly, the resolutions are about the increase of people who have eating disorders and height of the rate of eating disorders. These are related to “good health and well-being”, SDGs 3. I also want to connect this research to resolve poverty problems. This is related to “no poverty”, SDGs 1.

3. **Discussion and implications**

Eating disorders cause many health hazards. For example, hypotension, bradycardia, hypothermia, hypoglycemia, anemia, and leukopenia. In this way, this disease appears itself in the form of cardiovascular diseases, hematological diseases, gastrointestinal diseases, endocrine and metabolic diseases, and refeeding syndromes. It also causes mental problems

such as mood swings, uneasiness, and increased commitment. It has a tendency to cause complications. Moreover, it has a great effect on social rehabilitation. For example, difficulty in personal relations and communications, and aggravation of disease by work. In addition, it has a tendency to cause kleptomania, so it has the ability to commit a crime. Therefore, eating disorders are serious diseases which need to decrease the number of patients early. The mortality of eating disorders is about 5%, which is the highest mortality in mental disorders. We have to resolve this present condition.

The food loss in hospitals is about 6t per month. There are many foods which are not opened and are reserved food. I focused on the food which was not opened. In addition, many people who have eating disorders live in developed countries, and 1 in 15 people are poor in Japan. Therefore, I want to suggest a useful plan to resolve poverty problems in developed countries and use food loss in hospitals.

4. **Conclusion**

My proposal is establishing a hospital specializing in eating disorders.

This purpose is to supply medical care tailored to characteristics of eating disorders, decrease the number of patients and mortality rate, and eliminate poverty by establishing food loss conscious hospitals. This hospital handles individual commitment regarding food and lifestyle which is specific to eating disorders. People who have eating disorders have a strong commitment to food. There are many cases of rejecting treatment by fear of increasing weight. Therefore, treatment of handling individual commitment which people who have eating disorders have effective to accept medical treatment.

If the hospital handles individual commitment, they are concerned about foodloss. It is possible to produce more prepared ingredients than used ingredients. Therefore, my proposal is to open a cafeteria which uses prepared ingredients. This cafeteria fulfills the role of a kid's cafeteria, but it is possible to use adults, so it is named “free cafeteria”. The Staff of this cafeteria tell visitors how to make the recipe. There are not expensive ingredients at the hospital by estimate. For this reason, the ingredients used there can be gotten easier than expensive ingredients for poverty. Therefore, offering the recipe helps visitors to live from now on.

There are differences between this hospital and others. At the existing hospital, there is therapeutic food and personalized meals, so it is possible to change staple food. However, it is not fulfilled with the commitment of eating disorders. For example, minimum calories and yes or no of staple food. If it didn’t execute, people who have eating disorders are disgusted with treatment because it become pronounced the increase of intravenous drip and nutritional supplements. Therefore, if the hospital examines and treats the patients who have eating disorders, it is easy to collect doctors who are specialized with eating disorders, and it is possible to supply good medical care and friendly treatment.

There are hospitals which are specialized with eating disorders in the world. On the other hand, there are no exist in Japan. According to an investigation targeted at female students in 22 countries around the world, Japan has a social situation that is predisposed to eating disorders, so this plan is anticipated to be in high demand. Free cafeteria which uses prepared ingredients should open, and it can influence not only medical care but also poverty.

We went to Medtronic Singapore for an innovation training school trip. I learned that we can make a big innovation with many improvements after making one innovation. I want to make this research into a big innovation to keep resolving the problem.

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Measures for Water Issue
～Tie Tommorow to Children～

5407 Ogata Ayano

0. Abstract

According to the article,there are 500 children in Sub Saharan Africa per a day who are killed by dirty water and the environment. Therefore, I researched through some literature. I found the amount of water which we can use safely in the world is only 0.01%. Also, some organizations such as Unisef and others do some activities such as building wells for areas of water shortage. However there are many people who live in the area who have to go far away to get water to live. Therefore, I will suggest two things to fix this problem. First, the government gives “Q drum” at a low price. “Q drum” is a product invented by an architect in South Africa, Hans Hendrix, to bring 50L water at once with a simple and easy way to use. People can use it only trailing. Second, I’d recommend filtration and boiling. It’s based on survival. Also, my perspective is research for financing and technical cooperation about improving infrastructure.

1. Introduction

<backgraunds>

Mainly in this study, my purpose is to find a solution for a serious water problem in Sub Saharan Africa(See under drawing 3). According to the Unicef, in Sub Saharan Africa, 500 children per a day are killed by unsanitary water and environment. To improve this situation, Unicef works and thanks to their hard work, the problem has been improving step by step. Unicef gives them some safe water with waterworks and soaps and tells them how to wash their hands(See under graph 2). However, There are many people in the area that have such a problem that they’re compelled to use dirty surface water with such a lot of support.
Therefore, I setted my research question but I changed my first goal. My goal is to increase areas that can use “limited water source” or “improved water source” from “safely managed water source”(See under graph 1) . Then, I considered problems that should be improved.
First, it is water resources. They get water from ponds, rivers, lakes and others. People take 3 to 6 hours to get water. They are almost all children and females and they walk about 6 kilometers. Also, with all the effort, people have a possibility of being killed or getting sick by drinking the water because the water is too dirty to drink.
Therefore, I started researching to solve these problems.

<Previous research>

Unicef has been working on these water solutions. According to the Unicef, children can’t help but drink surface water but by drinking dirty water, this water could infect children with some virus such as pneumonia. From Unicef, the well became a trigger of enhancing their hygiene awareness. Then the areas, children’s health and the employment rate were improved and the area started to change.

<The ways of researching>

ⅰ research some informations on the internet
ⅱ considerate about how to use filtration system of survival

2. Discussion and implications

I learned that many organizations in Africa, such as Unicef, are working on water issues and child workers but I know that there are still people suffering from dirty water. In addition, there are still more than 100 million people who are forced to drink surface water (See under figure 2). Also there's the "Q drum" which was invented by the Hendrix brothers. It has not been used for carrying water because the cost was very high. One of the reasons is the drum is used with rolling so it should be strong but the materials' cost were too expensive to popularize. So if the "Q drum" could be rented at a lower cost through crowdfunding or other donation methods, it would make it easier for those who cannot obtain surface water and have to go far away to get some water. In addition, I suggest that a filtration device (See under figure 4) that can be made with stones, clothes, and a bottle which is used in survival and other situations, and then boiled. It is not only easy to make but also safer than surface water because it was introduced about the way of making drinking water from dirty water.

<What I learned about innovations>
I learned that it's important to not only make it from zero but also to make it from what we already have. When we went to Medtronic Singapore, I felt that using our own interest to help others is very amazing.

3. Conclusion

My research question was "What can we do for people who live in the areas of water shortage to use safe water anywhere and anytime?" However, it's difficult to change the lives of the residents of the areas' water from "surface water" to "safe water" because there is only 0.01 percent water in the world. The rate of the water is just "safe water." Also the long roads to carry water are almost bad and not only roads. Therefore, in my research, I suggest ways that fill the water and become easy to carry with an invention by Hans Hendrix, "Qdrum." However, I will research with this goal "Limited water : Drinking water from an improved water source that can take longer than a 30-minute round trip from home (including waiting time) to fresh water." So, we need to research how to secure and improve water sources.

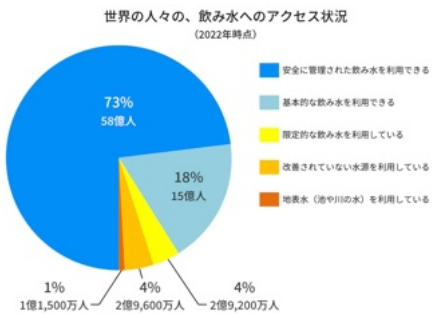
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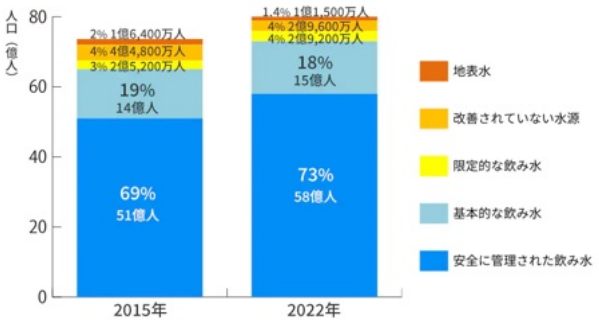


図1 世界の人々の、飲み水へのアクセス状況
（ユニセフ・WHO報告書）

図2　2015年から2022年にかけての成果
（ユニセフ・WHO報告書）



図3 In 2022, 142 countries had estimates for safely managed drinking water
（ユニセフ・WHO報告書）

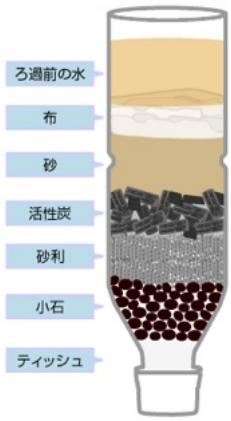


図4 手作りろ過器（Kitakata city water department）

Environmental Issues vs. Global Chemical Power

Let's improve education!

5408　Kato Yu

Abstract

〈Background of Research〉

We often hear news about environmental problems.

They talk about reducing carbon dioxide emissions, but even with a slight reduction, we are clearly emitting more than we did before the Industrial Revolution.

〈Significance of research〉

It will lead to fundamental solutions to environmental problems (global warming).

It gives everyone an equal opportunity to receive quality education.

〈Research〉

Mainly using the Internet

Compare education in different countries.

Create a school for gifted children.

Result: Use of 3D printer housing

Dispatch teacher system

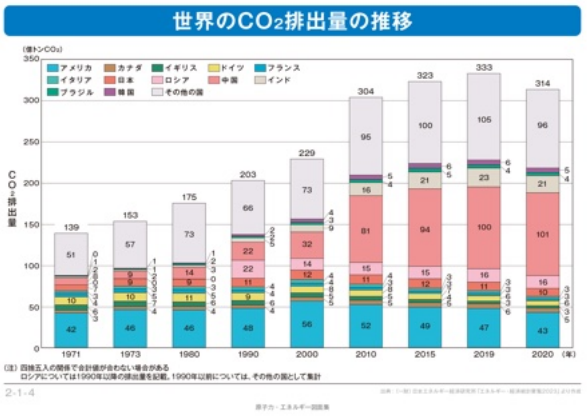
Online classes by former scientists

Consideration: None of the above is very feasible because it is essential for the world to cooperate.

Prospects: Send out information to small-scale areas and expand.

2. Introduction

〈background of the study〉

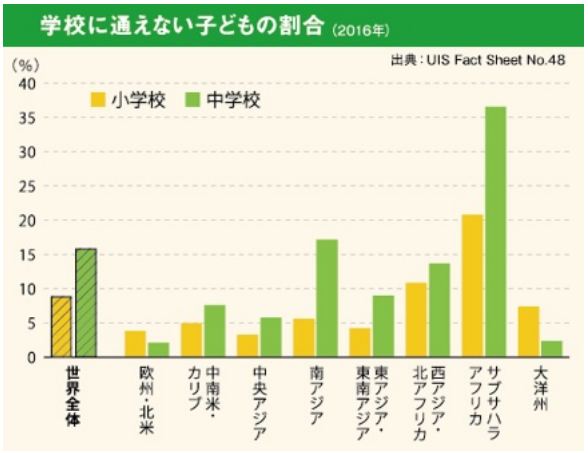


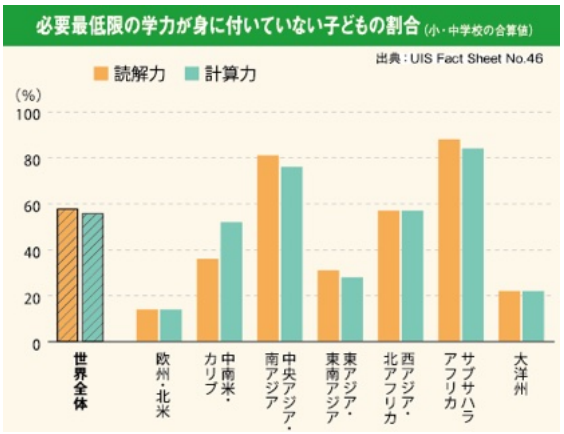
Global warming is currently progressing around the world. The entire world is working to reduce CO2 emissions, and although they have been decreasing in recent years, they are still nearly three times higher than they were during the period of rapid economic growth. It is probably impossible to reduce CO2 emissions in modern society to the same level as during the Paleolithic Era. Therefore, I thought that if we could not reduce CO2 emissions significantly, we should try to eliminate them through the power of science. Unfortunately, I do not have the ability to develop such a method. Therefore, I thought that raising the level of education on a global level and creating a place where people who are truly capable can demonstrate their abilities should be given top priority. Therefore, I decided that the true theme of this year's conference would be to raise the level of education in developing countries.

〈Purpose and Significance of the Study〉

Raise the level of education worldwide to increase the number of scientific geniuses. Promote the improvement of education in the least developed countries since the developed countries have already achieved a certain level of education.

〈Research Methods〉
Use the Internet.
Use books.





2.Discussion and implication
Why Least Developed Countries Do Not Have Adequate Access to Education.
· The environment for learning is not good enough.
· Cannot attend due to family reasons.
· Cannot attend due to war or conflict.
Specific examples of lack of environment for learning.
· Schools are not located near each other.
· Insufficient number of teachers, poor quality of teachers

3.Conclusion
I thought the use of 3D printer housing was an effective way to address the issue of not having a school nearby.I have three reasons I think so.
· Low construction cost
· Short construction period
· Reduced carbon dioxide emissions

As for the issue of teachers, we propose a “dispatched teacher system". In fact, Japan has developed by hiring foreigners in the past. I believe that if developing countries try to do the same, they will also develop.

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5. What we learned from our company visits

When I asked about medical care, I was told that Japanese medical care is far behind that of Singapore. However, I was told that it is difficult to change the national system and that Japanese medical care will never be reevaluated. I keenly realized that my research is difficult to realize because I am trying to change not only one country but the world.

Possibilities for Animation Therapy
～Are Cartoons and Video Games Effective in Treating Mental Illness? ~

5409 Kameyama Haruki

1. Abstract

This study is intended to reduce the number of patients with mental illnesses, which are on the rise worldwide, and to solve some of the problems of the animation industry in the proposal described below. The research is being conducted mainly on the Internet and in articles. Based on the existing narrative and game therapies, animation therapy has a good chance of success. Therefore, in order to start and spread it, I therefore propose to create a new “animation therapy” as a genre of animation.The research question is the same as the sub-theme, "Are anime and games effective against mental illness?

2. Introduction

According to WHO data, about 264 million people in the world currently suffer from anxiety disorders, and 300 million people suffer from

depression.

At 20 million, the population exceeds 300 million (2015), an increase of approximately 18% since the last survey in 2005. (2015) This is an increase of approximately 18% since the last survey in 2005, a situation that cannot be overlooked. In order to break through this situation, I wondered if animation therapy, which is still new and has not yet been tested, could be used. I conducted research on mental illness the year before last and on the Japanese animation industry last year. Through these two studies, I have learned about the fascinating and wonderful aspects of anime and its role in the treatment and prevention of mental illnesses. I then turned my attention to anime therapy. I believe that the benefits of anime's ability to captivate, heal, and inspire many people can be effectively used as part of the treatment of mental illness.

3. Purpose and meaning of this research

The purpose of this study is to effectively achieve a partial solution to depression and anxiety disorders in developed countries using familiar animations. This is expected to have economic benefits, not only in terms of health, but also by enabling more people to engage in activities. According to the Japanese Ministry of Health, Labor, and Welfare, the economic benefit of eliminating suicide and depression in Japan, at least in 2009, is estimated to be 2.7 trillion yen, and the estimated GDP increase in 2010 is a whopping 1.7 trillion yen.

4. Research Methods

The research was done mainly using the Internet, using WHO documents and many, many texts on narrative and game therapy. The most useful reference was a series of articles by Banto Francesco, an advocate of anime therapy, which appeared in the "医学界新聞"(medical journal).

5. Discussion and Implication

The premise is that animation therapy has not been clinically tested. Therefore, it is important how to make it convincing enough to reach the stage of clinical experimentation.

SPARX, a game developed in New Zealand, where the suicide rate is said to be high (11 per 100,000 people) in recent years, has shown efficacy, and the depression remission rate (in depression, the state in which symptoms are completely treated is described as "remission" rather than "cure". In this case, the term "remission" refers to a state of clinical control in which symptoms have turned around or almost disappeared.) was 43.7% more effective with SPARX compared to 26.4% with face-to-face counseling. This game is intended to teach cognitive-behavioral therapy. Cognitive-behavioral therapy is a form of psychotherapy that approaches stressful events from four perspectives: cognitive, emotional, physical, and behavioral. For example, let us consider the case of Mr. A, who experienced an event in which a friend looked away from him as he passed by, and a pessimistic thought came to his mind, "Maybe he doesn't like me..." (cognition), making him feel sad and anxious (emotion). Her heart pounded, her stomach ached... and her body reacted (physical), so she strode home to avoid being seen, crawled under the covers, and fell asleep
(Action). In this case, let us consider which part is easier to treat. At this point, regarding the emotional and physical parts, it is difficult to control emotions immediately, and it may be difficult to control a stomach ache by oneself. In other words, in these four aspects, it is easier to be able to control cognition and behavior compared to the others; SPARX deals mainly with this cognitive and behavioral treatment in a narrative form. (Figure 1)

Level	Theme	Location	Content
1	Finding hope	Cave country	• Explanation of depression • Explanation of cognitive behavioral therapy • Explanation of negative automatic thoughts • Explanation of the fact that many people overcome depression • Relaxation method 1: Breathing practice
2	Behavioral activation	Ice country	• Explanation and practice of the benefits of planning your next action and actually taking action • Relaxation method 2: Muscle relaxation practice • Explanation and practice of basic communication and interpersonal skills tips
3	Emotion control	Volcano country	• Explanation and practice of how to deal with strong emotions such as anger and hurt • Interpersonal skills: Explanation and practice of assertiveness, listening, and negotiation methods
4	Overcoming problems	[illegible]	- Explanation and practice of problem-solving procedures - Explanation and practice of cognitive restructuring
5	Recognizing negative cognition	Swamp country	- Cognitive restructuring: Recognizing the types of negative cognition
6	Challenging negative cognition	Bridge country	- Cognitive restructuring: Reconstructing negative cognition into more realistic cognition
7	Summary of all	Valley country	- Review of all skills - Psychological education that painful events may occur in the future, but remember the coping skills you have learned

Figure 1. From 2ndLabo. (Original foreign language data from British Medical Journal (19 April 2012 edition)) And this is a translation of a Japanese document.

There are three main advantages to this SPARX-based treatment: First, it can be easily done anywhere and at one's own pace; Second, it is much more fun than existing study-based cognitive behavioral therapy. If we were to do a cognitive-behavioral therapy study without actually using the game, this would be a lot more work and stressful. The third is that the characters explain things to you, so it is easier for you to take in the advice and other information. In many cases,

people are more likely to accept the advice of the cool characters they are manipulating than the guidance they receive from books or counselors. This makes it easier to be effective.

In SPARX, the use of games as a study-type psychotherapy was shown to be effective. There are several other examples of the use of games, such as the use of Minecraft to treat schizophrenia, and it may be effective to use not only games but also animation, a form of entertainment, to study works for psychotherapy in a narrative format.

Another example: since the 1990s, a new type of "narrative therapy" has emerged. This is different from animation therapy in that it has actually been practiced, and in particular, similar to animation therapy, is called film therapy. The process is as follows（1）Divergence: the viewer is immersed in the world of the story and psychologically detached from the actual world.（2）Identification: the viewer overlaps with the fictional characters.（3）Internalization: viewers will feel a sense of familiarity and connection to the content they see.（4）Transference: the viewer chews up the content in his or her own mind and is transferred to real-life emotions and thoughts. This is what it means.

There are several cases in which film therapy has improved the condition, but I will give one example from 2005. Here is an example from 2005: a 59-year-old woman was diagnosed with depression. She had been diagnosed with depression and "The Lord of the Rings" was chosen as her film therapy. Many of you may have seen the movie, which has themes of difficult life journeys, hope and recovery. The therapist described the main character, Frodo, as a symbol of hope after overcoming hardship. It was found that after five weeks, the patients' awareness of hope and optimism was significantly higher.

One important rationale behind such film therapy is that it can lead to cognitive restructuring through the processing of emotions, which, it is noted, may help to change viewers' behavior (Yang and Lee 2005).

A related paper, "アニメ視聴による心理的構造の変化(Changes in the Psychological Structure of Anime Viewing)," is presented in the following section.This research mainly consists of a questionnaire survey on (1) the anime, (2) the scene, (3) the time and situation at the time, (4) the change of state of mind after (3), and (5) the behavior of the respondents. In this (3), I examined the responses of those who were in a relatively negative state (“fatigue, worries,” “busyness,” and “stress/depression” in the questionnaire) and found that I actually watched the scene, and found that the scene was largely

①Exciting scenes where friendship and affection can be felt.

② Scenes that provide so-called “healing” through cute characters

③ Touching scenes with encounters and partings

④ Scenes that are interesting due to the rapid development of the story that makes you forget about everything else and get absorbed in the story.

These can be divided into four major categories. Of these, scenes ①, ③, and ④ are considered effective because they are similar to the idea of “film therapy,” which is to immerse oneself in a film and apply it to real-life actions by becoming emotionally involved with the characters and content, and by feeling a sense of familiarity with them. In addition, with regard to ②, there is no doubt that the deformed animation is more “healing” than movies in which actors perform, and this could be a strength unique to animation therapy.

To summarize what has been said so far, the two examples similar to anime therapy in SPARX and film therapy suggest that games and movies are effective in cognitive-behavioral therapy, and that they have some similarities with anime and some strengths because of anime. In addition, other than that, the fact that even animation, which is simply a masterpiece, may show

improvement in mental health, may be expected to have a descent in terms of making people feel more cheerful than usual. In addition to the aforementioned, another benefit would be that there is more information that can be drawn and the stress on therapy may be reduced.

6. Conclusion

Based on the above, I would like to help people with mental illness by producing an animation specialized in cognitive behavioral therapy. And if my research progresses, my goal is to eventually establish a genre of animation that can help many people around the world.

The issue for the future is still feasibility. This issue has always been with us. We will continue our research to solve this problem.

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Balancing Livestock Farming and Environmental Conservation

Effectiveness of the Using of Seaweed Feed for Environmental Conservation

ID 5410 Kikuchi Shoko

Abstract

As environmental problems progress around the world, methane gas emitted by livestock is becoming a problem. Meanwhile, a study has reported that adding seaweed to regular feed can suppress methane gas production in cattles. Interested in using seaweed feed, I set the research question as "Will improving feed with seaweed lead to methane gas reduction and environmental conservation?" I developed two hypotheses: 1) "Feed with seaweed is effective in reducing methane gas from cattle." and 2) "Feed with seaweed does not put a burden on the environment. Regarding hypothesis 1, it was revealed that the seaweed effective for methane gas production is the algae Asparagopsis, and Australian research has revealed that it can reduce methane gas production by over 50%. On the other hand, regarding hypothesis 2, it was found that the production and transportation of algae Asparagopsis impose an environmental burden due to the destruction of ecosystems and the energy required for equipment operation, the emission of carbon dioxide in transportation, and the use of plastic as packaging material. To solve this problem, I propose cultivation by land-based aquaculture, utilization of abandoned school pools and unused land, feed processing at aquaculture farms, and the use of packaging materials other than plastic. These improvement measures aim to reduce the environmental impact of using Asparagopsis into feed and to provide more sustainable feed. However, the cost remains an issue. Further consideration is needed to balance environmental conservation with business.

1 Introduction

Currently, human beings have had a variety of environmental problems such as abnormal weather and global warming around the world. While there are many causes of environmental problems, livestock farming has a significant impact on them: according to GREENPEACE, livestock farming causes problems such as deforestation, water pollution, greenhouse gas emissions and outbreaks of infectious diseases. AFP BBNews says that methane accounts for one third of greenhouse gas emissions released by livestock such as cattle and goats. We need to reduce greenhouse gas emissions in the livestock sector.

This study focuses on livestock production, especially feed for livestocks. There is a question about what people can do to reduce greenhouse gas emissions while continuing to raise livestock. Looking for the answer, I decided on this research topic which is balancing livestock farming and environmental conservation.

Researching previous research, there was a study that found that mixing seaweed into cows' feed can reduce methane emissions from cows' burps.The fact that seaweed suppresses methane production in cows was found in “Effects of marine and freshwater macroalgae on in vitro total gas and methane production (2014)”. According to this study, in a test tube experiment that reproduced the intestines of a cow, it was found that adding Asparagopsis

armata to regular feed can suppress methane production by 98.9%. Subsequent research, “Inclusion of Asparagopsis armata in lactating dairy cows’ diet reduces enteric methane emission by over 50 percent (2019)” actually showed that when dairy cows were given feed mixed with Asparagopsis, the production of methane gas was reduced by about 50%.

I was attracted to the idea of improving feed using natural materials, but I was concerned about whether using seaweed would lead to other environmental problems and whether using seaweed would really lead to environmental conservation. Therefore I decided to research the use of seaweed in feed. I set the research question as "Will improving feed with seaweed lead to methane gas reduction and environmental conservation?", and made two hypotheses 1) "Feed with seaweed is effective in reducing methane gas from cattle." and 2) "Feed with seaweed does not put a burden on the environment."

For research and Verification methods, I worked on information gathering, consideration, suggestion, conclusion, and additional research. To improve my suggestions, I visited Sea vegetable company. Also, I visited Mitsubishi Heavy Industries Asia Pacific Pte. Ltd. to learn about innovation.

2 Discussion and Implication

[Hypotesis 1]

○ Information Gathering

- Previous Research

“Effect of the macroalgae Asparagopsis taxiformis on methane production and rumen microbiome assemblage (2019)” shows the effect of Asparagopsis taxiformis. It is said that Asparagopsis taxiformis can reduce methane production from enteric fermentation in dairy cattle by 95% when added at a 5% OM inclusion rate. The methane reducing effect of Asparagopsis taxiformis during rumen fermentation makes this macroalgae a promising candidate as a biotic methane mitigation strategy for dairy cattle.

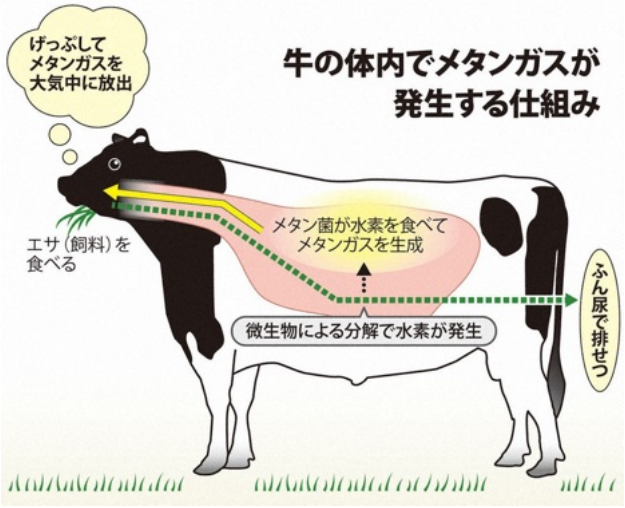
In a study, “Red seaweed (Asparagopsis taxiformis) supplementation reduces enteric methane by over 80 percent in beef steers(2021)”, Twenty-one Angus-Hereford beef steers were randomly allocated to one of three treatment groups: 0% (Control), 0.25% (Low), and 0.5% (High) A. taxiformis nclusion based on organic matter intake. Steers were fed 3 diets: high, medium, and low for age total mixed ration (TMR) representing life-stage diets of growing beef steers. The Low and High treatments over 147 days reduced enteric CH4 yield 45 and 68%, respectively. Supplementing low forage TMR reduced CH4 yield 69.8% ($P < 0.01$) for Low and 80% ($P < 0.01$) for High treatments.

Development of Asparagopsis into feed is worked on. Volta Greentech, a company in Sweden has commercialized Asparagopsis feed named "Lome." It is said that adding Lome of 100 grams to daily feed can reduce methane emissions by up to 90%. Sea Forest, an Australian company, has stabilized the active compounds extracted in the oil and removed bitter components by mixing the algae with Australian canola oil. It has been confirmed that when this oil is mixed with feed at about 40 ml per day per cow, methane production can be suppressed by about 70% on average.

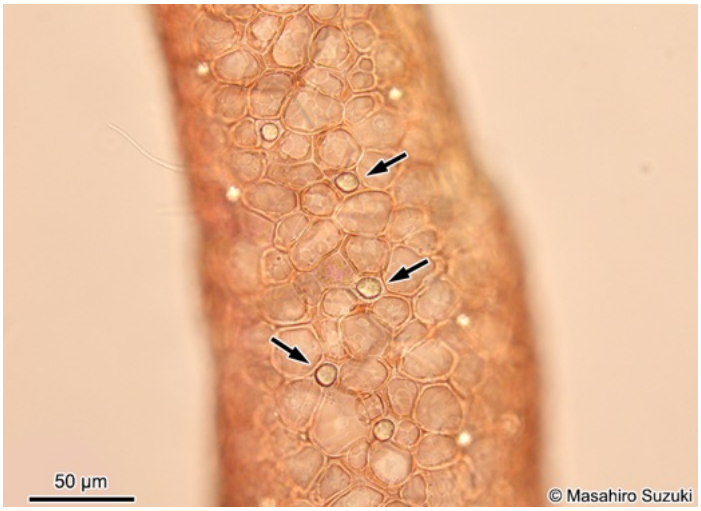

Lome (Reference: VOLTA GREENTECH)

- How seaweed feed reduces methane gas

It is believed that a substance called bromoform is responsible for suppressing methane production. Bromoform is also synthesized in seaweeds such as kombu and ulva, but not much of it remains in the bodies of these seaweeds. On the other hand, Asparagopsis has special cells called gland cells, which accumulate organic halogen compounds such as bromoform. Asparagopsis, which contains a lot of bromoform, is added to the feed, so it is thought to have a higher methane reduction effect than other seaweeds.



Mechanism of generation methane gas in a cattle’s body (Reference: 毎日新聞)



Grand cells of Asparagopsis (Referebce: 生きもの好きの語る自然誌)

- About Asparagopsis
Asparagopsis is a type of red algae. It has a brush tip shape and is about 10 to 30 cm tall. It lives in tropical and temperate regions such as the Pacific Ocean, Atlantic Ocean, Indian Ocean, and Australia, and is distributed in Japan in the central and southern Pacific coast of Honshu and Kyushu. It lives on rocks and coral reefs at depths of about 3 to 10 meters. It grows from winter to early summer. It is cartilaginous and its branches are easily chipped. The same species as the algae of the order Polypodium also have glandular cells.



Asparagopsis (Referebce: 生きもの好きの語る自然誌)

○ Consideration
Various research results show that feeding feed containing Asparagopsis suppresses methane production, so it is believed that using Uncaria japonica is effective in reducing methane gas. Hypothesis 1, "Feed with seaweed is effective in reducing methane gas from cattle," was proven correct. Based on the mechanism of methane reduction by Asparagopsis, it is believed that the synthesis of bromoform and the presence of glandular cells are conditions for suppressing methane production. Based on this, it was thought that not only Asparagopsis but also other seaweeds with glandular cells may be able to be used to suppress methane.

[hypothesis 2]
○ Consideration
I considered the environmental burden from three aspects: production, transport and use.
In terms of production, I considered marine and land-based aquaculture separately. What marine and land-based aquaculture have in common is that seaweed cultivation has a low environmental impact in terms of increasing the amount of carbon dioxide absorbed. Seaweed beds are decreasing worldwide in the ocean, so it is important to increase seaweed beds and they must be in the habitat of Asparagopsis. If they are grown outside of their habitat, they will become an invasive species. Even in the habitat of Asparagopsis, excessive expansion of the habitat will destroy the ecosystem. These lead to environmental impact. In the case of land-based aquaculture, seaweed does not grow beyond the cultivation area, so the environmental impact can be reduced. However, there is an environmental impact in terms of the energy required to operate the equipment, manage the temperature, and transport seawater.
In terms of transportation, I considered the process from cultivation to processing and delivery to the farm. Since automobiles, airplanes, and ships are used for transportation, environmental impacts due to emission of carbon dioxide and the use of fossil fuels are considered. If the processing plant is far from the farming facility, the transportation distance increases, which boosts greenhouse gas emissions. Furthermore, using plastic as packaging material during transportation places an even greater burden on the environment.
When used by farmers, it is simply mixed with regular feed. Therefore, it is thought that the environmental impact of use is small due to the suppression of methane gas emissions.
For these reasons, seaweed feed has a low environmental impact in terms of use, but is thought to impose an environmental impact in terms of production and transportation. Therefore, it cannot be said with certainty that seaweed feed does not place a burden on the environment.

<Issues and improvements arising from hypothesis verification>
The results of hypothesis 2 showed that the positive impact on the environment of using seaweed feed is limited. Improvements are necessary in the production and transportation of seaweed feed. In particular, in terms of production, the issue is that the cultivation technology for Asparagopsis has not yet been established. I need to think of a more efficient cultivation method that has less impact on the environment.

○Proposal
I propose improvements to the newly emerged issues in production and transportation.

(Production)
- Cultivation by land-based
Seaweed cultivation in the ocean places a large burden on the environment. Asparagopsis is relatively short, soft, and prone to chipping, so I thought that it would be difficult and unsuitable for marine cultivation. On the other hand, with land-based cultivation, the growth environment can be controlled rather than cultivated directly in the ocean, which reduces the

environmental impact. For this reason, I thought that land-based cultivation would be suitable for Asparagopsis cultivation. However, there is an issue that energy is required for transporting seawater and operating the equipment. I suggest using artificial seawater instead of seawater. Using artificial seawater would make it possible to cultivate inland areas where there is no sea nearby, expanding the range of farming areas. In addition, artificial seawater has more stable water quality than natural seawater. It may lead to a reduction in the amount of water used and environmental burden. I propose that part of the electricity required to operate the equipment be supplemented by self-generation. By installing solar power generation or hydroelectric power generation equipment along with the aquaculture equipment, renewable energy can be used and the environmental burden can be reduced. Since renewable energy is dependent on the weather, we will use a combination of supplied electricity and self-generated electricity. One issue is that if the discharged seawater contains seaweed spores, it may have an impact on the ecosystem. A filtration system that prevents the spores from being discharged is required. Another issue is the cost of equipment with self-generated electricity.

- Utilizing the pools of abandoned schools

We propose using the pools of abandoned schools as a way to increase the number of aquaculture sites. According to the Ministry of Education, Culture, Sports, Science and Technology, there are currently 7,398 abandoned schools with existing facilities in Japan. About 20% of these are schools whose uses have not been decided. Although the use of school buildings has progressed among abandoned schools, the use of pools is limited. In recent years, sea grapes and sturgeon have been cultivated in the pools of abandoned schools. The advantage of pools in abandoned schools is that they have water distribution and drainage facilities. In the case of seaweed cultivation, there is no leftover food or waste. The burden of building new facilities is reduced, and production can be promoted efficiently. If artificial seawater is used, it can be cultivated all over the country. However, since it is cultivated outdoors, it is likely to be difficult to cultivate in areas with a different climate from the natural habitat of the algae.

- Utilization of unused land

I propose utilizing unused land to cultivate seaweed. This involves setting up small cultivation facilities on unused farmland or vacant land and cultivating algae. Kanagawa Prefecture is promoting the "Distributed Land-Based Algae Cultivation Project in Vacant Spaces." Seaweed is cultivated by installing shells in vacant spaces that can hold small tanks equipped with water quality sensors and a mechanism for remote management using AI data analysis. Such small facilities are not affected by outside temperature or weather, so the environment can be kept constant. While it is efficient to be able to cultivate automatically without human intervention, electricity is required for communication and electronic devices. Supplementing this electricity with in-house power generation will lead to further reduction in environmental impact.

(Transportation)

- Processing into feed at the aquaculture site

In order to shorten the transportation distance, I propose to carry out cultivation and processing in the same facility. This will reduce carbon dioxide emissions during transportation and lead to a reduction in environmental impact. In addition, by utilizing the pools of abandoned schools and unused land, I aim to cultivate and process seaweed near livestock farmers and to consume seaweed feed locally. Dryers and crushers are mainly used for processing. Small crushers are also available, but dryers are relatively large machines. A dryer requires a larger area than a cultivation machine alone, and the equipment costs will also increase. Therefore, small dryers and crushers for home use will be used. Since the amount that can be produced at one time is smaller than that of general land-based aquaculture, I thought that even small machines could be used instead. If the harvesting period is staggered, the machinery can be reused, which is expected to reduce costs. One issue is that we do not know the process by which the algae is currently turned into feed, so it may not be possible to process it using existing machines such as dryers and crushers. If special technology is required, new machines dedicated to algae will need to be developed.

- Use of packaging materials other than plastic

I propose using biodegradable plastic and cardboard for packaging the feed. Biodegradable plastic is eventually decomposed into water and carbon dioxide by the action of microorganisms, so it has a low environmental impact. In addition, cardboard is almost 100% recyclable. Collected cardboard is used for new cardboard and can be reused repeatedly, making it an environmentally friendly material. By using biodegradable plastic and cardboard, the environmental impact during transportation is reduced.

○Additional Research

I visited Sea vegetable company to interview online. Sea vegetable company collect and study seaweed, which is in decline in its natural state, and restore it through land-based and sea-surface cultivation with a low environmental impact, while also developing new ways of consuming the product.

As the company is currently cultivating on land as proposed, I asked Mr. Miyagi about the cultivation method, the feasibility of his proposal, and the cost issue, and he answered my questions.

-Is it possible to cultivate in areas without the sea?

Mr. Miyagi believes that it is possible to cultivate pufferfish by using artificial seawater instead of seawater, eliminating the need for free-flowing water, and treating the water with biological filtration. However, these developments are costly. There are cases where pufferfish are actually cultivated using hot springs. Nakagawa Town in Tochigi Prefecture uses hot spring water that contains salt, and Yodoe Town in Yonago City, Tottori Prefecture cultivates pufferfish using hot spring water and spring water.

-Are your sales from producing and selling seaweed stable?

Sales are increasing. Sea vegetable company mainly sells green laver. There was originally a market for green laver, but production was low and there was a need. They produce seaweed

with an emphasis on making delicious food, making it attractive, and increasing sales. They are concentrating on food because we are not profitable in departments other than food.

-What can we do to reduce costs?
It is important to reduce production costs and increase sales. There is no special sales strategy or management method at the company. He told me to keep thinking about how to reduce costs. It is also important to increase efficiency by using new technology and high-tech equipment. Producers should be able to maintain their profits.

- Thoughts from the interview
Asparagopsis grows in warm areas. I thought that if hot spring water was used for aquaculture, it would be easier to regulate and manage the water temperature. There are many hot springs in Japan, so there may be a possibility for it to be used. Currently, seaweed farming is mainly for food, and efforts are being made to popularize it, so I thought it would be difficult to farm seaweed for use in the livestock industry right now. I think it is necessary for technology to advance further and for Asparagopshis to become more well-known in the public.

I visited Mitsubishi Heavy Industries Asia Pacific Pte. Ltd. to learn about innovation. Mitsubishi Heavy Industries Asia Pacific Pte. Ltd. in Singapore. Mitsubishi Heavy Industries Asia Pacific (MHI-AP) provides reliable and innovative cross-industry solutions that make a lasting difference to customers and communities in Asia Pacific and worldwide. MHI-AP builds on its global outlook and deep local insights to deliver integrated solutions to the region in urban development and infrastructure, energy and utilities, as well as logistics and transportation. Mr. Takahashi, who is Senior Vice President of Business Development and New Business at MHI-AP, explained about the company and taught what is needed for innovation.
Mitsubishi Heavy Industries, Ltd. (MHI) has strengthened its commitment to realizing a Carbon Neutral society by setting two ambitious new targets called MISSION NET ZERO. First, MHI Group is aiming to remove all carbon dioxide emissions from its own operations by 2040. MHI Group will work on decarbonizing its factories by implementing the technologies it has developed in its own facilities and further advancing energy conservation.MHI is adopting a new goal to achieve Net Zero emissions through its entire value chain by 2040. These targets include the reduction in emissions attributed to our customers' use of our products and services, and the reduction contribution from MHI's Carbon dioxide Capture, Utilization and Storage (CCUS) business.
Mr.Takahashi said that you should take a risk of failing when you do and challenge something new. If you make a stable and unchanging choice, there will not be innovative action. It's better to take a small chance of success than to keep doing the same thing over and over again.
Through this visit, I learned that in order to create innovation, it is important to challenge yourself to do something new that no one else has done. To do that, I thought it was necessary to believe in what I have done and my abilities. Since many people from various fields are involved in one project, I thought it was also important to value human connections.

3 Conculusion

Seaweed feed using Asparagopsis is effective in reducing methane gas. On the other hand, the manufacturing process and transportation of the feed place a burden on the environment, and improvements are considered necessary. In answer to the research question "Will improving feed with seaweed lead to methane gas reduction and environmental conservation?", I found that it does lead to methane gas reduction, but does not lead to environmental conservation in terms of production and transportation. As a way to solve this problem, I propose cultivation by land-based aquaculture, utilization of pools and unused land of abandoned schools, feed processing at aquaculture sites, and using packaging materials other than plastic. Through these improvement measures, I aim to reduce the environmental burden of using Asparagopsis as feed and to produce feed more sustainably. Future issues remain, mainly the cost. Further consideration is needed to balance environmental conservation and business.

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Eliminate Child Deaths caused by Vaccine-Preventable Diseases

A New Proposal for Medical Care in Africa

5411 Kubo Momoko

1. Abstract

One child dies from vaccine-preventable diseases (VPD) every 20 seconds in the world. Therefore, in order to eliminate the number of children dying from PVD in Africa, I researched ways to increase the vaccination rate. First, I propose to introduce a micro-needle patch (MNPs) that can be placed on the arm to administer vaccines, and to attach it to the mother-child handbook(MCH handbook). The micro-needle patch has many advantages: it can be self-administered, does not require temperature control, and is small and thin. At the same time, I also aim to have a vaccine calendar application installed to promote the spread of vaccines and correct knowledge.I suggest that the management of vaccination status on the part of medical institutions be digitized, and that a biometric authentication system be included in the system. This will enable smooth monitoring and planning of vaccination status and calls for vaccination. I believe that these measures will make vaccines more accessible and easier to administer, and it will increase the vaccination rate among children.

2. Introduction

According to data from a recognized NPO, 4,000 children a day, or one child every 20 seconds of time, die from vaccine-preventable diseases in the world. Learning this fact, this study aims to eliminate the number of children dying from diseases that could have been prevented. According to the Japan Committee for UNICEF, 57% of all under-five deaths are among children in sub-Saharan Africa. Therefore, this study focuses on children in Africa and to begin research on increasing the vaccination rate among children.

3. Purpose and meaning of this research

With the goal of reducing to zero the number of children who die from vaccine-preventable diseases, I set the research question “What should be done to reduce deaths from VPD among children under 5 years old in Africa to zero by 2035? “. This is also related to SDG 3-2, “All countries aim to reduce newborn mortality to at least 12 per 1,000 live births and under-5 mortality to at least 25 per 1,000 live births, and eradicate preventable deaths of newborns and under-5s by 2030.”

4. Research Methods

I collected information using the Internet.

5. Discussion and Implication

One child dies from a vaccine-preventable disease every 20 seconds worldwide. Young children in particular have undeveloped immunity to infectious diseases, and it is important to provide them with sufficient immunity in advance with vaccines.

However, according to the Japan Committee for UNICEF, the vaccination rate among African children is very low, and 57% of all under-five deaths are among children in sub-Saharan Africa. I believe that the reasons for this are the lack of doctors and difficulty in accessing hospitals.

The number of doctors in Japan is 2.5 per 1,000 people, compared to 0.2 in Africa. Compared to Europe's average of 1 doctor per 293 people, Africa has an average of only 1 doctor per 3,324 people, indicating a serious shortage of doctors. In addition, 287 million people in sub-Saharan Africa live in places where transport time is more than two hours from the nearest hospital. Two-thirds of sub-Saharan countries are not meeting the global goal of 80% of people living within two hours of a hospital. Data also show that more than 50% of hospitals are concentrated in large cities, even though 62% of the population lives in the countryside.

Considering these current conditions, microneedle patches (MNPs) should be introduced to increase vaccine coverage in sub-Saharan Africa.

MNPs are patches lined with microscopic short needles, that are applied to the arm to administer the vaccine, and according to The Lancet, data from a randomized clinical trial involving 285 participants, including 240 infants and young children in the Gambia, showed that measles and rubella vaccine.Those vaccinated with the microneedle patch had an immune response equal to that of those vaccinated by subcutaneous injection. MNPs have the same efficacy as conventional vaccines and are less painful and can be self-administered. In other words, the vaccine can be managed without going to a hospital or relying on a doctor.

I also believe that the reasons for the low vaccination rates in sub-Saharan Africa are the lack of information among individuals and the lack of understanding of the vaccination status at hospitals. Therefore, I propose to attach the MNPs to the Maternal and Child Health Handbook (MCH handbook) and distribute it to each household. If the MCH handbook and MNPs are distributed at the same time, correct knowledge will be spread. And since the MNP can be self-administered, it can be received at home, which is expected to increase the vaccination rate.The MNPs are small and thin, so they can be inserted into the MCH handbook. And while conventional vaccines require a cold chain to maintain a constant temperature, MNPs do not, and can be safely administered at home. It is also considered safe from the perspective of disposal, as it produces almost no infectious waste.In addition, according to the chart below, 18 African countries have experience with the use of the MCH handbook. MCH handbooks can provide and record information according to the needs of each country, the state of the health system, and the social and cultural background of the country. Several African countries have already distributed them adapted to their countries. For example, in Senegal, the handbook includes a section on health checkups, advice, and alerts not only during infancy but also through school age and adolescence in order to prevent young pregnancies. In Ghana, in order to also provide care for improved nutrition, a column for recording nutritional guidance and nutritional counseling is included. Distributing a MCH handbook that fits the characteristics of the country will help spread more necessary and correct knowledge and maintain the health of the people.

Moreover, the Internet and smartphones are becoming increasingly popular in sub-Saharan Africa. Therefore, I suggest the introduction of a vaccine schedule application in areas where they are widely used. The calendar shows which vaccines should be administered and when,

and allows individuals to visually manage their vaccination status. If notifications are sent out when recommended vaccination dates approach, it is thought that forgetting to administer vaccinations will be reduced. In addition, it would be easy to use the system if only the date of birth and age were entered. If columns on the importance of vaccines, health information related to children's growth, and child-rearing information could also be distributed, correct knowledge could be spread.

In addition, in advancing the monitoring of vaccination status in hospitals, I propose that a biometric authentication system should be introduced.This system was being tested in Kenya in 2023 by the Central Medical Research Institute of Kenya and the Institute of Tropical Medicine, Nagasaki University. This system uses the fingerprints of newborns and the voice of their parents or guardians to identify them, and can check their vaccination records and plans. In other words, it digitizes the management of vaccination status. As a result of previous research, it was found that while fingerprint identification sometimes involved difficulties, voice identification can be done in as little time as saying the name of the person and the child, minimizing the burden even immediately after the birth of the child. Medical institutions can also introduce voice authentication with little change to their conventional medical procedures. They can also register vaccination records and management of vaccination plans. This system would allow them to manage the vaccination status more properly than manual procedures, encourage vaccination at the appropriate time, and increase the vaccination rate. Moreover, since smartphones are becoming increasingly popular, it would be possible for medical institutions to distribute columns of vaccination notices and information on preventive medicine and health to personal smartphones and other devices.

Another thing high school students like me can do is to donate money to help deliver more vaccines. We should also volunteer to promote vaccination by communicating the importance of vaccination in English and other languages to communities that lack understanding of the importance and necessity of vaccination.

During the visit to the susGain company in Singapore, we learned about the innovation of combining existing things into a new way. I applied this perspective to our proposal to combine and distribute the Maternal and Child Health Handbook (MCH Handbook) and MNPs.

Figure



6. Conclusion

I believe it is necessary to attach the MNPs to the Maternal and Child Health Handbook and distribute it. In addition, to introduce the vaccine schedule application to a large number of people. I also propose that medical institutions digitalize the management of vaccination status and introduce a biometric authentication system. Making vaccines more accessible and easier to administer can be expected to increase the vaccination rate among children.

There are still many unclear aspects about the vaccine patch, such as how well it can be adapted to vaccines for children under 5 years old and whether it is effective. Therefore, further research is needed. I also believe that the dangers of vaccination outside the control and instructions of medical institutions need to be considered.

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Microneedle Vaccine Patches Generated Immune Response in Children（JAMA）
https://jamanetwork.com/journals/jama/article-abstract/2819374

世界の母子手帳 （Jica）
https://www.jica.go.jp/activities/issues/health/mch_handbook/world.html
https://www.jica.go.jp/activities/issues/health/mch_handbook/effect.html

生体認証を活用した新生児のワクチン接種管理システムの有用性を世界で初めてケニアの病院で実証（NEC）
https://jpn.nec.com/press/202302/20230207_01.html

1日4,000人の子どもたちがワクチンを接種できずに亡くなる世界の現実
（認定NPO法人 世界の子どもにワクチンを 日本委員会）
https://prtimes.jp/main/html/rd/p/000000010.000007754.html

子どもの予防接種率低下
2,300万人がワクチン接種できず 2019年から370万人増加（ユニセフ）
https://www.unicef.or.jp/news/2021/0142.html

アフリカの医療改革からみるアフターコロナの世界（NTT DATA）
https://www.nttdata.com/jp/ja/trends/data-insight/2020/0630/

Are Earth languages necessary?

～Can the Tower of Babel be restored～

- Earth language, Tower of Babel, limitless language -

5412 Kurabayashi Toraki

1. Research Summary

The background of this research is based on the Tower of Babel from the Old Testament. It discusses how language barriers cause conflict and proposes research aimed at overcoming these barriers. The purpose of the research is to explore the question, "Can the Tower of Babel be rebuilt?" It highlights the importance of protecting linguistic diversity and endangered languages. The methods involve investigating endangered and nearly extinct languages, collecting regional statistics, analyzing the pros and cons of unifying languages, and studying the spread of Esperanto. The results discuss examples of endangered languages, the effects of language unification, reasons why Esperanto hasn't spread widely, and possible ways to promote it.

2. Background of the Study

In the Old Testament’s Genesis 11, people tried to build a tower high enough to reach heaven. This is the "Tower of Babel." They wanted to become like God and prevent being scattered across the Earth. However, God disrupted their plan by confusing their language, making them unable to understand each other. As a result, they scattered across the world. Inspired by this story, I thought that removing the language barrier might reduce conflict.

3. Purpose and Significance

The research question, "Can the Tower of Babel be rebuilt?" explores whether unifying languages can create a conflictfree world. According to UNESCO, there are 8,324 languages, of which 1,191 are no longer spoken. Only about 17.2% of spoken languages are safe from extinction. I see language loss as the loss of cultural identity. This research aims to protect endangered languages while considering whether unifying languages is possible. Unlike the Tower of Babel’s focus on a single language, modern efforts might instead focus on mutual understanding between different cultures.

4. Research Methods

1. Investigate endangered and nearly extinct languages.
2. Identify regions with many endangered languages.
3. Consider the benefits of having one language.
4. Consider the disadvantages of having one language.
5. Decide whether to unify languages or maintain diversity.
6. Develop specific methods based on the decision in Step 5.

5. Results and Discussion

(1) Endangered and Nearly Extinct Languages:
Examples of endangered languages include "Yaghan" (Chile) and "Bo" (India).

(2) Regions with Many Endangered Languages:
Many endangered languages are found in Africa and the Middle East, where dominant languages are replacing minority languages.

(3) Benefits of One Language:
International communication in business, research, and politics would improve.
Sharing ideas and technology globally would become easier.

(4) Disadvantages of One Language:
Cultural diversity could be lost.
Speakers of minority languages might lose their identity.

(5) Decision: Unify or Maintain Language Diversity:
Esperanto, a language created by Ludwik Zamenhof in 1887, could serve as a second language for all. It is neutral and belongs to no one, making it a potential global common language.

(6) Promoting Esperanto:
Current Status: About 2 million people use Esperanto as a second language, but no country recognizes it as an official language.
Challenges: Lack of cultural context and aging speaker population.
Advantages: Easy to learn, fair for all, and ideal for translation.

Ways to Spread Esperanto:
1. Use Esperanto for international official documents.
2. Introduce Esperanto as an additional official language in developing countries.
3. Encourage older speakers to teach Esperanto, addressing employment issues.
4. Promote Esperanto culture by publishing fairy tales and other works.

6. Conclusion and Future Challenges

This research examines the relationship between language and culture, suggesting that language unification could reduce conflict while preserving diversity. By promoting Esperanto, it proposes a way to achieve mutual understanding across cultures. Future studies should explore other alternatives and challenges for a more comprehensive solution.

Digital Footprint and Environmental Impact

~How Can We Use Digital Devices Efficiently and Minimize Their Impact on the Environment?~

- *Environment Digital Devices E-Waste* -

5413 Kurosaki Haruto

1. Abstract

The amount of e-waste disposal is increasing every year. According to some data, the amount of waste in 2019 is estimated to be 53.6 million tons. 2021 Tokyo Olympic Games will be held under the “Mina-no Medal Project” which will be made from urban mines, and people's interest in e-waste is increasing. E-waste has caused many problems such as environmental pollution. In fact, the iPhone 15, which will be released in 2023, is also designed to reduce the amount of e-waste. This study will take an in-depth look at the “production” and “disposal” of e-waste.

2. Introduction

In recent years, digital devices have become widespread, and the amount of digital device waste has increased accordingly. They are called “e-waste". Digital devices are not easily recyclable, and incineration or landfilling them emits greenhouse gasses and toxic gasses, leading to global warming and pollution problems. Knowing this fact, we decided to think about how we can reduce the disposal of digital devices. We thought that we could reduce the amount of digital equipment waste by using digital equipment more efficiently. Through this research, I would like to think deeply about “efficiency".

3. Purpose and Significance of The Study

The ultimate goal of this study is to consider how to reduce electronic waste. However, because digital devices are a necessary part of our lives and their use is increasing, it is difficult to reduce e-waste immediately. Therefore, as mentioned in the background, we believe the solution to reducing e-waste is to use digital devices more efficiently. Our first goal is to find a method for using digital devices efficiently.

4. Research Methods

First, I will collect information using the internet and other sources. The topics I will investigate include the current situation of digital device disposal, where and how much

digital equipment is being thrown away, the environmental effects of this disposal, and the rules behind it.

Then, I will organize information about the areas and methods currently used to reduce digital waste, like recycling. I will study how to improve these efforts and suggest ideas for improvement. Finally, I will propose my ideas for preventing waste to everyone.

5. Research Results and Discussion

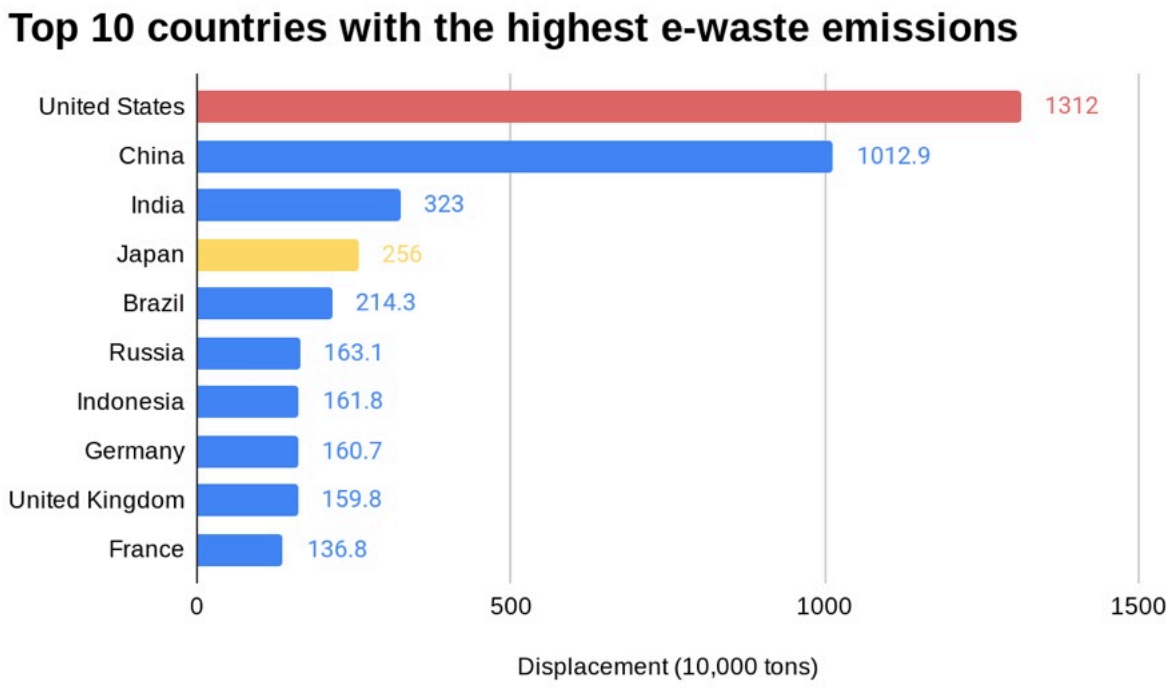
I. What is Electronic Waste?

Electronic waste (also called “E-Waste” or “WEEE”, which stands for Waste Electrical and Electronic Equipment) refers to electronic products with batteries or circuits that are thrown away. Items like smartphones, computers, refrigerators, and televisions are part of e-waste.

II. Current Status of Digital Equipment Disposal

According to the Global Transboundary E-waste Flows Monitor 2022, published by the United Nations Institute for Training and Research (UNITAR), 53.6 million tons of e-waste were disposed of worldwide annually as of 2019. This means that each person discards about 7.3 kg of e-waste per year. If this trend continues, the amount of waste is expected to rise to 74 million tons by 2030 and 110 million tons by 2050.

Which countries and regions are discarding the most digital devices? The following graph, created based on data from The Global E-Waste Statistics Partnership, shows that the U.S. and China produce the largest amounts of e-waste. Japan ranks fourth in the world for e-waste emissions.



<Based on “THE GLOBAL E-WASTE MONITOR 2024”>

III. Why Digital Equipment Should Not Be Disposed of

(1) Toxic substances generated from electronic waste

If e-waste is not disposed of properly, toxic gases such as carbon dioxide, mercury, lead, chlorofluorocarbons, and cadmium are released. These substances can cause pollution and contribute to global warming. How does it effect on our health?

(2) Export to developing countries

Appliances that are difficult to dispose of properly are often exported to developing countries. The Agbogbloshie district in Ghana is considered the largest e-waste dumping ground in the world. There, people make a living by burning e-waste collected from all over the world. In addition, child labor is sometimes used to reduce labor costs, which has become a major problem.

IV. Causes of E-Waste

(i) Diffusion of Digital Devices Due to Information Technology

In recent years, we have been living in the information society, and electronic devices have become part of our daily lives. For example, the spread of smartphones is almost at 100%. Data shows that in 2001, the amount of discarded digital devices discarded was 2,015

tons. However, as mentioned in Section II, the amount of e-waste in 2019 was 53.6 million tons. This is a 26,600-fold increase in about 20 years.

(ii) Decrease in Product Life Expectancy Due to Technological Improvements

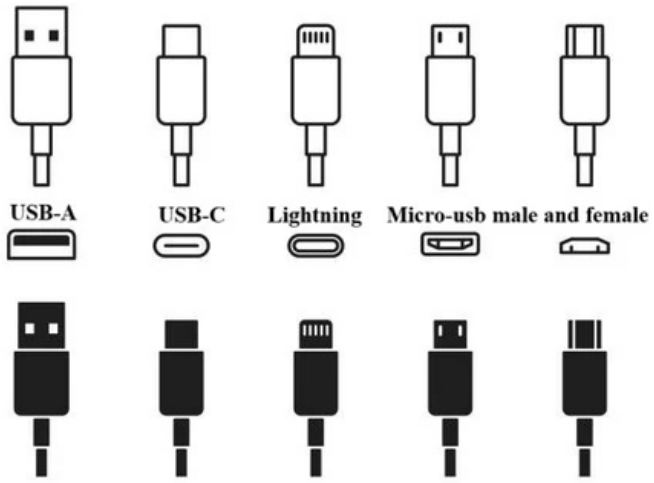
As technology advances in home appliances like air conditioners and washing machines, their mechanisms become more complex, leading to shorter product lifespans. As a result, these products need to be replaced more often.

V. Efforts to Reduce Digital Device Disposal

Many initiatives are underway to reduce e-waste. For example, in Europe, the European Parliament passed a bill in 2022 that makes USB-C compatibility mandatory for mobile devices. The goal is to standardize chargers and reduce battery waste.

In September 2023, Apple launched the iPhone 15, which switched from the Lightning connector to USB-C, a major change after many years of using Lightning.

As shown in the images below, different standards require different chargers for each device. By unifying the standard, one charger can be used for all devices. This law will apply to products sold in Europe by the end of 2024 after a grace period.



Top 6 Different Phone Charger Types (All You Need to Know) [Online image]. (2024). Anker

VI. Proposals to Reduce E-Waste

◎ Smartphone Repair & Sales Service

To reduce e-waste, I propose a “Smartphone Repair & Sales Service.” The service’s goal is to repair broken smartphones and PCs, then sell them to third parties, as shown in the image below. By selling broken devices to repairers or those with repair skills at a low price, we can prevent them from being discarded as waste and instead add value. The repairer can then sell the repaired devices to others and earn a profit. The price is lower than the usual used equipment market, making it affordable for buyers.

What makes this service different from traditional repair services is that the equipment doesn’t always need to be repaired. The broken devices can be purchased at a low price, and their parts (like phone or computer components) can be collected and reused.

◎ Renewable Energy Made from E-Waste

Next, we propose an idea to convert e-waste into renewable energy. The idea is to recycle e-waste into wind turbines and solar panels. One past example of recycling metals from e-waste is the “Everybody’s Medal Project.” In this project, metals from urban mines were used to make medals for the Tokyo Olympics. Electronic devices like smartphones contain not only iron but also gold, silver, and copper. These metals can be used to make wind turbines from iron and solar panel conductors and cells from copper. This approach helps reduce e-waste while creating renewable energy.

6. Conclusion and Future Challenges

The amount of digital device waste is increasing every year, and we need to respond accordingly. We need to take two approaches: one is “no waste” and the other is “proper disposal of waste. The “no waste” approach is to avoid creating multiple standards, as in Europe, and the “proper disposal of waste” approach is to increase the recycling rate.

It is also important to use electronic devices for longer periods of time, and we need to rethink how we use our electronic devices. Replacing them after a short period of time and purchasing more electronic equipment than necessary will cause the creation of waste.

For future issues, I would like to propose more efficient measures, taking into consideration what should be done to increase the recycling rate of electronic devices.

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How Can We Eliminate Food Waste Using Methane Fermentation Biogas Power Generation?

5414 Koike Maya

1. Abstract

We produce a lot of food waste. When they are burned, they promote global warming, and when left unattended, they can cause serious infections especially in developing countries.Therefore, according to Zero Waste, I want to establish a system to reduce food waste to zero. At first, I thought composting and feed conversion would be better, but then I found a method called methane fermentation biogas power generation, in which food waste can be used to generate electricity. However,the use of this method is not yet widespread. I suggest popularizing the small generators processed by each area, and eventually popularize as household generators and processed by each household.

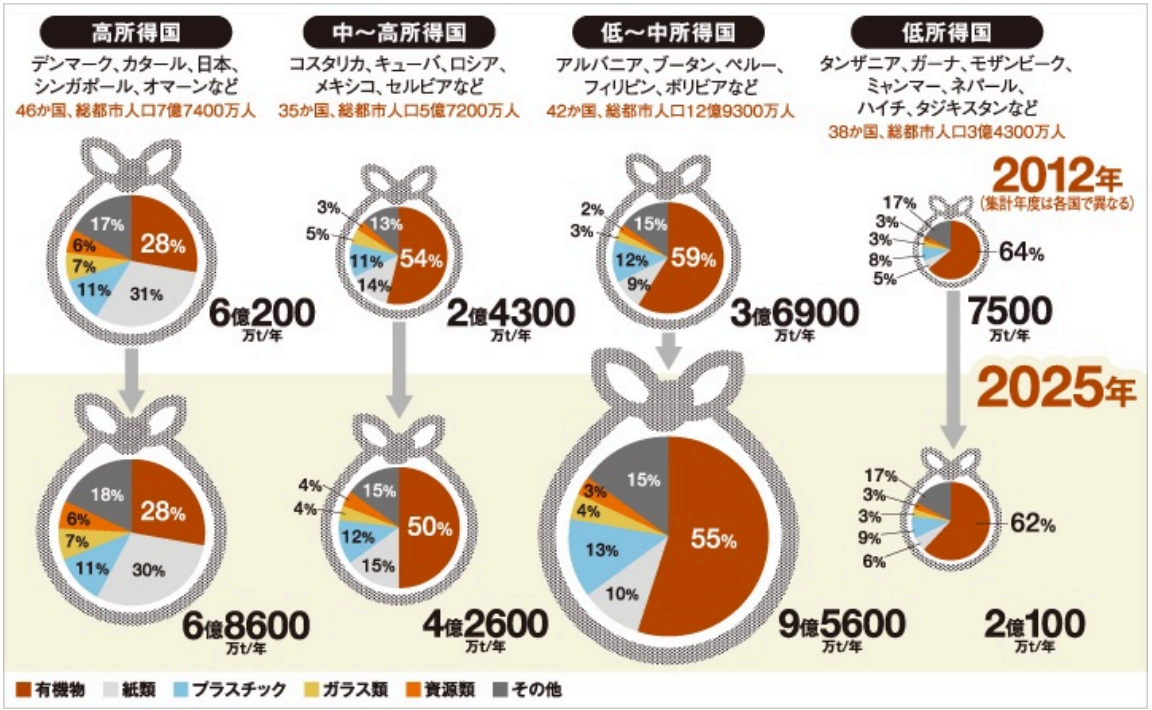
2.Introduction

In particular, food waste occupies much of the ratio of all garbage(Figure1). This is directly related to solving food problems caused by population growth.Abandoned raw garbage in developing countries emit a foul odor and even cause severe infection.So, I think it is a priority to reduce raw garbage.

3.Prior Research

I looked into garbage issues on the internet, and I found some examples that countries could achieve the goal.

Figure1: Global Garbage Emissions Percentage of Food Waste



Based on What a Waste 2012

What is Zero Waste?

Zero-waste means eliminating all of the burning or landfill waste.

To achieve this, it is considered important to create a system that does not generate waste, starting at the manufacturing stage.

Effort in Kamimatu town

Kamikatsu Town was the first town in Japan to declare a zero-waste policy. In the city, each town resident is responsible for separating garbage. The recycling rate exceeds 80%. Townspeople themselves separate garbage into 13 types 45 species

Table1: The List of Kamikatsu Town Separated Items

raw garbage	Without bringing it to the garbage station, Compost or use an electric garbage disposer to make compost at home.
metals	1. Aluminum cans 2.Steel cans 3.Metal caps 4.Miscellaneous metals
paper	1.newspapers and flyers 2.cardboard 3.magazine,miscellaneous paper 4.paper cartons(white) 5.paper caps (white) 6.paper cartons(silver) 7.hard paper core 8.shredder scraps 9.other paper
cloth	1.clothes,curtains,blankets 2.other cloths
biomass	1.Disposable chopsticks and wooden bamboo products 2.Waste cooking oil
plastic	1.Plastic Containers and Packaging 2.Other Plastics 3.White trays 4.Styrofoam other than trays 5.Plastic bottles 6.Plastic caps
glass bottle	1.Clear Bottle 2.Brown Bottle 3.Other color bottle 4.1 square bottle. Beer Bottle
dangerous items	1.Ceramics and Glass 2.Mirrors, mercury thermometers 3.Light bulbs and fluorescent lamps 4.Dry cell batteries

	5.Waste batteries 6.Lighters
bulky garbage	1.Metal 2.Wooden 3.Futons, carpets, tatami mats 4.Vinyl chloride products, rubber products, etc.
items must be burned	1.Diapers and sanitary products
items must be buried	
items cost a lot of money (processing cost personal expense)	1.Waste tires 2.Specific home appliances

Effort in San Francisco

San Francisco has also declared a zero-waste.

In San Francisco, household garbage is separated by three color-coded garbage cans.

Blue box = Recyclable resources such as bottles, cans, plastics, paper, etc.

Green box = Food waste

Black boxes = Landfill waste.

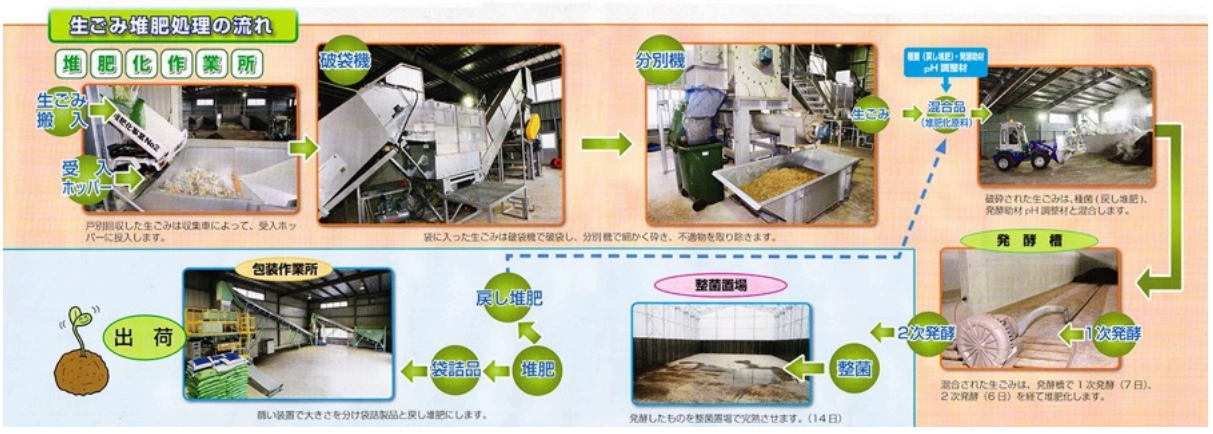
Surprisingly, all food waste is turned into compost.

4.Discussion and implications

・Composting Method

Require separation of food waste from landfill waste→The local government collects them and composts them in a composting facility.

Figure2: Flow of food waste composting process



However, I have found that there are various issues in collecting and composting all food waste.

Demand is not stable and there is a risk of exceeding fertilizer.Therefore, the quality of the product must not be declined even if it is stored for a long time.Need to offer a lower price to

farmers.The cost of constructing and operating a composting facility

・Feeding method

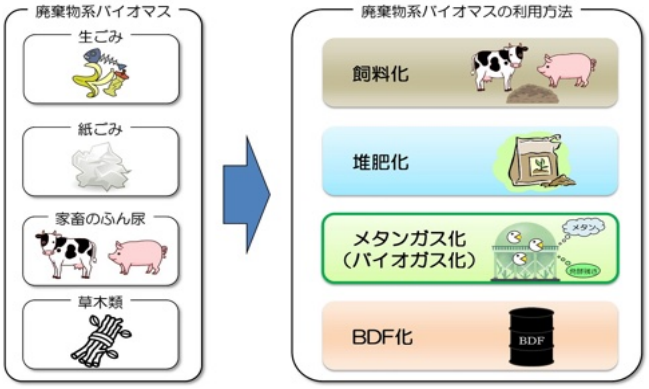
Using food waste as animal feed

Leftovers from food manufacturing factories(bread crumbs, pastry scraps, noodle scraps,vegetable scraps, fruit scraps, etc.)

・Biomass Power Generation Methods

Biomass conversion is to generate electricity to ferment methane by using microbes.

Figure3

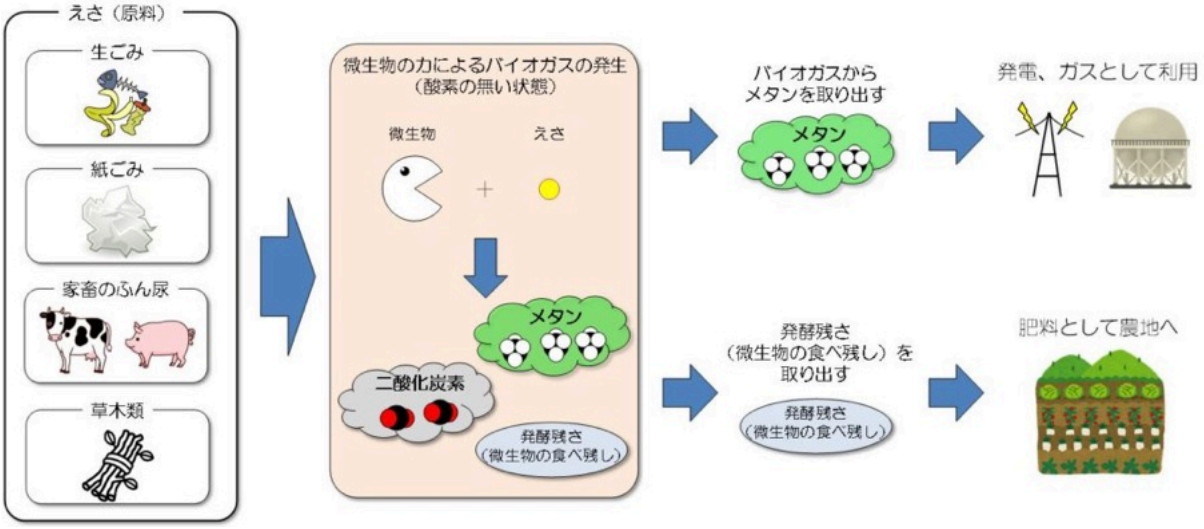


Demand for electricity, heat, and city gas is stable in urban areas, and sustainable recycling and high recycling rates can be expected without demand concerns in the future.

What is Methane Fermentation and Biogas Power Generation?

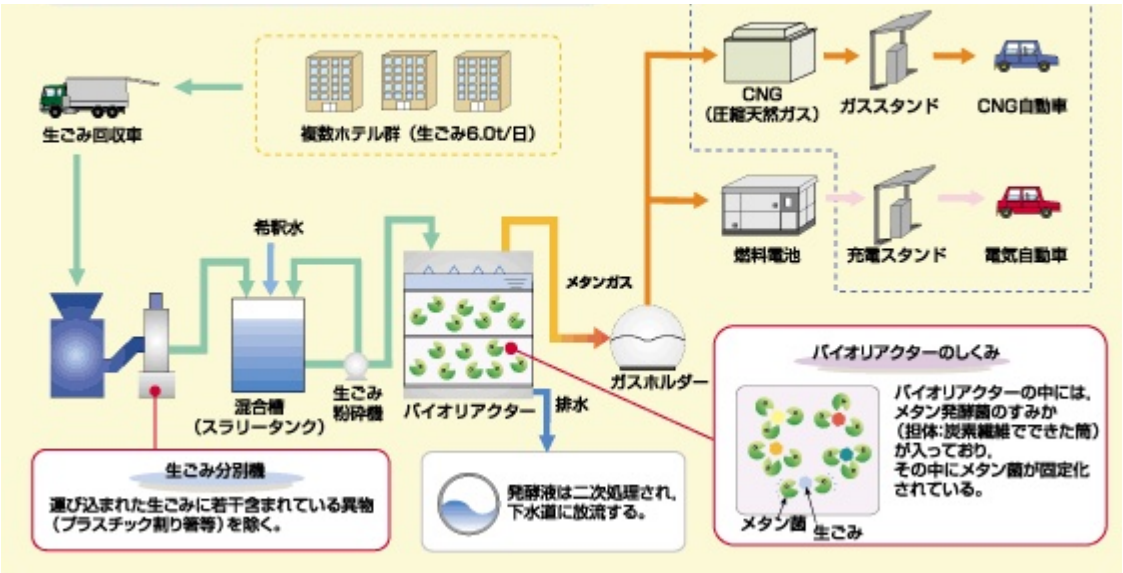
Methane fermentation and biogas power generation refers to power generation using methane gas, which is generated when microorganisms decompose organic material such as food waste, paper waste, and livestock manure, as fuel.

Figure4: How Methane Fermentation and Biogas Power Generation Works



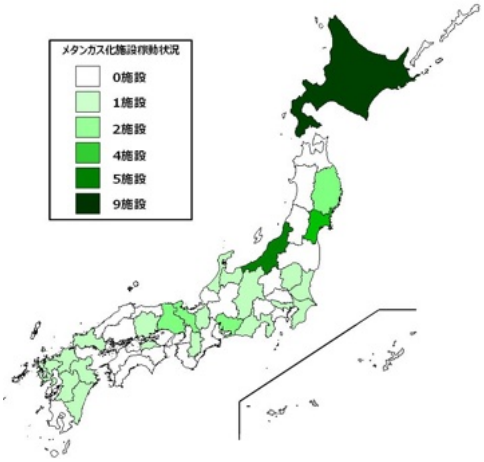
Biogas broadly refers to the gas produced when biological excreta, organic fertilizers, biodegradable materials, and energy crops are fermented, and the process of generating biogas through the action of microorganisms is called “methane fermentation”.

Figure:5 How Methane Fermentation and Biogas Power Generation Facilities Works



Remove vinyl, plastic, and fish bones from food waste (garbage) delivered to the power plant. It is then placed in a processing and conditioning tank, and water is added to make a paste. When it is fermented in a fermenter, it is separated into methane gas and water. The methane gas extracted from the fermenter goes through a pre-treatment system and is used to generate electricity, or is used to generate electricity or hot water from a gas engine.

Figure6: The Situation of Methane gasification facility in operation



For example, the world’s first biogas fuel cell power generation facility from food waste has started operation in Kobe City.

The facility uses a methane fermentation system for food waste called “Metacress”. METACRESS has already proven itself in several large commercial facilities, and was the first in the world to demonstrate gasification fuel cell power generation.

Approximately 2,400 kWh of electricity can be obtained from 6 tons of food waste. This is equivalent to the daily electricity consumption of 240 households.

Problems

⑴Initial Investment and Maintenance Costs

Large power plants require special equipment such as bioreactors and refining facilities, and the initial investment costs as well as the construction and maintenance of the facilities are high.initial investment costs as well as the construction and maintenance of the facilities are highConstruction of incineration facilities for disposal of fermentation residues and other costs are also high.

(2)Raw Material Collection Methods

The collection and transportation of organic waste requires a large amount of labor and cost. In addition, the characteristics of organic waste, which requires freshness, need prompt transportation. However, it is difficult to set up specific routes and secure ways of transportation, and collection efficiency has not been improved, especially in some areas.

(3)Disposal of Fermentation Left

If the leaves after fermentation (digested liquid and residual solids) cannot be utilized as fertilizer, it is necessary to dispose of it. Especially in urban areas, where there is little demand for fertilizer, it is necessary to consider how to dispose of fermentation left. There are methods to discharge digested liquid into sewage, but in many cases, residual solids are burned.

(4)Lack of Information

Manuals on how to select facilities and equipment for biogas production and utilization are not well developed. In particular, there is a lack of information for the private sector for small and medium scale. Therefore, the public and private sectors should work together to provide information on good biogas facilities and manufacturers, as well as publicize the delivery and operation status of biogas utilization equipment.



What is a household garbage disposal machine?

Dries food waste and makes it easy to dispose of
←Picture1: *Paripari kyu*　about 5,000 yen
1 kilogram (2.6 liters) at a time, processing time: about.5 hours

About 30 yen per drying, about 1000 yen per month if used daily
Deodorizing filter replacement in 4 to 9 months (about 3000 yen per filter)



What is composting (household use)?
Making compost
←Picture2: LFC compost approx. 4,000 yen
Only 400 grams can be put in per day
Soil cost per month: approx. 2000 yen
2 months input → 1 month maturation

May be smelly. For LFC, I think two backs are required.

5. Conclusion

From last year's research, I aimed to reduce food waste to zero through composting, but found it difficult to achieve due to the demand for fertilizer and the smell. Instead, we believe that the use of biogas power generation through methane fermentation would be effective.

6. Suggestion

There are many issues such as equipment cost and transportation for large facilities. However, it had better promote installing the small biogas plants in food factories, schools, roadside stations, such as.

Individuals take their household garbage to a nearby plant, so they do not have to consider transportation routes.



Picture3: Ohara Ironworks Co. BG-30A

In the future, we would like to popularize generators that can be changed for about 5,000 yen, similar to the household garbage disposals currently on the market, so that each household can generate its own electricity. I would like to ensure that grants are available.



Picture4: Bio-Resys

Bio-Resy is officially launched on December 1, 2018, a small-scale biogas generator from German-based Bio-Ways UG (it can fold into the size of a suitcase and weighs 23 kilograms)
up to seven liters of food scraps and you're on your way.
Cost: About 67000 yen

People living in areas without fuel infrastructure spend several hours a day collecting firewood and this takes away from children to go to school. Bio-Resy not only reduces food loss, but also solves the problem.

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Spreading the clean energy to the world

~Introducing the power generation in water pipes~

5415 Koike Ryudai

Abstract

I believe that it is necessary to increase the ratio of renewable energy to the amount of electricity generated, which has been increasing in recent years, and I wanted to research the widespread use of the " LucidPipe™ " system for generating electricity in water pipes, which I found in last year's research. **My research question** is "How can we adapt water pipe power generation to the characteristics of different regions of the world? My research will take the form of a more detailed investigation of the aforementioned " LucidPipe™ " system, and the features obtained will be used as a basis for considering how to introduce the system, other research will be conducted as necessary. **As a result of my research**, I found that " LucidPipe™ " has a cost problem. In order to reduce costs, I focused on aging water pipes, and I propose the use of water pipes with power generation systems in their replacement using software developed by a company called "FRACTA," which uses AI to predict water pipe ruptures. **Looking ahead**, I would like to investigate the actual cost, sanitation issues, other power generation systems, and the status of water supply in the world, as questions remain. I would like to look into the hygiene issue and the cost as a priority.

Introduction

In recent years, global electricity consumption has been increasing. The amount of electricity generated has increased accordingly. Fossil fuels account for the largest share of this increase. According to the report "CO2 Emissions in 2022," published by the International Energy Agency (IEA), which analyzes energy-related greenhouse gas emissions in 2022, the increase in global energy-related CO2 emissions in 2022 was limited to 321Mt (0.9%), but the amount of CO2 emissions reached a record high. emissions are said to have reached a record high level. This is believed to be due to an increase in power generation from fossil fuels. However, as mentioned above, the increase was limited to 0.9%, which was not as large as initially feared. This is believed to be due to the promotion of the introduction of renewable energy generation. In fact, its installed capacity is actually on the rise. **Therefore**, in order to reduce energy-related greenhouse gas emissions, it is necessary to increase the proportion of renewable energy in the growing amount of power generation.

In addition, since I have studied power generation for two years, the year before last on power generation in Gunma Prefecture and last year on power generation in Japan, I wanted to conduct research again this year on the topic of power generation. In last year's research, I focused on the flow of water in water pipes as a possible source of small-scale hydroelectric power generation, and after researching on the Internet, I found " LucidPipe™," a facility that

actually generates electricity in water pipes. However, it does not seem to be widely used in the world yet, so I wanted to conduct research on how it could be used.

The research question for this study was “How can we adapt water pipe power generation to the characteristics of different regions of the world?” I thought that by making some innovations and promoting the introduction of water pipe power generation, we could help promote the introduction of power generation using renewable energy sources.

The aforementioned water pipe power generation “ LucidPipe™ ” uses excess pressure in water pipes to generate electricity (New Energy Foundation, 2019). When I was in the 3rd grade, when I visited The Tokyo Electric Company as part of my research institute visit, the company advised me to consider this point, as there are places where there is surplus pressure and places where there is not. Therefore, it is necessary to consider the situation of water supply in the world in this regard. They also said that I need to consider how to make it profitable. I will consider how to introduce such a system after studying these issues.

In order to promote the introduction of water pipe power generation, the following studies will be conducted.

Investigation 1: To further investigate “ LucidPipe™ ” in detail and link its features obtained to the consideration of innovations for its introduction.

Other investigations will be conducted as necessary.

Discussion & Implications

To begin with, let me explain what “ LucidPipe™ ” is, citing my research paper from last year. LucidPipe™ is a power generation system that utilizes excess pressure in water pipes. It was developed in the U.S. and can be installed in place of conventional pipes. The system generates electricity by utilizing the downward slope of the pipe.

The features of “ LucidPipe™ ” include: its simple in-line structure, which means that the pipes are aligned in a straight line; the fact that it uses the downward slope, which eliminates the cost of pumps for pumping out water; the short installation period; the fact that the water can flow even when the unit is stopped; and the fact that there is no need to create a bypass valve, which allows the water to bypass the unit. The system can also be used even when the unit is not in operation, eliminating the need to create a bypass valve.

It was also **stated** that the “ LucidPipe™ ” is suitable for water pipes 600 to 1500 mm wide, making it ideal for large-scale applications such as urban water mains, sewers, and agricultural areas. **Therefore**, the target countries are considered to be limited to those with somewhat developed cities.

Further research into “ LucidPipe™ ” led to an article describing the costs. Comparing this power system with conventional renewable energy sources such as wind and solar power, it

costs three to four times as much to produce the same amount of energy. It also stated that the construction and installation of the 60-ft-long pipe and the turbine inside would cost nearly $2 million, far more than a conventional water pipe. Cost proved to be an issue with this power generation system.

When thinking about how to reduce the cost **as much as possible**, I **came up with** the idea that we should replace the old water pipes with pipes that have the power generation system installed instead of ordinary water pipes. This would be relatively less expensive than replacing water pipes that could still be used. In recent years, aging water pipes have become a problem, and the number of water pipe bursts and leaks in Japan is 20,000 per year, and 240,000 per year in the United States. However, I thought that it would be difficult to introduce such a system because it is impossible for us to know when and where a water pipe rupture will occur. I looked into this and found a company called FRACTA, which had developed software that uses AI to predict water pipe ruptures. The software uses AI to learn more than 100 different types of environmental data to predict the deterioration of water pipes due to corrosion, and to determine when and how likely it is that a pipe will burst. The software also displays detailed information about water pipes, such as the year they were laid, the material they are made of, and their length on a map. This software has actually been introduced in the United States and Japan. I propose that as the software is introduced and replacements are made in the future, water pipes with power generation systems installed be used as replacement water pipes in areas where there is excess pressure. I believe that this will enable efficient introduction of the system in various regions of the world while keeping costs as low as possible. However, as I considered this proposal, I wondered whether this would really reduce costs. Another question that arose during the interim presentation was whether the introduction of power generation through water pipes would solve the water sanitation problem. Other questions remain, such as what other types of power generation are possible with water pipes, and what is the actual state of the world's water supply. In addition, I also have questions about the benefits to the installer, how many sloped locations there are, and whether special techniques are required for installation.

During a school excursion, I visited AI Medical Service as one of the activities. AI Medical Service invented AI to assist in endoscopic imaging diagnosis in order to “save lives all over the world”. A person from the company mentioned that different countries have different attitudes toward risk. It is not that they do not consider risk at all, but some countries place more importance on benefits than on risks, while others thoroughly seek to avoid risk at all costs. He said that the demand for risk avoidance leads to a situation where a product is completed but cannot be launched. For this reason, sanitation issues, for example, need to be given special emphasis. In addition, he said there are technologies that are not viable due to money problems, even if they have excellent technologies, and I learned that it is important to have not only technologies but also how to manage them. Therefore, the question of how to make a profit must also be emphasized.

Conclusion

I have been working on a research question “How can we adapt water pipe power generation to the characteristics of different regions of the world?”. As a result, I found that cost was an issue. Therefore, as a conclusion, I propose to incorporate “ LucidPipe™ ” into the replacement of aging water pipes using AI.

For future prospects, I would like to investigate the actual cost, sanitation issues, other power generation systems, and the status of water supply in the world. In addition, I would like to investigate the benefits to the installer, sloped location, and techniques for installation.

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Improving Forests through Smart Forestry Technology

How to Prevent Forest Fires Amid a Labor Shortage

5416 Koeda Hikaru

Abstract

This research addresses the question, “How can we prevent forest fires amid a labor shortage?” by exploring methods to mitigate the occurrence of large-scale forest fires, which have become increasingly prevalent in recent years. The study began with the hypothesis that insufficient forest maintenance, in addition to climate change, might contribute to these fires. The aim is to propose solutions accessible to all, emphasizing early detection to contain fires while they are still small.

To address the labor shortage in forestry, the study advocates the use of smart forestry technologies. These technologies include remote sensing, drones, and AI-based monitoring systems to identify potential fire risks and detect outbreaks early. By enabling fewer workers to manage larger areas effectively, smart forestry provides a practical and scalable solution to the challenges posed by labor shortages and increasing fire risks.

The proposal underscores the need for integrating these technologies into forestry practices, ensuring that even with limited human resources, forests can be monitored and maintained proactively to prevent catastrophic wildfires. (The proposal underscores the need for integrating these technologies into forestry practices, which ensures that forests can be monitored and maintained proactively to prevent catastrophic wildfires even with limited human resources.)

1. Introduction

In recent years, we have often heard news about large-scale forest fires occurring around the world. One notable event was the prolonged forest fire in Australia in 2019, which destroyed 21% of the country’s forests and burned many plants and animals. This tragedy is still fresh in our minds. Since then, forest fires have also occurred in places like the United States and the Amazon.

I have a strong interest in forests, and hearing these stories made me wonder why such massive forest fires are happening so frequently and why they cannot be prevented in advance. These questions led me to start this research.

The research question is: How can we prevent the large-scale forest fires that have been occurring in recent years? I hypothesized that since the mechanism behind forest fires is triggered by “dryness,” keeping forests moist could be a solution. The ultimate goal of this research is to propose methods to prevent forest fires from occurring or to stop fires from growing larger once they have started.

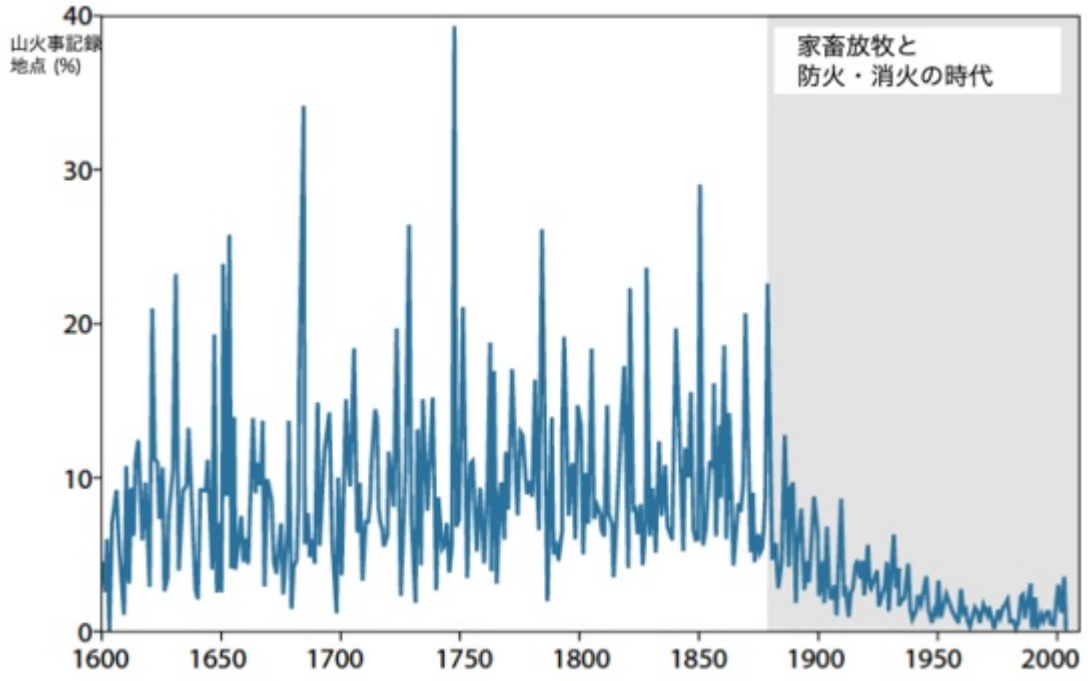
I will mainly use the internet to gather information. Since it is impossible to understand the state of forestry worldwide, I will compare countries with thriving forestry industries, such as Germany and Finland, with Japan, where forestry is in decline. Finally, I will propose a method to address the research question.

2. Discussion and implications

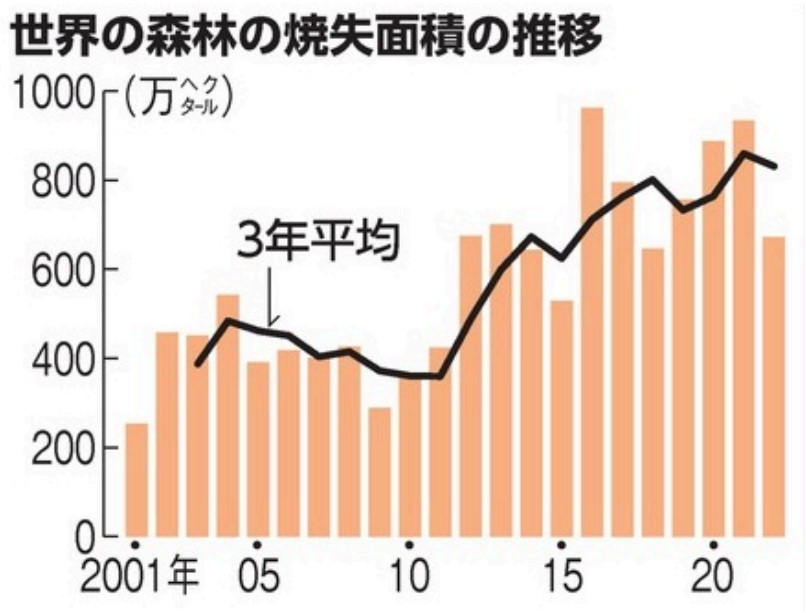
First, there are two main types of forest fires: human-caused fires, such as those caused by discarded cigarettes, and natural fires, such as those caused by lightning or volcanic eruptions. Among natural fires, some are caused by dryness, and I have investigated the mechanism behind this. The process is as follows:

ⅰ. The air becomes dry.
ⅱ. In forests that are not well-maintained, dead leaves accumulate.
ⅲ. Friction occurs between the dry dead leaves, causing a fire to start.
ⅳ. The fire quickly spreads to the surrounding area.
ⅴ. Additionally, when rainfall is low or temperatures are high, fires tend to last longer and are more difficult to extinguish. Most of the recent large-scale forest fires have been caused by this dryness.

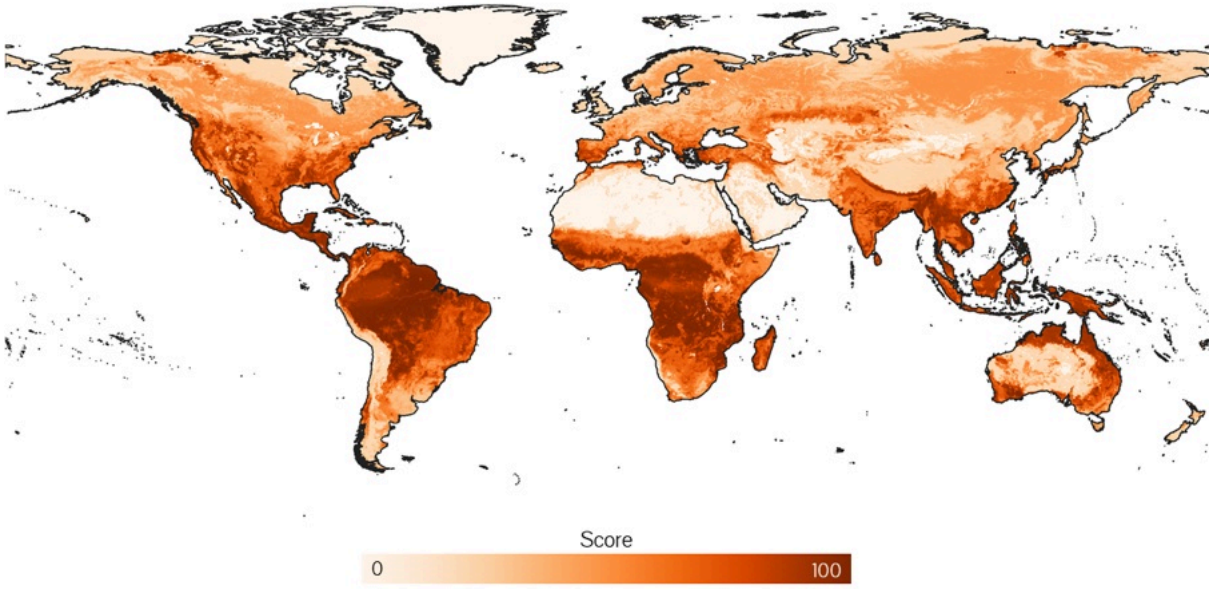
In the general public's view, these forest fires are thought to be caused by global warming, which has led to increased dryness and rising temperatures, and finally prolonged the fires. In 2023, large-scale forest fires occurred in Chile in February and in Canada in May, and some reports attributed these fires to "global warming." However, can we really say that global warming is the cause of these fires?



This is a chart showing the trend in the number of forest fires in the United States. Surprisingly, the peak of forest fires occurred before the 19th century. After entering the 19th century, humans began to intervene in nature and implemented various measures to prevent forest fires, which led to a significant decrease in their occurrence. However, if we closely examine the chart, we can see that since the 2000s, the number of forest fires, though small, has been increasing. This trend is believed to be caused by global warming.



This is a chart showing the trend in the area of forest loss worldwide. It is clear that in 2001, the area was 2 million hectares, but by 2022, it had increased to 6 million hectares. Looking at the three-year averages, we can see that over the past 20 years, the area of forests lost to fires has doubled.



This is a visualization of the potential risk of forest fires in the future. It shows that large-scale forest fires may occur in Southeast Asia, South America, and Central Africa. Additionally, it indicates that even in colder regions, such as Siberia, the risk of forest fires is increasing.

From this, it can be concluded that recent global warming has contributed to the increase in forest fires or has made it easier for forest fires to occur. The prolonged firefighting efforts can also be attributed to global warming. Furthermore, the reduction of

forests, which absorb carbon dioxide, directly contributes to global warming, making the increase in burned areas a problem that must be addressed.

However, according to Mr. Sugiyama from the Institute for Global Environmental Strategies, it is a mistake to simply attribute the cause of forest fires to global warming. He argues that:

Wildfires are a natural part of the ecosystem
Many plants that thrive in burned areas are adapted to such conditions, and after a fire, new plants sprout. In fact, some animals rely on forest fires for their habitat. For example, at Yellowstone National Park, where many such species exist, fire suppression efforts were eventually halted because it was deemed unnatural for the ecosystem.

Human management is necessary to prevent wildfires
The management methods include:

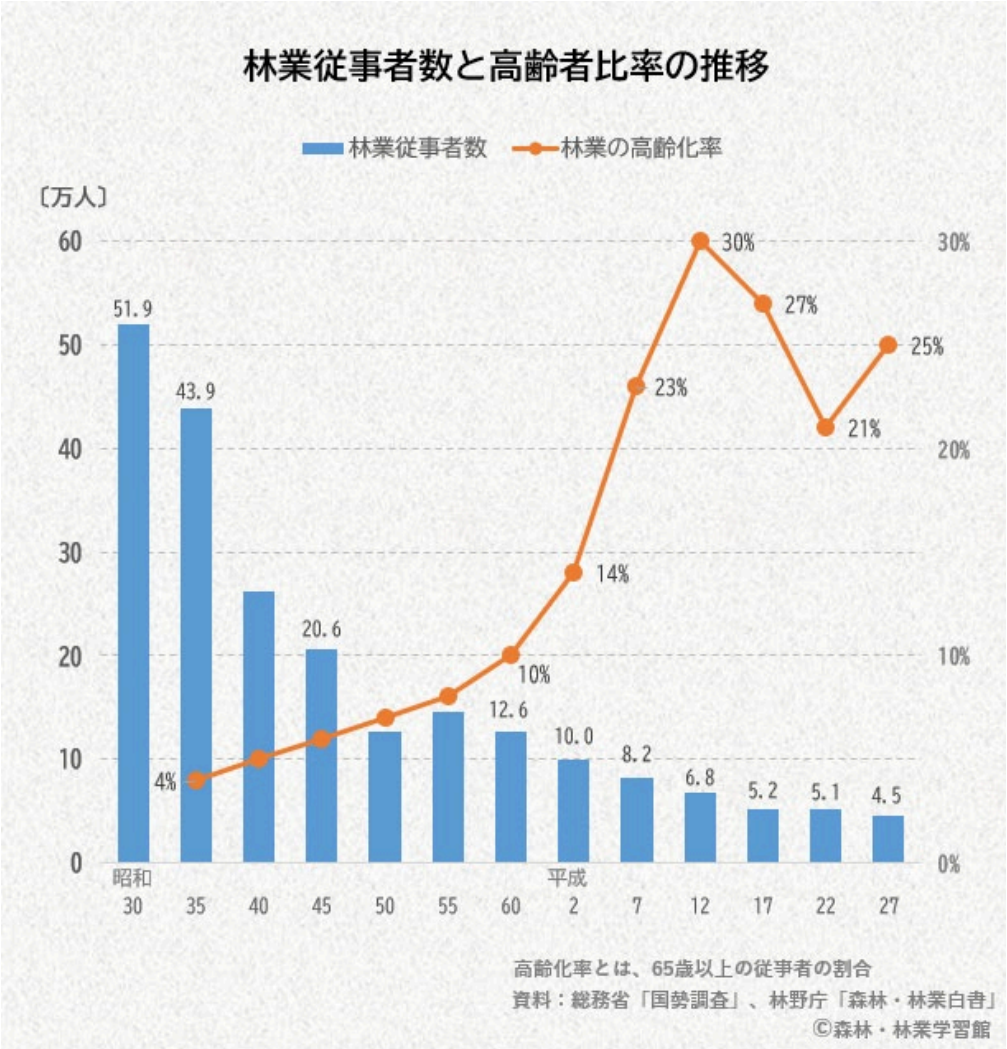
・Creating firebreaks by cutting sections of the forest into strips
・Preventing careless use of fire
・Regularly thinning the forest and conducting controlled burns
・As plants grow over time, they become fuel for potential fires. Therefore, regular thinning of trees and controlled burning are necessary to reduce the risk of larger fires

Other causes of wildfires besides global warming

・Long-term fire suppression has led to an accumulation of fuel in the forest
・Decline in the use of wood products has led to increased fuel in the forest
・Restrictions on the use of forests have led to an accumulation of fuel
・Expansion of human settlements into forested areas has increased the risk of fire

While global warming has certainly caused more frequent dry and hot days, the direct causes of forest fires may also be related to phenomena like the El Niño effect, leading to dryness and heatwaves. Therefore, it cannot be said that global warming is the sole cause of forest fires.

From this, it can be inferred that the direct cause of forest fires is not global warming, but rather the lack of proper human management. If the cause of recent large-scale forest fires is the lack of forest management, the next question is: Why is forest management not being properly carried out today?



This is a graph showing the number of forestry workers in Japan and the aging rate of the workforce. From this chart, we can see that the number of forestry workers has been steadily decreasing, reaching 45,000, while the aging rate has significantly increased. It can be inferred that the lack of proper forest management is due to the shortage of workers in the forestry sector.

Now, let's compare Japan with Germany, one of the world's leading forestry countries. First, the forest coverage ratio (the percentage of land area covered by forests) is 32% in Germany and 67% in Japan. Germany does not have a significantly larger forest area than Japan. In terms of forest area, Germany has 11.42 million hectares, while Japan has 25 million hectares, meaning Japan possesses a much larger forest resource. However, when it comes to annual wood production, Germany produces 64 million m^3, while Japan produces 33.72 million m^3—almost double the production in Germany. The reason for this difference lies in the number of forestry workers. Japan has about 45,000 workers, while Germany has more than 1.2 million. As seen from the difference in wood production, the number of forestry workers directly affects the activity level of the forestry industry.

In many countries other than Japan, the aging of the forestry workforce is also progressing, and except for countries like Germany, the forestry sectors in most countries are expected to face labor shortages in the future. Labor shortages lead to the abandonment of

forests, which in turn results in neglected forests becoming a potential source of fire. Additionally, it is expected that firefighting efforts will be delayed.

From the above, we can conclude:　←この内容はConclusionに入れる

Large-scale forest fires are increasing and are expected to continue.
The causes of forest fires are often not only global warming, but also a lack of human management.
The decrease and aging of forestry workers are leading to management deficiencies.

3. Conclusion

To address these issues, I have focused on “smart forestry.” Smart forestry involves using IT to efficiently advance forestry operations and is encouraged by the government. For example, technologies like walking robots and drones are being used for transporting materials, and laser measurements are being used for forest surveys. This approach supports the few forestry workers and helps improve the efficiency of operations, making it something that should be adopted by many municipalities. By utilizing smart forestry, I believe the issue of management deficiencies due to labor shortages can be mitigated.

However, this alone cannot completely eliminate forest fires. While we can predict the damage caused by forest fires, it is impossible to predict when a fire will occur. Therefore, I would like to propose using smart forestry for post-fire response as well.

This proposal involves the use of “forest cloud data.” It is an application that handles GPS map data, temperature information from thermography, and other relevant data. When the app is opened, images of the forest from above are displayed, and users can switch between a map image and a thermal image showing temperature distribution. Once registered as a forestry worker, they can monitor the forests they manage in real-time. If AI detects a forest fire based on the thermal data or aerial images, an alert will be sent to the forestry workers. This will allow for quicker notification when a fire breaks out and faster reporting for firefighting efforts. Furthermore, non-forestry users, such as hikers, can also use the app to check hiking routes that are difficult to confirm on-site or to check their current location within the forest using GPS.

Therefore, I propose the “forest cloud data” application which provides valuable information for forestry workers. The challenges moving forward include the high implementation costs and the low feasibility of such a system.

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Quality Water for the World

Methods to Improve Water Quality to Solve Drinking Water Problems

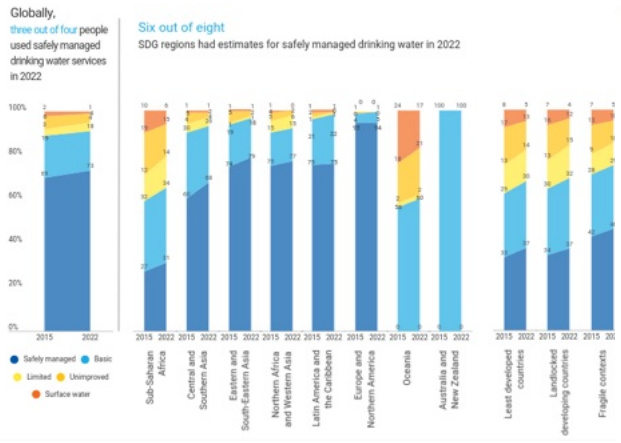
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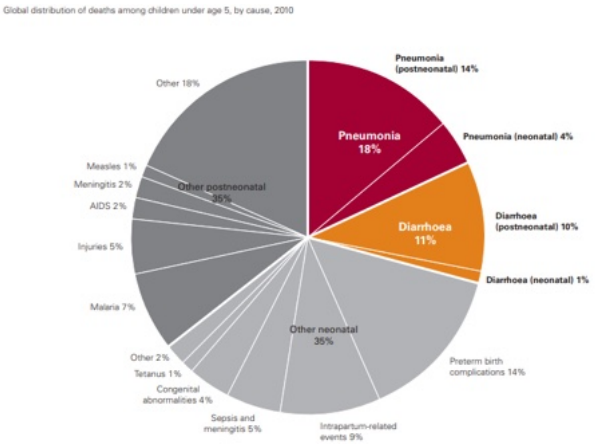
Abstract

These days, many people in developing countries suffer from infectious diseases caused by microbes and other chemical substances in the water. So the objective of this study is to eliminate these toxic substances and reduce the number of people suffering from an illness. In developing countries such as Africa, more than 300,000 people die every year because of contaminated water. In these countries, about 30% of people do not have safe water to drink and they suffer from infectious diseases such as cholera, typhoid and salmonella enteritis. There are two causes of water pollution in developing countries: the first is bacteria living in the water, and the second is toxic substances such as iron. In order to solve these problems, I divided the two causes into two categories and considered ways to remove them. As a result, I concluded that the bacteria should be killed by heat treatment, and the toxic substances should be removed by installing a water purification system using iron bacteria.

1 Introduction

In some areas of the developing world, rivers and lakes are now contaminated by domestic wastewater and toxic chemicals originally included in the soil. According to a WHO survey, pneumonia and diarrhea cause about 20% and 11% of deaths in children under 5 years old worldwide (Figure 1). Pneumonia is mainly caused by air pollution, while diarrhea is caused by toxic substances in drinking water. In fact, about 30% of people do not have access to safe drinking water (Figure 2), so I decided that it is necessary to improve the quality of drinking water in developing countries. Bacteria found in drinking water in developing countries that cause diarrheal diseases include Vibrio cholerae, Shigella, Salmonella, and Salmonella. In addition to bacteria, parasites such as Echinococcus, Dracunculus, and Schistosoma are also thought to cause diarrhea. Furthermore, iron, phosphorus, manganese, and other elements contained in raw water have also been found to cause poisoning symptoms when we intake them. Therefore, the purpose of this research is to eliminate bacteria, parasites, iron and manganese from raw water in developing countries and to reduce the number of people who become ill due to these contaminated waters.





2 Discussion and implications

Currently, the number of children's deaths in developing countries, especially in Africa, is higher than in other countries. Major causes of deaths include respiratory disorders such as pneumonia, diarrhea, typhoid fever, and cholera infection. Causes of these diseases are bacteria, parasites, and chemicals in the water that are harmful to humans. Therefore, I studied how to improve the water quality in order to eliminate bacteria, parasites, and toxic chemicals.

First, I considered methods to remove bacteria and parasites. There are two methods to remove them, filtration and Boiling disinfection. For filtration, there are currently three major filtration methods: slow filtration, rapid filtration, and filtration using a membrane module. The advantages of slow filtration are that it expensive and easy to manage, while its disadvantages are that it is not suitable for highly contaminated water and that filtration takes time. On the other hand, the advantages of rapid filtration and filtration using membrane modules are that it can treat water with high turbidity and is fast, while their disadvantages are that it is expensive and difficult to manage. Water in some developing countries that require purification contains a lot of mud, chemicals, and organic matter, making it difficult to use slow filtration. In addition, because the settlements requiring purification in Africa are distributed over a wide area, it was also difficult to realize rapid filtration and filtration using membrane modules, which are expensive and difficult to manage. Therefore, the filtration method is inappropriate as a method to remove bacteria and parasites in developing countries such as Africa.

Next, I considered boiling disinfection. Most species of bacteria and parasites living in developing countries, including Africa, are heat sensitive and can be killed by boiling at 80°C or higher for 10 minutes. Since boiling disinfection is obviously simple and quick, this method is suitable for eliminating microorganisms. One disadvantage, however, is that it does not remove chemicals such as iron and manganese. Therefore, it is necessary to propose a method to remove chemicals such as iron and manganese.

Regarding these toxic chemicals, it was found that the toxic substances found in the water of developing countries, including Africa, that are harmful to human health are mainly manganese and phosphorus in iron and fluorine and arsenic in liquid. These substances are mainly included into the water from the soil originally, or melt into the surrounding water due to metal mining. Removing these substances generally requires huge water purification facilities. However, this is not realistic in terms of space and cost. Therefore, other purification methods are considered. First, the coagulation sedimentation method and the biological contact filtration method are mentioned as methods to remove iron (manganese and phosphorus).

The first method, coagulation sedimentation, removes iron from water by adding aluminum or chlorine to the water. This method has good treatment efficiency in high-concentration areas, but it is expensive to treat large amounts of sludge and to install equipment. It also requires maintenance regularly.

The second method, biological contact filtration, is simple and does not require costly and time-consuming installation. However, it requires cleaning of the filter media.

Of the two purification methods, the second method, biological contact filtration, was considered more suitable to reduce costs because of its smaller capital investment cost than the other.

The biological contact filtration method is a water purification method that uses bacteria called iron bacteria. Iron bacteria are found throughout the world, including the African continent, and live mainly in waters that contain iron. Iron bacteria themselves are found in African water sources and can be obtained easily for water purification purposes. First, the iron bacteria absorb the melted iron in the water, accumulate it in their bodies, and settle to the bottom as iron bacteria aggregates. Next, the water containing this accumulation is poured into a physical filtration system using sand or stones, which removes the accumulation and iron from the water. Iron bacteria may remain in the water without forming accumulations, but they are harmless to humans. Here, I present a previous study on biological contact filtration using iron bacteria. This study was conducted on groundwater in Japan as an experiment to improve water quality using iron bacteria.

This study was conducted by Yoshimori Kato and Akimasa Nakata. The water subjected to this experiment had a raw water temperature of 15°C, a filtration rate of 70 m/d, and DO of 6-8 mg/L. The experimental device was designed to aerate raw water pumped from a well through an aeration jammer plate and filter iron bacteria accumulations generated by the aeration process (Figure 3).

（In this experiment, dissolved enzymes in the raw water were used as a manipulating factor (Figure 3). Dissolved enzymes are the amount of oxygen dissolved in the water, and this value can be adjusted by the aeration process described above. It is said that a concentration of 2 mg/L or more is required for aerobic microorganisms such as iron bacteria to be active. And the dissolved enzyme concentration is called DO concentration. Experimental results, as shown in Figure 4, indicate that Fe treatment deteriorates when oversaturation occurs due to excessive aeration. This is stated to be due to the passage of Fe particles formed by air oxidation through the filtration layer. The experimental results also showed that the concentration of Fe in the water was kept within the standard value.

Based on this previous study, we considered this means of improving water quality in developing countries, including Africa, to be effective. Based on the results shown in Figure 3, it is necessary to consider the dissolved oxygen saturation rate. Dissolved oxygen saturation is calculated based on DO concentration and saturated dissolved oxygen. (Dissolved oxygen saturation = DO concentration (mg/L) ÷ saturated dissolved oxygen (mg/L) × 100) Figure 3 shows that the removal rate of iron in the experimental system reaches its maximum when the dissolved oxygen saturation is 70-80% and decreases rapidly after 80%. Therefore, the dissolved oxygen saturation must be 70-80% to maximize the iron removal rate. The saturated dissolved enzyme content is a constant value that is proportional to the temperature of the water. (Figure 5) For example, if the water temperature of the source is 25°C, the saturated dissolved enzyme content is 8.11 (mg/L), and the DO concentration for 80% saturation is 80 x 8.11 x 1/100 ≈ 6.49 (mg/L). In fact, it is not possible to know if aeration is necessary without going to the site and measuring it, so it is necessary to measure it with an inspection kit when the equipment is installed.

From the above, it was found that bacteria and parasites can be removed by boiling, and toxic chemicals such as iron can be removed by biological contact filtration method using

iron bacteria. In addition, the actual purification of water should be done in the order of boiling disinfection → biological contact filtration. This is to prevent other bacteria from inhibiting the activity of the iron bacteria.

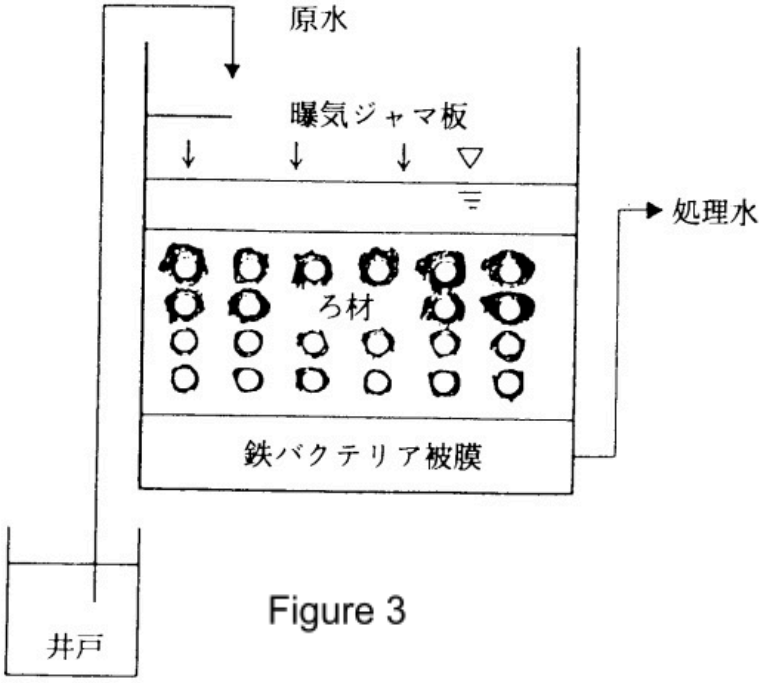
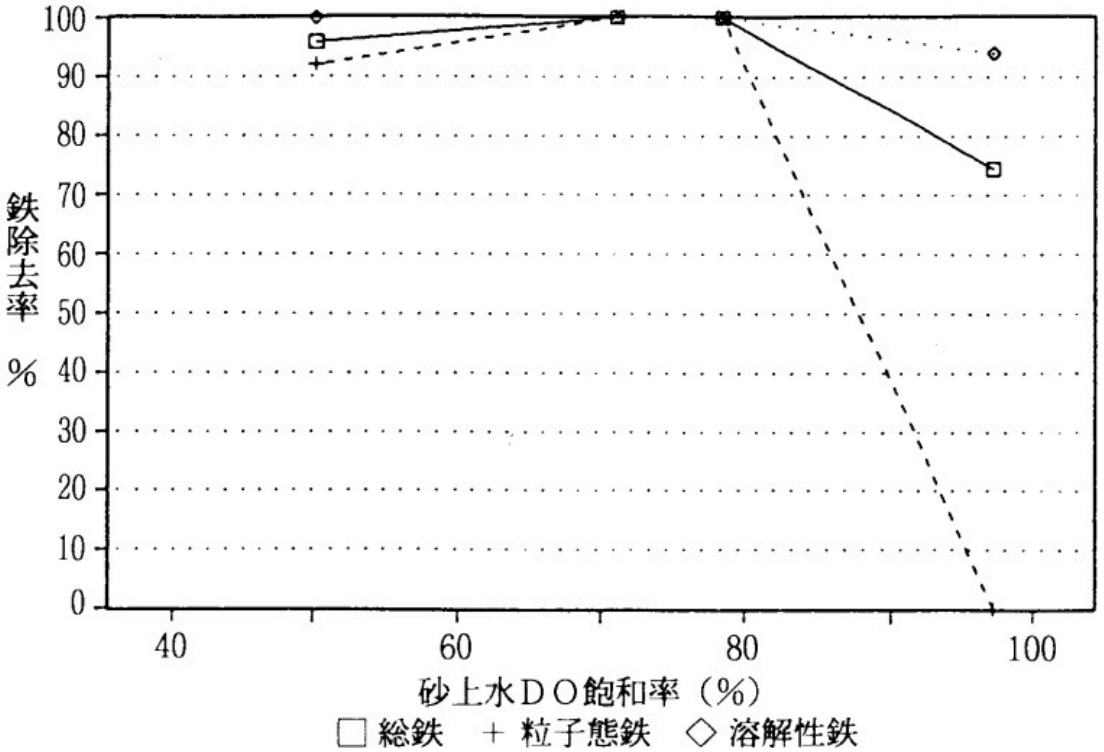


Figure 3



図－７　溶存酸素飽和率と Fe 除去率

水温(℃)	溶存酸素(mg/L)	水温(℃)	溶存酸素(mg/L)	水温(℃)	溶存酸素(mg/L)	水温(℃)	溶存酸素(mg/L)
0	14.16	11	10.67	22	8.53	33	7.22
1	13.77	12	10.43	23	8.38	34	7.13
2	13.4	13	10.2	24	8.25	35	7.04
3	13.05	14	9.98	25	8.11	36	6.94
4	12.7	15	9.76	26	7.99	37	6.86
5	12.37	16	9.56	27	7.86	38	6.76
6	12.06	17	9.37	28	7.75	39	6.68
7	11.76	18	9.18	29	7.64	40	6.59
8	11.47	19	9.01	30	7.53		
9	11.19	20	8.84	31	7.42		
10	10.92	21	8.67	32	7.32		

注）1気圧で、塩化物イオンがない場合

3 Conclusion

To improve the water environment in developing countries, two substances must be eliminated: bacteria and parasites and toxic chemicals. Bacteria and parasites can be killed by boiling disinfection, which involves heating water to 80°C or higher for 10 minutes. Since disinfection by boiling can be easily carried out as long as there is a fire and a container that can hold water, this method can be spread by sending the media and technicians to villages in developing countries such as Africa. In addition, toxic chemicals such as iron will be removed by a biological contact filtration method using iron bacteria, and equipment for aeration will be installed as needed. By doing these two things, drinking water can be produced from river and lake water. In addition, the proposed equipment and methods are as cost-effective as possible and do not require complicated and advanced technology, so if actually introduced, they can be expected to be effective in a wide range of areas.

As a future challenge, it is necessary to consider ways to spread the word about the existence and dangers of bacteria, parasites, iron, and other harmful substances and to make people in developing countries aware of the risks of drinking water, since they may not know that these substances are dangerous and have adverse effects on the human body in the first place. We also need to think of ways to remove not only iron but also other toxic chemicals such as arsenic and fluorine.

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Let's Save the Cows!

5418 Taito Shitara

1. Research Summary

This research focuses on cows. The reason for choosing this topic is that I wondered how cows, which are necessary for a part of our daily life such as milk and beef, affect our lives. As I researched, I found that cows emit a lot of methane gas and carbon dioxide, which are one of the causes of global warming. Methane gas accounts for nearly 30% of the total emissions. It was also found that a lot of wheat is essential for raising cattle and other livestock, which accounts for about 90% of soybean consumption. This not only leads to soil pollution but also affects water quality and aquatic life. We can also see the disadvantages of cows, even though they are essential to us. Therefore, I decided to look for alternatives to cows and gradually reduce the number of cows. As a result of my research, it was revealed that “cultured meat” has been growing in recent years.

2. Background of Research

I was interested in cows because I learned that they have a great impact on the environment.

3. Purpose and significance of the research

The first step is to reduce the number of cattle raised and killed for beef. The second is to promote the improvement of environmental problems such as global warming and water pollution by reducing the number of cattle.

4. Research Methods

Internet research on cattle damage

5. Research results and discussion

According to the 2015 “Percentage of Global Methane Gas Sources,” 24% of all emissions come from cattle and other livestock. Methane gas is a major factor contributing to the progression of global warming.

First of all, the main theme of “saving cows” can be achieved through the spread of cultured meat, . However, when we looked into the demerits of cultured meat, we found that “it is expensive, so it is not available to many people” and “the taste and texture are not to our liking. These will be resolved in the next few years. Currently, research on cultured meat is being conducted at many universities, and it is known that mass production by machine will

be possible. Therefore, meat will become more reasonable than current meat and will be available to a large number of people.
Next, in order to achieve the sub-theme “Let's curb global warming,” it is necessary to reduce the number of cows. This is a good idea based on the many endangered species due to poaching, overhunting, invasion of exotic species, deforestation, etc. I thought that overhunting was an effective measure to reduce the number of cattle. making a brand using cow skins a trend also leads to reducing the number of cows and improving environmental problems. I also thought about creating a transportation system using cows.

6. conclusions and future tasks

For the future, we would like to pursue specific cattle brands.

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Translated with DeepL.com (free version)

Protecting Athletes from Doping

5419　Yuka Shinohara

1.Abstract

I became interested in doping after hearing the news that Russian athletes were found to have violated doping rules at the Olympics and had their results invalidated. My research question is What can Japan, with its relatively low number of doping violations, do for the rest of the world?To research this question I used the Internet and e-mail to the Japan Anti-Doping Agency. First of all, Russia and Italy are the countries with the highest number of doping violations, and I found that the reasons for this are a lack of correct knowledge about doping and intentional doping. Based on the current worldwide efforts related to doping, it was considered necessary to separate measures for primary , secondary, and tertiary prevention. Primary prevention consists of doping education, secondary prevention consists of expanding and strengthening the doping testing system, and tertiary prevention consists of legal measures against doping violators. The primary and secondary prevention aim to prevent doping violations, while the tertiary prevention aims to prevent those who have committed violations from ever trying to dope again. Based on the above proposals, we would like to protect athletes from doping.

2. Introduction

(ⅰ) Background

Russian figure skater Kamila Valiyeva helped Russia win the team title at the February 2022 Beijing Olympics, but before the individual competition, she caused quite a stir when a sample taken at the Russian Championships on December 25, 2021, tested positive for the banned substance trimetazidine, resulting in a doping violation. The case became a major controversy. According to the World Anti-Doping Agency (hereafter referred to as “WADA”), doping is defined as “the act of intentionally trying to gain an advantage and win by enhancing one's athletic performance through the use of prohibited substances or methods in sport.” The term “doping” also includes various “methods” of enhancing athletic performance, whether intentionally or unintentionally, that are against the rules, as well as “concealing” these acts. This invalidated her results at the Beijing Olympics. I became interested in doping after hearing the above news. I wanted to research further, so I looked at the “Countries with the Most Sanctioned Athletes” surveyed by WADA and found that although WADA has strengthened sanctions against doping, the number of violations has remained flat, with Russia and Italy having the highest number of violations in the world in recent years, while Japanhas had very few violations.

(ⅱ) Purpose and meanings of this research

Based on the above findings, I decided the research, “What can Japan, with its relatively low number of doping violations, do for the world? I believe that if we can answer this research question, countries with both low and high numbers of doping violations will be able to work more closely together to reduce doping, which will be a step toward reducing the number of doping violations in the world as a whole.

（iii）Research methods

(1) Investigate the countries with the highest number of doping violations from the "Countries with the Most Sanctioned Athletes" published by WADA.

(2) The countries surveyed in (1) above are examined on a country-by-country basis to determine why there are so many doping violations in those countries.

(3) The common problems found in the investigation in (2) are treated as the central issue for the research.

(4) In order to solve the problems identified in (3), we investigate what is being done in countries that are currently making progress in their anti-doping efforts, particularly Japan.

(5) Among the items in (4), select those that are useful in reducing doping worldwide, and consider how they can be applied.

(6) Make my own proposals based on the current policy issues in the countries with the highest number of violations in (2).

(7) Send an e-mail to the Japan Anti-Doping Agency to see if your proposal is effective.

(8)Draft a final proposal.

2.Discussion and Implications

①According to the FY2020 Rules Violation Report published by WADA, Russia ranked first, India second, the United States third, and Italy fourth, with Russia accounting for 30% of the total, and India and the United States accounting for 20% of the total. The previous year's FY 2019 Regulatory Violation Report also showed Russia in first place, Italy in second, India in third, Brazil in fourth, and the U.S. in seventh, with the top three countries accounting for just under 20% of the total. 2018 survey results show that the top countries remained the same, with Japan not in the top 10 countries in any year. Japan was not among the top 10 countries in any year. And in the 2019 survey, Japan was ranked 52nd, accounting for 0.5% of the total.

From the three-year survey in ②①, the countries with the highest number of violations were found to be Russia, Italy, India, and the United States. It was also found that Japan had fewer doping numbers than the other countries. We will now examine the causes of the high number of violations, focusing on the top four countries with the highest number of violations.

First, we looked at Russia. Russia's former Soviet Union's State Security Committee (KGB) and its successor agency, the Russian Federal Security Service (FSB), tasked with preventing acts of terrorism and state treason, have been linked to the sports world for quite some time: in February 2014, the World Anti-Doping Agency (WADA) Independent Commission released a 335-page report, which found that the number of doping violations in the U.S. was about the same as in other countries. The report states that the FSB has been connected to the sporting world for quite some time. According to the report, Gregory Rodchenkov, director of the Moscow-based WADA-accredited laboratory, demanded money from athletes who tested positive in return for cover-ups and knowingly destroyed 1,417 samples to obstruct the independent commission's investigation. In addition, there was a "second laboratory" in Moscow involving the FSB, where negative specimens were stored and replaced with positive specimens from the accredited laboratory. The authorized testing laboratory informed the players in advance of the schedule of unannounced inspections, and inspectors

routinely received bribes from players, but the coaches were persuaded that “other countries do similar things. They convinced the players that it was their duty to represent the national team.FSB officials were in and out of the official inspection bodies, putting pressure on them to cheat. During the Sochi Winter Olympics, FSB officials monitored the facility and continued to visit weekly thereafter. the KGB and the FSB not only prevented leading athletes from defecting, but also made it possible for successful athletes to consult the KGB and the FSB on all issues, including athlete life and housing problems. A system had been created. Behind the doping problem lies the problem of poverty that Russia faces. According to the Organization for Economic Development and Cooperation (OECD), there were 18 million poor people in Russia in 2019, with a poverty rate of 12.3%. In addition, only residents in and around urban areas such as Moscow and St. Petersburg are benefiting from economic growth, while many people in other regions are living at a standard of living even lower than the official poverty line. Therefore, sporting competitions, especially the Olympics, are a big opportunity for coaches and staff to make a lot of money. Doping is therefore a dark tool that is attractive to both athletes and staff.

The above survey results show that Russia is deliberately involved in doping on the nation as a whole.

Second, I investigated the actual situation in Italy. According to “Research on the Current State of Italian Doping and Anti-Doping” by Mitsuyo Yoda of the Japan University of Health and Sport Sciences, it is highly likely that there are many amateur athletes who are ignorant of doping and use doping without understanding the harm it can do. In coaching seminar courses, they show theoretical understanding of doping but not interest in it. Although anti-doping education was provided in yachting courses, many coaches had neither interest nor knowledge of doping, and only learned about it when they were in violation. Seminars on anti-doping were held every year for Federation participants, but these did not fulfill their educational function. Large cash prizes are awarded to individual winners. Some athletes want to get paid for doping. Even though they know that doping is bad for their bodies, young athletes are said to be tempted by the money in front of them.

These findings show that many in Italy do not understand the negative effects of doping, and that both athletes and coaches must be equipped with correct doping knowledge.

Third, I researched the U.S. According to True Sport, the root of the doping problem in American sports is the intensification of victory supremacy. Eating disorders and burnout among top athletes, who are constantly demanding results, have become a problem, but there are also constant athletes who rely on drugs to win, overcoming rigorous training and intense pressure to win. Furthermore, the results-oriented approach has a strong influence on coaches and parents in the developmental years, resulting in intense pressure on student athletes and even children playing sports, which is also seen as a problem. Furthermore, every year since 1975, the National Institute on Drug Abuse has conducted a survey of middle and high school students across the U.S. on drug use and attitudes, and according to the 2019 results, 0.8% of eighth and tenth graders and 1% of ninth graders used steroids, a type of prohibited drug. The reason cited for drug use is “to improve performance. In addition, this background is based on John Stuart Mill's liberty theory, which states that each individual is free to do whatever he/she wants with his/her body as long as it is within the scope of private liberty, in other

words, the concept of bodily ownership is based on the idea that one's body belongs to him or her.

The above findings indicate that the U.S. does not understand the negative effects of doping and tends to prioritize winning.

Fourth, I looked into India. According to Courier Japon, on the last day of the Delhi State Athletics Championships held on September 27, 2023, about half of the athletes who were scheduled to participate suddenly had to withdraw. The reason for this was reportedly that the National Anti-Doping Agency of India (NADA) came for an unannounced inspection. In the men's 100-meter run final, seven of the eight athletes abstained due to muscle cramps or injuries. Only one athlete made it to the starting line. Also, according to the Indian Express, in the women's steeplechase, one athlete who crossed the finish line continued running across the field to escape anti-doping officials. Other reports indicate that only three of the finalists in the under-20 men's 100-meter final showed up, and only one in the under-16 men's hammer throw, suggesting that doping may be rampant not only among adult athletes, but also among underage athletes.Sunny Joshua, president of the Delhi State Athletics Association, said that some of the prize-winning athletes did not show up to receive their medals. And a video posted by an Indian Express correspondent the day after the Games, showing countless used syringes strewn about the stadium toilets, was also reported.

From the above examples, I thought that such a cheating problem may have occurred in India due to lack of awareness of doping.

Looking at the causes of violations in the top four countries, it became clear that, with the exception of Russia, the causes were a lack of awareness of doping and a lack of widespread correct education on doping. In addition, in common with all four countries, it was found that doping is done intentionally, with the involvement of the state in attempting to dope or using doping to win.

③Based on the results of the survey in ②, I wanted to educate people about doping and thereby reduce the number of intentional doping. Therefore, I investigated what kind of efforts are being made in other countries.

④We first investigated Japan, a country with a low level of doping, and found that Japan has certified sports pharmacists, who are experts in doping. Certified sports pharmacists advise sports competitors and instructors on how to use drugs and conduct anti-doping awareness activities at schools. In recent years, the number of certified sports pharmacists has increased rapidly against the backdrop of an increasing number of international sporting events and reported cases of doping among athletes. Immediately after the start of the certification system (2010), the number of certified individuals was 796, but as of April 2022, 12,345 individuals have been certified.

Certified sports pharmacists have also been found to play an important role in anti-doping education. According to a study conducted by Kitasato University, a public high school softball team competing in the 2009 National Championships, where doping testing is scheduled to take place at the university, was the target team, and research was conducted on 17 male high school students who belonged to that team. In the study, educational lectures were given to the entire team on how to avoid doping in sports. The effectiveness of the lecture was assessed by examining the players' knowledge and awareness of anti-doping in sports before and after the lecture. The results showed that there was a significant difference

after the lecture regarding the appropriate knowledge and awareness of anti-doping in sport. This specific awareness was found to persist for at least one month. Furthermore, various anti-doping products have been invented in Japan by these certified sports pharmacists. To give an example, they have created a card game called Doping Guardian and a doping manga. However, the challenge with certified sports pharmacists is that they operate only in Japan.

Finally, in Japan, there is a Global DRO that investigates anti-doping and is available in the US, Canada, UK, Switzerland, Australia, New Zealand, and Japan.

Next,I researched German policy. Germany is the country that has regulations about anti-doping in their law.Under the Pharmaceutical Affairs Law, since 1998, the "prescription," "use," and "distribution" of doping drugs to others has been punishable by a fine or a prison term of up to three years.By doing this, a legal basis of doping for players and trainers was created.Also, the Nationale Anti- Doping Agentur Deutschland: NADA plays a central role in anti- doping. NADA was established in 2022, and has been legal effective since January 2003.

⑤Next, I investigated what the countries with the highest number of doping violations are currently doing to address the problem. The purpose of this survey was to identify current issues and to discover which areas need to be focused on for improvement.

First I looked at Italy. In Italy, an Anti-Doping Committee was established in 2016 within the organization NADO Italia. The control committee within this organization uses the Biological Passport, which is a passport-like registration of all components, such as hormones, that are detected during testing. There is also a “Law for the Integrity of Sporting Activities and the Overcoming of Doping,” which treats doping as a type of crime. However, anti-doping activities are not widespread in Italy, and the disparity in anti-doping measures between top athletes and amateur athletes is a problem. While top athletes are receiving thorough and ongoing professional anti-doping education, which is showing positive results, amateur athletes and sports enthusiasts are not taking sufficient measures to combat doping.

In the U.S., the Rotchenko Anti-Doping Act was passed in 2020. In 2022, the U.S. District Attorney in the eastern state of New York and the Federal Bureau of Investigation (FBI) arrested Eric Lira, 41, a self-proclaimed doctor from El Paso, Texas, on suspicion of having two female track and field athletes who competed in the Tokyo Olympics ingest illegal drugs. The FBI announced the arrest and prosecution of Eric Lira, 41, a self-proclaimed doctor from El Paso, Texas in the southern part of the country. This marked the first prosecution under the Lhotchenko Anti-Doping Act.

Finally, Russia and India were also investigated, but no specific measures against doping were found. Based on the above examples of anti-doping measures, we believe that although legal penalties have been implemented to combat doping, they are not yet well recognized. In addition, considering the situation in Italy, we found that it is necessary to provide all athletes, from amateur to professional, with opportunities for doping education, because even if laws are put in place, results will not be achieved if doping education is not advanced.

⑥Based on the results of the above research, I will make some suggestions. I have conducted my research on the theme of “protecting athletes from doping. I would like to make it possible to achieve this goal by establishing clear step-by-step measures for primary prevention, secondary prevention, and tertiary prevention. First, with regard to primary

prevention, I would like to further expand doping education with the goal of “preventing doping before it occurs. The main content is to introduce certified sports pharmacists, which is currently only available in Japan, to the rest of the world. As mentioned above, research conducted by Kitasato University has shown that education by certified sports pharmacists is meaningful. In addition, when education by certified sports pharmacists is conducted, it is important to teach the coaches and the athletes. First, we believe that it is effective to introduce education on the athlete side starting at elementary school. In the U.S., as mentioned above, there were some high school students who were found to be using drugs that violate doping laws. Therefore, we felt that it is important to educate children at the elementary school stage, when they are likely to start taking part in sports as lessons. As for the education of coaches, it is necessary to require direct instruction by a certified sports pharmacist to prevent cases of coaches not showing interest in doping, as is the case in Italy. Furthermore, to make doping education easier to understand, I think it would be effective to spread doping karuta and cartoons, which are now available in Japan, throughout the world. This is because when I went to talk to an environmental app company that is currently expanding its market share in innovation learning this year, he said, “We try to create apps that users can enjoy as if they were playing a game.” He said. We thought that these doping cartoons and karuta cards would be the best and most effective educational materials for children to learn about doping while having fun. Next, we propose the expansion of the testing system as a secondary prevention measure. Currently, global droppers are in operation, and we would like to increase the number of countries where these droppers can be used. We would like to increase the number of people who are able to recognize violations in advance, before they become violations. There are two types of doping tests: in-competition tests, which are conducted after the competition, and out-of-competition tests, which are conducted outside of the competition. Out-of-competition testing is so-called “unannounced testing. A qualified Doping Control Officer (DCO) will visit the athlete's practice area unannounced. Based on this information, the DCO can meet with the athlete without notice.

I feel that increasing the staffing of these DCOs could be a way to avoid violations in advance. These are done as part of JADA's human resource development for the Japan Anti-Doping Commission, which is defined as having the important role of protecting athletes and preserving the value of sport by conducting fair and reliable doping testing. However, according to research conducted by the Tsukuba Graduate School, the lack of knowledge and training of DCOs at the 2016 Rio de Janeiro Olympics caused confusion in testing, and at the 2020 Tokyo Olympics, until just before the start of the games, 120 out of 450 DCOs were under-resourced, indicating that DCOs are an important personnel, yet the system was not in place. Therefore, we would like to increase the number of DCO personnel as part of this secondary prevention. Finally, as for tertiary prevention, after a violation has occurred, legal measures should be taken to ensure that the offending athlete does not subsequently engage in doping. However, since this has already been done in Italy, Germany, the U.S., and other countries, I believe that awareness of the fact that doping violations are against the law should be raised through doping education, etc., as set forth in primary prevention.

I would like to protect athletes from doping by taking these step-by-step measures.

6Conclusion

In answer to the research question, “What can Japan, with its low number of violations, do for the world? As for the future, he wants to make sure that his proposals are really effective. Currently, as part of this process, I am investigating whether my proposal for primary prevention, “expanding the number of certified sports pharmacists around the world,” is a feasible and effective policy. For this purpose, I have sent an e-mail to the Japan Anti-Doping Agency (JADA), which is the management company of the certified sports pharmacists, and am currently awaiting their reply.

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Effects of Videogames Against Aging Dementia

Increasing Cognitive Ability

5420 Kotoko Shimizu

Abstract

Video games have a positive effect on brain functioning. According to the World Health Organization, “Dementia is a syndrome caused by a number of diseases that, over time, destroy nerve cells and damage the brain, typically leading to deterioration in cognitive function (i.e. the ability to process thought) beyond what might be expected from the usual consequences of biological aging.” The number of dementia patients is increasing year by year. To halt this situation, I focus on video games.I suggest playing video games for the prevention of dementia, in detail, for elderly people who receive home care. If elderly could make a community in video games, they won’t feel lonely, which is good for their health. To do so, holding an event to learn how to play and set the video games are necessary. Teenagers and other young people who have interests in video games can teach it so that elderly and young people can play together. Moreover, eSports are now becoming popular in elderly. There is an official gaming team constituted with only people whose ages are more than 60. Because they don't need to mind about body disabilities, everyone can have their chances to start their 2nd career as a pro-gamer.

1.Introduction

I conducted research about the necessity of video games for foreign language learning last year, and I decided to change my mind to connect with aging populations. This research has an objective to decrease the number of dementia, improve cognition, prevent aging by using video games. Video games have additional effects such as a superior ability to quickly analyze situations, generate new knowledge, categorize facts, and leverage knowledge gained especially in situations involving high uncertainty.

According to the World Health Organization, “Dementia is a syndrome caused by a number of diseases that, over time, destroy nerve cells and damage the brain, typically leading to deterioration in cognitive function (i.e. the ability to process thought) beyond what might be expected from the usual consequences of biological aging.” The number of dementia patients is increasing year by year. To halt this situation, I focus on video games.

There was a past study from Yoshiyuki Tamamiya that stated that video games have an ability to increase cognitive power. Additionally the article mentions that using computers lowers the risk of getting the syndrome.

Playing video games is a popular activity that provides a cognitively engaging and sensory-rich environment, potentially leading to cognitive benefits in those who play frequently. In some research, they examined the behavioral and brain responses of video game players and non-video game-players during decision-making tasks. In behavioral responses, video game players were overall faster by approximately 190 ms and more accurate by 2% than non-video game-players. In brain responses, comparing percent signal

changes in commonly activated brain regions between groups, the researchers found that video gamers had increased task-related signal changes in the right lingual gyrus, right supplementary motor area, and left thalamus associated with improved behavioral response. Directed functional network activities to the right SMA and the left thalamus were also increased. The regional signal changes and network activities of all participants were found to be negatively correlated with decision response time, indicating that higher the node and network activities better the performance. These results provide novel insights into the brain mechanisms that underlie improvements in sensorimotor decision-making abilities due to playing video games .

2.Discussion and Implication

From my recent study, video games have positive effects on our cognitive functions. Especially with 3D action games and First Person Shooter games (here after FPS games). According to an article by Janina Krell-Roesch, PhD, sensorimotor task improvements in video game players can be associated with enhancements in various aspects of low-level and high-level brain processes including sensation, attention, spatial navigation, cognitive control and workload. From this information, the causes of dementia might be connected to the impact of playing video games.

Video games have various types. In this research, I focused on Crime Action Games and FPS Games. According to an article, Crime Action Games are action games that deal with criminal or anti-social themes such as gangs. Because of the cruelty description, they tend to be rated as Z(18+) games. Some people have claimed that these extreme games have influenced them to commit real crimes. However, there is a lack of scientific evidence and some people point out that this is impression manipulation. People enjoy these games not as a substitute for reality, but as games in their own right. Because this freedom can be pursued further, they lend themselves well to the open-world system, such as the “Grand Theft Auto series”(GTA). FPS games are a type of shooting game and a popular genre of game. In these games, the scene is displayed from the perspective of the player controlling the game, the target is shot down, and basically only parts of the character's body or weapons are displayed on the screen. The appeal of this game is the sense of unity and immersion that comes from sharing the view with the character. Online battles are constantly taking place and many FPS titles have been selected for e-sports. The basic controls are simple, but the difference in skill between players in terms of control and movement is both the fun and the difficulty of FPS.

There are few open world games that can communicate with other people. However, using these Crime Action Games, if we restrict some of the movements, it might be a virtual space where the elderly can have communication with others. Communicating in this way can help elderly not feel loneliness. Moreover, most of the FPS games consist of 3 to 5 players’ groups to fight against other groups. Elderly can form their group and have communication with group members. From this research, there are many similarities between the points to activate our brain and positive effects of video games.

From my experience in innovation work, it is important to combine two other things to create new solutions. Also I think we have a limit for the medical treatment to make a complete recovery against dementia. Being healthy for a longer time, my suggestion can be the bright

solution for modern generations. Thus, my suggestion is to make an opportunity to play video games.

3.Conclusion

I suggest playing video games for the prevention of dementia, in detail, for elderly people who receive home care. If elderly could make a community in video games, they won't feel lonely, which is good for their health. To do so, holding an event to learn how to play and set the video games are necessary. Teenagers and other young people who have interests in video games can teach it so that elderly and young people can play together. Moreover, eSports are now becoming popular in elderly. There is an official gaming team constituted with only people whose ages are more than 60. Because they don't need to mind about body disabilities, everyone can have their chances to start their 2nd career as a pro-gamer.
Network services will become more and more common for all of us in the near future. To get used to the internet, video games will definitely support seniors.

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Life Without Fear of Infectious Diseases in Developing Countries

To Maintain a Hygienic Environment

5421 Sekita Himari

Abstract

I set the research question as “How can we maintain a hygienic environment in developing countries?” and my hypothesis was “ Making soap more accessible to maintain a clean environment and body. I reached the conclusion to make soaps immediate for people in developed countries and make a system of reusing the soaps within each country.The target in his system is South Africa. In addition to assistance from developed countries that are now participating in the recycled soap initiative, I have come up with an action to be taken within the Republic of South Africa. First, volunteers in the country will sort, clean, and remold soaps that are planned to be disposed of in hotels as amenities in the Republic of South Africa.Those recycled soaps will be checked and tested by companies in developed countries, and then distributed to areas in that country and surrounding countries that do not have good sanitary conditions.The companies in developed countries that help will charge the hotels a fee based on per room or weight of soap collected. And the hotels will get advertising materials that will show that they are working to solve sanitation and waste problems.The benefits of this initiative are that soap originally scheduled for disposal can be used to improve sanitation. In addition, local volunteers can get jobs and hygiene education. Companies in developed countries can save costs by reducing the need for sorting and other labor that they had previously required. A portion of the reduced costs can be sent to the developing countries to be used as rewards for work and costs for sanitation education.

1.Introduction

I know that people in developing countries are more easily affected by disease and less able to recover from the same disease than in developed countries. The data are as follows: According to “Gooddo” and “the Japan Committee for UNICEF”, more than 80% of global under- five children deaths in 2017 occurred in sub-Saharan Africa and South Asia, where most under-five deaths are from pneumonia, diarrhea, and malaria. While these diseases are both treatable and preventable in developed countries, these three diseases alone killed more than 1.5 million people worldwide, about 30% of all infant deaths in 2017. These issues are caused by a lack of time and money, poor nutrition, and unsafe water and sanitation.

Based on these facts, this study will focus on the issue of sanitation in developing countries and how to keep people's bodies and environments hygienic.

My previous research is on toilets in developing countries by Bill Gates et al. I found that various activities are currently carried out around the world to improve sanitation in developing countries. In Japan, private companies have been actively involved in donating toilets and supporting the improvement of sewage facilities in developing countries. As a result of these efforts, many toilets have been installed in developing countries. However, we have found that even after toilets are installed, people often stop using them.

According to a study by Bill Gates and his colleagues, the reason for this is the unpleasant odor that toilets emit. In developing countries where sewage systems and cleaning services are generally poor, it is difficult to keep toilets clean at all times. As a result, people stop

using toilets that emit unbearable odors. And a negative spiral has been established there, with local people using the water from those unsanitary rivers for daily life, which leads to the spread of diseases. To improve the sanitary environment, it is necessary not only to install toilets but also to solve the “odor” problem. And Bill Gates and his colleagues were studying solutions to these unpleasant smells.

Based on the above, I concluded that it is not enough to “spread toilets” as a solution to the issue of maintaining a sanitary environment in developing countries, but that other fundamental problems must be solved. Therefore, in this study, I decided to come up with a solution from a different perspective than toilets in order to maintain a sanitary environment.

Therefore, I decided to focus on “soap” in my research for the maintenance of sanitation. I set the research question as “How can we maintain a hygienic environment in developing countries?” and my hypothesis was “ Making soap more accessible to maintain a clean environment and body.

I will research current soap-related projects on the Internet and develop my own strategies. Then I will consider from various perspectives to make the method more feasible and make suggestions.

2.Discussion and implications

First, to answer the research question of how to maintain a sanitary environment in developing countries, I researched current efforts. One of them is “PGD21Ca” and a simple water filter developed by Nippon Poly-Glu Co., Ltd. However, in my research, I found that it would be difficult for us to implement solutions such as water purification devices to clean water that are currently being carried out mainly by the company. This is because it would be nearly impossible for ordinary people like us, who are not involved in the company, to work for the realization of the proposed measures on a large scale, as the company would do.

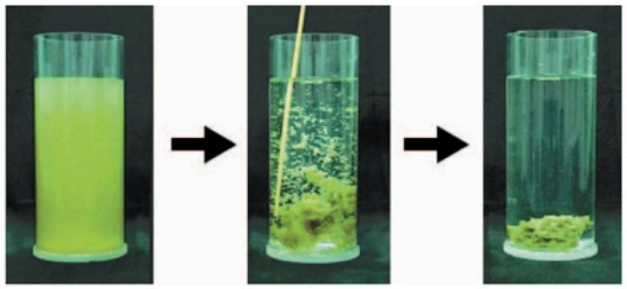
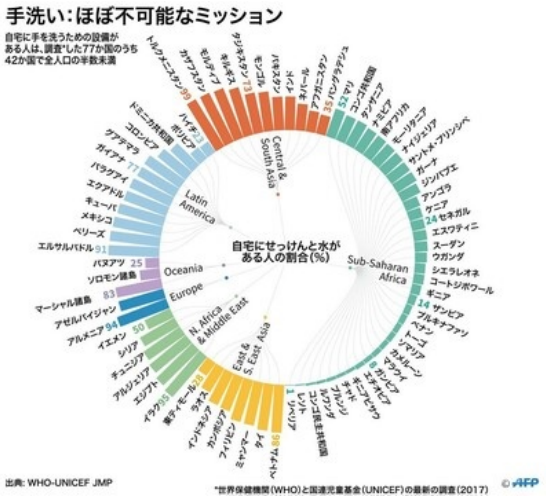


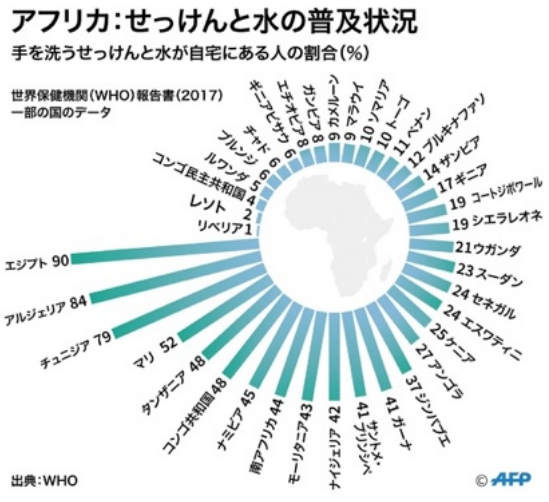
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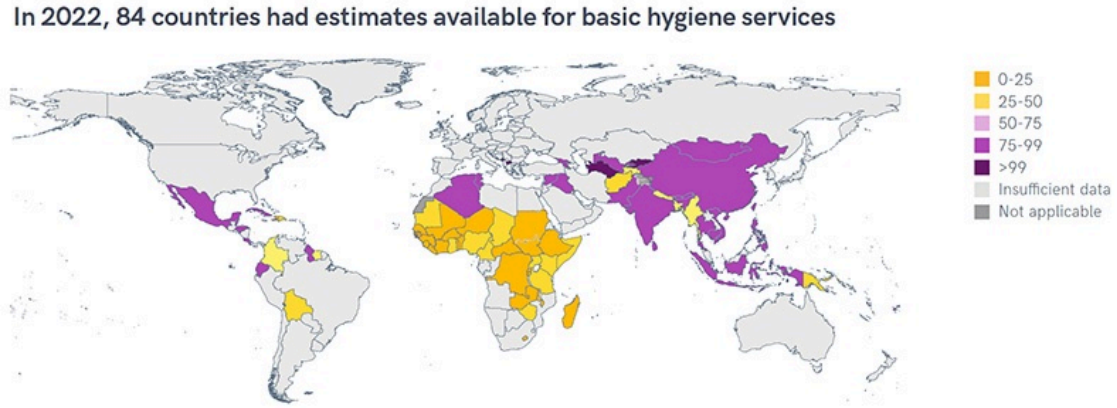


図6. 簡易浄水装置

Therefore, I focused on soap. First, I examined how widely soap is used around the world. The following figure shows that many people in developing countries, especially in Africa, do not have soap available to wash their hands at home.







Next, I researched efforts already done around the world about soap. First, I gathered information on two non-profit organizations that work together with hotels. Hotel bar soap, which is used only a few times during a stay, is collected and disposed of without being reused in most cases. According to the Global Soap Project, there are about 2.6 million soaps in the U.S. each day. On the other hand, as I have shown earlier, there are many children in the world who cannot afford to buy soap and die from unsanitary conditions. There seems to be a movement across the United States to do something as a solution to this waste and inconsistency. Two non-profit organizations, Global Soap Project and Clean the World®,are working with hotels. These organizations collect used soap that would be thrown away, remold it, and deliver it to people in need in countries, regions, and facilities where soap is not available.

First, I researched Clean the World®, a U.S.-based social enterprise that recycles soaps and amenities that would otherwise go to waste in the hospitality industry around the world. The recycled soap is distributed to children and families in poor sanitation environments. In addition to soap, the company also collects and recycles used shampoo, conditioner, and lotion. In exchange for a monthly fee of 65 cents to $1 per room from partner hotels, hotels are provided with collection boxes, posters, and other advertising materials, and Clean the World® is responsible for collecting and delivering the boxes to the storehouse. Soap is sometimes distributed disinfected and not remolded, but is tested by a state-certified laboratory, so there are no sanitation issues. So far, the company has partnered with more than 1,200 North American hotels, collected more than 600 tons of used soap, and distributed more than 9 million pieces of recycled soap to 45 countries, including the United States. In addition, they donated 7,000 pieces of recycled soap to Tohoku in the case of the Great East Japan Earthquake.

Clean the World®



Next, I looked into the Global Soap Project. In the Global Soap Project, the hotel pays for the collection of used soaps and their delivery to the warehouse, where volunteers separate the soaps by type, remove debris, and remold the soaps. The soaps are then inspected by a specialized organization for the existence of pathogenic organisms before being distributed to countries, regions, and facilities with the cooperation of NGOs. So far, the company has partnered with more than 300 U.S. hotels and distributed a total of 25 tons of recycled soap worldwide free of charge.

GLOBAL SOAP PROJECT

I also found an organization called Eco-Soap Bank. This organization recycles discarded soap from soap factories, distributes it to children and refugees in need in developing countries, and promotes proper hygiene education. In addition, the organization employs poor women in developing countries as “soap makers” who recycle soap. Since its establishment in 2014, the organization has distributed about 26.5 million soaps to 3, 500 schools and refugee camps.
It has also seen a 45% increase in the frequency of hand washing in Cambodia.





Next, I looked into the SAVE SOAP Project. This is a project established by ANGFA Co., Ltd. to improve the problem of infectious diseases in developing countries and to deliver ANGFA's idea of “preventive medicine” to as many countries and people as possible. The “SAVE SOAP Project” is an activity in which one soap is delivered to a child in Cambodia for every one bought.

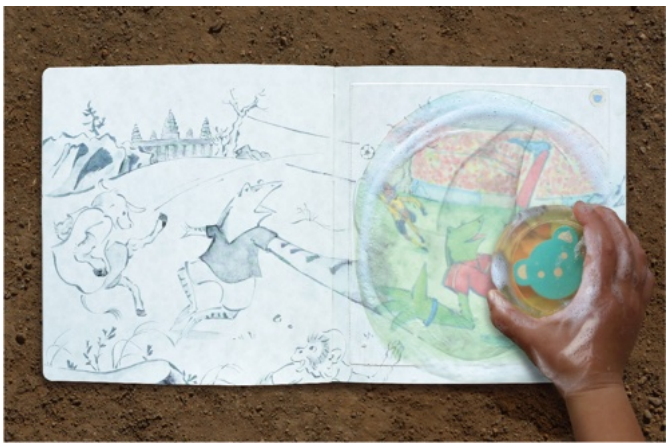




In addition, as a part of the SAVE SOAP Project, ANGFA will provide the world's first “Washable Book,” a picture book that can be read by washing with soap, to children in Cambodia at the same time with the distribution of soap. The Washable Book is the world's

first picture book that uses printing technology to create hidden color pictures which appear when water drips through the pages. The message of the book is “Wash your hands to prevent diseases and grow up for the future you want to achieve.” The picture book before getting wet shows the children's daily life in the present. When the dirty hands on the right page are washed clean with soap, a picture of a dream realized will appear. The goal is for children to experience and understand that by washing their hands while reading the picture book, they can prevent diseases and change the future.





From these actions which are already carried out around the world, I thought that in order to maintain a hygienic environment in the entire country, we need to work with hotels, companies, and governments to recycle and distribute soap, and to educate people about health and hygiene. I propose the solution to the research question, “How can we maintain a hygienic environment in developing countries?”and it is to promote soap by reusing soap within each country. In this research, I will propose an approach to use soap to prevent infectious diseases and to enable developing countries to reuse soap in their own countries instead of only receiving it. Therefore, I decided to consider South Africa as the main target of this study. This is because the slums of Cape Town in South Africa have a poor sanitary environment, and many people die every year due to diarrhea, pneumonia, cholera, and other infectious diseases, while there are also some hotels in the country that are highly ranked, so I thought the country would be easy to recycle soap.

Also, I visited AI Medical Service in Singapore to learn about their innovations. The company has developed an AI that can be used for early detection, which can be a burden for doctors alone or they sometimes make mistakes and early treatment of cancer. Hearing about innovation,

I learned that different countries have different ways of thinking and that the processes and the time it takes to do the idea are very different. In addition,I learned that by collaborating with many universities and research laboratories, new issues can be discovered and the sharing of results can lead to a higher level of technology. Therefore, I would like to consider the content of our proposal using what I have learned from these experiences in Singapore.

3.Conclusion

I reached the conclusion to make soaps immediate for people in developed countries and make a system of reusing the soaps within each country.I will suggest the following system to make soap reused and become popular. The target in this system is South Africa.In addition to assistance from developed countries that are now participating in the recycled soap initiative, I have come up with an action to be taken within the Republic of South Africa.

First, volunteers in the country will sort, clean, and remold soaps that are planned to be disposed of in hotels as amenities in the Republic of South Africa.Those recycled soaps will be checked and tested by companies in developed countries, and then distributed to areas in that country and surrounding countries that do not have good sanitary conditions.The companies in developed countries that help will charge the hotels a fee based on per room or weight of soap collected. And the hotels will get advertising materials that will show that they are working to solve sanitation and waste problems.The benefits of this initiative are that soap originally scheduled for disposal can be used to improve sanitation. In addition, local volunteers can get jobs and hygiene education. Companies in developed countries can save costs by reducing the need for sorting and other labor that they had previously required. A portion of the reduced costs can be sent to the developing countries to be used as rewards for work and costs for sanitation education.

I also thought that a positive cycle could be created by having a process of reusing discarded soap within developing countries, rather than having distributed the soap tested and collected in developed countries.

Compared to previous efforts, there is more interaction between developing and developed countries and longer delivery distances, so I will have to think about the cost of such efforts in the future. The issues are whether the fees are high enough to make people in poverty feel willing to give up their current jobs to participate in the regenerative soap initiative, and whether there is enough money to pay for sanitation education. In addition, it is not clear whether soap is effective when used with contaminated water, and only countries where water is available but sanitation is not maintained were targeted, so the effectiveness of soap used with contaminated water is a future issue to study with a view to more developing countries.

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World's IT Engineers' Health: New Ways of Working

~ How to Protect the Health of IT Engineers and Make IT Technology Better ~

- IT Technology, Health, Labor -

5422 Hiroto Takano

1. Research Summary

With the rising awareness about health, I started this research because I learned that some people in the IT industry struggle to work healthily. My goal is to make a better and healthier IT industry where everyone can work without stress. The purpose of this research is to review the IT industry before we try to promote IT in developing countries. By doing this, we can make IT technology grow even faster. I will ask doctors, engineers, and business owners about their opinions, and I will read books and use the internet to collect information. My conclusion is that if we combine a daily pay system and success-based rewards, along with a hybrid system of contract work, a 3-day weekend, and task-based jobs, we can make the industry healthier. I also want to develop communication apps and health-check apps to support people’s well-being.

2. Background of the Research

Since the outbreak of COVID-19 in 2020, people's awareness of health has increased. At the same time, the role of IT engineers has become more important because AI is being used more. However, the IT industry is known for long working hours. The reasons for this are the shortage of workers and the many unexpected tasks in IT projects. As a result, engineers often work overtime to meet deadlines. The important issue is not just the increase in overtime; it is the physical stress caused by lack of sleep and free time. Many engineers develop mental health issues, especially depression, because of this stress. Some engineers take time off to deal with their mental health problems, which causes more work for the remaining workers. This leads to a negative cycle. This is stopping the further development of IT technology. I became interested in using information and medicine to solve this problem, which is why I chose this topic.

3. Purpose and Significance of the Research

Research Question: "What is the best way to work in IT to make the industry grow without harming people’s health?"

The purpose of this research is to demonstrate that working long hours and pushing people to work until they become ill will limit the growth of the IT industry. I believe that if we introduce a hybrid system of contract work, a 3-day weekend, and task-based jobs, it will solve the problem. Additionally, making it mandatory for workers to report their health conditions every day could help prevent both mental and physical issues.

4. Research Methods

I will use books and the internet to collect information and create my own ideas. During this process, I will also contact doctors and business owners by email or phone to get their opinions.

5. Research Results and Discussion

The main problems facing the IT industry are: labor shortage, working conditions, and international competition. By improving the working conditions, more people will want to join the IT industry, which will help address the labor shortage. Therefore, this research focuses on improving working conditions.
Now, let's look at the problems in working conditions:

Long working hours: In the IT industry, projects have tight deadlines, and engineers often have to work overtime to finish their tasks. This leads to physical and mental health risks. Unexpected challenges and changes in project requirements can cause even more overtime.
The structure of the IT industry: The IT industry operates in a pyramid-like structure. When more companies take on projects, the profits for each company decrease. Additionally, companies sometimes cancel or reduce projects, which leads to job loss.
Mental health issues: Many IT engineers do desk work all day long, staring at computer screens. This leads to a lack of exercise and high levels of stress. The rate of mental health problems is much higher in the IT industry compared to other industries.
Compliance: With stricter laws around intellectual property and security, companies are more careful about making sure their employees are not breaking any rules. This adds additional pressure to workers.
Foreign workers: Managing employees from different countries can also be a challenge.
Out of these problems, I will focus on the issue of mental health and stress. When engineers experience mental health problems, they may develop depression, which leads to time off work. If they cannot get the support they need, their health will get worse.

6. Conclusion and Future Challenges

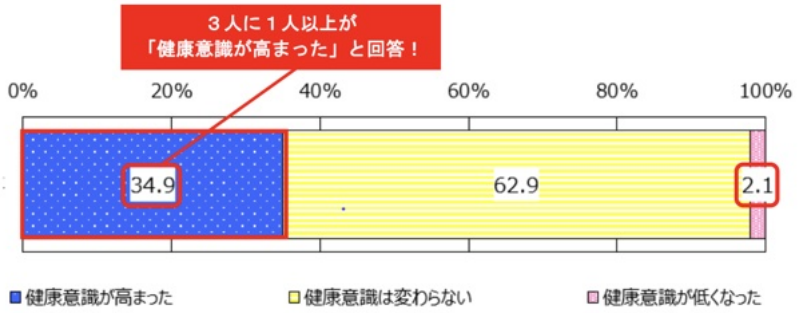
To solve the problems in the IT industry, I suggest a new working style. This style will include:

A hybrid system of contract work, a 3-day weekend, and task-based jobs (with limited overtime hours).
A daily pay system and success-based rewards.
Making health tracking applications mandatory to help monitor the physical and mental health of employees.
These changes will help create a healthier work environment, which will make IT jobs more attractive to new graduates. This will help solve the labor shortage, and make the industry

better and brighter. As a result, IT technology will grow faster, and more people will want to work in IT.
The challenge for the future is how to develop these apps and systems effectively.

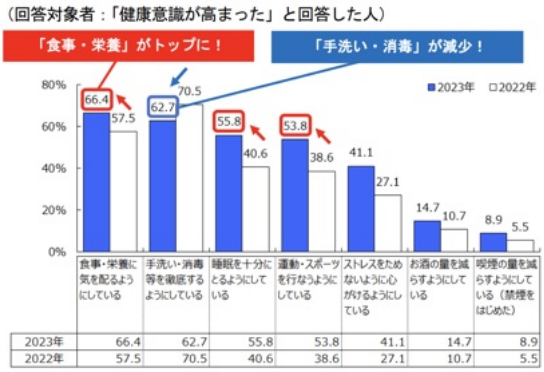
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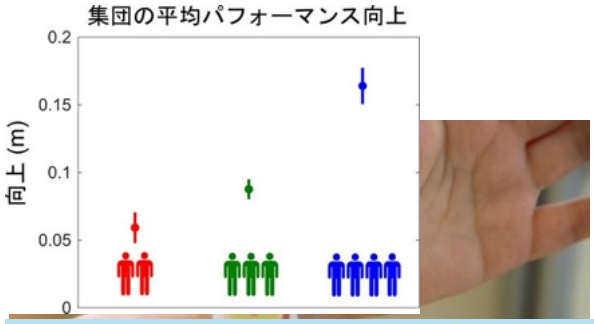
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Earth-Friendly Architecture

Using new building materials

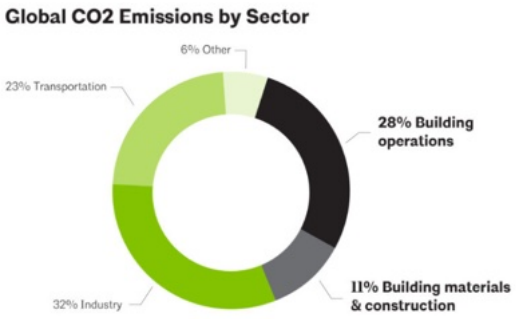
5423 Taniguchi Kokomi

Abstract

Architecture division occupies about 40% of the emission of CO2 in the world. The population is increasing. Unless architecture division reduces the emission of CO2, it would be hard to resolve environmental problems. The primary source of emission in architecture is consumption of electricity such as the use of heater, cooler, or light. However, we should reduce the amount of CO2 emitted when buildings are constructed,as the demand for new buildings continues to grow. Cement concrete, the main building materials used nowadays, emits a lot of CO2 when they are produced, while wood not only does not emit CO2 but also absorbs and fixes it. Moreover, if we use CLT, which are new materials made of wood, we can compensate for wooden building weaknesses like the rack of earthquake and fire resistance. However, this material needs high cost when we install it because it is new.

Introduction

In recent years, there have been numerous environmental problems. Actually, according to research, building operations account for approximately 40% of global CO2 emissions. Its primary emission sources are divided into two categories. First one is “operational carbon”. It is the CO2 emitted when a building is in use. For instance, it is created by the consumption of energy to heat, cool, light, and power a building. Second one is “Embodied carbon” that has been long overlooked. It’s all the carbon emitted before a building is occupied. In the next 10 years, embodied carbon will be responsible for 74% of all CO2 emissions of new buildings constructed during that period. Compared with operational carbon, this is a staggering number. The embodied carbon of concrete, steel, and aluminum alone accounts for 22.7% of global CO2 emissions, and most of it is from buildings and infrastructure construction. Unlike operational carbon, which can be reduced during a building’s lifetime, embodied carbon is locked in as soon as a building is completed. It can never be recaptured.



Additionaaly, the population in the world is increasing. It means that we need more buildings to live in. It is said that by 2060, the world is projected to add 2.4 trillion square feet of buildings—more than double the current global building stock.

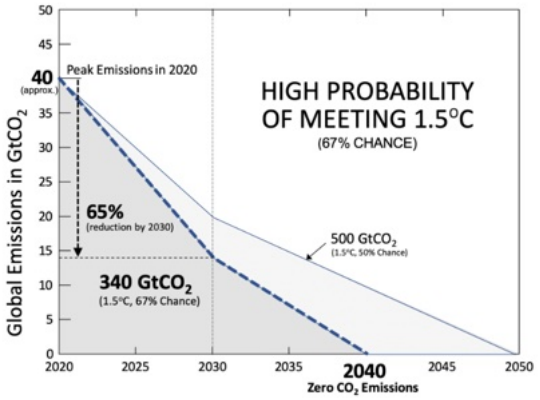
According to these studies, we must decrease the global emission of greenhouse gasses in building operations. We should establish earth-friendly building techniques as soon as possible.

According to the study by Emmanuel Augustine Etukudoh, “GREEN ARCHITECTURE AND ENERGY EFFICIENCY: A REVIEW OF INNOVATIVE DESIGN AND CONSTRUCTION TECHNIQUES”, there are four solutions. They are “passive design”, “Sustainable Materials and Construction Methods”, ” smart grid and building automation system”, and “Renewable Energy Integration”.

Using these studies as references, I will research what kind of method is effective to build earth-friendly buildings. Therefore, my research question is “What kind of building method is earth-friendly?” .

Discussion and implications

According to Blueprint For Better, it is said that embodied carbon will be responsible for 74% of all CO2 emissions of new buildings constructed during the next 10 years because of the increase in new buildings caused by population growth. Hence we should prioritize embodied carbon over operational carbon. I categorized the paper’s four solutions into the methods to reduce operational carbon and the method to reduce embodied carbon. The method to reduce operational carbon is passive design, smart grid and building automation system, and Renewable Energy Integration. The method to reduce embodied carbon is Sustainable Materials and Construction Methods. The reason why the Sustainable Materials and Construction Method is effective is that the main building materials used now are steel and cement concrete. They produce CO2 when they are made because they have to be passed through a high-temperature furnace. Actually, if we use 100% recycled aluminum for window frames and building exteriors instead of normal ones, we can reduce the emission of CO2 by about 75%. Furthermore, when we use wood, we can not only reduce the emission but also wood can absorb and trap CO2 during growth. The CO2 emission of architecture division in America is now decreasing by 18.9% than the level in 2005, even though building is increasing by 50 billion square feet. In addition, the seven- story wooden office building constructed by Sumitomo forestry can reduce 2,600 tons of carbon dioxide. Additionally wood, the building material, can fix 3,800 tons of carbon dioxide. Previously, there were restrictions on the construction of high- rise buildings in terms of earthquake and fire resistance. However, now, we can build high- rise wooden buildings by using new wooden material like CLT(Cross-laminated timber), made from several layers of solid wood panels bonded with a structural adhesive at alternating right angles. Using wood for building material can reduce the earthquake impact, because wood is less lighter than steel and cement concrete. The heavier building materials are, the stronger earthquake resistance we need. Furthermore, CLT itself is stronger and better earthquake resistant because of their structural adhesive at alternating right angles. The National Research Institute for Earth Science and Disaster Resilience experiment and checked CLT’s earthquake resident in 2015. This



experiment reported that CLT building was not broken despite the bigger impact than seismic intensity 7. It is said that CLT also has the advantage of superior fire resistance. The thick wood panels like CLT create carbonized layers on the surface when they are burned. This layer has thermal insulation. According to the experiment done by Japan Housing & Wood Technology Center, CLT burns 1 mm per minute, and if 90mm CLT burns, the wall will not burn through.

Conclusion

The earth-friendly building method is using wood as building materials. We can reduce environmental load by using wood when we construct new buildings because they can fix CO2. If we use new wooden materials, we can compensate for wood shortcomings such as the rack of earthquake resistance and fire resistance. In order to meet rising demand for buildings and reduce the CO2, we should take in new materials. However the price of CLT is more expensive than other materials. High prices may prevent the spread of CLT.

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Exercise for Health

The Relationships between Muscle and Health

5424 Koshin Tsunoda

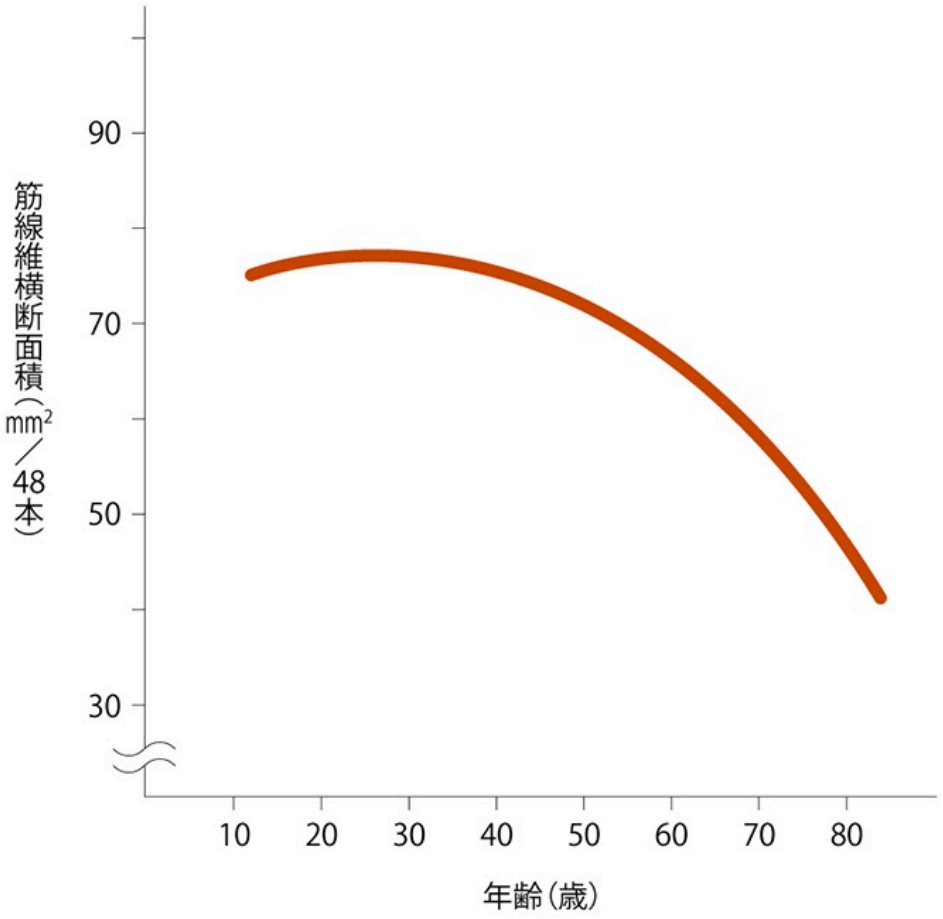
Abstrat

Introduction

I like to train muscles and I am a thrower in track and field. I want to live a healthy life and extend my healthy life span, and I want to know how muscle training is related to health. I also wanted to consider ways to address the problem of lack of exercise in this age of the Internet.

Discussion and Implications

Muscle is an essential organ for human activity. Therefore, I believe that muscle training is essential for humans to stay active.



This graph shows a change in thigh muscle thickness with age. Muscle volume decreases with age. At its peak, muscle volume is about 40% of body weight for men and about 35%

for women. However, muscle volume slowly begins to decrease after the age of 30, and by the age of 80, muscle volume is reduced to less than 70% of its peak level.
To stay healthy, it is important to build muscle.

Q13.運動不足を感じますか。 (%)

n=20,000		大いに感じる①	ある程度感じる②	感じる ①+②	あまり感じない	ほとんど(全く)感じない	感じない ③+④	わからない
全体		34.8	43.1	**77.9**	15.2	5.1	20.3	1.8
性別	男性	29.4	44.7	74.1	17.4	6.4	23.8	2.1
	女性	40.1	41.5	81.6	13.1	3.8	16.9	1.6
年代	10代	34.8	39.3	74.1	15.8	5.6	21.4	4.5
	20代	32.5	44.4	76.9	14.3	5.8	20.1	3.0
	30代	40.7	40.8	81.5	12.4	3.7	16.1	2.4
	40代	40.9	40.9	81.8	12.0	4.5	16.5	1.8
	50代	39.7	41.5	81.2	12.8	3.9	16.7	2.1
	60代	30.7	45.9	76.6	17.2	5.3	22.5	0.9
	70代	23.0	46.1	69.1	22.8	7.4	30.2	0.7
直近1年の運動頻度	週に5日以上	15.0	39.2	54.2	29.1	16.1	45.2	0.5
	週に3日以上	18.1	48.8	66.9	25.1	7.8	32.9	0.2
	（小計）週に3日以上	16.5	43.9	60.4	27.2	12.1	39.3	0.4
	週に2日以上	24.2	51.4	75.6	19.7	4.1	23.8	0.6
	週に1日以上	34.0	53.0	87.0	11.2	1.2	12.4	0.5
	（小計）週に1～2日	29.4	52.3	81.7	15.2	2.6	17.8	0.6
	（小計）週に1日以上計	22.4	47.7	70.1	21.7	7.7	29.4	0.5
	月に1～3日	47.4	45.9	93.3	5.8	0.7	6.5	0.2
	3か月に1～2日	57.2	37.7	94.9	3.9	0.7	4.6	0.5
	年に1～3日	55.2	36.9	92.1	6.4	0.7	7.1	0.8
	運動・スポーツはしたが頻度はわからない	37.9	41.6	79.5	12.2	2.4	14.6	5.9
	（小計）週1日未満・わからない	49.1	42.3	91.4	6.5	0.9	7.4	1.2
	（小計）この1 年間に運動・スポーツを行った	30.3	46.1	76.4	17.2	5.7	22.9	0.7
	この1 年間に運動・スポーツはしなかった・わからない	52.8	30.8	83.6	7.3	2.7	10	6.4

This graph shows 77.9% of respondents feel that they do not get enough exercise.
The proportion of those who do not feel inadequate in physical activity was 20.3%.
By gender, the proportion of women who feel they are not getting enough exercise is 7.5 percentage points higher than that of men.
By age group, more than 80% of those in their 30s to 50s say they do not get enough exercise.
By frequency of exercise, 94.9% of respondents “feel” they are not getting enough exercise on one or two days every three months in the past year, the highest percentage among all age groups.
In addition, working adults seem to be less likely to exercise because they do not have the time or space to do so. Lack of exercise makes them more likely to become obese, and obesity makes them more likely to develop lifestyle-related diseases. This means that exercise is linked to good health. So it is important to exercise voluntarily, and at the same time, it is necessary for society to create an environment conducive to exercise.

Conclusion

Leg and hip muscles are important for good health, because they are essential for humans to walk. In addition, it is important to exercise moderately; to exercise for a total of 60 minutes a week, every week, to the extent that you can catch your breath and sweat. Therefore we can see that we should do things like jogging, walking, yoga, stretching, or going to the gym on a daily basis. However, it is difficult for people today to take such time. Especially for working people, it is even more difficult to find time for exercise because they are busy with work and do not have enough time to sleep. Moreover, some people work at a desk and keep the same posture for a long time, which makes it easy for them to become inactive.

In order to continue exercising, it is important to enjoy it. For example, make a group of people to exercise with, do the exercises you like, and prepare a reward. While these are things that each individual can do on his or her own, the use of applications or other means to assign points to people based on their exercise records would help spread exercise throughout society.

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How to Deal Safely with Pesticides

To Reduce the Risk of Pesticide Residues as much as Possible

5425　時松史臣

1.Abstract

Last year, I researched Japanese farmers, and I wanted to do research on agriculture again this year. Then I got interested in pesticides. And I decided to research pesticide residue, a problem when pesticides are used. Pesticide residues are pesticides that remain on harvested crops. Continued eating of foods with pesticide residues can cause various effects on the body, including physical symptoms such as dizziness, nausea, skin rashes, fever, and thirst. In addition, the effects of pesticide residues are not limited to the physical but often extend to the mental health as well. I found out through my research that there is a residue level for pesticides called ADI in the world, and imports are banned based on whether or not they meet this level. However, the standards vary from country to country, causing problems such as the inability to import products because the standards in one's own country are met but not in the other country. Therefore, I suggest that the standard values for residue levels be standardized around the world. However, this has already been considered around the world, and it has not worked out well because of the risk that farmers in countries with stricter standards for pesticides will reduce their production and income. Therefore, I focused my attention on substandard vegetables, which are expected to increase when the use of pesticides is reduced. In the U.S., there is a service that sells substandard vegetables at a lower price than the list price, and I thought that by introducing such a service worldwide, more vegetables could be sold and the decline in income could be reduced. Also, as another suggestion, I suggest that establish pesticide residue levels for all crops. Doing so, Currently, the positive list system sets uniform standard values for many pesticides, but we thought that if there were pesticides that could be used in greater quantities than the current standard values without harming health, vegetable production would increase and farmers might be able to earn more money.

2.Research Background

I have been doing research on pesticides all this year, and at first I wanted to think about pesticides that would not harm the human body or the environment by removing the toxicity contained in them, but as I continued my research, I realized that almost all ingredients are toxic and that I could not do it on my own due to my lack of knowledge on how to neutralize them. I could no longer do it on my own. Therefore, I changed my theme and focused on pesticide residues, which have become a problem with pesticides.

3.Purpose and Significance of the Study

Pesticide residues are not currently treated as a particularly serious problem. However, we thought that food production might not be able to keep up with population growth and climate change in the future. We expected that the use of more pesticides for mass production would increase the risk of pesticide residues. Therefore, we would like to study the dangers pesticides pose and make some recommendations.

In this study, we would like to propose countermeasures against pesticide residues so that we can reduce health hazards and accidents.

4.research methods
1,Find out what pesticide residues are
2,Find out examples of pesticide residue incidents
3,What is the problem in the world?
4,Think about the proposal

5.Research Results and Discussion
1. Pesticide residue is the pesticide left on crops and other materials as a result of the use of pesticides. Continued consumption of food with pesticide residues can have various effects on the body. Physical symptoms such as dizziness, nausea, skin rash, fever, and thirst may be symptoms of pesticide poisoning. In addition, the effects of pesticide residues are not limited to the physical, but often extend to the psychological as well.
2. Currently, no concrete number of damage caused by pesticides can be found when researching the number of people affected, and it is thought that there may be almost none in the world as a whole. Therefore, I would like to propose that pesticide regulations be firmly established so that in the future, when food shortages occur due to population growth or wars, pesticide abuse will not cause harm to the human body even if crops can be grown.
3. Problems in the world
1) The fact that each country has a different ADI for pesticides.
ADI is ... translated as “acceptable daily intake. This means the maximum daily intake of an individual pesticide active ingredient that is considered to have no adverse health effects even if taken daily over a person's lifetime.
The types and amounts of pesticides used differ due to differences in climate, climate, and types of pests. Therefore, the ADI differs from country to country, which causes problems when importing or exporting products.
(An actual example: Chinese carrots were imported into Kagoshima Prefecture in violation of the standard values.
Positive List System
The Positive List System is a system in which a standard value of 0.01ppm is uniformly set for all pesticide residues.
This system itself is not a bad thing, but it would be possible to grow crops more efficiently if proper standard values were set for all pesticides instead of relying on this system.

6.Conclusion and Future Issues
I have two proposals to address this issue.
The first is to establish common residue levels for pesticides in all countries. This approach is being considered around the world, but when a certain standard is set, countries with higher standards will be able to use more pesticides, while countries with lower standards will be able to use fewer pesticides, resulting in lower production and more crops with poor shape, color, and size. Crops that are misshapen cannot be sold and are thrown away, resulting in reduced income for farmers. Therefore, we believe that selling such misshapen, out-of-spec

vegetables will help farmers reduce their income. There is a service in the U.S. called “imperfect produce” that purchases out-of-spec vegetables from farmers and sells them at 30-50% off the regular price sold in supermarkets. If such a service is introduced in each country and out-of-specification vegetables, which are increasing due to a decrease in the use of pesticides, are sold, we believe that the decline in income can be suppressed and residue standards can be adjusted.
The second proposal is to set standards for all crops. As mentioned earlier, some agricultural products do not yet have a clear standard value, but a uniform standard value is applied to them under the positive list system. If there are crops for which the use of pesticides can be increased by setting those standard values, we thought that the production of those crops could be progressed. If there were crops that could be produced in greater quantities than under the positive list system, it would lead to an increase in farmers' income and bring us closer to the realization of the first proposal.
In addition, it is important to incorporate pesticide residue on vegetables into our daily lives by “soaking in running water,” “pickles,” and “boiling” as we can do to remove pesticide residue.
The challenge is to establish a global standard, which is expected to take a lot of time and cost.

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To Ensure that Everyone can Receive Medical Care with Peace of Mind
To improve the insurance system in Côte d'Ivoire

5426 Negishi Mika

Abstract
I went to Singapore on a school trip this year. Visiting hospitals, I learned that Singapore's healthcare system is highly regarded worldwide for its efficiency. I then wondered if that system could be applied to Africa, where insurance systems are still in the process of spreading. We conducted a survey of insurance systems in the target countries and came up with a system that could solve the current problems by applying mobile money and Singapore's healthcare system from abroad.1. Introduction
In October of this year, I visited Singapore. Singapore is a country that has a high reputation worldwide for its medical insurance system. I learned more about the system and wondered if this system could be connected to the improvement of insurance systems in developing countries. I looked into the insurance systems in Africa, and found that there are countries that do not have insurance systems in the first place, and others that do have insurance systems, but the penetration rate among the population is low. One of the reasons for this is the lack of bank accounts. Therefore, we decided to conduct research based on the hypothesis that mobile electronic money, which originated in Kenya, could be utilized in insurance systems. The target countries were selected from among African countries with infant mortality rates of 50%, average life expectancy of less than 60 years, and cell phone ownership of more than 90 per 100 cases, among which Cote d'Ivoire was selected because the latest information was available.

2.Discussion and Implications
Land and Nature
Land area is 322,436 square kilometers (equivalent to about 90% of Japan)
Population is 24.29 million (2017, World Bank estimate)
Most of them live in the southern part of the country.

Economic Situation
Following the end of the civil war that lasted almost nine years since 2002, real Gross National Products (“GDP”) grew by 8.3% in 2016, according to the International Monetary Fund. growth was high at 8.3% and remained at 7.8% in 2017, indicating that the economy is recovering and growing well.
According to the UNICEF Annual Report 2017, the percentage of people living below the international poverty line (US$1.90 per day) in Cote d'Ivoire was 29% in 2010-2014, lower than the Sub-Saharan African average of 45%, but the benefits of economic recovery are not being felt. The literacy rate among young people (aged 15-24) was 59% for males and 47% for females from 2011-2016, far below the Sub-Saharan African average of 79% for males and 72% for females. This is a generation that has been deprived of primary education due to civil war. This poverty and low educational attainment tend to be disincentives for disease prevention and health promotion, and lower levels of maternal and child health care.

Disease structure

Infectious diseases, maternal and child diseases, and malnutrition are the leading causes of disability and death, accounting for 63% of the burden of disease, down from 72% in 1990. In addition, the number of non-communicable diseases (NCDs) has also declined. In addition, non-communicable diseases (NCDs) are increasing due to urbanization and unhealthy lifestyles, creating a double burden of disease.5 Key health indicators such as maternal, neonatal, and under-five mortality rates are all worse than the sub-Saharan average. At the same time, the table below shows that, although the proportion of maternal and child health-related and communicable diseases is decreasing in 2019 compared to 1990, the structure of the major causes of death has not changed, while the number of deaths due to NCDs is also increasing.

Mobile Phone Penetration Rate

In Cote d'Ivoire, the ICT sector accounts for 70-8% of GDP, 90% of the population owns a cell phone, and Internet use is spreading rapidly. On the other hand, digitization of public services has lagged behind, and the government is promoting digitization of health care under the policy of PND2016-2020, “Integration of ICT use in all areas of national life.

表 1-9　5 歳未満児死亡率（出生 1,000 対）の地域比較

地域	1998-1999年	2005年	2011-2012年	2016年
中北部（Centre-Nord）	N/A	83	74	未掲載
南西部（Sud-Ouest）	N/A	156	75	未掲載
北部（Nord）	N/A	130	209	未掲載
アビジャン（Abidjan）	118.2	103	97	未掲載
全体	180.7	125	108	96

出典：EDS 1998-1999年、2005年、2011-2012年、MSHP資料

表 1-8　乳児死亡率（出生 1,000 対）の地域比較

地域	1998-1999年	2005年	2011-2012年	2016年
中北部（Centre-Nord）	N/A	59	43	未掲載
南西部（Sud-Ouest）	N/A	123	51	未掲載
北部（Nord）	N/A	78	137	未掲載
アビジャン（Abidjan）	80.0	67	69	未掲載
全体	112.2	84	68	60

出典：EDS 1998-1999年、2005年、2011-2012年、MSHP資料

表 1-7　新生児死亡率（出生 1,000 対）の地域比較

地域	1998-1999年	2005年	2011-2012年	2016年
中北部（Centre-Nord）	N/A	30	23	未掲載
南西部（Sud-Ouest）	N/A	59	18	未掲載
北部（Nord）	N/A	38	86	未掲載
アビジャン（Abidjan）	46.6	37	46	未掲載
全体	62.2	41	38	33

出典：EDS 1998-1999年、2005年、2011-2012年、MSHP資料

注1　：1998-1999年及び2011-2012年は、実地調査期間が両年にわたっていることを意味する。

表 3：医療従事者の保健州別の分布状況（2017 年）

	保健州	各医療従事者1人あたりがカバーする人口の数		
		医師	看護師	助産師[10]
1	ABIDJAN 1-GRANDS PONTS	7, 790	3, 332	1, 400
2	ABIDJAN 2	5, 266	3, 300	1, 245
3	AGNEBY-TIASSA-ME	8, 922	1, 992	1, 246
4	BELIER	6, 817	1, 890	1, 227
5	BOUNKANI-GON-TOUGO	14, 971	2, 799	2, 185
6	CAVALLY-GUEMON	20, 496	4, 055	2, 380
7	GBEKE	12, 828	3, 034	1, 494
8	GBOKLE-NAWA-SAN-PEDRO	18, 765	4, 117	2, 327
9	GÔH	12, 116	2, 337	1, 368
10	HAMBOL	11, 890	2, 781	1, 603
11	HAUT SASSANDRA	18, 032	3, 243	1, 817
12	INDENIE DUABLIN	9, 071	1, 809	1, 227
13	KABADOUGOU-BA- FING-FOLON	8, 831	3, 104	1, 508
14	LÔH-DJIBOUA	16, 472	2, 671	1, 402
15	MARAHOUE	17, 623	2, 856	1, 904
16	N' ZI-IFOU	10, 912	2, 448	1, 643
17	PORO-TCHOLO-GO-BAGOUE	18, 760	3, 954	2, 550
18	SUD-COMOE	5, 646	1, 605	917
19	TONKPI	15, 782	3, 203	2, 207
20	WORODOU-GOU-BERE	14, 518	3, 804	2, 062
	合計	7, 390	2, 335	1, 333

出所：Plan de Développement des Ressources Humaines pour la Santé 2018-2022 に基づき調査団作成

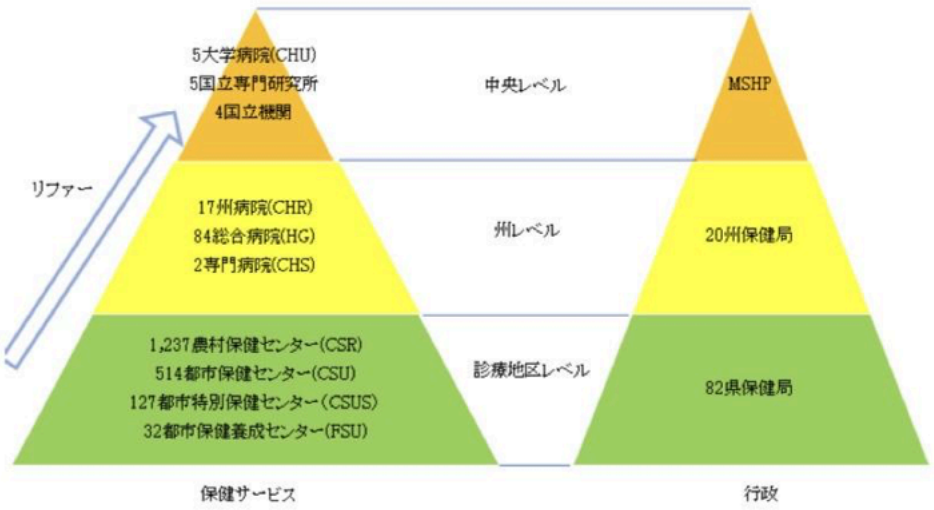


図 1-1 保健医療サービス提供体制

出典：PNDS 2016-2020

表1-12 公的医療施設数年次推移

施設種別	2014年	2015年	2016年
CHU	4	4	4
HG	84	84	82
CHR	17	17	17
一次医療施設	1,860	1,964	2,023

出典：MSHP、保健の現状年次報告書 2015年、2016年

In Côte d'Ivoire, there is a health administrative division with the MSHP at the top, in addition to the local administrative divisions. According to the National Health Development Plan (Plan National de Développement Sanitaire 2016-2020, hereafter “PNDS 2016-2020”), the national health administration is divided into 20 health provinces (Régions Sanitaires). According to the National Health Development Plan (Plan National de Développement

Sanitaire 2016-2020, hereafter “PNDS 2016-2020”), the nation is divided into 20 health provinces (Régions Sanitaires), which are under the jurisdiction of the State Health Department (Directions Régionales de la Santé), an agency of the MSHP. Under the MSHP, there are 82 health districts (Districts Sanitaires), which are under the jurisdiction of the Directions Départementales de la Santé (Provincial Health Departments). The health service delivery system in Cote d'Ivoire is a pyramid system as shown in the figure below. The top referral tertiary care facilities are the four university hospitals (Centre Hospitalier Universitaire, hereinafter referred to as “CHUs”) in the Greater Abidjan area, the CHU in Bouake, and five tertiary care facilities in the Greater Ivory Coast area. The top referral tertiary care facilities are four university hospitals in the Greater Abidjan area (Centre Hospitalier Universitaire (CHU), Bouake CHU, five national specialized laboratories, and four national institutions), which are located directly under the MSHP as independent administrative entities. Secondary health care facilities - 7 - include 17 State Hospitals (Centre Hospitalier Régional, hereinafter referred to as “CHR”), 84 General Hospitals (Hôpital Hôpital, hereinafter referred to as “Hôpital”), 17 CHUs (CHUs) and 5 National Specialized Institutes in Bouake. 84 general hospitals (Hôpital Général, hereinafter referred to as “HG”) 84 general hospitals (Hôpital Général, hereafter “HG”), 2 specialized hospitals (Centres Hospitaliers Spécialisés, hereafter “CHS”). These are supervised by the respective state health departments. Primary health care facilities (Etablissements Sanitaires de Premiers Contacts, hereinafter referred to as “ESPCs”), which are supervised by the respective state health departments. The ESPCs include 1,237 Rural Health Centers (Centre de Santé Ruraux, hereafter “CSR”), 514 Urban Health Centers (Centre de Santé Ruraux, hereafter “CSR”), and 1,967 Primary Health Care Facilities (Etablissements Sanitaires de Premiers Contacts, hereafter “ESPCs”). The ESPC includes 1,237 rural health centers (Centre de Santé Ruraux, hereafter “CSR”), 514 urban health centers (Centre de Santé Urbain, hereafter “CSU”), 127 special urban health centers, and 1,967 rural health centers. 514 urban health centers (Centre de Santé Urbain, “CSU”), 127 special urban health centers (centres de santé urbains spécialisés, “CSUS”), and 32 urban health training centers (centres de santé urbains spécialisés, “CSUS”) The FSU includes 127 Centres de santé urbains spécialisés (CSUS), 127 Centres de santé urbains spécialisés (CSUS), and 32 Formation Sanitaire Urbain (FSU). These primary health care facilities are located in the prefecture. These primary health care facilities are under the supervision of the provincial health department.

表 14：一人当たりの保健支出の推移（ドル換算）

指標/年度	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
一人あたりの経常保健支出（CHE）	74.05	74.29	76.09	72.76	80.53	63.51	67.48	69.77	72.17	75.09
一人あたり国内政府保健支出（GGHE-D）	9.85	9.80	12.82	14.24	16.78	15.87	17.33	20.04	20.98	21.84
一人あたり自己負担（OOPS）	43.33	43.99	40.17	40.86	41.19	27.05	27.00	27.36	28.35	28.00

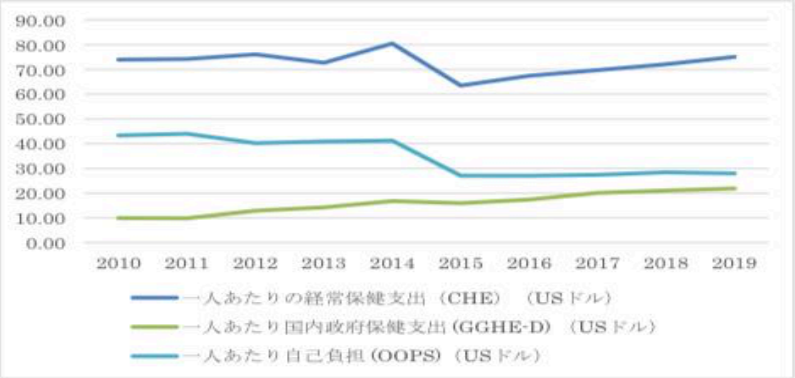


図 8：一人あたりの保健支出の推移（グラフ）

出所：世界銀行データベースより調査団作成

表 13：主な保健財政指標(2018 年)

指標	コートジボワール	セネガル	ケニア	サブサハラ・アフリカ平均	低中所得国平均	低所得国平均
①GDP に占める経常保健医療支出（%）	4.19	3.98	5.17	5.16	4.1	5.23
②GDP に占める国内政府保健支出（%）	1.21	0.95	2.18	1.92	1.47	1.12
③1 人あたり国内政府保健支出（米国ドルレートドル）	20.71	14.00	37.24	30.25	35.35	7.19
④政府支出における国内政府保健支出	5.07	4.26	8.55	n/a	5.62	n/a
⑤経常保健医療支出に占める利用者自己負担（%）	39.43	55.89	23.62	33.39	51.23	43.41
⑥経常保健医療支出に占める国内民間保健支出の割合）（%）	58.87	62.50	42.35	51.41	61.15	49.73
⑦経常保健医療支出に占める自発的健康保険支出の割合（%）	7.49	4.21	9.78	n/a	n/a	n/a
⑧経常保健医療支出に占める海外援助（%）	12.32	13.72	15.51	12.26	2.66	29.5
⑨社会保険の経常保健支出に占める割合（%）[84]	1.20	3.52	12.42	n/a	n/a	n/a

出所:①~⑧世界銀行データベース（2022年） https://data.worldbank.org/topic/health、⑨WHOデータベース
World Health Organization Global Health Expenditure databaseより調査団作成

Existing insurance plans

表 20：医療保障スキームの比較

スキーム	(1)CMU 一般基本スキーム（RGB）	(2)CMU医療補助スキーム（RAM）	(3)公務員向け健康保険	(4)民間給与所得者等向け健康保険	(5)特定ターゲット無料医療プログラム
対象	全国民、ただし困窮層として別スキーム対象となったものを除く	困窮層（保険料を支払うことが困難と認められた層）	公務員、政府職員	民間給与所得者	妊産婦 5歳未満 マラリア 急患
実施機関	IPS-CNAM	IPS-CNAM	MUGEF-CI	IPS-CNPS	MSHPCMU
財源	保険料	税（MEPS事業費、IPS-CNAM向け補助金）	税と公務員給与	雇用主と給与所得者	MSHPCMU予算
資金プール	CNAMの基金	CNAMの基金	MUGEF-CIが運営するプールおよびCNAM基金	CNPSの運営プールおよびCNAM基金	税
サービスの購入					
パッケージ	パッケージは表21にて記載	RGBと同様	RGBと同様のサービスに加えてMUGEF-CIでの追加サービスが可能	RGBと同様のサービスに加えてCNPSでの追加サービスが可能	産前健診、出産（帝王切開含む）5歳未満の児童の診療、マラリア
提供体制	CNAMの認定した公立および公目的の民間病院および薬局	RGBと同様			公立施設
支払い方式	対象者は窓口で3割負担し、施設がCNAMに7割請求	対象者は無料、保健施設はCNAMに全額請求			窓口負担は無料で施設が保健省に請求

出所：調査団作成

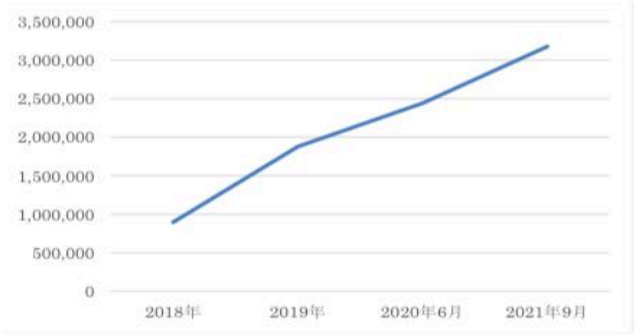


図 20：CNAM 登録者数の推移

出所：世界銀行によるCNAMへの質問票（2021年9月）をもとに調査団作成

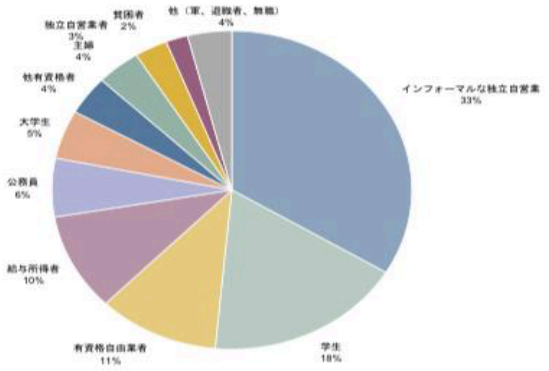


図 21：CNAM 登録者カテゴリー別内訳

出所：世界銀行によるCNAMへの質問票（2021年9月）をもとに調査団作成

As of September 2021, there were 3,175,000 people enrolled in the CMU system. Of this total, 2,091,000 (70% of the registered population) have received a registration card (to be brought or presented when receiving services at CNAM-registered facilities), and only 140,000 have actually received services, indicating that services are not being provided very well. Figure 20 shows the number of registrants, and Figure 21 shows the breakdown by category as of the end of September 2021. The categories are based on the categories socio professionnelle used by the CNAM. The number of registered workers is dominated by "Profession liberale informel" (informal self-employed), students, and other qualified free-lance workers (Auto ayant droit). Unfortunately, the definitions of this socio-professional classification were not available, so it is unclear where the agricultural workers described by CNAM are classified, but it is assumed that they are either "informal independent self-employed" or "qualified self-employed". In addition, the population groups assumed to be salaried workers (10%), civil servants (6%), and their families (housewives and students) have also been registering. The number of people in need accounts for 2% of the total enrollment. On the other hand, the beneficiaries of the actual treatment and provision of medicines are mainly public officials (52% of the subsidies for the purchase of medicines and 35% of the treatments are for public officials). In this regard, there is a discrepancy between expectations and reality as insurance. There are several reasons for the lack of registration. First, many rural populations are unable to meet the requirements for birth certificates and other necessary documents, and there are delays in the issuance of such documents by the companies that handle the registration process, as well as the time and effort required to receive the cards. In addition, it is reported that the range of benefit packages available to citizens is narrow and they are unable to use the services they desire, and that there are few facilities to register or that services are poor. As for the RAM scheme for the needy, as of September 2021, there were only 40,000 cardholders and 1,600 actual service beneficiaries, and there were many cases where cardholders were denied services due to lack of thorough information at the facilities.

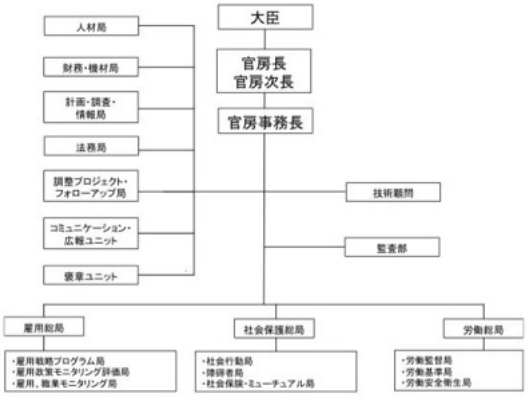


図 22：雇用・社会保護省　組織図

出所：MEPSホームページを基に調査団作成

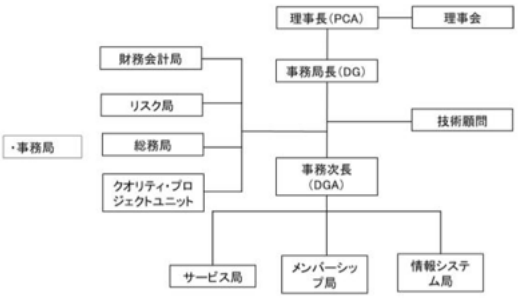


図 23：CNAM の組織図

出所：IPS-CNAMホームページ

表 23：CNAM財務計画

10億FCFA

CNAM の財務計画	2020	2021	2022	2023	2024
収入総計	38.6	33.2	44.1	54.8	65.5
保険料収入(C)	33.6	29.3	39.8	50.2	60.6
RGB 保険料収入	26.4	20.6	27.1	33.9	41
RAM 補助金	8.7	8.7	12.7	16.3	19.6
運営補助金	3	3	3	3	3
金融収入	0.5	0.9	1.3	1.6	1.9
支出総計	30.3	20	20.5	33.7	50.1
保険金支払い (P)	23.2	12	12.5	23.7	38
運営費	7.1	8	8	10	12.1
保険金 - 保険料収入(C-P)	10.4	17.3	27.3	26.5	22.6
収支	8.3	13.2	23.6	21.1	15.3

出所：DPBEP2021-2023および2022-2024より作成

Issues in the Implementation Structure
The ministry in charge is not clear.
Policies for membership expansion and regional expansion are not clear
Expansion of membership among the poor is lagging behind
As a young organization, there are still concerns about the organization's capacity
⇒There is a high possibility that the operation of the system is not thorough due in part to the perception that “=> will not be able to receive actual services ”113. The contract for issuing health insurance cards has been awarded to SNEDAI, which has been contracted to issue the

cards for 7 years starting in 2015; the contract expires at the end of 2021 and must be renewed, but IPS-CNAM needs to budget for and continue the program since the government has directly contracted and implemented the program. However, according to IPSCNAM, 4 billion FCFA per year are required, including personnel costs for 280 people dispatched from SNEDAI, and the current operating budget is 7-8 billion FCFA per year, which limits financial capacity, so the continuation of card issuing operations is an issue at hand.

3. Conclusion

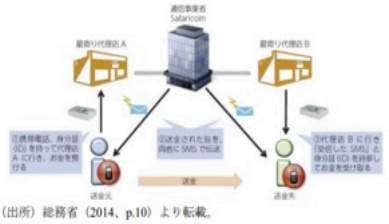
(1) Transition to compulsory funded insurance

A proposal to shift to a compulsory funded insurance system, following the example of Singapore's insurance system, at the current stage when insurance registration is still not very advanced, for the reasons that the payment of insurance premiums is not balanced with the actual spread of services, lack of public confidence in CMU, and prevention of future national financial strain. This will aim to make insurance premiums affordable and in line with each person's salary. In addition, the government budget will be used to pay interest in order to build public confidence in the insurance system.

(2) Use of mobile money

The mobile money system will be used to eliminate delays in issuing cards, reduce labor costs, and expand enrollment in rural areas that do not have the necessary documents. A mechanism is needed for organizations to transfer money to the people's mobile money accounts when needed. Mobile money is unique in that it can be used on any mobile device with basic functionality, which is an important element of financial inclusion in developing countries. The ability to use mobile money not only on expensive smartphones, but also on inexpensive feature phones with simple functionality has facilitated the spread of mobile money in developing countries. USSD is a message exchange technology on the network standardized in the GSM17 and 3G specifications and compatible with all types of cell phones, making it a good fit for mobile money.

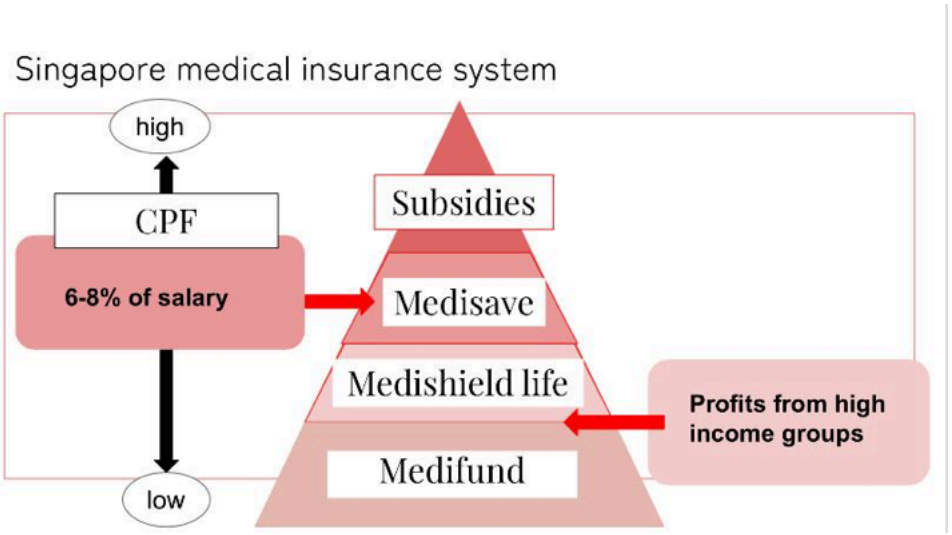
図表 5：モバイル送金の仕組み



（出所）総務省（2014、p.10）より転載。

図表 6：セッション開始後の操作画面イメージ





(3) Fundraising through donations from other countries

Singapore's medical insurance system includes a free medical insurance program called medifund, which is limited to low-income people with no co-payment. The source of this funding is the revenue from providing high quality medical services to high income groups. This would be equivalent to the free health care program (Gratuité Ciblée) for the target population in Côte d'Ivoire. Before the CMU was established, the government had been implementing a free health care program since 2012 to reduce the patient burden and to combat specific demographic groups and diseases, including childbirth (including routine checkups and C-sections) and treatment of children under 5 years old. Malaria care and treatment is free of charge for all. However, according to the World Bank (2020), this free health care program is inefficient and does not work in practice. The report states that underfunding, delays in budget allocation, and stock-outs of medical supplies hinder efficiency. The report also states that the free medical care program has had a negative impact on patients who are unable to receive medical care at primary facilities due to stock-outs of medical supplies, etc., and are referred to higher-order medical facilities without referral, increasing congestion at higher-order facilities. The government also admits that the budget for the free medical care program is insufficient. According to the government, the implementation of the free healthcare program is estimated to cost 41.5 billion FCFA in direct costs alone (excluding CMU), but the budget for the past three years has ranged from 15 to 18 billion FCFA, indicating that the budget is under allocated. The pace of increase is also sluggish. In order to prevent this revenue shortfall, we propose that donations from other countries be allocated directly to low-income groups as premiums. In addition, we will continue to report the breakdown of how the donations were spent to the donors in order to sustain the donations over the long term. (Make sure they are notified?)

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Enriching the world with physics

~Is physics necessary for world development?~

5427 Kihiro Fuse

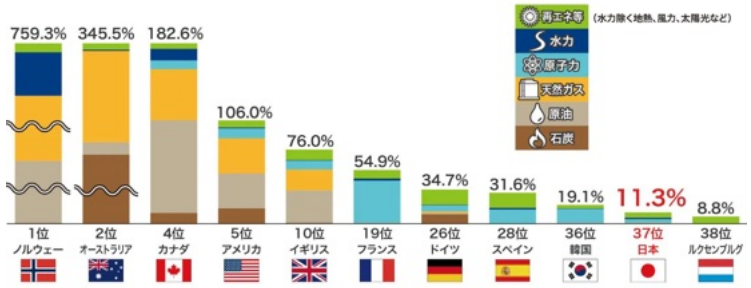
Abstract

When I was interested in physics, I wanted to know the photoelectric effect. One of the famous examples of the photoelectric effect is photovoltaics. In this study, I aim to consider what is needed for the development of the world by photovoltaic power generation. However,it is difficult to create a new way to produce electricity by using sunlight so I considered a way to use it effectively. Creating a system that collects the world's electricity and distributes it to countries where there is a little energy.

1. Introduction

It is certain that physics has enriched the world. Therefore, by searching for what is needed in this world and what can be done in physics this project aims to consider how it can be used to improve the world from one's own perspective.

According to 2017 data, energy self-sufficiency in major countries is shown in the figure below.



This figure shows that the world's energy is mainly coal, crude oil, and petroleum gas. It also shows that the top countries have high self-sufficiency rates, while the others of the world have low self-sufficiency rates. Photovoltaic power generation can generate a lot of energy, so I think it will be needed in the future.

However, there are some challenges in current photovoltaic power generation.

First, the time to generate electricity is limited . In addition, the amount of power generated is unstable because it is affected by weather conditions.

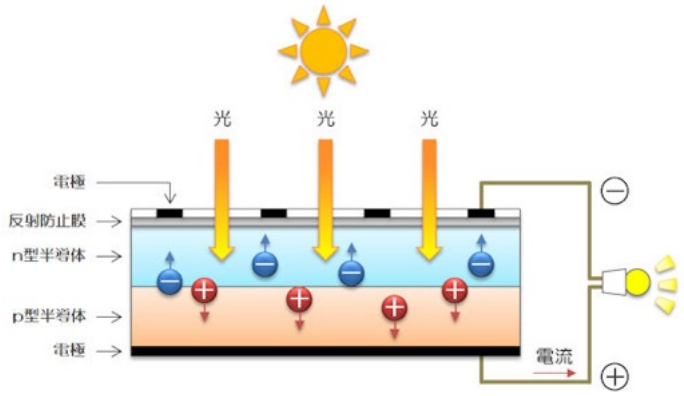
Second, the conversion efficiency is lower than other forms of power generation.

2. Discussion and implications

1. How does photovoltaic power generation work?

Photovoltaic power generation is a way of power generation that uses the electromotive force generated by sunlight to generate electricity. There are some factors to be considered to make this method efficient, including installation location, use of materials with high conversion efficiency, and maintenance. I considered the installation location for efficient

power generation. First, I investigated the mechanism of photovoltaic power generation. When sunlight hits a solar panel made of n-type and p-type semiconductors, the photoelectric effect occurs. Then, electrons charged with negative electricity gather in the n-type semiconductor and holes charged with positive electricity gather in the p-type semiconductor, and it forms a positive pole and a negative pole. This causes the flow of electricity as electrons are able to move through the conductors. (Figure 1)



Therefore, it is suitable for generating electricity in areas with long hours of solar radiation in order to generate a lot of electricity. (Figure 2, Figure 3)

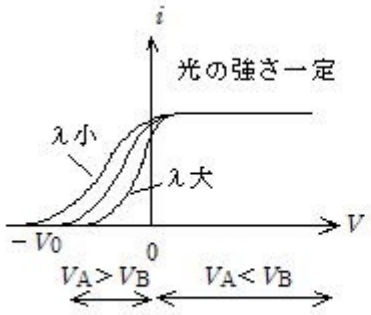


図2

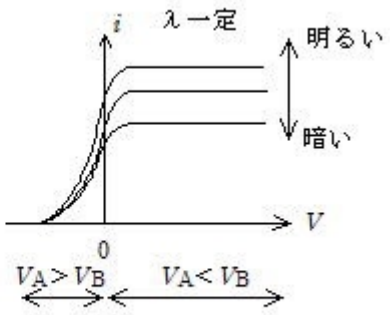


図3

Therefore, I thought that solar power could be generated efficiently by using such land. While some foreign countries trade electricity between nearby countries. However, Japan is an island so making such trade is difficult. However, if such trade becomes possible at low cost, the percentage of renewable energy in Japan will increase.

2. Challenges

1. Unstable power generation

Photovoltaic power generation uses sunlight to generate electricity, so it can only generate electricity during the daytime when the sun is shining. In addition, the amount of electricity generated depends on the month due to climate.

2. low conversion efficiency

The conversion efficiency of photovoltaic power generation is about 20%, while other major types of power generation include thermal power generation at 40-60%, wind power generation at 30%-40%, hydroelectric power generation at 80%, geothermal power generation at 20%, and biomass power generation at 20%.

3. The Future of Photovoltaic Power Generation

There is an increasing need to improve the conversion efficiency of photovoltaic power generation because a decarbonized society is needed. The first way to solve the problem which is mentioned in sention2 is to improve power generation by generating power in locations where more sunlight is shining during the daytime. In addition, some companies are working to improve conversion efficiency by using new materials for photovoltaic panels, and this is being developed all over the world. I believe that this will be solved in part by future developments in physics.

3. Conclusion

In this study, I mainly focused on photovoltaic power generation. Photovoltaic power generation is one of the renewable energy sources, and I considered how to generate power and how to make good use of it. In order to increase its efficiency, it is a good idea to create a system to cooperate with other countries to take advantage of their places and produce electricity efficiently. In addition, the development of physics is necessary to further improve the efficiency of power generation and utilization. In the future, I need to investigate various problems to broaden and deepen my research.

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Children who will live in the future have the right to happiness

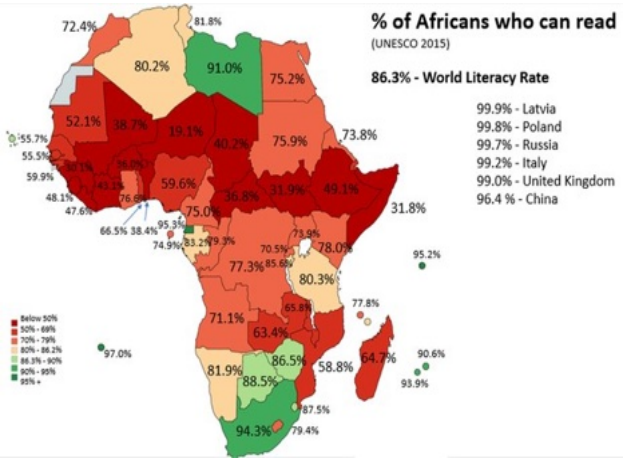
How can We Provide Educational Support to Many Children?

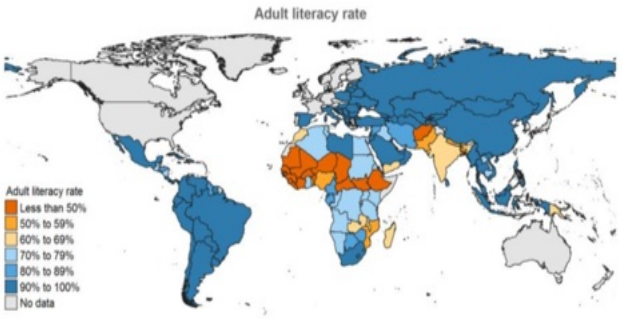
5428 星野有結美

Abstract
I will suggest DVD education and stationary bank.First I will talk about DVD education.If it could be used for education,It has the advantage of being more cost-effective than face-to-face classes.There are other options, such as remote classes, but remote classes are a less desirable form of education for poor families when monthly communication fees and other costs are taken into account. In addition, face-to-face classes require the construction of facilities, which is difficult from a financial standpoint.
There are precedents for DVD-based education, and results have proven that DVD-based education is effective, such as students entering universities.In addition, the system can be used over and over again, so that students can go back later to look at areas they did not understand.They can provide education to children at a lower cost than building schools or teaching classes remotely.
The Stationery Bank also collects stationery that we no longer use that could be reused and distributes it to children who are unable to receive an education through specific institutions. In this way, we believe that even children who are unable to attend classes due to lack of funds will be able to participate in them.
In these,I suggest two solutions.

Introduction
My mother works helping some children who have trouble.While I saw her,I was interested in education.Also,one of the reasons was that I saw my favorite artist donating to UNESCO.There I thought that I want to know about education around the world.I somehow know about education in Japan,but I have never been exposed to the world.Do you know how many children in the world are able to take some classes?Some children can’t take them even if they want to.When I know for real that they can’t take education,I want to research about education in the world.Also I want to suggest some solution that they can take.Many of the precedents for support were general, such as remote classes and donations. However, upon further investigation, it became clear that this type of support has its weaknesses. For example, most donations are made from items that are no longer needed by the recipients, which means that the recipients may not be able to use them.That is not considered to be the original purpose of the support. Therefore, in this study, we would like to consider support measures that would reduce such incidents as much as possibleTherefore, I would like to conduct my research with the goal of making a limited donation of stationery and creating an environment where local children can receive education on the spot.To this end, we will first gather information from the Internet and summarize in detail the precedents we can identify

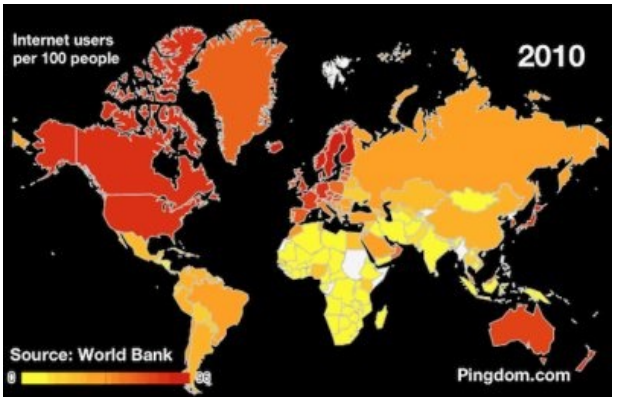
and their effects. Afterwards, we compare the information and examine the disadvantages of the measures in detail, and finally consider which measure is the most optimal. In this way, we will come to a final conclusion.





This graph shows the rate of Africans who can read.It was made by UNESCO in 2015.Almost countries in Africa have a low rate of Africans who can read.I will compare with developing countries.Actually,There are a number of countries with literacy rates below 50%.Lowing the literacy rate means not to provide to some children education.

After all, literacy rates in African countries are lower than in developed countries.Literacy rates are very low, especially in countries near the equator.These countries have some problems that they are poor and climatic.Then I have heard the cycle of poverty in Africa is a problem.I thought we should consider a proposal that would provide an environment where children can receive an education, even from poor families.



When I collected information,I found a way to use devices.For example,like remote classes.This has the advantage that even distant teachers can attend classes. We thought it would be good if children living in remote areas could take classes without having to go out of their way to go to school.However, there must be an Internet environment in order to conduct remote classes. According to Internet users per 100 people,Africa doesn't spread Internet.Also, there is the problem of having to purchase a device. This is not a very effective solution for children who cannot



attend school due to poverty.When we wondered if there was a way to reduce the burden on children and their parents in terms of remote teaching, we found an institution that was providing educational support in a certain way that was different from remotes. That method is DVD-based educational support.The advantage of DVDs is that they can be played over and over again and can be viewed by a large number of people at a single desk. The advantages of DVDs over remote learning are that they can be replayed without an Internet connection as long as there is a desk available, and they can also reduce labor costs by eliminating the need to hire a teacher for each class.However, there is a disadvantage in that it is not possible to ask questions, etc. However, since the fundamentals can be understood by watching the DVD, the aim of this project is to learn the basics first.DVD education is considered quite effective for acquiring basic academic skills.I would add that I would recommend watching the DVD with a large group of people. Not only does this reduce costs, but it has also been shown that teaching with others, as in the Learning Pyramid, increases retention. It is said to increase the learning retention rate to nearly 90%. We believe that the retention rate will increase if children who are unable to attend school gather together.
But,If it does that,we can't help with those projects,because we aren't teachers and don't have money,so I think that we will work with and support companies that collect educational DVDs. For example, when those companies want to advertise, we will cooperate with them, sending out information on SNS and distributing posters.For example, UNICEF is one such company.
Also,If DVDs don't correspond to various languages,some children can't understand each of the classes,so we will help to translate various language.If we do that,we can learn them.From what we have learned in Singapore, we think in a way that benefits both the client and the provider. As a company, it will improve its own image, and as a client, it will benefit from the education.

And the second solution is to promote stationery banks.Actually,Some children who are from poor countries give up on learning,because they don't have enough stationaries. The idea is to collect unused stationery from schools and other places and donate it to charity.When we can collect them,we send organizations that it send to poor countries,but If we send them to organizations,we have to pay money,because they cost to send them.We don't have enough money,so if we do that,we should solicit donations in the school like a red feather donations.It will be hard to donation.So we demonstrate some idea,we act them to be known this project.
Doing this project can provide some environment to learn.Also, regarding used stationery, since the regulations are not well defined, we will collect new items that have never been used.
Conclusion
No.1 We have to act specific companies to support education in developing countries.
Low cost and high return can be expected by utilizing DVDs. A single DVD can be used over and over again, and can be viewed in their own free time.
Also,we will work with and support companies that support some children who are from non developing countries.For example we do publicity and translate some languages.We can also learn to contribute to the company and our society and language skills.

No.2 We do that by collecting some unused stationally.
We collect some stationallies that we don’t need,after that,we send it to the organization that sent them.But we don’t have enough money to send to non developing countries,so use posters and broadcasts within the school to call out to others.

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～Promoting a path for society to participate in power generation～
RQ How can we promote avenues for us to participate in power generation in our society?

— Pressure Lack of energy Fit in with daily life —

5429 Eitaro Horikami

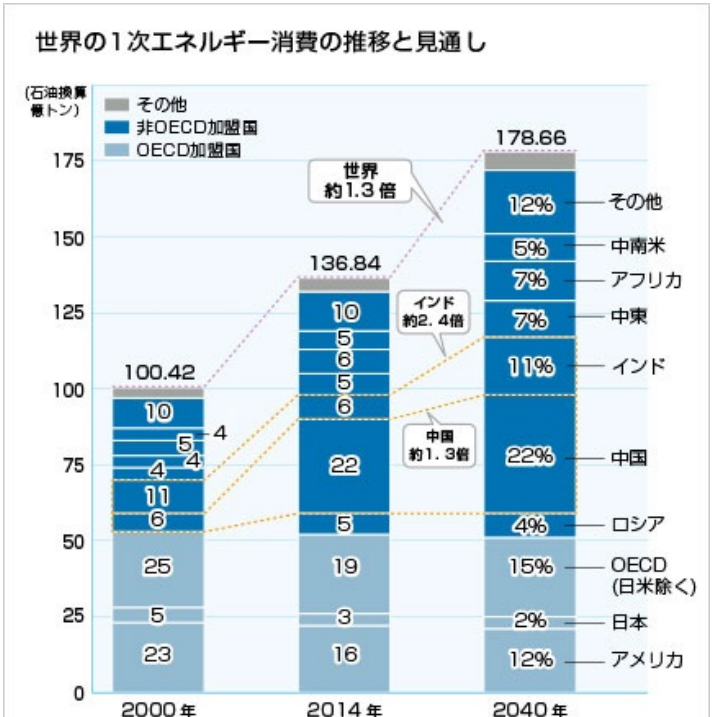
◯Overview

Approaches from diverse perspectives are needed in today's society, which is facing energy shortages due to rapid population growth. With the depletion of resources used for power generation also becoming an important issue, we believe that the effective use of renewable energy is the most important issue. Therefore, we focused on the “movement” of people, which continues to increase at an astonishing speed. We propose a method to utilize renewable energy on the “roads” that people around the world use to move around in their daily lives.

◯Motivation

I am interested in thinking about the structure of society, and have been researching ways to deepen the relationship between society and certain things under the theme of “Spreading Yaki Manju throughout Gunma” the year before last, and “Connecting Local Soccer Clubs and the Community” last year. This year, I would like to research energy issues, which happened to catch my attention when I was looking for a topic for my research. I would like to connect energy issues by closely relating them to society, and I will focus on “roads” that are built in every region of the world.

◯Objective



Global energy consumption is increasing every year; it is estimated to increase about 1.3-fold from 2014 to 2040. Thermal power generation accounts for much of the energy supply, and the earth's resources such as oil are threatened with depletion. The impact on global warming due to CO2 emissions from the use of fossil fuels will also increase. Against this backdrop, various measures are being taken, including renewable

energy. Although this energy problem concerns the entire human race, only a few people at power plants are actually active. Currently, the world population is 8 billion. If all of them could generate electricity, today's energy problems could be solved. So, I thought about the things that people use and are involved in every day. There are many different countries in the world, and the proposal needs to be tailored to the lives of people with limited patterns of behavior in their daily lives, such as developing countries, rather than developed countries. Therefore, I propose to use “roads” to generate electricity. Electricity is generated by people using “roads,” which are used in every country around the world, and the electricity generated by such a way is used in towns. This will reduce the amount of electricity that has to be provided by thermal power and other non-earth-friendly power generation. This could be used in any country in the world and would also help the development of the country. We would also like to clarify the issues of technology, cost, and necessary maintenance to install the equipment, so we proceed with our research.

◯Method

1Information Gathering
1) Is it possible to generate power on the “road”?
What methods of power generation can be used on the “road” and under what conditions will the “road” function?
2) Can the electricity be used in the town?

2Visit research institutions
1) Is there anything wrong with what you have researched and considered?
2) How can I make this research more practical and usable?

3Improvement
1) Based on the advice I received, I will continue to verify and improve my research.
2) Summarize the research results at the end.

◯Results

One of the main causes of energy problems is the shortage of electricity due to rapid population growth. I considered taking advantage of this situation by utilizing the movement of people and facilities for human movement to provide power. In addition, although developed countries obviously have larger populations than developing countries, 75% of the world's energy consumption and 73% of CO2 emissions come from developed countries. This leads us to believe that power should be generated in places with large populations in developed countries, which consume a lot of energy. If you imagine a place with many people, pedestrian crossings, concert halls, tourist attractions, etc., come to mind, but in all of these places, you can see that people are active on the ground. Therefore, we have come to the conclusion that the best way to generate electricity by making good use of population

growth is to generate electricity on the ground. When people move around, they use “roads”. Since roads are indispensable in our daily lives, we think that the best way to generate electricity is to use something familiar to us. Energy harvesting is an effort to find and generate energy from sound, heat, light, and vibration in everyday spaces. We will introduce two methods of power generation that are earth-friendly and can solve the problems of conventional renewable energy.



One method is to generate electricity by using gravity when people walk. A generator floor converts the vibration energy of a person or car into electrical energy. By using pressure for the piezoelectric element in the device, for example when a person rides on it, the pressure is efficiently converted into electrical energy. The British venture company that developed the floor power generation system has created a path on a London street called “BIRD STREET,” where you can hear the twittering of birds. The system consists of black triangular tiles covering an area of about 10 square meters, and the vibration energy of people walking on the tiles is converted into electric power, which is then used to generate the sound of the birds. We thought that by installing this system on the floors of facilities such as train stations, where the greatest number of people pass by, it would be possible to generate electricity more efficiently. We conducted an experiment at JR Tokyo Station, where power-generating floors were installed over a 90-meter stretch, including the ticket gates, to investigate the amount of power generated and its efficiency over several days. Tokyo Station is used by approximately 280,000 passengers per day, and the test results showed that the amount of electricity generated per day was more than 1,400 kW-second, which is equivalent to enough electricity to light LED lighting (40W straight tube) for approximately 17 hours.





The other is to lay solar panels on the road. MIRAILABO's photovoltaic road surface panels, mobiway, are load-bearing to withstand the loads of pedestrians and vehicles, and weather- and water-resistant to cope with Japan's four seasons. Solar Mobiway" road surface solar panels were installed on approximately 100 square meters each of a moderately trafficked roadway and sidewalk at the site of Oriental Land's headquarters in Urayasu, Chiba Prefecture. These roadside solar panels will be ready for practical use in 2025. If the roadside solar panels were used on a hypothetical 60-meter bridge, they would save the equivalent of 180,000 yen per year in street lighting. However, there is a problem that the efficiency of power generation is reduced due to problems caused by people and vehicles passing by, snow and cloudy weather and dirt caused by vehicles passing by, which is a serious concern due to the high cost of installation.

These power generation methods can be used for electronic billboards and street lights around roads, taking into account their installation on roads when they are put into practical use.

◯Suggestion

First, I propose that a large marathon be held on a path paved with vibratory generators. Marathons can be promoted by many companies and organizations. In this context, laying the generators on the road will appeal to the public, raise awareness, and lead to wider use. In addition, marathons are open to both adults and children, and can gain viewership through television broadcasts and other means. Large-scale marathons have a large economic impact. For example, the Tokyo Marathon had an economic impact of 30.9 billion yen, about 8.6 times the cost of running the event.The New York City Marathon held in the United States in 2017 had an economic impact of 43.7 billion yen. In addition, the electricity generated during the event can provide a portion of the region's electricity, and we believe that the event can generate more electricity in a shorter time and contribute to the status quo. However, the exchange of opinions brought to light a major issue. For marathon runners, power generators installed on the road are an obstacle, causing them to fall over and become fatigued. Therefore, we thought of a place where these problems could be eliminated and a lot of power could be generated. Therefore, we propose power generation on stairs. There are many staircases in Japan, and we think it would be a good idea to install

them especially in facilities and tourist attractions that are used by many people. Although less communicative than the first proposal, one of the major differences between a marathon and stairways is whether they are events or daily facilities. We think that staircases are a very good approach in terms of spreading the word in society as a path that can generate electricity and has the potential to be a daily source of power for the world.
These power generation methods are such a hot topic that even the United Nations is holding a conference on sustainable power generation methods. And although it is difficult to realize this technology at this point, we believe that it will be more effective if it is spread throughout the world, especially in India, which has a large population. In addition, as an effort to spread the technology throughout society, it would be a good idea to display the current amount of electricity generated on a given day on an electronic bulletin board in places that are easily seen by people, such as stadiums and train stations. Therefore, we believe that we can spread power generation in society in which we can participate through initiatives that utilize vibration power generation and its technology. In the case of JR Tokyo Station, 280,000 people walk through the station every day, and the amount of electricity generated is very small, only enough to light one LED light for 17 hours. The power generation equipment is very expensive, and with current technology, it could easily take several years for the developers and the companies that cooperated in the project to actually make a profit. The piezoelectric element, which is the material used, is also a resource that has not been studied in detail. However if there is a shortage of resources when it begins to be used around the world in the future, it may suffer the same fate as fossil fuels, which are currently a major energy issue. Since there are still two major concerns, I would like to clarify these issues in my future research and find a better way to deal with energy problems.

◯Literature

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Ikaho Onsen

How to improve the carbon dioxide emissions trading

To keep our beautiful earth for the future

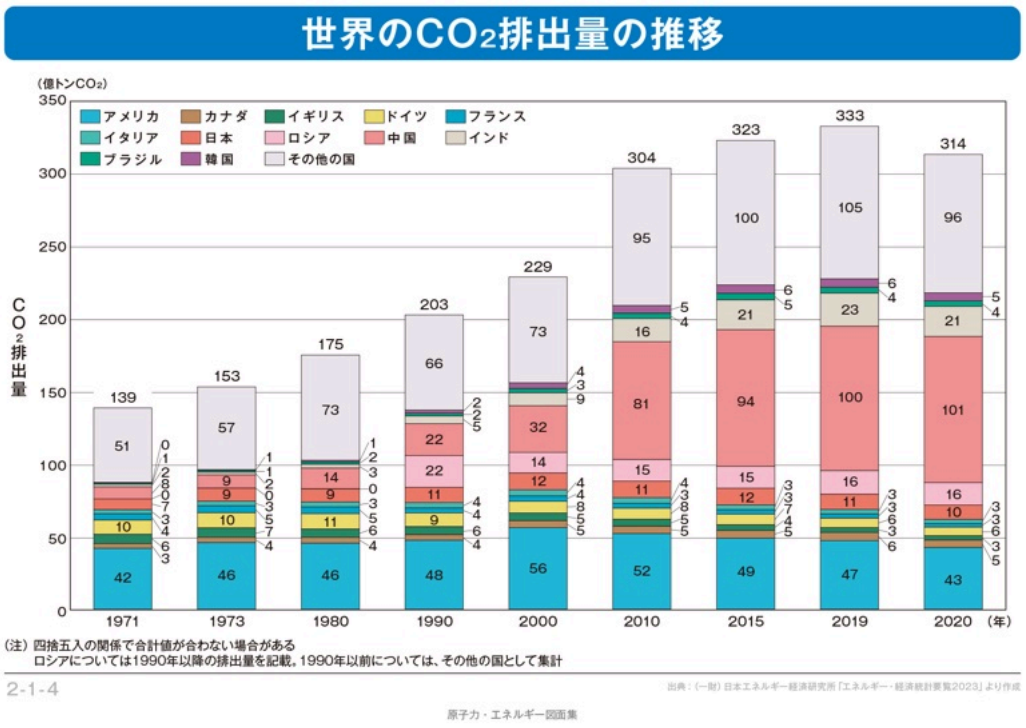
5430 Honma Ayato

Abstract

These days,many countries are compelled to find a solution to global warming because of the increasing carbon dioxide emissions and most companies have to do it because they emit a lot of carbon dioxide.In such a situation,companies attract attention to the carbon dioxide emissions trading.I began this research with the goal of spreading this initiative worldwide to stop global warming and to increase interest for the issue. The research question is “Does carbon dioxide emissions trading have the power to stop global warming?” After searching for information, it was found that trading of carbon dioxide emissions between individuals was needed. The proposal for the practical application of carbon dioxide emissions trading was prepared based on current policies and reference papers.

1,Introduction

In recent years, global warming caused by carbon dioxide emissions has become an issue around the world.Although countries are making efforts to curb emissions, the amount of emissions is still high.So, further actions are needed. In recent years, many companies and individuals have begun actual efforts to reduce CO2 emissions as a countermeasure against global warming. In order to curb emissions of greenhouse gasses, which are believed to be the cause of global warming, companies started CO2 emissions trading which is a scheme allocated a quota of CO2 emissions in advance. In a scheme,companies that emit more than the quota are required to pay a fee to companies that emit less than the quota. If a company emits less CO2 than the quota, it can sell the surplus to other companies that emit more CO2 than the quota. This system has been popular in many countries in recent years, and we will continue our research on this system this year.



Purpose and significance

Research Question.

"Does carbon dioxide emissions trading have the power to stop global warming?"

CO2 trading has been attracting attention in many countries in recent years, and trading between companies is beginning to take place. However, there is still no effort for trading among individuals. I will focus on this issue and conduct research to realize CO2 trading among individuals and households. The ultimate goal is to establish a mechanism for CO2 trading among individuals and to conduct CO2 emission trading in a global network.

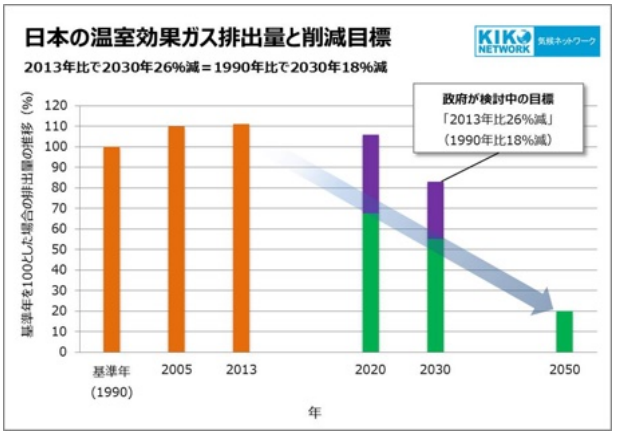
Method

1,Gather information with using the Internet
2,Formulate research questions
3,Conduct research based on the research questions
4,Conclude the final proposal

2, Discussion and Implications

○Global Warming Countermeasures of Japan

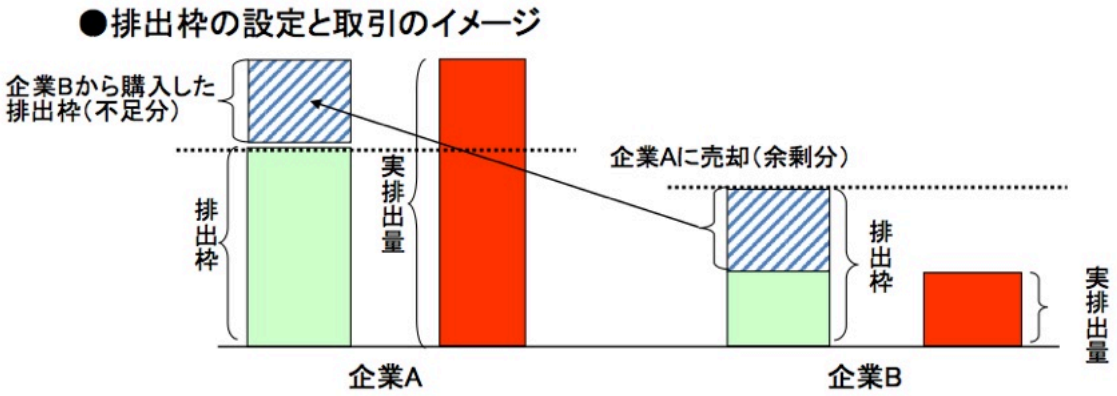
First, we examined the current status of CO2 emissions in Japan and the world. Japan currently emits 1.044 billion tons of CO2 annually, which ranks 5th in the world in terms of CO2 emissions. The Japanese government is implementing various policies with the aim of reducing emissions in 2030 by about 50% from the 2020 level and achieving a carbon-neutral society by 2050. To achieve this goal, companies are beginning to take the lead in carbon dioxide emissions trading.



○What is carbon dioxide trading?

Carbon dioxide emission rights trading (hereinafter referred to as "CO2 trading") is a system in which companies are allocated a maximum amount of CO2 emission rights in advance in order to reduce emissions of greenhouse gases which are considered to be a cause of global warming.Currently, this system is implemented in 40 countries around the world, and in all countries in the EU region. However, only four of the top 10 CO2 emitting countries in recent years have adopted this system, which means that the system has not been put into practical use yet. If all of the top 10 countries in terms of CO2 emissions were to implement this system, and if they succeeded in reducing their CO2 emissions by about 30%, they would be able to reduce their CO2 emissions by about 6.555 billion tons, which is about 15% of the world's total CO2 emissions. However, according to Japanese statistics, 20% of all CO2 emissions come from households, and this can be expected to be the trend in all countries. Therefore, it is very difficult to achieve a large effect with the current corporate-centered approach to CO2 emissions trading, which requires efforts not only by

companies but also by individuals. This leads to the conclusion of this study's research question, “Does CO2 emissions trading have the power to stop global warming?



<u>○Proposal for Practical Application of Individual CO2 Trading</u>

The first and biggest problem in starting individual CO2 trading is how to set household CO2 emissions in detail. Compared to a company's emissions, household CO2 emissions are very small and detailed. So it is impossible to keep track of all of them. Therefore, a global standard for CO2 trading is needed. The first example of an actual standard is to calculate CO2 emissions from the three elements”electricity,gas, and gasoline”.Then,they record them by linking them to personal information, such as the My Number Card in Japan.The information is used for smart transactions with the Internet. The system is based on the information that is recorded and used to make smart transactions over the Internet. In addition, a market will be created for each region based on climate as a market where each individual trades CO2. Since the amount of electricity and gas consumption is highly dependent on climate, trading between regions with different climates will result in a large disparity. Therefore, it would be better to create multiple markets in each country and link them together worldwide, similar to the current securities trading system for CO2 trading. In addition, there are multinational companies that operate in China and other countries overseas. For such companies, it would be possible to equalize the advantages and disadvantages of each country by calculating CO2 emissions in the country where the company is headquartered, rather than conducting transactions in the country where the factory is located. Simultaneous CO2 trading between individuals and between companies can be expected to greatly reduce CO2 emissions worldwide, and the CO2 trading system could be a major trump card to stop global warming.



3,Conclusions

CO2 trading is currently only a corporate initiative, and its effectiveness is quotaed; CO2 trading will not stop global warming as it stands. Therefore, it is necessary for CO2 trading to be conducted on a global basis. Only when CO2 trading between individuals and between companies is conducted together will CO2 trading be able to stop global warming. Future issues include the creation of standards for individual transactions and how to disseminate these standards to other countries around the world.

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Transportation in the Future

How to introduce eco-friendly and low-cost transportation

5431 Mayuzumi Fuki

Abstruct

This study compares various transportation methods, focusing on their advantages and disadvantages, in order to think of what transportation to introduce. Trains and subways are fast and safe, they are costly to build. Buses are easier to implement but contribute to greenhouse gas emissions. Ropeways, however, are cheap, eco-friendly and space-efficient, making them a good transportation to introduce. Although ropeways have some problems, like stability, speed, and disaster resilience, Zippar technology is improving their stability and speed. To make ropeways a global transportation solution, further work is needed to deal with its weakness to disasters.

Introduction and meaning

Today, the number of elderly people is increasing rapidly, not only in Japan but in many developed countries. According to the cabinet office in Japan, though car accidents are decreasing year by year, looking at the number of them caused by elderly people, it isn't decreasing. This means the ratio of the number of car accidents caused by elderly people to the whole number is getting higher and higher. That's why many people say elderly people should make their car licenses invalid by themselves. However, for most of them, who live in the countryside, it is very difficult to go out without the car, because of the inconvenience of public transportation in the countryside. Thus, to reduce car accidents, we have to construct convenient public transportation not only in urban areas but in rural areas. Actually, I was writing about the problem only in developed countries, but the idea that we have to construct it can be said in developing countries, too. Many people there carry things by their hands and move on their feet, because of its poor infrastructure. This is way too far from the efficiency that developed countries have. For this reason, developing countries do need cheap and easy transportation, too. We must think of this.

Body

First, let's compare some kinds of transportation respectively.

Hearing the word "public transportation", most people would come up with trains or buses at once. Some might come up with subways or monorails, too.

Each of them has its own features, and they must have both good and bad dimensions. I thinking of trains and subways, actually they have the advantages in swiftness and safety, but they cost too much; they cost 30 billion dollars per kilometer to construct. Buses can be introduced easily, but they can't run without the road, and what is more, they emit mass greenhouse gas. From these examples, I find that we need transportation that doesn't need vast land, much money and doesn't emit a lot of greenhouse gas.

Thinking of these requirements, I take a look at ropeways. Actually, they are compact and emit little greenhouse gas. Moreover, they cost much cheaper than any other transportation; one-fourth of LRT, one-tenth of monorails and one-thirty of undergrounds do. Ropeways are already introduced in some cities, including La Paz, Bolivia, known as the highest city in the world. Thus, they introducing them to other places mustn't be so difficult.
Though ropeways have a big advantage in eco-friendliness and ease of introduction, they have some problems: stability, swiftness and ability to deal with disasters.
The first two ones can be solved easily. A new ropeway Zippar, which Zip Infrastructure is developing, can do. They use two wires and enhance stability very much. Also, Zippar can move by themselves, unlike ordinary ropeways. It can move at the speed 1.5 times as fast as ropeways can do, with the same cost as them. However, they still have a disadvantage in its ability to deal with disasters, like earthquakes and typhoons.
Zippar is a wonderful eco-friendly transportation which is easy to introduce and useful in both developing countries and developed countries. Spreading this technology can enhance a level of infrastructure in the whole world. In order to do this, firstly we have to think about the solutions to solve its weakness towards disasters.

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How Should We Deal With Passive smoking?

Improvement of Smoking Areas and Alternatives to Cigarettes

5432 Yamaki Kei

Abstract

Passive smoking is estimated to be responsible for 600,000 deaths worldwide each year. Diseases caused by passive smoking include stroke, ischemic heart disease, lung cancer, and sudden infant death syndrome. This study was initiated to publicize the dangers of passive smoking. We believe that it is important to improve smoking areas and research alternatives to cigarettes, and that we should seek ways to coexist in order to protect nonsmokers, rather than forcing smokers to quit. As for improvements to smoking areas, ventilation fans and air passageways are required to address the problem of smoke flowing to outside smoking areas and harming passersby.
As an alternative to cigarettes, e-cigarettes are promising and are considered to have less impact on the surrounding environment because they do not contain toxic substances.
E-cigarettes are popular mainly among young people and less so among the elderly.
In conclusion, we suggest improving smoking areas and promoting the use of e-cigarettes to prevent passive smoking, and improving facilities by introducing a feedback system.

1 Introduction

It is estimated that passive smoking causes 600,000 deaths worldwide each year. Diseases caused by passive smoking include stroke, ischemic heart disease, lung cancer, and sudden infant death syndrome. I began this research to bring the dangers of passive smoking.
I decided that we must consider efforts to reduce secondhand smoke, so I decided to research and compile information on improving smoking areas and alternatives to cigarettes.I disagree with the idea of forcing people to stop smoking because I realize the low social status of smokers and want to reduce their frustration. We need to protect non-smokers from harm in order to coexist. Smokers use cigarettes for enjoyment the same way we drink coffee. Many non-smokers believe that it is okay for someone else to smoke as they please as long as they don't mind. I believe that coexistence is possible.I will proceed with my research as follows.
1.Consider the issues of smoking area
2.Research alternatives to cigarettes

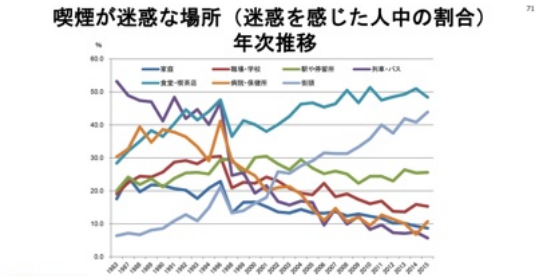
2 Discussion and implications

1.Consider the issues of smoking area
Considering the places where smoking is a nuisance, diners and coffee shops were the most common, followed by the streets. The current situation in outdoor smoking areas is that smoke flows and causes damage to civilians, and we believe that ventilation fans and air passageways should be secured. In addition, the number of non-smoking areas has increased, which makes areas more convenient for smokers.

Regarding smoking at home

Air purifiers can only remove the particulate component and odor of cigarette smoke; gaseous substances are re-emitted into the air untreated. Ninety-seven percent of toxic substances pass through untreated air.

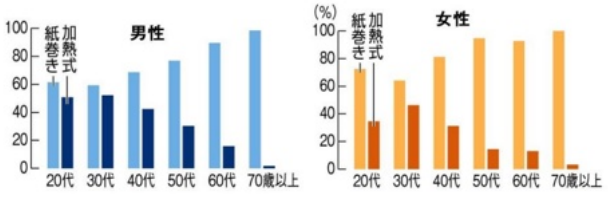
Cigarette smoke is dispersed from smoking areas even when doors are closed and ventilation is provided.



2.Research alternatives to cigarettes

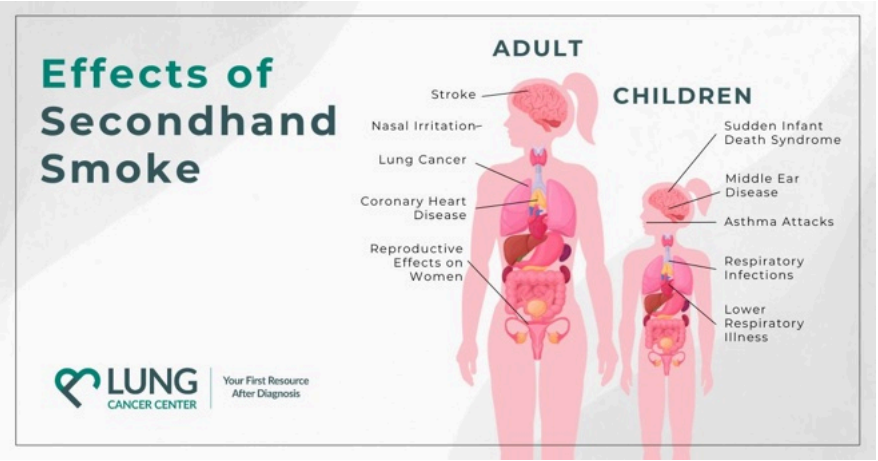
Regarding alternatives to paper cigarettes, there are a variety of cigarettes (electronic, heated, cigars, shisha, and smokeless), and heated or electronic cigarettes in particular were thought to be a good alternative. Heated cigarettes are less smelly cigarettes, but they usually contain toxic substances, which would not be suitable for my study. E-cigarettes are very good as they do not contain toxic substances and do not bother others, as can be seen from the table below. I also found that the prevalence of e-cigarettes is about 30%. The reason for this is that most people who use e-cigarettes are young people, and the elderly who have smoked paper cigarettes for a long time do not use e-cigarettes.

	紙巻タバコと同様	加熱式タバコ	電子タバコ	紙巻タバコ
タバコ葉		使用	使用しない	使用
有害化学物質		あり	あり	あり
ニコチン		あり	なし（海外はあり）	あり
充填液		一部製品で使用	使用	不使用
燃焼		なし	なし	あり
タバコ事業法		対象	対象外	対象
タバコ税		あり	なし	あり
ニコチン・タール量表示		なし	なし	あり
外部加温装置		使用	使用	使用しない
煙・エアロゾルの発生原理		加工されたタバコ葉を加熱	味のついたプロピレングリコール等を熱コイルで蒸気にする	タバコ葉の燃焼



3. the effects of passive smoking

Passive smoking is defined as carcinogenic. As the table below shows, the damage caused by secondhand smoke is several times greater than that of the smoker himself/herself. Studies have also shown that passive smoking increases the likelihood of developing cancer by 1.3 times. 16.7% (2019) (27.1% for men and 7.6% for women) of the total population smoke cigarettes. Furthermore, a look at the percentage of deaths among Japanese people shows that cancer is the most common cause of death. Compared to the world's ratio of causes of death, Japan can also be said to be a cancer powerhouse. According to the National Cancer Center, the probability of developing cancer during one's lifetime is very high: 63% for men and 48% for women.



3 Conclusion

1. Installing Ashtrays and Deodorizers in Smoking Areas
To maintain a comfortable smoking area, it is important to manage cigarette smoke and ash properly. By installing ashtrays and deodorizers, we can prevent cigarette smoke from affecting other areas and facilities. Deodorizers help reduce odors inside and outside the smoking area, which also contributes to creating a more comfortable environment for non-smokers.

2. Promoting the Use of E-Cigarettes and Setting Up Pop-Up Stores
Compared to traditional cigarettes, e-cigarettes produce less smoke and have less impact on the surrounding environment. Therefore, promoting the use of e-cigarettes can help improve smoking areas. A suggestion is to set up pop-up stores to promote e-cigarettes. A pop-up store is a temporary store that is open for a short period of time, usually from a few days to a few weeks. These stores can provide information about e-cigarette products and how to use them, giving consumers the opportunity to try them. This can help accelerate the spread of e-cigarettes.

3. Mapping Smoking Areas and Introducing a Feedback System “SmokeSpot”
To manage smoking areas efficiently, it is important to have a system that makes the condition of each area visible. A mapping system can be introduced to track cleanliness, equipment, and crowd levels in smoking areas in real-time. Additionally, a feedback system can be set up to collect users' opinions about the condition of the smoking areas. This feedback can be used to improve the areas quickly, addressing issues such as dirty places or equipment problems, which can be fixed immediately.

The measures proposed in this study offer practical strategies for improving smoking areas to meet the needs of both smokers and non-smokers. By implementing measures such as installing ashtrays and deodorizers, promoting e-cigarettes, and using a feedback system, we can improve the quality of smoking environments. These measures will help make smoking

areas more convenient for smokers while ensuring a comfortable environment for non-smokers.

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How to Spread HIgh Quality Health Care to the World

~ How should we ensure that people in developing countries have access to quality healthcare? ~

Healthcare Developing Countries Vaccines

5433 Yokoo Natsumi

Abstracts

In developing countries, medical care is less developed than in developed countries. I began my research to help people in developing countries receive quality medical care. A large number of children under the age of five die from pneumonia, diarrhea, and malaria due to malnutrition. As a countermeasure, health centers are promoting the use of Vitamin A to increase immunity and providing nutritional guidance to parents.

The probability of People Receiving the New Coronavirus Vaccine in Africa is extremely low compared to the world as a whole. A tablet-type new coronavirus vaccine was being developed at an American university in 2022.This is said to be effective not only in preventing infection but also in suppressing airborne transmission. It was thought that if the vaccine becomes available in tablet form, individuals can prevent the infection without being under the care of a doctor.

The first of my suggestions is to promote the use of vitamins and tablet-type vaccines. I believe that taking vitamins can strength the immune system and making it harder to catch infections. Additionally, I believe that the use of tablet-type vaccines will make vaccination easier than before.

Another problem is the shortage of medical care. To solve the shortage of doctors in developing countriesI considered sending initial clinical interns from Japan. However, several problems arose. Language and financial problems occurred. Moreover, “Doctors Without Borders” is now working all over the world to reach people who do not have access to medical care. In 2022, there were about 49,000 doctors in 75 countries and regions around the world, and 89 doctors in 26 countries and regions in Japan. I would like to further research to achieve this dispatch of doctors to developing countries and to expand and promote “Doctors Without Borders” in the future.

1.Introduction

Unsanitary. Nutritional deficiency. Decreased immunity. Lack of medical workers

These are some of the causes of high death rates in developing countries. What should we do to solve these problems and reduce deaths?

~Research Question~.

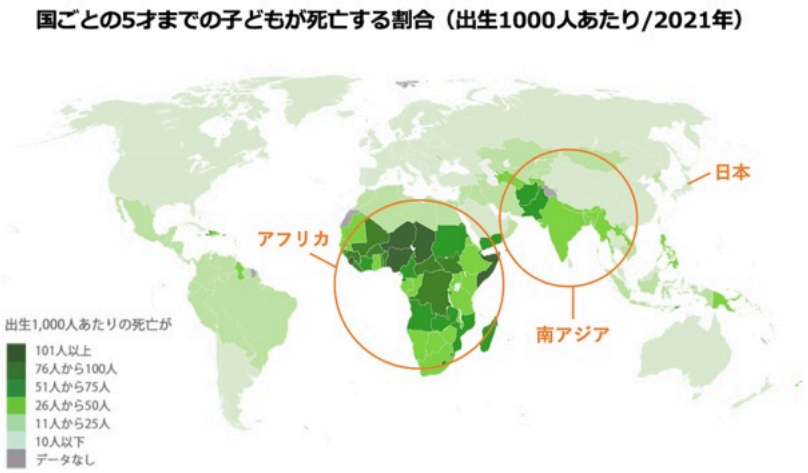
What should do to help people in developing countries to receive high-quality medical care?

Recently, I have seen a lot of news about the disparity in medical care between developed and developing countries. This has made me feel motivated to learn more about these issues.

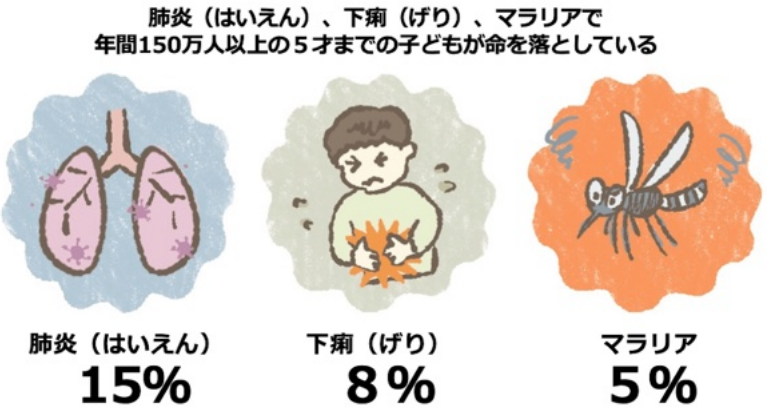
In developing countries, there are many deaths due to illnesses and a shortage of medical workers, and medical care is not as well provided as in developed countries. I thought it was necessary to solve this problem in order to save the lives of people in developing countries.

2.Discussion and implications

The map on the right shows that Africa has a higher mortality rate for children under 5 years old per country. Japanese are able to receive treatment for illness and injury, and even vaccinations to prevent disease. However, in the world, 5 million children die each year before the age of five. Furthermore, more than 80% of these children are from Africa and South Asia.



Although there are various causes of under-five mortality, such as pneumonia from a cold, dehydration from diarrhea, and malaria, it is said that malnutrition is actually a contributing factor to the deaths of children under 5 years old.Lack of nutrition causes severe illnesses because the body's immunity is not enough when a person gets sick, or just get an upset stomach from drinking dirty water, which can lead to a life-threatening situation. Diseases that can be treated and prevented in developed countries like Japan are the main cause of death in the world.



This figure shows that more than 1.5 million people, about 30% of the total number of infant deaths in 2017, died because of these three diseases.

The causes of these diseases are summarized from three viewpoints: 1, immunodeficiency due to unsanitary conditions and malnutrition, 2, lack of vaccines and medicines due to delayed infrastructure facilities, and 3, delayed early detection and treatment due to lack of medical services, and I focused on prevention of 1 and 2.

First point is about nutrition. It is difficult for people in developing countries to obtain nutrition through food, because most of Africa is impoverished. I suggest supplementing the nutrients that should normally be obtained from food by using nutritional supplements in pill form. Therefore, people in Africa are currently taking vitamin A through the use of supplements. This is a tablet intended to prevent vitamin A deficiency, and one tablet will last

for six months. This not only prevents disease, but also boosts the immune system, reducing the risk of death from diseases such as malaria and diarrhea by 25%.

The next point is about vaccines. The world's vaccination rate of COVID-19 is 60%, but in Africa it is only 17%.The reasons were that vaccines were not available due to lack of infrastructure, few doctors were available to give vaccines, and refrigerators for vaccine storage could not be set up. In 2022, a vaccine for new corona in tablet was developed at a U.S. university. There are several differences between the injectable type and the tablet type vaccine.

〈Injection〉

・Compatible with mutant strains with high risk of becoming severe.

・ The purpose is to guide the immunity of the whole body.

・Needs a dedicated refrigerator for storage at -70°C

・Inoculation by a physician

〈Tablet〉

・Compatible with mutant strains with high infectious.

・ The purpose is to guide immunity of mucous membranes.

・Store in the same way as common tablet-type medicines.

・Individual prevention is possible.

The first of my suggestions is to popularize the use of vitamin supplements and tablet-type vaccines. I thought that taking vitamin supplements would boost the immune system and it help people become less susceptible to disease, and that the use of tablet-type vaccines would make vaccination easier than before.

Another problem is the lack of medical care. Because the number of doctors in developing countries is extremely few compared to that in the world, more than half of the children in African countries do not receive enough treatment when they become ill, including 53% for pneumonia, 62% for diarrhea, and 70% for malaria. The shortage of medical care causes a decrease in the number of hospitals, a decline in the quality of medical care, and a rise in the cost of medical care. Therefore, I considered solving the shortage of medical workers.

Doctors Without Borders, an organization that rushes to people around the world who are lacking in medical care, is currently active.

In 2022, about 49,000 people worked in 75 countries and regions in the world, and 89 people in 26 countries and regions in Japan. However, these volunteers are not enough to provide aid.

In Japan, it is common for doctors to undergo initial clinical training for two years after graduating from a university medical school and passing the national examination. In order to solve the shortage of doctors in developing countries, I thought of dispatching doctors from Japan who have undergone such training as part of their training. Because some people want to learn skills in Japan for their future, we do not force them to be sent abroad, but only those who want to work abroad wish to do so. And because the environment is different and more dangerous than working as a doctor in Japan, we should provide support such as exemption of tuition fees for a certain period of time.

There are several issues for the future.

・This is a temporary solution, so it will not solve the shortage of medical care in the future.

・Although they have medical licenses, they are inexperienced, so there are concerns about their technical skills.
・It is difficult to communicate because of the difference in language.
・Lack of advantages of this dispatch.
I would like to research more to solve these issues.

3.Conclusion

In this study, I have two suggestions.
The first is to promote the use of vitamin supplements and tablet-type vaccines. The main cause of death in developing countries is caused by malnutrition and immune deficiency. So I thought that taking vitamin supplements would help boost immunity and supplement malnutrition. In addition, vaccination rates in developing countries are currently low compared to that in the world. Therefore, I thought that making vaccines available in tablet form would make prevention possible even without a doctor.

The second is to solve the shortage of doctors. Developing countries do not have enough doctors, and this is considered to be a problem. I thought that the shortage of doctors could be solved by dispatching doctors to developing countries as part of the two-year initial clinical training after taking the national examination in Japan. However, several problems arise. The problem is that residents are concerned about their technical skills, and although this may solve the temporary shortage of doctors, it will not solve anything in the future.

The question for the future is how to solve these problems in order to realize the dispatch of doctors from developed countries like Japan to developing countries.

4.References

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