

## 2. Overview and Schedule

### Introduction to Fieldwork in Minamata

Date: 3 July		
Time: 16:30-18:00 (5th Period)		
Place: Room 22-A, Main Building (Honkan 22-A), Fuchu Campus		
Contents:		
Lecture/video on background of Minamata Fieldwork		
- Minamata Disease – History and background		
- Minamata Jimotogaku or participatory community study - why and what?		
Division of students into groups for presentation on 18 July		

### Students Presentation

Date: 18 July		
Time: 13:00-14:30 (3 <sup>rd</sup> Period)		
Place: N103 (Multi-purpose Lecture Room), Building 2, Fuchu Campus		
Contents:		
Presentation by students		
- Pollution and its impacts to people and society in Asia and Africa		
Information on the Minamata field work		

### Fieldwork in Minamata

Date: 24-26 July (Detailed schedule will be notified in class)		
Contents:		
Day 1: Learning about Minamata Disease—visit to museums and local communities		
Day 2: Training for participatory community study— “Jimoto-gaku” – by Mr. Tesuro Yshimoto		
Day 3: Reflection on the participatory community study training/ Learning about present Minamata — Visit to Chisso/JNC		

## FOLENS Fieldwork in Rural Communities 2012

### Minamata Fieldwork: Schedule

Tuesday 24 July

Time	Activity	Lecturer
10:00	Meet at Kumamoto Airport Move to Minamata by Bus Lecture on Participatory Community Study (Jimotogaku) by Mr. Yoshimoto	Mr. Tetsuro Yoshimoto (President, <i>Jimotogaku</i> Network)
11:30	Arrive in Minamata Meet Ms. Ori, Coordinator Lunch	
12:20	Carry the bags to Shorinji Dojo (Fieldwork Base and Accommodation)	
12:30	Minamata Disease Municipal Museum	
13:30	Minamata Bay Water Amenity Seawall	Ms. Arisa Ori (Minamata Nature School)
14:00	Depart Water Amenity Seawall	
14:15	Soshisha, The Supporting Center for Minamata Disease/ Overview of Minamata Disease Incidents and Citizens' Actions	Mr. Kunio Endo (Soshisha- the Supporting Center for Minamata Disease)
16:15	Depart Shoshisha	
16:30	Arrive in Modo District/ Story by a Minamata Disease victim	Mr. Takeshi Sugimoto (Fisherman/Witness for Minamata Disease Municipal Museum)
18:30	Depart Modo District	
18:50	Arrive in Shorinji Dojo Information: Accommodation Prepare Dinner	
19:30	Dinner	
20:00	Reflection of the Day – Impressions of Minamata Information: Schedule of Day2 (Jimotogaku Talk)	Mr. Tetsuro Yoshimoto
22:00	Shower/ Sleep	



Wednesday 25 July

Time	Activity	Lecturer
7:00	Get up/ Breakfast/ Clean the room	
8:30	<p>Lecture</p> <ul style="list-style-type: none"> <li>- Explanation of the process of <i>Jimotogaku</i> (Participatory Community Study) – Arumono Sagashi (Looking for Things that a Community Has)</li> <li>- Introduction of Local People and Study Leaders</li> </ul> <p><i>Jimotogaku</i> Leaders:</p> <ul style="list-style-type: none"> <li>· Mr. Hiroshi Amano (Organic tea producer/ <i>Minamata City environmental meister</i>)</li> <li>· Mr. Katsuhiko Inoue (Bamboo craftsman/ <i>Minamata City environmental meister</i>)</li> <li>· Mr. Kunio Endo, Ms. Tomoko Mitsushima, and Mr. Kinoshita (Soshisha – the Supporting Center for Minamata Disease)</li> <li>· Mr. Akihiro Takeshita (Minamata Disease Municipal Museum)</li> <li>· Ms. Shoko Ikezaki (Minamata Municipal Government)</li> </ul> <p>Mr. Takashi Fukui (TUAT visiting professor)</p>	<p>Mr. Tetsuro Yoshimoto</p> <p>Ms. Arisa Ori</p>
9:00	<p>Group Work – Interview to local people</p> <p>Local Residents:</p> <p>Ms. Rimiko Yoshinaga</p> <p>Ms. Mitsuko Ooya</p>	
12:00	Lunch	
13:00	Make a Map – Propose Ideas	Mr. Yoshimoto
18:00	Map Presentation	Local people/ Minamata Disease Municipal Museum
20:00	BBQ with Locals/ Shower	Seafood BBQ
22:00	Sleep	

Thursday 26 July

Time	Activity	Lecturer
7:00	Get up/ Breakfast/ Clean the rooms	Shorinji Dojo

8:30	Reflection - Impressions/ realization of the Day1 & 2 – What I can do in my own local community based on this experience	Mr. Tetsuro Yoshimoto Ms. Arisa Ori Mr. Takashi Fukumoto
10:45	Closing Remarks	Mr. Yoshimoto
11:00	Clean up the rooms	Ms. Arisa Ori
12:00	Departure Lunch/ Shopping	
13:30	Visit JNC (Chisso)	
15:30	Depart Minamata	

9:00	Group Work - Interview to local people	Local Residents Ms. Ritsuko Yoshimaga Ms. Mitsuho Ooya
12:00	Lunch	
13:00	Map Presentation	Mr. Yoshimoto
18:00	BBO with Local's Show er	Local people Minamata Disease Municipal Museum
22:00	Sleep	

Time	Activity	Location
7:00	Get up, Breakfast, Clean the rooms	Shorunji Digo



### 3. Participants list

Name in English	Nickname	Major	Nationality
NA-NGERN Pathomrak	Tiew	Graduate School of Agriculture · Department of Environmental Science on Biosphere	Thailand
ANTONIO MANUEL DOS SANTOS JUNIOR	Antonio	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Mozambique
JAIKAEW Piyanch	Nuch	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Thailand
JOLLIBEKOV Vladimir	Vladimir	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Uzbekistan
WANG Jigemude	Jigemude	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	China
OKURA Fumi	Fumi	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Japan
TONO Rimi	Rimi	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Japan
TSUKANO Katsura	Katsura	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Japan
YING Chun	Habura	Graduate School of Agriculture · Department of International Environmental and Agricultural Science	China
HUSSAIN Poya Ghulam	Poya	Graduate School of Agriculture · Environment Conservation	Afghanistan
AOKI Kazuya	Kazuya	Graduate School of Engineering · Department of Applied Chemistry	Japan
KAMIMURA Miu	Miu	Graduate School of Engineering · Department of Applied Chemistry	Japan
HIGUCHI Ryo	Ryo	Graduate School of Engineering · Department of Applied Chemistry	Japan
ABE Chihiro	Chihiro	Graduate School of Engineering · Department of Applied Chemistry	Japan
MUTO Genki	Genki	Graduate School of Engineering · Department of Applied Chemistry	Japan
YAMADA Keisuke	Keisuke	Graduate School of Engineering · Department of Applied Chemistry	Japan
YAMAMOTO Masahiro	Masahiro	Graduate School of Engineering · Department of Applied Chemistry	Japan
Masaaki Yamada		Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Japan
Yosei Oikawa		Graduate School of Agriculture · Department of International Environmental and Agricultural Science	Japan
Sachi Ninomiya-Lim		FOLENS Assistant Professor and Coordinator	Japan

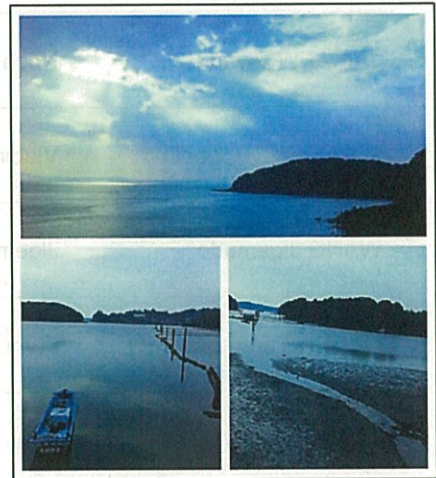


## 4. Students Report

**Prathomrak NA-NGERN (Graduate School of Agriculture/ Department of Environmental Science on Biosphere • Thailand)**

This course provided students an opportunity to visit Minamata in Kumamoto Prefecture. Minamata is the area affected by the serious contamination of the seawater with pollutants that were released through an industrial process and accumulated in marine organisms as organic mercury. The participatory community study (Jimotogaku) was used as a tool, which lead students to penetrate and understand the local people in that area as much as possible.

Through this trip, I had new experiences to learn rural community perspectives and three main important points of Jimotogaku . Jimotogaku activities comprised “Looking”, “Thinking” and “Doing”.



**Fig.1 Seaside in Minamata area**

In the past Minamata encountered very serious environmental problems very difficult to tackle and solve. Until nowadays the effects of these problems, Minamata disease and economic problems, still remain , not completely solved yet. However local people who spend their lives in this area need to adjust their living because they cannot avoid or escape this situation.

I am a foreign student from Thailand and this is the first time for me to visit Minamata. Truly, I was very impressed by the view of Minamata (as shown in Fig.1) and kind local people. It had very beautiful nature and people. If there were no victims of Minamata disease and evidences such as the Chisso Company, I wouldn't believe that this place received negative impacts from such a big environmental issue. I also learnt and gained basic knowledge about Minamata disease. Minamata Disease Municipal Museum made my understanding clearer. Pictures and data of victims



**Fig.2 Chirimen production**



and exhibition in the museum also confirmed that local people were depressed by Minamata disease. Moreover I had a good chance to learn and receive opinions from local people through Jimotogaku activities. These were very good activities, which I experienced in this trip.

#### ■ Jimotogaku: participatory community study

My group had a chance to visit the fisherman who is an owner of the Chirimen fish factory (Fig.2) and also interview the old farmer lady who has spent her life in Minamata during the critical period. From these activities my understanding on Jimotogaku became clearer.

Looking for the things we have is better than try to looking for the things that we lost or we do not have.



**Fig.3 Group activity in Jimotogaku**

very interesting learning method for both students and local people. With this method, we can share experiences, knowledge and also opinions together to answer the problems or create new solutions.

#### ■ Crosstalk

I would like to thank FOLENS who created this very wonderful course. It was terribly hot and I was burned during the trip because there was no air-conditioner, which is easily found in a laboratory at the campus. However we could see the sea anytime and this was what cannot be found in Tokyo. This was better. Our cafeteria was fully self-service, we started with rice cooking until we became a dish washing machine. This was very much fun and gave me many new friends (Seafood very delicious). Through presentations we learnt until bedtime. This made me alert. Finally I was very impressed and happy to have taken this subject and absorbed a lot of new wonderful things

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**Antonio Manuel dos Santos Junior (Graduate School of Agriculture Department of International Environmental and Agricultural Science • Mozambique)**



I think the whole attempt to rehabilitate the ecosystem and compensate the victims in Minamata “*will never restore the justice in Minamata*”. Nothing can restore life and health of those innocent people who were poisoned by eating seafood contaminated with organic mercury discharged by Chisso Corporation in Minamata bay.

The Minamata disaster should serve for the present and future generations to think about their act and consequences. We as human beings, we have the ability to predict and prevent accidents. We should not wait for the consequences to remedy, but rather, we must prevent.



Fig 1. Minamata bay reclaimed area

The first and most important in production process is sustainability, which means producing without damaging the environment. That means to produce today without compromising the ability of future generations to meet their needs. The company goal is profits, but all companies must first reach sustainability; that means reaching not only economic results, but combining all (economic, social and environment).

If a company kills consumers and workers, what is expected of this company? Who will operate and produce in this company? Who will consume their products? We can expect that if a company proceeds like that also the company will die.

In Minamata tragedy, Chisso Corporation has the great responsibility, but at the end of the process Chisso corporation was just a big loser:

-In an attempt to "save or contain the production costs" discharging directly untreated industrial waste into Minamata Bay, Chisso actually incurred higher expenses: Chisso had to share cost to clean and decontaminate all waste it deposited in the bay of Minamata (Fig 1).

Chisso Corporation had to indemnify their victims. Although compensation money has had only a symbolic value, because that compensation money was provided by Chisso Corporation, it could never return the life and/or good health to its innocent victims.

- Chisso Corporation had its image completely tarnished (denigrated) due to this accident.

I think that the local government and that era itself also had the responsibility of disaster in Minamata:





**Fig. 2 Timber forest product**



**Fig. 3 farm in Minamata**



**Fig. 4 Visit to reclaimed area**

-They should have regularly monitored the Chisso Corporation's production process to avoid an environmental disaster. But they do not seem to have done that, probably because that era had not yet much concern and perception about the interaction between human activities and the environmental pollution.

As the mercury has already been removed from the waters of the Minamata bay and surrounding areas and the entire environmental crisis was already resolved, now it is time to look to the future. Minamata has enormous potential, including: favorable climate, abundant and diverse natural resources among the forests (Fig 2), marine resources, arable land suitable for agriculture (Fig 3).

In Minamata there are possibilities of implantation of sustainable and environmentally friendly industries, besides an unusual Rice natural beauty that provides for eco-tourism (Fig 4).

Minamata's new generation plays an important role; they must transform the image of Minamata with a former tragedy to a sustainable development pole.

I like the monument (Fig 5) and museum dedicated to the victims of the Minamata accident. I think it was a simple

and unique way to honor the victims of the tragedy of Minamata. I think the Minamata survivors are dignified and honored with the good name of Minamata, I saw it there through: local people's daily struggles to show that Minamata is a welcoming place, to show its enormous potential, especially for explaining that there is no risk of consuming local products. I really liked the people of Minamata because they are very creative, hardworking, and humble.

Nowadays my country Mozambique is in a process of highly accelerated development, and I have seen cases of aggressions to the environment in an attempt to increase production by reducing costs. I hope there will be changes to environmental friendly attitude in Mozambique, and all around the world. I hope that the Minamata tragedy examples serve as an example to avoid future mistakes in the world.



**Piyanuch Jaikaew (Graduate School of Agriculture Department of International Environmental and Agricultural Science • Thailand)**

The fieldwork in Minamata was focused to gain the knowledge and understanding about management of pollution, supports from the government, and management by communities. We also learned the cause of the methyl mercury contaminated soil and water flowing to Minamata Bay and its solution, and how to protect self-sufficiency of the people in the area. I was impressed with the fieldwork on the people of developed towns and villages surrounded by the nature of the sea (the first picture), I could not imagine that there were environmental problems before. I found that many fish species were living in the sea and the color of the sea was very beautiful. People told us that they are the various plant species both edible and inedible and properties of the medicinal plants now. Fishery Food products were delicious. The process of production was very different from my country. Such new knowledge makes sense to have new ideas. I was very happy that they saw their products happily.



I am impressed to see the local people who are encouraged to take care of the in the community, and local people have confidence in their life. It would be beneficial that people come to understand more about the treatment of substance use in my country. Many people do not understand the problem and solutions to the local people and give up on their mother land. Now, our society cannot ignore these issues.



This fieldwork highlighted the quality of life of people in the area with efficiency and effectiveness of development. In the community, comfortable and relaxed atmosphere seems to have provided the people with the opportunities to consult and decide how to deal with the problem by themselves. It is important to learn the problems and how to protect themselves through the food and other means. The fieldwork in this study can be one of the good applications to increase the knowledge of people in the area. Knowledge about the nature is important since the condition may change at any time, and if we have such knowledge before the problems occur, we would have had better solution. The problem in this Minamata is the evidence that can happen in many factories in the future. It is encouraged that people protect themselves by reviewing the pivotal issues of the problems that may occur in the future. This reviewing process



may have impacts on many aspects such as confidence in solving problems in the area. While the local or national agency still has a social obligation to investigate the health of local people, we have found the local people live happily in the community. Through conducting fieldwork in the communities, we would be able to realize more about Prof. Miyamoto's advices, "If you have any money, try the local food and you will know the nature of life there" and "if you have time, walk as much as you can, you will learn many things from nature around us."

Thank very much teachers and the program for the fieldwork in rural communities. The field exercise gave us study opportunities for the community development and environmental issues arising in the present and future. Understanding the problems of local communities supports the social and economic invigoration of rural communities.

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**Vladimir JOLLIBEKOV (Graduate School of Agriculture Department of International Environmental and Agricultural Science - Uzbekistan)**

Our primary interest of this fieldwork was to learn more about Minamata city and the Minamata disease. The study tour was held to visit various areas related to Minamata disease. We could gain overall information, knowledge regarding various institutes, their objectives & activities. One of the most important aspects of the visit was to learn from the local people there.

**Benefits:**

- a) I was able to observe how students can be trained at the environmental catastrophe zone of Minamata city.
- b) I learned to appreciate the culture and heritage values of the Minamata local people
- c) I raised my awareness and understanding on the social intricacies brought about by the recent catastrophe cases
- d) Through visiting the Chisso company I got more understanding regarding Minamata disease

**Recommendations:**

- a) To hold many study trips from different institutions or universities to Minamata.
- b) To hold many international conferences in Minamata city
- c) To extend fishery activities
- d) To develop eco-tourism
- e) To keep historical places and materials



**Conclusions:**

It has been a successful and fruitful trip. We, students, had the rare opportunity to visit Minamata city and meet with local peoples. I would like to say thank you to all teachers and supporters during our study tour.



**GOD BLESS MINAMATA PEOPLE FOR FUTURE PROSPERITY!!!**

**Wang jigemude (Graduate School of Agriculture Department of International Environmental and Agricultural Science - China)**

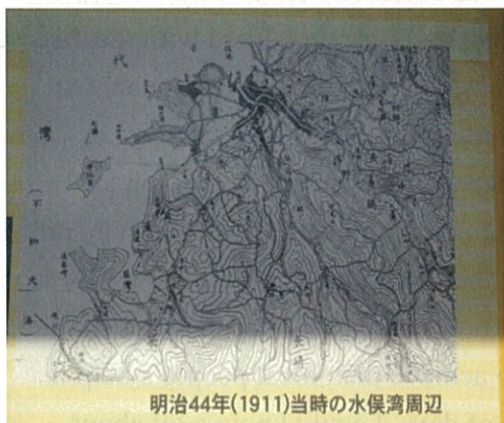
In the trip to Minamata, we discussed about Minamata, especially we talked about Minamata disease. As we all know, Minamata disease is methyl mercury poisoning caused by mercury contained in effluents released into the Shiranui Sea from the Chisso Minamata factory, that accumulated in the tissues of fish and other aquatic life, which were then consumed by the local population.



As we learned, Minamata is a city afflicted by a human disaster. The Minamata people have suffered a lot. From 1956, an unidentified disease outbreak was verified in Minamata. They experienced so many social problems and so many moments of desperation. However, they have not been defeated. Instead, they have become more united. We were



impressed to learn how strong they really are. So we are supposed to do some profound thinking. Obviously, it is important for environment pollution to be prevented. For us all, everyone should bear it in mind how to prevent environmental pollution as soon as possible. Besides, although it is difficult, it is important to resolve the issue during the local people's life time.



And for the government to save more people's lives, they should take quick actions with the disease relief system. What's more, the government should assure us the safety by clarifying the reasons for failures - why the sea became polluted and why they did not take action as soon as possible - and what they need to do not to repeat the same failures. Also it is important to promulgate and put into effect laws

and regulations regarding environmental protection, continuously improve the statutes concerning the environment, formulate strict law-enforcement procedures, and increase the intensity of law enforcement so as to ensure the effective implementation of the environmental laws and regulations.

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**Fumi Okura (Graduate School of Agriculture Department of International Environmental and Agricultural Science • Japan)**

At the end of the trip, I realized that the education about Minamata which I had received before was limited. For example, what I knew was that Minamata disease is one of the pollution diseases and even now many victims were suffering from it. However through this trip, I learned a lot of deeper things that the disease brought to Minamata people. First, I am very appreciative of having known real voices of victims. I was choked with their sorrow and their distressful experiences. Especially poems that victims wrote showed their sadness vividly. How cruel it was for parents that seeing their child suffering and dying. And even though I did not listen to an elder woman's tale directly and I just heard some parts of her talk, I could not keep my tears back thinking her hardships and loneliness, and at the same time, I was also touched by her strength to overcome her difficulties. Second, I got to know plenty of things that existed in Minamata city. There were good people, beautiful sea, many kinds of trees, plants and



bugs. When I thought about these things, it was understandable that people love Minamata and are trying to revitalize the city. I also learned how Minamata people's lives are connected to sea. Especially a slope leading to the sea was memorable for me. I think it was a token of relationship between Minamata's people and the sea. Third, because I grew up inland as a city person, it was difficult for me to imagine their lifestyle if I did not visit Minamata. In addition to that, from a talk of woman who worked for Chisso Co., I learned what Minamata people thought and how they lived with the disease. If I did not have a chance to visit Chisso Co. and listen to her story, I was not able to understand that the disease had become a part of their lives, and there was no clear boundary between victims and offenders. These gave me an important lesson to conduct my research. Sometimes books and documents cannot convey the truth and without intention some truth may be distorted. I thought I understood that but this trip taught me that in a more vivid way. In order to know a situation, I need to see the site firsthand and listen to many people's stories. To achieve that, local people's help is crucial. Although our trip was only for a couple of days, I could know a lot about Minamata. However this time we had coordinators and local people who kindly told us their stories, so that we could learn about Minamata efficiently. Hence if I try to know my research area, I will be faced with a lot of difficulties to grasp the situation. But now I understand that it is worth taking effort to do that, and I want to try to know the area from many different aspects.

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**Rimi Tohno (Graduate School of Agriculture Department of International  
Environmental and Agricultural Science • Japan)**

It was a very precious opportunity for me to learn about Minamata disease from the local people who had been living with it. I had studied about the disease in class and from the textbook, and thought I already knew much of it. However, in my first contact with Minamata people this time, I was exposed to their thoughts and feelings which I never had imagined before. I met with Rimiko-san who was one of the victims of Minamata disease. She told us of her childhood, when she played in the Gulf of Minamata in front of her house, and the sea had always been the precious thing for her though its old and cherished image were gone forever due to the reclamation sealing mercury-contaminated seabed. Though she had lost not only her family but also the beautiful sea, she rarely used harsh words about Chisso Corporation in her interview. She



just told us what she saw and felt in her life. It was a fresh experience for me to talk directly with people living on a site of long-lasting disputes, and to understand not only the calamitous pollution but also the meaning of Minamata for local residents. I expect the lessons learned in this FOLENS program may help me in my thesis research, in making comprehensive observations in the field.

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**Katsura TSUKANO (Graduate School of Agriculture Department of International Environmental and Agricultural Science • Japan)**

I could learn a lot of things in Minamata, but especially I could learn “the importance of trying to understand each other” and “there are a lot of things in the field.”

We can know but cannot understand what others think. “To know” and “to understand” are not same. But still, we should try to understand each other.

And we cannot know or understand in only a classroom. I was very surprised to learn that there are many resources in a field. The resources include not only energy or products but also the people, nature or anything.

When we try to understand, we must think or find together with local people. It is important to find the problems and to improve the situation together. We must not forget this experience.

I appreciate everything in Minamata.

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**Habura (Graduate School of Agriculture Department of International Environmental and Agricultural Science • China)**

My name is Habura(迎春),and I am from Inner Mongolia. After three days of our visit, I had deepened my understanding of the local people, and I also learned a lot of things. I think this trip is an unforgettable and precious experience for me.

Before I participated in FOLENS program, my knowledge of Minamata disease was blank, it can be said that I have never heard about it. But in this course, I watched the video of Minamata disease. At the beginning, I felt a little terror, but later I found myself in tears, because I learned the distress those young life and the beautiful sea had



to face and I felt the resentment at the culprit of such a damage to the environment and life. Then I was determined to visit Minamata and meet the local people . On the 24<sup>th</sup> of July, I came to the Minamata city, and breathed the fresh air of nature. After three days of interviews and contacts, I found the image of Minamata was completely different from I had watched in the video before.



The local people were warm and cheerful, everyone had a high spirit, everywhere looked so beautiful and so natural.



During the *JIMOTOGAKU* session, our team and the local people were divided into several groups and conducted a local survey and interview. Our purpose were to “Look for something that we have” and “take care of the small things”. We must break the framework, and freely generate ideas, create a bold plan, and then implement carefully. Finally, our work went beyond our imagination and each group made a poster of a unique





style.

However I feel that the result is not important, but the process is more important to us. Because at that time, our hearts were linked together, we had the same goal---a hope for Minamat to be better.

From this three-day field trip I learned lot of things and to end this report I would like to list my feelings on this field trip.

1. Scenery of Minama is natural green.
2. City buildings of Minama are neat and beautiful.



The sky of Minama is blue, the sea is blue



3. People of Minama live with the sea and the sea creatures.
4. Every person of Minama is full of vitality, their life is full of passion and imagination, and everybody is trying to build a better hometown with each other.
5. I had completely changed my view of JNC Corporation after I visited it. I thought it was an industry causing a high degree of harm to the environment and people's life. But after the introduction of the staff and a short time visit, I understood this company has a huge operating system and excellent products, and it was an important force to drive the economy of Japan for a long time. More importantly, it brought a great help to the lives of local people.





**POYA Ghulam Hussain (Graduate School of Agriculture ▪ Environment Conservation ▪ Afghanistan)**



**Figure1. The old lady whom we interview, expressing her patriotism for her home town**

I heard about Minamata disease which was causing the death and disability of thousands since its appearance in 1950. I was interested in visiting the people of Minamata for having a face to face interview with the members of a community and any other associations which have somehow relation with this community. Finally, my idea became real. I could travel to Minamata, and visit a rural community in the context of Japan. I found out something different from the community which was somewhat interesting for me. I would like to highlight some of these as numbers.

I. People's patriotisms really impressed me. I interviewed an old lady who had lost her husband and father in-law as the result of Minamata disease. She really suffered from Minamata disease, but never tried to leave her home in Minamata to any other part of the country. Typically, she had a great story of marriage process by the age of 18.

She was a girl of a mountain village in Minamata, and never had thought to start living in a sea village where only 3 families were living at that time (Myojin, the area where Mrs. Ohya lives now). Now she is at the age of 86 and sharing lots of stories of her life from fishing and farming. She told us that Minamata disease made it possible for you and other visitors to visit my lovely Minamata. I really impressed by her love of her country home. According her, she will never leave Minamata and keep her home, her lovely



sea, mountains, forests and all environments of Minamata. As the result I explored that first of all the inhabitant of a place should love their home country in order to have a joyful life.



**Figure2. Shows a monument of the people who died by the Minamata disease**

II. Community enterprises in terms of building some reminders from Minamata disease like the museum exhibit what happened in this community and its environment at the result of Minamata disaster, I think such activity passes the message to all the people who visit Minamata or to the next generations in order to remember the disaster and think about what will be the danger linked to the human factors in environmental disturbances.

III. Social or community initiatives, the backgrounds, and studying methods of Jimotogaku (Participatory Community Study), in which I practically participated, were really valuable part of this visit for me. Based on the principle of this approach, “look for the things that a community has, not for those that a community does not have”, I have practically noticed that this concept is really somehow logical, we can think freely, we can see things around a community and living environment that the community itself may never recognize. Although this approach to rural

community development is not a complete scientific approach but practically a useful mean to identify a community's potential resources for sustainable prosperous living and development.

In addition, this approach of rural community development does not need a big project financing and resources management because the community can manage with its own resources.



I have learned more than I expected from this field visit. Undoubtedly, the rural community in the context of Japan is quite different from my home country Afghanistan in terms of livelihood resources, ratio of access to the public services, over all communities' structure, and human capabilities. The concept of Jimotogaku and what I learned practically, however, could be useful



to apply in rural Afghanistan where people highly depend to natural resources in terms of livelihood.

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**Kazuya Aoki (Graduate School of Engineering Department of Applied Chemistry • Japan)**

First year grade, Chemical Engineering Process, Tokyo University of Agriculture and Technology

There is a concept called “good for three sides” which was held by Omi merchants in Edo Period.

This means that in business or trading it is important to provide benefits for the seller, the buyer and the society (local community). It is not good if the seller and the buyer get benefits while giving disadvantage to people around, causing resentment. I think that environmental pollution caused by the trades is a result of having neglected benefits for a society (local community).

During the Fieldwork in Rural Communities, I was surprised at three points.

1. Minamata Bay had such beautiful scenery.
2. Local people live doing things in their traditional way.
3. A number of people in Minamata City try to work cooperatively to develop their town with Chisso Corporation (current name JNC Corporation).

1. I had an erroneous image for Minamata Bay. I thought that it did not get the beautiful scenery back after being polluted seriously by environment disruption. However, when I indeed saw the scenery from the landfill site on the first day, my previous image was reversed. The sea surface was bland, and there were some fish, so it looked like any other ordinary places in Japan.

2. On the second day, we did “Arumono Sagashi” (Finding something that exist). We looked for the evidences of that there used to be the sea. Walking around the cape, in brush, we found the stone fort and soil layer. We considered that the stone fort was for a port, and the soil layer was slashed by waves. Local people around the cape, they earn their living by fishery, I thought, but they had a croft. Around the cape, the damage from salt air for crops and crofts is unavoidable. But they have windbreak forest to reduce the damage, composed of some kinds of trees to avoid diseases. In addition to windbreak forest, crops were mainly small plants –for example, sweet potatoes, onions and okras - to avoid being fell by strong wind.

According to some local people, they used to have pigs. They ate pigs or sold them to earn money to buy rice, clothes and articles for daily use. They could not become luxury, but they could live in the community. I think that this is a kind of completed lifestyle. I was impressed by the lifestyle of local people, they live to do things in the old way.



3. It is not easy to get over or redeem the relationship between the local people and Chisso because of environment pollution by Chisso. However, in this two decades, they have come to a compromise. It is true that there are some radical groups, but almost all groups are friendly, the JNC agent spoke.

The new ideas come from combining the ideas in existence, this is the critical core of “Jimotogaku”. I have read this idea in the book of James Webb Young. I think that science researches are also to combine the principles or effects to get the new phenomena. It is better to do so than searching something totally new or seeking things one cannot reach. Also, the improvement of goods should be for the needs of users not just for improving specs. I felt that it is an important point for engineering research.

To value what exists locally, it is necessary to sustain the local community. Because trading is absolutely necessary for our lives, the idea “good for three sides” is needed for a local community to sustainably develop.

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**KAMIMURA Miu (Graduate School of Engineering Department of Applied Chemistry • Japan)**

I could know about local people’s love for Minamata in Minamata Fieldwork. And I also felt responsibility of engineers from the history of Minamata and Chisso Company.

I had opportunities to listen to talks of Sugimoto-san, Maeda-san, and Shimada-san, who are sufferers of Minamata disease. They have suffered from the disease and also discrimination. But they still love Minamata and try to revitalize Minamata and their own life. I felt their big love for Minamata from their story and expression. I have never felt like that in my life in Tokyo

I am going to work as a chemical engineer to construct factories after graduation. I strongly felt that I must have the responsibility for local people and the environment.

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**Ryo Higuchi (Graduate School of Engineering Department of Applied Chemistry • Japan)**

We FOLENS members visited Minamata between July 24 to 26 and touched their history about Minamata disease caused by environmental pollution, and the Participatory Community Study (Jimotogaku) which was one of their revival methods. I write in this report some of my



impressions from this fieldwork.

First, Minamata disease occurred due to environmental pollution in Minamata City, Kumamoto Prefecture. The company named Chisso caused this environmental pollution, and they were to take responsibility for victims. However, although Chisso caused the environmental pollution, not only it was guilty but also any big existence that Government and a society as a whole.

We listened to the detailed story from Mr. Takeshi Sugimoto who has been a fisherman since that time.

When we listened to the story about Minamata disease, I felt the horribleness of the group mind. The people having Minamata disease were discriminated by surrounding people. The fear of Minamata disease is not only the loss of health by methyl mercury but also discrimination of patients and their family by surrounding people. Moreover, people who indicated that the cause of the disease came from Chisso or fish were isolated by the community or rejected to buy goods from local shops. What they had in their group mind might have been that they wanted to live as usual and to remove unusual. Many victims of Minamata disease said that the most painful thing was discrimination from surrounding people.

The victims of Minamata disease increased, but Chisso did not stop discharging their wastewater. These things had never been on the newspaper. According to Mr. Sugimoto, he asked to some reporter to write about Minamata disease and that it is caused by fish, the reporter was regrettably fired after some days. It might be that mass media were pressured by a big power such as a government because they were in the high growth period at that time. Stopping Chisso's operation would have inhibited the development of Japan. Thus, responsibility for causing Minamata disease was not only with one company but also with a government. As a result, the safety for people's lives was sacrificed to the development.

Minamata city, which was the site of serious disease fifty years ago has rich nature and is surrounded by beautiful sea now. Mr. Tetsuro Yoshimoto has taken part in reviving Minamata to a present beautiful city. He proposed Jimotogaku, which is a method to understand one's own community by surveying what exist what can be done, etc. Once, the mind of local people was filled with discrimination, hate, rejection and deep depression, so they needed to understand their community with Jimotogaku. When we understand our own community, we can develop, love and change with flexibility. Moreover, when we know something that exists in our own community, we can produce new things while combining existing things. Minamata has been



revived based on this method, performing the top-level environmental countermeasures.

We have also experienced Jimotogaku in this fieldwork. We have visited and listened to the story from local people. The most impressive story for me was told by Mrs. Toshiko Shimada, who is very kind. She happened to meet us when she just finished her farm work. She experienced the World War and Minamata disease while living there. According to her, there were many dolphins coming to seaside before they had Minamata disease. But it has greatly changed because of reclamation of seaside to block methyl mercury. She had Minamata disease, and once she had convulsions when riding a bike and fell off. But she was sturdy and not injured, she just temporarily lost a bit of memory. In the war time, because she got angry at a military officer who whipped an old soldier, she bit his arm. Moreover she had many interesting stories that cannot be written here.

I have never asked passers-by to tell their story, so I did not expect that she would tell such an interesting and funny story. I learnt that seeing with one's own eyes, listening to local people and understanding their community, these are the essence of Jimotogaku, because we cannot obtain these real information from books, news and so on. I want to apply the method to my hometown to understand my own community.

Finally, Minamata disease was occurred as a result of eager desire for development. Although many victims are still suffering, Minamata has revived to a beautiful city. But now, the nuclear power plant accident occurred for the same reason, people's desire to obtain energy. I wish that radiation contamination is removed as soon as possible, Fukushima is revived as a beautiful city as Minamata, and such an accident that sacrifice the safety of people's lives for the development would never happen again.

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**Chihiro Abe (Graduate School of Engineering Department of Applied Chemistry · Japan)**

There are many things that impressed me in Minamata. I'll report some experiences I can utilize in the future as below.

I had thought that Minamata disease victims had been opposed to Chisso Corporation until I visited there. But I found them cooperating with each other, from listening to Mrs. Oya's story who told me her experiences about Minamata disease, and from visiting Chisso Co. which helps Minamata local area to be restored. Mrs. Oya lost her husband and father by Minamata disease,



but she told me this disease also brought some happiness, as a lot of people come to Minamata to study about the disease. Through these experiences, I can now understand it is important to actually go and see the sites. I have researched about organic synthesizes. So I think that I have to cherish actual on-site studies, not only desk studies for my research.

I have learned Jimotogaku, developed by Mr. Tethuro Yoshimoto in Minamata. He said that we have to use what local area has already, to stimulate it. It has been important to bring in and out technologies, goods and others on infrastructural developments all over the world. But for Jimotogaku, we have to use what local area has already. I'd like to have a job related to infrastructural developments in development countries, so I'll use Yoshimoto Jimotogaku in the future.

Mr. Yoshimoto told us that it is important to learn from real voices of local people, and I was impressed by Mrs. Oya's talk with her Minamata dialects. Based on this experience, I understand it is important to introduce actual words of a local person when I report someone my on-site study. In relation to my research, I have a lot of chances to give presentations, so I will utilize this learning in the future.

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**Genki Muto (Graduate School of Engineering Department of Applied Chemistry · Japan)**

This Minamata field trip was my first visit to the Kyusyu region and the southern part of the country, because I am from Akita Prefecture in the northeastern region of Japan. So, I found a lot of new things, such as “Danchiku” (southern bamboo), “Bari” and “Arakabu” (fish). And Minamata's land form provides the beautiful view of the sea from its green cropland. Such beauty of the nature erases the image of Minamata disease that is one of the four most serious pollutions in Japan.



On the other hand, I was surprised that Minamata disease has exerted a bad impact on some Minamata people. For example, when we were working on an activity “Arumono Sagashi”, my group, three students and one teacher, looked for things we did not know in Minamata Bay.



We met five old men fishing at the sea side. Readily we saluted to talk about Minamata, but one



old man behaved as he did not hear anything. I thought the roar of waves blocked our voice, so went closer to talk again. However, he did not talk back. We had learned that Minamata's people did not want to talk to outsiders when Minamata disease became a big problem. Before this experience at the bay, I thought this was what happened in the past. However, I found out this was a deep problem from my actual experience with this old man's action.

By the way, I was glad to study a method for community and social development, Yoshimoto Jimotogaku "Arumono Sagashi". I plan to work to revitalize my hometown Akita, after graduating the graduate school. I had thought we need to create something what Akita does not have but want for its development. That is what Mr. Yoshimoto says "Asking for the moon (=Naimono Nedari)". In this practical training, I did "Arumono Sagashi", found a lot of things local people usually overlook. I thought these were key factors for developing Minamata.

Through "Arumono Sagashi", I learned that "asking for the moon (=Naimono Nedari)" is a top-down system which ignores local people and requires a high cost, and on the other hand, "Arumono Sagashi" is a bottom-up system for local people to re-discover the beauty of the area with a low cost.

In the future, I want to do "Arumono Sagashi" with local and outside people in my hometown Akita, and it would be the first step of development in the area!





**Keisuke Yamada (Graduate School of Engineering Department of Applied Chemistry • Japan)**

I came for the first time to Minamata that I had learned on TV and in a textbook. I learned again the tragedy in Minamata before this training. In comparison with what we learned in advance, the town and the sea were beautiful, and the people of Minamata were bright. I was surprised there were many kind people. When we arrived at Minamata, I could not imagine that the pollution had taken place before and the influence continued even now. However, there are still many Minamata patients, many persons who do not yet open their heart to other citizens. I heard from Mr. Sugimoto who was a professional reciter among the Minamata patients. He told us about the terrible event that happened in Minamata. He knew that Chisso was a main cause, but the area around the Gulf of Minamata was really sacrificed for the rapid economic growth of the whole nation. The people could say nothing about Chisso that had a great power in Minamata. They conflicted for the economic reasons. Mr. Sugimoto said he got sad when thinking about this country that would continue to operate nuclear power for national economy without making use of the failure. I also think so. We should confirm it once again which is really important, development of the economy, or human life.

Next is about "local study" exercise. This experience changed my sense of values in particular. It was good for my life to meet Mr. Yoshimoto. I was impressed most that important thing is not "getting the things that one does not have", but "finding the things which one has". This was a way of thinking that I had never thought in my life before. I think that students who continue to an upper university and graduate school to some extent supplement their carriers, because they do not have, or they do best to get what they want. In my opinion, it is important to have the spirit of self-advancement. However, in this Minamata training, I was reminded of importance of "finding the things that one has". From now, I would like to think about whether I recognize the things in the circumference, and what I have. In addition, I understand that I am related with what it was, even though it does not seem to the matter. I will stop thinking that it is useless and also stop cutting corners. I had a very good experience in this Minamata training, I knew that I did not really know it before. I hope to meet them again, especially Mr. Yoshimoto. Thank you.

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**Masahiro Yamamoto (Graduate School of Engineering Department of Applied Chemistry • Japan)**



In this fieldwork I was exposed to the facts of Minamata disease which I never had chance to know about before.

What Mr. Takeshi Sugimoto, a witness of Minamata incident, told surprised me because I was not aware that Chisso company (today's JNC Corp.) had tried hard to hinder local people collaborating with citizens in other areas and protesting against Chisso's measures. I was really impressed of Mr. Sugimoto's courage to speak out under such circumstances. I believe that he was determined to protect local people as well as the environment of Minamata.

Besides, I learned of participatory community study, or *Jimotogaku*, which was not a kind of study based on data collected and analyzed by the researchers, but rather a practical tool for community revitalization and development. *Arumonosagashi* (searching for existing local resources) was an interesting and useful practice for everyone, especially for local people themselves to become aware of their precious inheritance. I asked local people in the field what and where they like in Minamata, and got unique answers from them.

I have had two major lessons from this course. One is that Minamata disease has critically injured human health, local community and the environment, and accurate measures for prevention and recuperation of pollution is very important. The other lesson is on understanding the local area with practical tools, in reference to its unique characteristics. I have appreciated this FOLENS program in Minamata.





## 5. Reviewing the “Jimotogaku Spirit”

OIKAWA Yosei

(Assistant Professor, Department of International Environmental and Agricultural Science)

I accompanied with graduate students for FOLENS Study Tour. We aimed to learn approaches of Jimotogaku (literally translated as local studies, or nonliterally as participatory community studies) and practice it in Myojin one of the coastal communities in Minamata, Kyushu Island.

Through the preparatory seminars and field exercises, we have realized that the methods and approaches of Jimotogaku are quite similar to human geography and area studies, and also methods of rural development such as RRA and PRA. Different from academic works or scientific researches, Jimotogaku is more directed to and more made for local communities or the members there “Jimoto” (= local place and people). Jimotogaku has been practiced really for community revitalization by community members.

After the field trip, I reviewed and practiced Jimotogaku approaches in our technical cooperation in Vietnam and a study tour in Fukushima prefecture.



Photos (from top)

- Entrance Hall, Minamata Disease Municipal Museum
- Viewing Kojishima islet in the Minamata Bay from Tamashii Ishi monuments on the Eco-Park
- Lecture by Mr. Kunio Endo, representative of the Minamata Disease Center *Soushisha*
- Listening to Mr. Takeshi Sugimoto, a witness of Minamata Disease



When I visited villages in central Java, Indonesia, I could observe rural vitalization in Indonesia such as installation of hydram pumps in the upland villages, establishment of a cooperative of organic coconut sugar producers. The locals have been developing/improving the materials and human resources that they have in their environment.

We can enjoy learning the practices and experiences of Jimotogaku or rural development in various places of the world. I would like participate in such activities and exchange more with local stakeholders to vitalize our society.

## 6. Acknowledgements

Masaaki Yamada

(Department of International Environmental and Agricultural Science)

This FOLENS exercise was an opportunity for our Japanese and international students to learn about Minamata disease and the *Jimotogaku* community evaluation (and revitalization) approach. I believe that the participants will remember their *hot* experience in Minamata for life, and will make the best use of lessons learned for environmental conservation and sustainable development wherever they live and work. We'd like to express our greatest appreciation of supports provided by the kind people in Minamata, in realizing this fruitful off-campus program

Photos (from top)

- *Jimotogaku* interview in a Myojin farm, Minamata City
- At a house of Ms. Mitsuko Aya
- Farmer resting in his field in Myojin
- Ms. Arisa Ori of Minamata Nature School coaching *Jimotogaku* write-ups







Photos (from top)

- Refreshing with a water melon
- Visit by a TUAT alumna Ms. Satomi Matsumoto, an organic tea producer in Minamata
- Mr. Tetsuro Yoshimoto who taught us the essence of *Jimotogaku* regourously and gently told us at the end – “What you did shows the answer for you”
- Listening to *Jimotogaku* write-up group presentation





Photos (from top)

- *Jimotogaku* group presentation on their fieldwork at a Myojin hamlet
- Local people of Minamata came to listen to the presentation
- Ms. Rimiko Yoshinaga giving feedback – “I was surprised to know there are still lots of things that I don’t know about my own community. I was happy to know that the locals here said they love this place.”
- Submitting the *Jimotogaku* posters to Mr. Naomitsu Sakamoto, Director of the Minamata Disease Municipal Museum








野菜 好きなものは自分で育てた野菜!

大矢さんは、農作業中に足をけがしてしまいます。それでも今も野菜をつくっています。

トマト ピーマン ナス オクラ ナイモ...



海水浴

・タコ、貝、カニをとる(水俣にはタコがいっぱい!)

・おままごと

埋め立て後の変化

- ・アコウの木に虫が発生!
- 潮風が届きにくくなった
- ・生き物の変化
- ・フナムシがいなくなった!
- ・アマガエルがみられるようになった!
- ・蚊の種類が変わった!
- ・魚釣りができない!

植物博士

大矢さんの家の周りには植物がいっぱい!

- ・打撲に交わる木
- ・飾れるきれいな花
- ・食べれる里芋草
- ・草を畑に剪いて肥やし、日よけに!!

海とともにある暮らしの人々

Change of the ocean

タコ釣り名人 大矢ミツコさん

昭和18年お嫁に来る (当時、ワザが18才!!)

当時は大矢さんより多かった!!

今は一番よい所

大矢さん、大と来る、環境もよい、きれい

子供の頃は、タコ釣り名人で、一回に53匹つかまえました!!

マニキュアにしていました!

家族

吉野理恵

二は神様が住む所

小さい頃からの鮭びき

海ほおずき

井戸で冷たいスィカ

カベを皆でおさえる

台風一過は

カザぐる

大粒にしているのは

勇気をもつこと

1943 - Oyster (Pearl the water)

1906 - Chisso, one time (one more, Purpure, detritus and salt)

1990 - Area changed from Minamata Bay to landfill

2009 - Minamata relief




54 Station - Work 1st till

ピヤマン



















# 大切なことは 家を守ること

大矢さんは水俣病で夫と義父を亡くしました。しかし、その後も水俣に住み続け、4人の子供を一人で育てました。

Mrs. Oya lost her husband and father-in-law when they had been living in Minamata, and raised her four children.

◎ 1943 天が水俣病にかかる前

18歳 チョッ子に勤務する夫と結婚

- 山育ちの娘 → 悪さをやり兼ねない
- 娘の家の周辺には3軒しか家がない
- 天はいつか教育の大切さを娘に言っていた。

チョッ子に勤め、教育の大切さを知る。 娘は良子、良子は良子教育をうける

# 海は家族

この時期が印象的だった。 かくかくしてはじめて来た。 海は家族

1964年につくられた。 482

70年代の海上風景



夫が水保痛にかかり、1955 夫が水保痛を療養する（ロココ荘の山荘）入院を遂行

1956 徳新の義父が水保痛にかかり、7人の子供を育てるために建築現場で働き始める

1956 徳新の義父が水保痛にかかり、7人の子供を育てるために建築現場で働き始める

4人の子供を育てるために建築現場で働き始める

かみのはかに息子とまきと子（応用化学専攻大塚節）

農作業の手で車政で片足で歩く、一歩一歩の歩みで歩道は回復

昔の水保村、今の水保村が女子高

昔は水保村が、行く行くに人が散らばって、にぎやかな村になった

水保痛におと苦しいこともたくさんある

どうして明神が動かされたのか？

木ムは家を守らなければならぬ。一番大事な事は、木ムは家を守らなければならぬ。一番大事な事は、木ムは家を守らなければならぬ。

明神の歴史と明神が最大のふるまの

現代の

海と生物と暮らし

1 明神海岸

2 美しい水保!

3 小野田川

4 水保村

5 水保村

6 水保村

7 水保村

たけしの生物所が暮らしで暮らした山

2012/7/25 山田隆介 (Finn 君)

東京工科大学 大倉英美 (Finn 君)







金子さん  
(女) 74歳

1. おいしかった食べ物

**魚**, アジ, あさり, かつおの刺身

2. 好きな場所

**畑** (海が見える!!)

3. うれしかったこと

**子供** (4人) が元気に育つこと

4. 大事にしていること

**健康** (畑仕事)

5. こも一言であらわすと

**住みやすいところ**

余りでもないこと

インディーズも

試みている……

一言も口を聞いて

くれない人が……

昔の名残り!?

水保病の深い問題





~まとめ~

ここが山甲という証状を得た。  
 人の生活に面影があり。  
 “あるものも物語っている。  
 「これは何だ？」と考えることで、  
 それらが生活の知恵から  
 出てきたものだとわかった。



**8. Attachment: Environmental Issues, Society and People in the World (Students Presentation Slides)**








### Environmental Pollution issues in Thailand

- Case study in Factories area in Rayong Province East of Thailand.



### The history of industrial development in Rayong Province.




- 1988, Expanding industry from 8,000 to 20,000 acres.
- 2000-2003 Problem of air pollution. Especially odors from petrochemical plants
- 2005-2007, Problem of contaminants in soil and water.
- 2008, Declare a pollution control areas



**The World POLITICAL**

**Location**  
The Kingdom of Thailand is an independent country that lies in the heart of Southeast Asia.


### Caused of the environmental problems



### Environmental Pollution issues in Thailand

- Case study in Factories area in Rayong Province East of Thailand.

- Rayong province were chose to be the center of manufactories and industrial area.
- Easy to transport and ship the goods both domestic and international, because closed to the sea.
- Last few decade the environmental problems in Rayong province were occurred.



### It's effects to human community.



Victims

Cadmium

Cyanide

Ashes and dust

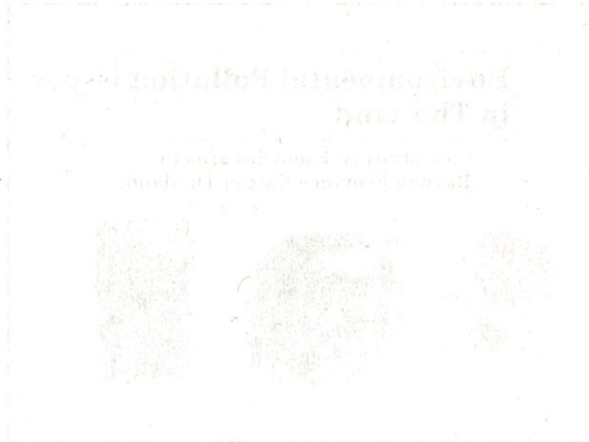
<http://www.oknation.net>



**Development and protection of the government.**

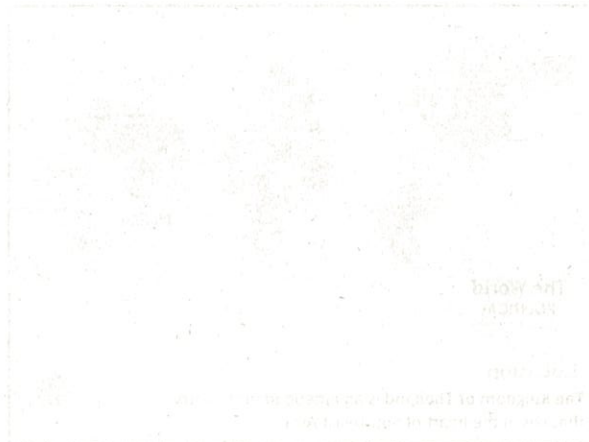
↓

- ❖ The industry is monitoring every **3 months** on the air, water, waste management sent report to the Ministry of National Resources Environment.
- ❖ Every **6 months**, officials from the Pollution Control Department will go to the factory checked and monitoring.
- ❖ **Every year** there is an officer of government information and medical communities around the industrial area of study.

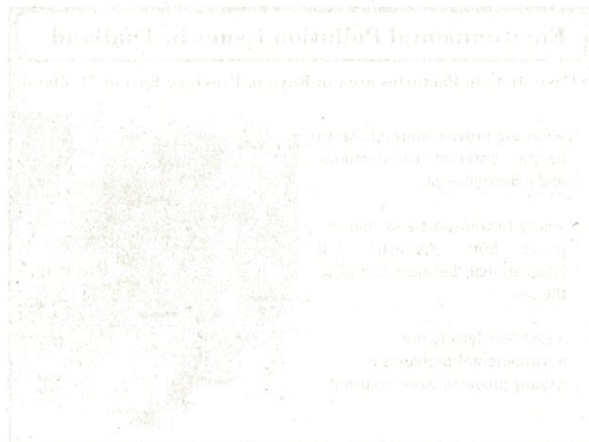


**The action plan. The goal of the operation.**

- Reduce air pollution, water pollution, waste, garbage and industrial waste. To comply with statutory requirements.
- Water, soli, and air quality should be with in the standard level.
- local community participation in monitoring and surveillance of environmental quality, and share the information. (**Pay attention on environment**)



**Thank you**





## アフガニスタン カブール市 の大気汚染

TAT

東京農工大学  
FOLENS

Group:C  
ボヤ  
上村 美羽  
武藤 元貴




2012年7月24, 25, 26日 FOLENS水俣実習

### 大気汚染の原因

人為		
車の急激な増加 手入れの行き届いていない中古車 燃料の質が悪い	汚染物質の排出	
道路の舗装が悪い 建築現場が多い	粉塵が巻き起こりやすい	
環境		
緑地が少ない 山々に囲まれている 標高が高い	粉塵が巻き起こりやすい 大気が循環しない	
社会		
市民は大気汚染が及ぼす影響を知らない		大気汚染を防ぐ活動をしていない
政府は経済発展を優先		大気汚染対策を講じていない

### アフガニスタンってどんなところ？

- 中央アジア、南アジア、中東に位置する
- 国土: 650,000 km<sup>2</sup>
- 人口: 2,900万人 (2005年7月時)
- 首都: カブール (国民の1/5が住む)
- 標高: 1,800 m
- 人口密度: 755人/km<sup>2</sup> (カブール市2010年)  
(水俣市: 163人/km<sup>2</sup>, 東京都: 6,030人/km)


TAT

### 大気汚染の対策

人為		環境
◆中古車輸入の禁止 ◆公共交通機関の充実 ◆道路の質を改善		◆緑地エリアを拡大
大気汚染		
社会		
◆政府	汚染度を計測, 対策を講じる	
◆市民	問題意識を持って取り組む	

### カブール市大気汚染の現状

- ・カブールの60%の人が人為的原因の塵に曝されている
- ・年間3000人が大気汚染を原因とした呼吸器疾患で亡くなっている (大半が5歳以下の子供)
- ・主な原因物質はNOx, SO<sub>2</sub>, Pb, CO<sub>2</sub>, CO, HC
- ・特にPM10, PM2と呼ばれる微粒子が排出される



TAT

~fin~  
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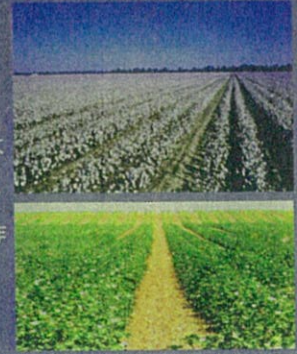
# アラル海における諸問題

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## 縮小の原因

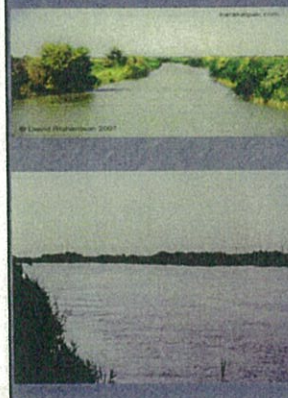
### 綿花栽培

- ウズベキスタンの主要輸出産物
- Karakalpakstan は巨大な綿花栽培地帯となる。
- 綿花栽培だけではなく稲作栽培も増加



## アラル海について

- カザフスタン・ウズベキスタンの国境に位置する。
- 世界で4番目に大きい湖
- 1960年代以来、縮小し続けている。



- 砂漠における綿花栽培は水が必要
- 巨大なダム建設
- 850マイルにわたる運河の建設
- 灌漑施設が完成後、
  - 水位は40フィート(約12m)下降
  - 体積は90%まで減少

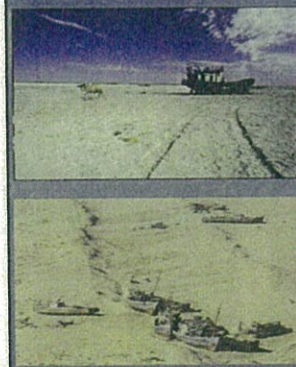
## アラル海の問題

### アラル海の縮小

- 元のサイズの10%まで縮小し、4つに分かれる
- 健康問題
- 環境問題



## 生態系の破壊



- 降雨の減少・気温の年較差拡大
- 周辺の森林が枯れる
- 湖とともに砂漠化
- 元々、湖底に塩分が含まれていた
- 湖が干上がると同時に塩分濃度の上昇



## アラル海付近の健康問題

化学物質と塩分を含んだ  
地表水・地下水、砂嵐



- ・住民の8%がHIVに疾患を持つ(中央アジア)
- ・呼吸器系に疾患をもつ人が多い。



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- ・乾燥地帯であり、喉を傷めるため大量の水を飲む。
- ・地下水に頼っていた地域では、塩分だけでなく農業地帯で使用された化学肥料や農薬などの混入も。
- ・栄養不足・経済の不安定さなども複合的に関係



## アラル海の回復にむけた取り組み

- ・世界銀行: アラル海に堤防を建設
- ・JICA: 周辺地域の復興を支援
- ・その他多くの機関から融資を受けて、回復に取り組んでいる。
  - アメリカ合衆国国際開発庁 (USAID)
  - ドイツ国際協力機関 (GIZ)
  - トルコ国際協力機関 (TICA)
  - 国境なき医師団 (MSF)







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**FOLENS**

モザンビーク、ザンベジ川に  
おける水質汚染について

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### ザンベジ川



長さ→2750 km  
源流: ザンビアの北側  
西→東→インド洋  
アンゴラ、コンゴ民主共和国、ナミビア、ボツワナ、マラウイ、ザンビア、ジンバブエ、モザンビーク

### モザンビークについて



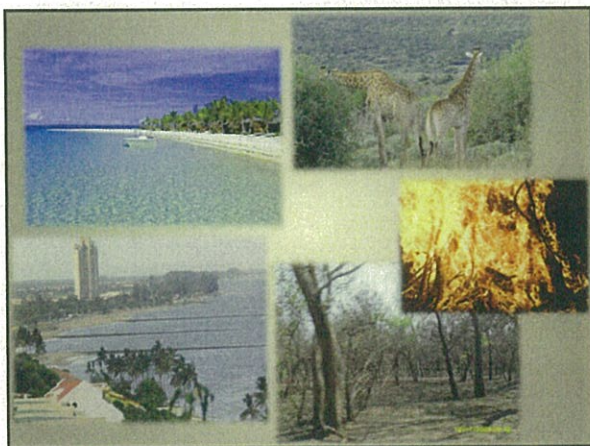


面積: 799,380km<sup>2</sup> (日本の約2倍)  
人口: 約2305万人 (日本の人口の18%)  
人口密度: 26人/km<sup>2</sup> (日本の人口密度336人/km<sup>2</sup>)  
気候: 熱帯性、亜熱帯性

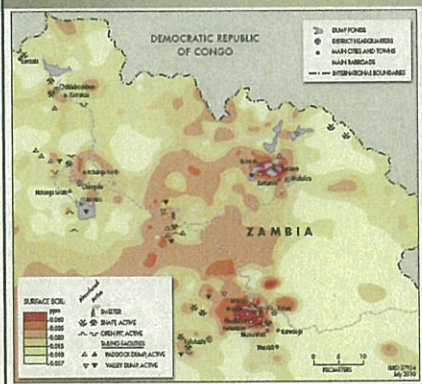
### ザンベジ川の水質汚染

原因

- ①家庭排水・・・処理が不十分、都市への人口集中  
→富栄養化・・・植物プランクトンが増殖  
藻類や植物の繁茂  
コレラ・チフス
- ②農業・・・肥料の過剰使用、過剰灌漑  
農薬、除草剤の使用
- ③鉱業・・・重金属の河川への流出  
鉛、水銀、ヒ素などが鉱山廃水から検出

### 水銀



赤・・・0.060ppm以上は異常値だと考える

重金属による影響が心配されている

鉱山活動による重金属汚染が人体に影響を与えている報告はされていないが、監視する必要性が指摘されている



