Completion Report

Vietnam Internship

August 5-12, 2012

Organized by

Environmental Diplomatic Leader (EDL) Education Program

Master's Program in Environmental Sciences
Doctoral Program in Sustainable Environmental Studies
Graduate School of Life and Environmental Sciences
University of Tsukuba

Strategic Funds for the Promotion of Science and Technology

Preface

This report describes the activities and learning outputs from the EDL Vietnam Internship, during August 5-12, 2012. The internship was carefully designed to provide the participants with opportunities to learn on-the-ground issues and solutions in Vietnam and also to organically link a diverse range of environmental issues such as water (industrial and domestic wastewater treatment in Hanoi, marine protected area management in Nha Trang, and lagoon management in Hue), biodiversity and local livelihood (coral reefs and fisheries in Nha Trang, and lagoon nature and aquaculture in Hue), and policy challenges. Also, public health topics were incorporated into the internship activities as another important and trans-disciplinary viewpoint.

As part of the internship program, we held two seminars with different partners and orientations: JDS-EDL reunion seminar supported by the the Ministry of Natural Resources and Environment of Vietnam, and an international seminar with Hue University of Agriculture and Forestry. The reunion seminar was the first official event for the JDS alumni, current JDS fellows and EDL students to meet and share academic and professional experiences, and the joint international seminar with HUAF was organized to exchange research ideas through academic presentations by the internship participants. We hope that this internship program as a whole including the seminars gave the participants new insights toward sustainable environmental management as well as contributed to expanding their network as future environmental leaders.

We extend sincere thanks for internship support to: Ms. Tran Thi Min Ha, Director General of the International Cooperation Department of MONRE; Mr. Kohei Toda and his colleagues, WHO Vietnam Office; Dr. Minoru Akiyama and his team, Bach Mai Hospital; Professor Nguyen Quang Linh and his team, Hue University of Agriculture and Forestry; Mr. Tadashi Suzuki and Ms. Ai Miura, JICA Vietnam Office, and all the partners and local experts in Vietnam.

Lastly, the participants were proactive in their engagement in interviews and discussions with local experts throughout the program. Their diverse academic backgrounds in chemical engineering, waste management, health and environmental management to community biodiversity conservation, and different cultural backgrounds (China, Japan, Jordan and Nepal) added to the academic excitement and fusion during the trip. We hope that this report prepared by each participant and compiled by the editorial team of Ms. Xiang Nan, Ms. Lin Xiaocun and Mr. Rejeev Kumar Singh, provides a good record of the internship activities to share with their fellow students, academic staff and partners.

EDL Vietnam Internship Instructor Team

Table of Content

List of Participants and Local Expert Contributors

Participants of the Vietnam Internship

Professor Naomi Wakasugi

Assistant Professor Naoko Kaida

Assistant Professor Rie Murakami

Xiang Nan	(Doctoral student)
Toda Miki	(Doctoral student)
Mahadi Ikhlayel	(Master's student)
Lin Xiaocun	(Master's student)
Rajeev Kumar Singh	(Master's student)
Liu Yu	(Master's student)
Hamajima Yuto	(Master's student)
Banu Yasin	(Master's student)

Local expert contributors

Mr. Nguyen Trung Thuan (Ministry of Natural Resources and Environment, JDS and EDL alumnus, Hanoi)

Ms. Tran Thi Minh Ha (MONRE, Hanoi)

Ms. Nguyen Thi Bich Huong (MONRE, Hanoi)

Ms. Nguyen Thi Loan (Thang Long Industrial Park, Hanoi)

Mr. Toshio Nagase (Japan International Cooperation Agency Vietnam Office, Hanoi)

Mr. Tadashi Suzuki (Japan International Cooperation Agency Vietnam Office, Hanoi)

Ms. Ai Miura (Japan International Cooperation Agency Vietnam Office, Hanoi)

Mr. Hiroyasu Sasaki (Swing Water Vietnam (Ebara), Hanoi)

Dr. Kohei Toda (World Health Organization Representative Office Vietnam, Hanoi)

Dr. Wu Guogao (World Health Organization Representative Office Vietnam, Hanoi)

Dr. Fabio Mesquita (World Health Organization Representative Office Vietnam, Hanoi)

Dr. Minoru Akiyama (Bach Mai Hospital (JICA), Hanoi)

Mr. Troung Kinh (Nha Trang Marine Protected Area Authority, Nha Trang)

Dr. Do Thai Hung (Pasteur Institute, Nha Trang)

Professor Nguyen Quang Linh (Faculty of Fisheries; Hue University of Agriculture and Forestry, Hue)

Dr. Ngo Thi Huong Giang (Faulty of Fisheries, HUAF, Hanoi)

Ms. Hoang Ngoc Tuong Van (Institute of Environment, Resources and Biotechnology, Hue University, Hue)

Mr. Ty (Fishery Association of Ngu My Thanh hamlet, Hue)

Ms. Dang Nguyet Anh (EDL student and JDS fellow, University of Tsukuba)

Mr. Ha Thang (EDL student and JDS fellow, University of Tsukuba)

Schedule

Date		City	Time	Theme	Activity
8/5	Sun	Hanoi	10:30		Narita to Hanoi (VN311)
8/6	Mon	Hanoi	9:00	WATER	Water environmental management (Mini lecture and wastewater treatment facility visit at the Thang Long Industrial Park)
			13:00-14:00	WATER	JICA Vietnam Office: Guidance on Japanese ODA on environment and health in Vietnam
			15:00-17:00	WATER	JICA Second Hanoi Drainage Project for Environmental Improvement (II): Yen So pumping station and Truc Bach wastewater treatment plant
8/7	Tue	Hanoi	9:00-12:00	HEALTH	WHO Vietnam Office
			13:30-15:00	HEALTH	Bach Mai Hospital
			16:00-17:00		JDS-EDL Reunion Seminar (MONRE)
8/8	Wed	Nha Trang	6:15	-	Hanoi to Nha Trang (VN1551)
			10:00-14:00	BIODIVERSITY	Marine biodiversity and sustainable tourism in MPA
			15:00	HEALTH	Pasteur Institute and Alexandre Yersin Museum
8/9	Thu	Hue	12:15	-	Nha Trang to Danang (VN1942)
8/10	Fri	Hue	7:30-9:00	BIODIVERSITY	Community-based tourism
			9:00-13:00	WATER	Environmental and socio-economic impact of aquaculture and fisheries on the Tam Giang Cau Hai Lagoon (by boat)
			14:30-18:00	-	International seminar with Hue University of Agriculture and Forestry
8/11	Sat	Hue	Morning	HEALTH	Rehabilitation hospital for victims of Agent Orange (chemical defoliants)
			17:00	-	Danang to Hanoi (VN1520) =>21:15 => 00:05 (August 12) Hanoi to Narita (VN310)
8/12	Sun		7:35	-	Arrival at Narita

Map


CHINA
LAOS
CAMBODIA
Gulf of Tonkin
Hanoi
Vientiane
Phnom Penh
Da Nang
Nha Trang
Hue
Vung Tau
Phan Thiet
Qui Nhon
Kon Tum
Dong Hoi
Vinh
Thanh Hoa
Haikou
Sanya
Hainan Dao
Pingxiang
Nanning
Beihai
Zhanjiang
Laos
Cambodia
Thailand
100 Miles
Boundary representation is not necessarily authoritative.

1

Daily Activity Records

Hanoi, Nha Trang and Hue

Day 1. Water environmental management in Vietnam

August 6, 2012 By Mahadi Ikhlayel

Figure 1. The group of participants at the pumping station in Hanoi

1. Introduction

Vietnam, a country located in Southeast Asia, has a total population of 87.84 million and an area of 331.212 km2 and a GDP of $USD 124 billion as of 2011. In recent years, the country has witnessed rapid economic development.

This economic development negatively contributed to serious environmental problems. The major environmental issues in the national agenda are air pollution control, wastewater treatment, water improvement, and solid waste management. As for the environmental water management, the main topic for Day 1, the country has already developed an action plan to control water quality.

Technically speaking, water in Vietnam is monitored by a regular BOD test in major rivers in the country, where the standard values of BOD tests meet the country's national standards. We received a brief introduction about the Pollution

Figure 2. the location of Vietnam

Control Department by Mr.Thuan, an alumnus of the University of Tsukuba, who provided an overview of the increasing trend in measured BOD values during the period 2005-2010.

Water management structure in Vietnam is overseen by the Ministry of Environmental Management, which was established in 2003. The ministry takes care of Vietnam's seas, rivers, lands and islands. The Pollution Control Department is the department that is in charge of various environmental measurements including water quality.

Figure 3. The drainage project in Hanoi City – The wastewater treatment plant

2. Water environmental laws in Vietnam

The first environmental law in Vietnam was released in 1993 and entitled the Law of Environmental Protection. The law was amended in 2005 and the next revision is planned during 2013. An important law regarding water management is the Law of Environmental Protection of Marine, River and Other Water Resources. Thus, water management in Vietnam is legislated by a specific environmental law that addresses water issues. Water environmental management also falls under the following sub laws:

- Law on water resources (2008): This law calls for water resources protection as well as exploitation and utilization of water resources and administration management of resources.

- Law on technical regulation on environment: This law consists of central and local regulations.

3. Activities

Our internship in Vietnam, took place in three cities: Hanoi, Nha Trang, and Hue. We started our activities by learning about water pollution policy in Vietnam through attending a lecture in Thang Long Industrial Park in Hanoi City. In this lecture, we received an in depth explanation about both environmental water control policies in Vietnam, and the situation of wastewater management in the country with a focus on Hanoi City.

Some questions we asked during the lecture and the answers:

Question 1: What are the environmental areas that receive the most environmental degradation?

Answer: Air, water, municipal solid waste.

Question 2: About the water control standards, are they international or local standards?

Answer: They are international standards that meet the regulations of the World Health Organization (WHO) and they meet our local standards as well.

Question 3: What kind of economic instruments are available to recover the cost of the wastewater treatment.

Answer: Wastewater fees, which are applied only to the industrial sectors. However, there is a need to improve our economic instruments so that we improve our cost and recovery rates as well.

The second activity was our visit to the JICA Hanoi office, which was followed by a technical visit to the city center waste treatment plant at Hanoi where all the waste of the community is connected to this waste water sewage plant. They treat 2000 cubic meter of waste per day. After that we visited the Pumping station established by JICA with the aim to decrease flood damage, improve water quality by developing drainage and sewage systems in Hanoi city, which will finally contribute to the improvement of urban sanitation and the living environment. During the visit to the Hanoi office, we had lectures. At the beginning of the lecture session, we received a booklet that explains JICA activities and its projects in Vietnam. The lectures included a quick review of the JICA activities in Hanoi including water improvement and waste management projects.

Later, we visited a drainage project in the central part of Hanoi City. The second Hanoi drainage project for Environmental Improvement is a well-established project in Hanoi City that deals with the wastewater in the city as part of other projects. The problem of wastewater in Vietnam is the discharge of wastewater to lakes and rivers from households and the industrial sectors. The project area covers the To Lich River basin in the central part of Hanoi City. This area is bounded by the Song Hong Red River in the north and east with a total area of 7,750 hectares. The wastewater is generated from different parts of the city and discharged directly into the lakes and the channel rivers as well, which poses several environmental problems such as water contamination as well as public health issues, besides the social acceptability to the environment.

The project is technically managed and maintained by Japanese engineers and JICA experts. For the technical aspects, the waste treatment plants all are made in Japan and assembled in Hanoi City. The objective of the project includes:

(1) Improvement of the discharge system in Hanoi City to reduce physical damage caused by improper drainage.

(2) Initiation of waste treatment practices so that more plants will be established later.

(3) Improvement of the technical skills of the local engineers.

The JICA office in Hanoi frequently releases several technical reports explaining the current and the future situation, which can be accessed online for in depth technical coverage.

Some questions we asked and the answers:

Question 1: How could you describe the effect of solid waste on water environment in Vietnam?

Answer: Solid waste is sometimes discharged into the water basins, lakes and rivers from households, besides wastewater, there used to be no drainage system available to collect and deal with wastewater. Solid waste puts pressure on the environment. Here, the place where this plant was established around the lake, you could never see the currently improved situation. In the past, before the establishment of this facility, the situation was very bad.

Question 2: JICA has established a waste separation project in Hanoi. Waste separation is difficult to establish, and I can imagine many challenges so how could JICA successfully establish such projects?

Answer: These projects are pilot scale projects (small scale). They are not efficient but the purpose is to initiate the practice of doing some waste separation at source by distributing waste collection bins in the streets and in several parts of the city.

Question 3: It was mentioned that wastewater is discharged into the river and water basins after the first treatment. Why is that?

Answer: This is a part of the waste treatment process. The wastewater after being discharged enters another stage of treatment, to be mixed with river water so that wastewater is naturally treated before the final stage.

Question 4: In many countries, there is difficulty in treating waste sludge. In Vietnam, how do you deal with such a problem?

Answer: Usually, a private company collects the sludge and treats it. The sludge is collected to make it dry first then the private company takes care of it.

Question 5: For this drainage project, JICA is working on different projects in Vietnam in different areas. How does JICA evaluate the project, the improvements, and the results?

Answer: This project is a new project and although it is several years since its establishment, it is difficult to evaluate the overall improvement. However, you can see the success of this project if you look at the environment around the area here where the project was established and compare it to several years ago.

4. Conclusion

The part of our trip about Environmental Water Management in Vietnam was informative and very helpful. It gave us an in depth understanding of the water pollution control policy in Vietnam and to learn from its experience. The part that related to wastewater treatment was very special because of the in depth technical explanations we received beyond the theoretical part with two technical visits, one to the drainage treatment plant and the other to the pumping house facility. The visit to the JICA office in Vietnam was one of the most important activities during the trip; it gave us the opportunity to learn more about JICA, and its vision for Vietnam as well as its achievements, especially for environmental improvement. We had the chance to meet some of the JICA team in Vietnam and to learn from them directly, through lectures and by asking questions directly and we received clear answers or further explanation.

Supplementary materials

Following is a list of supplementary materials that were obtained during the technical visits in relation to water management in Vietnam:

(1) JICA Development: Inclusive and dynamic development

A booklet prepared and published by the JICA office in Vietnam that explains JICA activities in the country.

(2) JICA Environmental Cooperation in Vietnam: Case projects

Power Point slides summarize JICA activities in Vietnam including case studies such as, water environmental protection, capacity building and waste management.

(3) Water Environmental Management in Vietnam

Power Point slides introduce water management in Vietnam, policies, water control and information about wastewater treatment.

References:

1. Ex-Post Evaluation of Japanese ODA Loan Project: "Hanoi Drainage Project for Environmental Improvement (I-1) (I-2)", JICA

2. JICA Vietnam website, http://www.jica.go.jp/vietnam/english/index.html

3. All the other supplementary materials that distributed during the technical visits, are mentioned in section 5 " support materials".

Day 2. Environment and human health in Vietnam

August 7, 2012 **By Yuto Hamajima**

1. Visit to WHO Vietnam Office

Figure 1. Lecture by infectious desease specialist

On the third day of our Vietnam Internship, we visited official government sites and hospitals to hear about the current situation of health security and management in Hanoi, one of the largest cities in Vietnam. The first tour site we visited was WHO, The World Health Organization; it was established in April 7, 1948 and has 191 member states. WHO is the specialized agency for human health security that measures population and tendency of disease in the vast majority of people all around the world. In the Vietnam Office, there are 68 staff making up the specialized team in disease areas which played roles in the polio eradication, leprosy elimination, and the rolling back of the border transmission of malaria

a) Medical lesson

In many undeveloped areas, the knowledge and information about disease and its treatment methods are not fully understood. Since Vietnam is still a developing country, some communities do not have an essential understanding of medicine usage and disease. The common sense basic methods of preventing disease such as washing hands, using safe water and cooking raw food thoroughly at a proper temperature are still unfamiliar. In some parts, people lack utensils and eat food with their bare hands, without washing first.

During the WHO presentation, we learned the important part of WHO activity; proper information sharing and informative investigation. In the first presentation, examples of emerging diseases, H1Avian Influenza and Malaria was described and the statistical decline in the number of patients was shown. We figured out that the fact that lack of information about disease is a major issue in emerging diseases. The analyzed population result showed a dramatic change in before and after the introduction of insecticide-treated mosquito nets. The disease malaria is well known for no existence of vaccination and treatment.

According to the presentation, when WHO introduced the insect net with insecticide application, the population who suffers from the disease was dramatically decreased. The most shocking image was the picture of child who cannot stand up on his feet since those feet are paralyzed from the malaria side effects. With proper investigation of each household and treatment, statistical analysis shows the population suffering from the disease is decreasing in Vietnam. The mindset here is to eliminate emerging diseases from all around the world, and we could see the WHO effort in treatment and cure.

b) Non-communicable disease and sexually transmitted disease

In Vietnam, the problem is not only the disease that can be cured from medical treatment or methods using equipment such as insect nets or sprays. The non-communicable diseases that are caused mostly from personal habits are also fatal. Those diseases tend to have a longer span and need proper nutrition to cure. The concern is still high in the organization, and nutrition advice is a small part of the activity they are offering. In the human reproductive process, sexual intercourse is necessary however; understanding of the proper process is still limited. Under the commitment of diagnostics and commodities, Vietnam is also fighting against HIV. They offer HIV sentinel surveillance, routine monitoring and reporting, and operational studies. Cynically the chief officers said “I am in a good position since I can talk about sex”, he knew how serious sexually transmitted disease is. With further investigation and proper treatment notification, these diseases related to personal habits and sensitiveness can be prevented or cured.

c) Medicine uses and proper treatment policies

The rising problem in developing Vietnam is the abuse of drug use. When a country tends to become abundant in materials and resources, problems related to drug use stands out. According to Dr. Toda, diseases related to blood contamination through sharing needles in drug use become prominent when visiting Vietnam became popular. Some addicted drug users steal needles used for medicinal purposes in hospitals and medically related organizations and re-use them without proper sanitation. There are two major ways that have developed after drug use in civilians who have no rights to use drugs: combustion of needles and the invention of self-destructive needles. The incineration chambers for burning waste in Vietnam are ineffective compared to other countries. WHO is still putting efforts into waste management and technical treatment to avoid harming people by saving people's life with needles for medicinal use.

Figure 2. Explanation about medical waste in Bach Mai Hospital at Hanoi

2. Bach Mai Hospital

The second site we visited was Bach Mai Hospital, one of the core hospitals in Vietnam. The facility cares for patients who are much larger in

number than the capacity of the hospital. The health care and cure of Vietnam is secured by these organizations and its usage of proper treatment information.

a) The security in food and wastes

The second topic discussed in the WHO office, was food security and its specific relationship to personal health and disease treatment. We visited the clinical nutrition center, patient department and isolation treatment department to gain deeper understanding. At the nutrition center, the department officers and doctors cooperate to make a menu for the patients who outnumber the capacity of its hospital. The nutritious facts are very important particularly, for the cure of non-communicable disease. With effort and a properly designed menu, the department covers patients with limited food resources. The waste from these foods and medicines used in the hospital were also managed properly by dividing the wastes into categories. The raw wastes are placed in a yellow bag, while the medical wastes were put in a blue container, which was later sorted and disposed.

b) Information Analysis

After the department visit, we listened to the presentation of Dr. Minoru Akiyama, who is one of the good friends of Dr. Wakasugi. The cooperation in the health field from Japan in Vietnam seems relatively important. The biggest problem discussed was insurance and monetary issues since many of the people in Vietnam still do not have sufficient insurance coverage. When we were out in the cities of Hanoi, Nha Trang, or Hue, we saw a lot of motorcyclists driving without a helmet, two or more passengers riding on the same vehicle, or even a person who crashed and was thrown off the bike they were riding. As the population is increasing and transportation is limited, these situations occur. The Japanese government provides grant aid in health faculties and helps the development of health care while giving the option of loans in Japanese yen. Dr. Akiyama expressed to us that also with technical issues, the relationship with many other countries is necessary,. The improvement in insurance issues and hospital treatment technology is also still a big theme.

3. JDS-EDL Reunion Seminar

The last part of the second day activities was the JDS-EDL reunion seminar. During the seminar, all internship group members and EDL graduates, alumni from the University of Tsukuba were invited to the Ministry of Environment. There we heard a presentation on Vietnam Environmental Development and Sustainable approaches to activity related to the environmental standard of Vietnam. Two main parts of the presentations were introductions by the director Mrs. Tran Thi Minh Ha and Professor Wakasugi who talked about the importance of EDL education in practice.

Discussion:

During the visit to these two main organizational sites, which represent the information and cure of communicable/non-communicable disease, we learned the current situation in Vietnam. The author was very surprised how Vietnamese health-related organizations are taking the situation seriously.as Vietnam is still under pressure as a mid-developing country.

Figure 3. Special lecture by Ms. Tran Thi Minh Ha at the JDS-EDL Reunion Seminar

Conclusions:

The information we received was very important to know about the activities of organizations in Vietnam as well as know the current situation in Vietnam related to health and development. Day three of our internship was successful in terms of collecting much new information and knowledge, and learning directly about the current situation that Vietnam, and near-by countries are facing. I felt that in both the facilities of WHO and Bach Mai Hospital, the officers who work there, think about saving people and to make people's life more comfortable. The human related environment is not separated from global issues. In order to help and heal both the globe and people who are live there, we re-recognized how the health care, and cure is important.

Supplementary materials

Presentation slides “Emerging Disease Surveillance and response: Team briefing for new WR (Hanoi April 2012)”

Presentation slides “HIV/AIDS in Viet Nam (WHO HIV Team)”

Poster “Action Against Dengue!”

Poster “Five Keys to Safer Food”

Pamphlet “Essential Drugs and Medicines Policy”

Presentation slides “Health Information of Vietnam, Cooperation of Japan in Health Field in Vietnam, The Project for Improvement of the Quality of Human

Resources in Medical Services System”

References:

WHO Internet Home Page - http://www.who.int/en/

WHO Vietnam Office Home Page - http://www2.wpro.who.int/vietnam/about_us/about_who_vtn.htm

Day 3. Nha Trang Marine Protected Area and the Pasteur Institute

August 8, 2012 By Yu Liu

1. Information about Nha Trang

Nha Trang is a coastal city and capital of Khanh Hoa province, on the South Central Coast of Vietnam. Nha Trang city has a metropolitan area of 251 km² and population of about 500,000 (as of 2007). The city is located on the beautiful Nha Trang Bay, which was chosen by Travel and Leisure in two successive years as one of the 29 most beautiful bays in the world. Nha Trang is surrounded on three sides by mountains and by a large island on the fourth side (in the ocean directly in front of the city's main area), blocking major storms from potentially damaging the city.

Figure 1. Location of Nha Trang

2. Visit to Nha Trang Bay Marine Protected Area Authority

As the first destination of our activities in Nha Trang, we arrived at Nha Trang Bay Marine Protected Area Authority at 10:00. Mr. Truong Kinh director of the authority received us and gave us a lecture on basic information about the authority and the Marine Protection Area. The Nha Trang Bay Marine Protected Area (MPA) is the first comprehensively developed and managed MPA in Vietnam. Since its establishment, in 2001, the Nha Trang Bay MPA was supported by the Hon Mun MPA Pilot Project. As the project drew to a close in 2005, a publication outlined the project's achievements and guidance on the future challenges facing the MPA.

The objective of the MPA and the project is to protect Marine biodiversity environment and to enable local island communities to improve their livelihoods and in partnership with other stakeholders to effectively protect and manage the marine biodiversity in Nha Trang Bay as a model for collaborative MPA management in Vietnam.

The Nha Trang Bay MPA is about 13,000 hectares and comprises many important habitats including coral reefs, seagrass and mangrove areas. Nha Trang Bay houses the highest coral reef diversity of any surveyed location in Vietnam. Due to its biodiversity values, Nha Trang Bay is an "area of highest national priority" for marine conservation and coastal tourism.

The Hon Mun MPA Pilot Project was financed by the Global Environmental Facility through the World Bank, DANIDA – Government of Denmark, IUCN - The World Conservation Union, and the Government of Vietnam. The project was implemented by the Ministry of Fisheries, Khanh Hoa Province and IUCN.

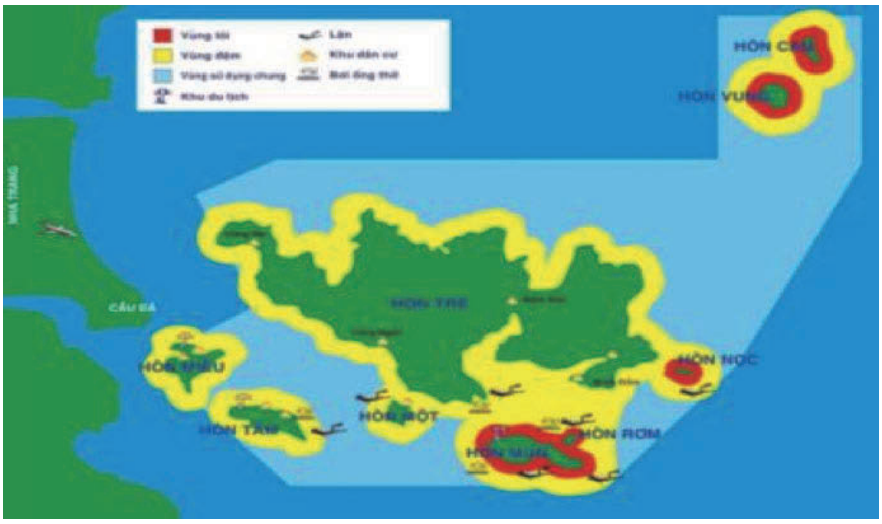


Figure 2. Marine protected area in Nha Trang

The main activities of Hon Mun Marine Protected Area Pilot Project are not only to protect the environment and biodiversity in Nha Trang Bay area, but also include the education of local people for the future and supporting local livelihood.

To get sustainable financing support for Nha Trang Bay MPA is a big challenge for the managers. The management of Nha Trang Bay MPA requires both investment in infrastructure and the provision of operational expenses for daily activities such as enforcement, education and the implementation of the Management Plan. The implementation of a sustainable financing strategy for the Nha Trang Bay MPA requires the Nha Trang Bay MPA Authority to develop transparent revenue and expenditure plans based on legislation and lessons learnt by MPAs both nationally and internationally. These plans have to state clearly different sources of revenue and expenditure to ensure clear understanding of sources and uses of funding.

3. Visit to the Institute Pasteur in Nha Trang and Alexandre Yersin Museum

We left the MPA Authority at about 12:30 and had a delicious local meal at a local restaurant. Then we headed for our second destination in Nha Trang. We arrived at the Institute Pasteur at 2:00. Director Prof. Bui Trong CHIEN gave us a lecture to show us information about the institute.

Since its creation in 1887, the Institute Pasteur has become famous throughout the world as a symbol of science and French culture. For 120 years, the foundation has been contributing to the prevention and treatment of infectious diseases through research, teaching and public health initiatives.

The Pasteur Institute, Nha Trang is located at the north end of Tran Phu Blvd. The Pasteur Institute, Nha Trang was established in 1895 by Alexandre Yersin, the first director of the institute, appointed by Louis Pasteur. The museum is dedicated to the French national Dr. Alexander Yersin (1863-1943). Yersin was a man of renaissance and was famous for his pioneering medical research and was himself an explorer, biologist, botanist and entomologist. He was very much interested in astronomy and photography as well. He introduced rubber and quinine producing trees. He also discovered the microbe that is the cause of the bubonic plague.

The Pasteur Institute, Nha Trang is among the thirty Pasteur Institutes present worldwide. The name of the institute has been maintained throughout the institute history. Soon after the reunification of Vietnam in May 1975, the institute was taken over by the government and it has been under the direction of Ministry of Health of Vietnam.

Figure 3. Pasteur Institute

The Pasteur Institute, Nha Trang nowadays performs research as well as makes vaccines. There is a public library as well as office within the complex for public viewing and has a good collection of his equipment used in research. On the recommendation of Yersin, his laboratory in Nha Trang and the Dr. Albert Calmette Laboratory in Saigon were created under the umbrella of the Indochina Pasteur Institute, which was the first to be established outside Paris.


Figure 4. Seminar at the Institute

The Pasteur Institute, Nha Trang is taking care of the 11 provinces as well as 99 districts in the central part of Vietnam. The total area covered is 130 kilometers of coastline and the population covered exceeds 11 million people. The terrain includes coastal to mountainous regions. The dedicated staff works in storms, floods, typhoons, drought and in other extreme conditions.

The main research undertaken by the Institute Pasteur, Nha Trang are:

Medical microbiology, epidemiology of infectious diseases, occupational medicine, agro-alimentary security, nutrition, water quality, and environmental studies and Medical entomology. The activities of this institute include: surveillance and epidemic prevention, vector control activities, clinical biology and vaccination, surveillance of water quality and environmental contaminants, food safety testing, hygiene at school and occupational health.

After the lecture, we visited the Alexandre Yersin Museum, which is near the institute. It is a very small museum but showed us about the activities of Alexandre Yersin in Vietnam.

Day 4. Aquaculture and the lagoon management, and the international seminar with HUAF

August 10, 2012 By Miki Toda

1. Environmental and Socio-economic impact of aquaculture and fisheries on the Tam Giang Cau Hai Lagoon & Sustainable tourism model project in the lagoon

1.1 Introduction:

It is tradition that people live on boats on Tam Giang Lagoon, which is 20 km long and 4 km wide and located along the central coast of Vietnam in Hue Province. However, due to the annual storms in the area and severe damage caused by flood, in the late 1980s, the government began promoting people to move onto the land and provided land right around this area. There have been various projects to improve livelihoods and maintain biodiversity around the Lagoon. We visited Ngu My Thanh hamlet, which belongs to Quang Loi Commune, one of the communes around Tam Giang Lagoon and learned about its aquaculture practices and eco-tourism.

In 1988, all the villagers in Ngu My Thanh hamlet moved onto land. Currently, some older people went back to the lagoon to live on the boats due to the land shortage after their children began their own families. The hamlet now consists of 886 people and 186 households. We asked questions to Mr. Ty, an aquaculturist and the head of the fishery association and tourism operation in Ngu My Thanh hamlet.

1.2 Main Content & Discussion:

1.2.1 Livelihoods in general

Main contents:

95% of villagers are engaged in fishery in this hamlet. The fishery association here was established in 2009. Fishers themselves sell fish only locally, but some buyers from outside come and buy fish here and sell to regional markets. In general, life on the land is better than that on a boat, however, the economy is not good enough. A fishery support program began in 2010 supported by Department of Tourism in Hue Province and the

Figure 1. Interview on boat on Tam GIang Cau Hai Lagoon

government of Denmark.

Discussion (Answers to questions):

1) Population of this hamlet has decreased by 2.5% due to the low birth rate and the migration of younger generations to the cities. Each household consists of 2 to 10 people. A single household live together. 2) One of difficulties faced (and aquaculture) is natural disasters; storm and flood during the rainy season between August and December. 3) Another difficulty is that the government provided only land. The villagers had to pay for building a house, etc. 4) Villagers in this hamlet are not engaged in agriculture. People in other hamlets cultivate peanuts, cassava, etc. 5) Solid waste is burnt at home. There is no system to treat liquid waste. In rainy season, it drains into the lagoon. The province provides drinking water.

1.2.2 Aquaculture

Main contents:

Aquaculture began in 2001 within 32ha of the lagoon allocated for Ngu My Thanh hamlet. No specific technology has been used and aquaculture has been undertaken. Since 2004, aquaculture began to bring a profit. The water quality is good enough for shrimp but every year cultured shrimp (Black Tiger Shrimp) faces White Spot Syndrome (Whispovirus sp.: Whitespot Syndrome Baculovirus complex), a viral infection of shrimp. Up to 2004, they were engaged in mono-culture, raising only shrimps however partly in order to prevent White Spot Syndrome, they began poly-culture, raising some fish as well since 2005.

Each household has at least a pond the size of 5,000m2. At this moment, there are 15 ponds within the total of 7.5 ha for aquaculture within the entire commune's water territory of 32 ha. Aquaculturists culture approximately 100kg of shrimps and 400kg of crabs and fish per season, earning 130,000 Don/kg. They raise shrimps and fish for 3 months a year during the dry season. In the case of Black Tiger Shrimp, it takes only few days for them to be cultured. In 3 months of the season, they cultured about ten rounds of shrimps. The first round provided 50kg of shrimps and thereafter 30kg/round. They earned about 1.5 million Don/round and 10 to 50 million Don/3 months. To undertake aquaculture, it requires an investment to the amount of approximately 25 million Don.

The villagers also catch wild fish for sale. Fishers used to use very fine nets, which often created ecosystem problems as it caught everything in nets and blocked the current. The Department of Fishery defined the net size increasing the net size to 18mm square each.

Discussion (answers to questions):

1) Fishers sell fish approximately 3kg/day/hh. Some economically valuable fish, such as Grouper fish and Rabbit fish can be sold at 350,000 Don/kg. 2) The local government only focuses on fishers' number and encourages people to change their job by offering skill training for other jobs. In this area, fishery can earn more than other work, which brings only 50,000 to 100,000 Don per day. 3) The lagoon

is the transition area to the ocean that creates a unique ecosystem. Tam Giang Lagoon receives a mixture of fresh water from three rivers and seawater from sea outlets 20km from the hamlet. 4) River waters do carry pollutions into the lagoon especially during the rain seasons. 5) IMOLA project funded by Italian and Vietnamese governments was launched in order to promote fishers' livelihoods through appropriate and sustainable management and utilization of natural resources in the lagoon. The project conducted research on the area's geography and ecosystem and livelihoods of fishers in order to develop regulations. As the result, 64 fishery associations were created from 2000 to 2012.

1.2.3 Eco-tourism

Main Contents:

The provincial government established tourism to protect the ecosystem. The provincial Department of Tourism and Culture promoted this project. In this hamlet, eco-tourism was officially started in November 2010 in order to improve the livelihoods of fishers and agriculturists.

Figure 2. Q&A session at a fisherman's house

The basic services provided are 1) visits to historical and national heritage sites, 2) visits to hamlets that have a vegetable garden and make bamboo handicrafts and 3) boat ride to visit the opposite side of the lagoon and seafood dinner on a 2-day-tour. In July 2012, 270 tourists visited the hamlet.

To manage the operation, 3 groups (food, boat and hand-craft) were created. Women take care of the food group, whereas men take care of boat and handcraft. Everyone in the commune shares income. Each person earns 50,000 to 60,000 Don. The reasons for low income from these services are that 1) tourism has just begun and 2) the villagers do not charge much. Although a home stay service is also provided, there are not enough guest houses. Home stay service seems to have the potential to increase income.

Discussion (answers to questions):

1) Hotels and travel agencies in Hue City arrange transportation and the local office in Hue does marketing. . A tourist pays separately for transportation and for services in the commune. In the commune, tourists pay Mr. Ty and the income is distributed among villagers. 2) Income from handcraft villages is increasing from 10,000 Don/day to 30,000 Don/day. 3) Bamboo hand crafts do not create any

waste as the left over bamboo parts are used for fire, etc. 4) Tourism is not yet popular in other communes. 5) Government offers no subsidies to build guesthouses or toilets, yet supports boats and training for management. Governmental support is limited, though there is a plan to build a small jetty for boats. 6) It is called “Eco-tourism” because a) the tourism integrates landscape, livelihoods and historic heritage, b) the services produce less waste and c) the local government forces people to maintain the ecosystem such as regulating fishing net size, etc. 7) Besides government the Luxemburg NGO ROSA Luxemburg Stiftung also provides funds. 8) Students have visited here but not for research.

Question to Mr. Vinh, Cultural Section of Secretary of Communist Branch

1) Quang Loi Commune consists of 9 hamlets, 3 of which are fishery hamlets and the others are agricultural hamlets. The government promotes other hamlets to operate tourism. The tourism of Ngu My Thanh hamlet has some cooperation with other hamlets for handcraft and vegetable garden services. As the lagoon situation is different from area to area, the case in this hamlet cannot be considered a general model. Each hamlet needs to find its own tourism activities. 2) Regarding trash to be cleaned-up in the hamlet, villagers separate and collect plastic waste from tourists in one place and there is a trash-pick up service. However, this practice is not done for their daily waste. Waste water is a problem and a challenge. 3) There is no official recycling service. However, each household separates plastic waste.

1.3 Conclusion (Reflection)

Ngu My Thanh hamlet was a good place to learn the practices of bio-diversity conservation and livelihood improvement programs. We learned the situation where geography, natural disaster (climate) and biodiversity and livelihoods issues interact. Although some programs have been implemented here, I felt that it is not easy and there are many issues remaining in order to improve livelihoods as well as biodiversity conservation. Yet, I saw a lot of potential for tourism here having not only excellent lunch we enjoyed but a variety of amenity and nature to offer.

2. International seminar with Hue University of Agriculture and Forestry

2.1 Introduction

Aiming at bridging environmental sciences and policy for better solutions toward a sustainable society, a seminar was held by Hue University and the University of Tsukuba. After presentations from professors in Hue University and Prof. Wakasugi, each student from UT presented their research topics.

2.2 Main Contents

Program of the seminar was as follows.

1. Opening remarks - Dr. Nguyen Quang Linh
2. Introduction I: Environment Challenges and Policies in Thang Gian – Cau Hai Lagoon - Dr. Nguyen Quang Linh

3. Introduction II: Environment and Human Health: Key role to public health – Prof. Naomi Wakasugi

4. Special presentation I: Assessment of assimilative capacity of Dong Ba River Branch, Hue City – Ms. Hoang Ngoc Tuong Van

5. Special presentation II: Community-based lagoon management in Hue – Dr. Ngo Thi Huong Giang

6. Research presentations by students from University of Tsukuba

   Nan Xiang, Miki Toda, Mahdi Khaleel Mohammad Ikhleel, Xiaocun Lin, Rajeev Kumar Singh, Yu Liu, Yuto Hamajima, Yasin Banu

7. Closing remarks – Prof. Naoko Kaida

2.3 Discussions

A few questions were made by some students of UT to Ms. Tuong Van and Dr. Huong Giang. There were few questions from Dr. Nguyen Quang Linh and the audience to some students from UT. Details of the questions are shown here. Dr. Linh expressed his interest in the variety of topics.

Figure 3.
Seminar participants

2.4 Conclusions (Reflection)

The presentation by Dr. Huong Giang regarding “Community-based lagoon management in Hue” showed a variety of programs implemented and planned for communities around Thang Giang Lagoon. The information made me realize the international attention to the problems around the lagoon area that we visited in the morning. I certainly enjoyed learning about the research topics of our internship members and learned a lot. Because the Thang Giang lagoon area is a good place to learn about

environment, biodiversity and livelihood development issues, I would say that the seminar was a great opportunity for UT to build a relationship with HUAF.

2.5 Supplementary materials

1. Hue-Tsukuba International Seminar provided by UT, EDL

2. Environment and Human Health – Key role of Public Health provided by Prof. Wakasugi.

Day 5. Hue University Hospital

August 11, 2012 By Yasin Banu

1. Orientation about the Office of Genetic Counseling and Disabled Children (OGCDC)

According to our busy and short schedule, Day 7th was the last of our internship in Vietnam. According to the schedule, we visited the OGCDC and Rehabilitation hospitals for victims of Agent Orange. At first, we went to the OGCDC office where all the staff welcomed us. They apologized for the absence of Professor Nguyen Vietnhan, who is the head of Department of Medical Genetics of Hue College of Medicine and Pharmacy and manager of OGCDC. He was supposed to give us more information about the office and Rehabilitation hospitals.

We introduced each other and mentioned our objective to them. They appreciated our purpose and again they apologized for the visit to the Rehabilitation hospitals because we visited on a Saturday and most of the staff were absent so we were not allowed to visit there. One staff member called Huyuh Thi Cam Tu gave us a wonderful presentation about OGCDC, its activities and objectives. She explained about the 12 programs, under which they are undertaking.

The Office of Genetic Counseling and Disabled Children is a private initiative (quasi NGO) under the management of Hue College of medicine and pharmacy. It was founded by Dr. Nguyen Viet Nhan. Its main focus is to help children with disabilities in all parts of Vietnam that have high rates of poverty as a consequence of the war. OGCDC has implemented a range of programs that provides vital assistance to sick and disabled children and their families in central Vietnam and the central highlands. It has twelve programs.

- Heart operation Program

In this program, they help children of poor families with heart defects to undergo heart operations.

- Others Operation Programs

Physical defects like brain tumor, hydrocephalus, palate etc in children can only treated by operations, OGCDC provides support for operational costs and also provides transportation and accommodation expenses for poor families who need access.

- Treatment and Other Supports

Children with severe and urgent diseases like meningitis, encephalitis, burn etc who needs to stay a long time in hospitals, OGCDC supports the family who cannot afford to pay for medicines and hospitals fees.

- Rehabilitation Program

For children who do not have the opportunity for rehabilitation, OGCDC provide funding that allows family members to attend the program to continue rehabilitation at home.

◉ Adaptive Equipment and Transportation

Provides wheel chairs for the disabled children as a means of transportation and also provides adaptive equipment for preventing or correcting their bodies' deformity.

◉ Loan Program

Provides loan projects for poor families with disabled children to help them effectively improve the family's income sources.

◉ Scholarships Program

In this program, OGCDC provides scholarships to poor students who are often orphaned, disabled or have a family member with a disability.

◉ Job Training and Creation Program

With the collaboration of the SPIRAL Foundation, OGCDC gives job training to disabled children so that they will be able to be independent. It has its own shop called Healing the Wounded Heart where eco-friendly gift items produced by the disabled children are sold.

◉ Early Education Program for Children with intellectual disabilities

It undertook the assessment of fourteen young children, aged 0 to six years, and designed individual home training programs to be performed by the parents at home that will help parents to monitor their children's progress.

◉ Inclusive and special education programs for children with intellectual disabilities

OGCDC has established inclusive kindergarten classes for children with mild intellectual disabilities and six special education classes for children with intellectual disabilities that help disable children to be independent.

◉ Training local health workers and supplying information on disabilities

Local health workers receive training programs from OGCDC to be able to recognize disabled children early and supply good advice to parents who have disabled children.

◉ Genetic counseling

OGCDC supplies essential advice for the prevention of some genetic diseases and disabilities.

After the explanation, she mentioned the challenges they face in running the programs. She said that OGCDC do not get any financial support from the government. It is funded by different international organizations, like ROTARY CLUB – MATAYOSHI Fund (Japan) VIETNAM, LES ENFANTS DE LA DIOXIN

(France) Mr. KAZUZO NOMURA (Japan) VACEF Fund (USA) LA VIETNAM Co. Ltd (Vietnam) etc. She mentioned another challenge is to convince disabled children's parents to involve their children in these programs, which surprised me. The reason is because of their poverty and lots of children families do not want to spend their time on one child. She said that the OGCDC wants to expand their program more effectively however they need more financial support.

Figure 1. Ms. Huyng Thi Van Anh introduces us about Healing Wounded Shop

2. Visit to the Healing Wounded shop

At the end of explanation about OGCDC, Miss Huyng Thi Van Anh told us about the Healing Wounded Shop which is run with the collaboration of SPIRAL Foundation and OGCDC. In this shop they sell handicrafts made by disabled artisans using recycled materials.

OGCDC provides all the net proceeds towards fair salaries and health insurance for the disabled employees and funding heart surgeries for poor children in Hue and surrounding areas. Because our previous schedule to visit the Rehabilitation hospital failed we decided to visit that shop. We went there and saw beautiful handicrafts made from recycled materials. They are doing a very good job to clean up the environment by using recycled materials, making art from trash. Each of us bought a handicraft gift which we liked. I hope our very small contribution will be helpful to the disabled children.

Figure 2. Shopping at Healing Wounded Shop

OGCDC is doing really hard work for victim of Agent Orange which is really admirable. I am really impressed their respect towards disabled children which helps them

to be an independent. To be an independent is not so easy for us also, we have to get lots of opportunities and to achieve opportunities is really hard. OGCDC provides opportunities for disabled children by which they become proud, productive members of society and they are no longer disabled but are the empowered to give to those who are even more in need. One thing I found out through our discussion is that OGCDC do not have any awareness program for local people so that they can get information easily about the facilities and activities of OGCDC. Though, they keep information on the Internet and in the airport and other main areas by displaying pamphlets. I think this is not useful for those people who are uneducated and live in areas further away. OGCDC should have such kind of awareness program through which people can easily obtain information.

References:

www.hwhshop.com

http://www.ogcdc.org

2

International Seminar (I)

Abstracts of student presentations

Hue-Tsukuba International Seminar

August 10, 2012 (14:30-18:00) at Hue University of Agriculture and Forestry

Organized by the Environmental Diplomatic Leader (EDL) Education Program, the University of Tsukuba and the Faculty of Fisheries, Hue University of Agriculture and Forestry

Time	Program	Speaker
14:30	Opening remarks	Dr. Nguyen Quang Linh Dean and Associate Professor, Faculty of Fisheries, HUAF
	Introduction I: Environment Challenges and Policies in Thang Giang – Cau Hai Lagoon	Dr. Nguyen Quang Linh Dean and Associate Professor, Faculty of Fisheries,HUAF
14:50	Introduction II: Environment and Human Health – Key role to public health –	Dr. Naomi Wakasugi Professor, EDL Program, the University of Tsukuba
15:10	Special presentation I Assessment of Assimilative Capacity of Dong Ba River Branch, Hue City	Ms. Hoang Ngoc Tuong Van, Institute of Environment, Resources and Biotechnology, Hue University
15:40	Special presentation II Community-based lagoon management in Hue	Dr. Ngo Thi Huong Giang Faulty of Fisheries, HUAF
16:10	Break	
16:25	Research presentations by students from the University of Tsukuba (5 minutes each)	
	Comprehensive Evaluation of Environmental Policies Utilizing Reclaimed Water to Effectively Accomplish Sustainable Development in Tianjin, China	Ms. Nan Xiang Doctoral student, EDL Program
	Assessing the role of medicinal plants in the livelihoods of the rainforest dwellers and biodiversity conservation: In the interaction between traditional medicine and primary health care	Ms. Miki Toda Doctoral student, EDL Program
	Towards an integrated municipal solid waste management in Jordan: A life cycle assessment study in Amman City	Mr. Mahdi Ikhleel Master's student, EDL Program
	The destruction of geosmin using titanium dioxide photocatalysis	Ms. Xiaocun Lin Master's student, EDL Program
	Solid Waste Management in Kathmandu	Mr. Rajeev Kumar Singh Master's student, EDL Program
	Antidiabetic activity of aqueous extracts from the stem of Actinidia kolomikta in diabetic rats	Mr. Yu Liu Master's student, EDL Program
	Human health reaction toward environmental atmospheric electrophile	Mr. Yuto Hamajima Master's student, EDL Program
	Choices of water resources by the people in relation with water born diseases in Kathmandu, Nepal	Ms. Yasin Banu Master's student, EDL Program
17:15	Discussion	
17:50	Closing remarks	Dr. Naoko Kaida Assistant Professor, Graduate School of Life and Environmental Sciences, the University of Tsukuba

Comprehensive Evaluation of Environmental Policies Utilizing Reclaimed Water to Effectively Accomplish Sustainable Development in Tianjin, China

Xiang Nan

Doctoral Program in Sustainable Environmental Studies, Graduate School Life and Environmental Science, University of Tsukuba, Japan

nancyxiang86@hotmail.com

Currently, increasing water shortages and water pollution have spurred reclaimed water utilization as an additional source of water and an efficient method of reducing water pollution. Taking Tianjin City as a target area, this study aims to analyze the potential of local water management through reclaimed water while exploring the feasibility of the government target to achieve a 50-60% reclaimed water recycling rate by 2020. In this research, a comprehensive simulation model was designed to forecast the socio-economic development trends for Tianjin relative to the introduction of developed water reclamation technologies. This model contains 3 sub-models: a socio-economic model, a reclaimed water cycling model, and a water pollutant flow balance model. Through simulation accomplished by LINGO programming, this research formulates a development plan for reclaimed water usage from 2010 to 2020; and a specific planning basis for policy-making. Reclaimed water is shown to be effective in saving water resources, reducing water pollution and improving sustainable development.

Keywords: Reclaimed water, Sustainable development, Environmental Policy Evaluation, Dynamic Simulation

Comprehensive Evaluation of Environmental Policy with Emphasis on Reclaimed Water Utilizing to Effectively Accomplish Sustainable Development in Tianjin, China

Nan XIANG

Graduate School of Life and Environmental Sciences
University of Tsukuba

2012/08/10

1. Background and purpose

Area:11860.6 km^2

Population:

11.76 Million

GDP(2009):

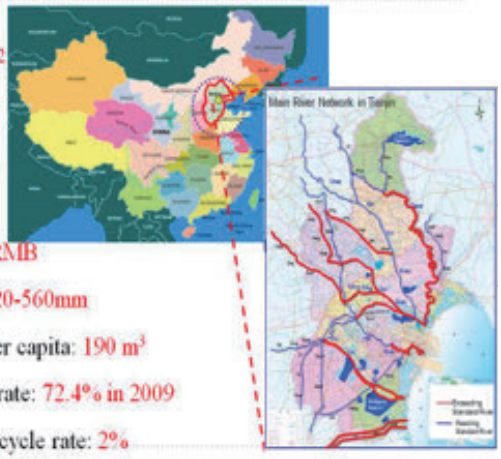
752.19 Billion RMB

Annul rainfall: 720-560mm

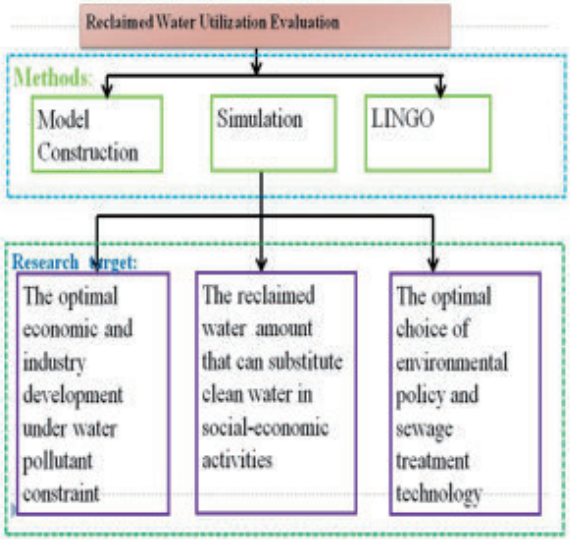
Water resource per capita: 190 m^3

Sewage disposal rate: 72.4% in 2009

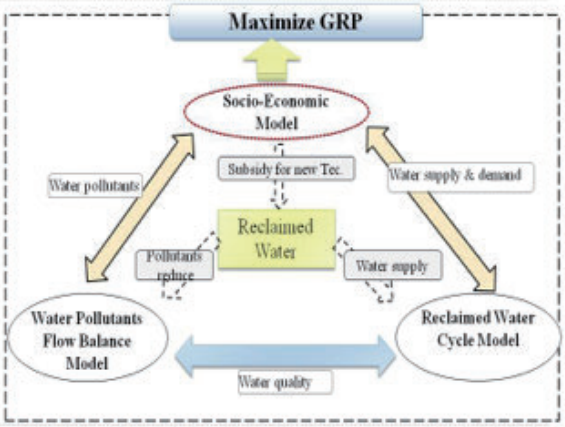
Reclaimed water cycle rate: 2%



2. Research method



3. Simulation Model Framework



4. Results and discussion

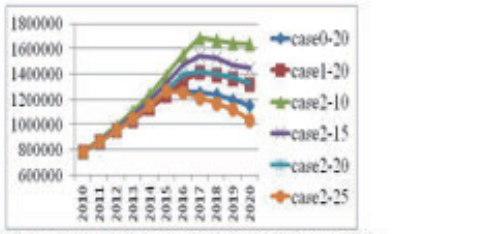


Fig.1. GRP trend of 6 cases of Tianjin from 2010 to 2020

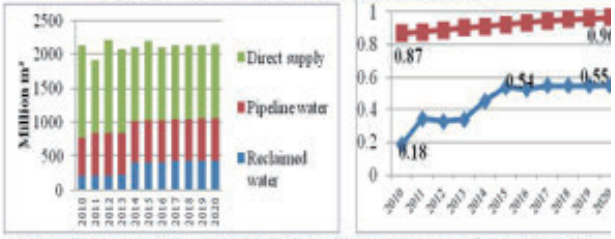


Fig.2, 3. Water supply structure, sewage disposal rate and reclaimed water recycle rate of Tianjin in case2-20 from 2010 to 2020

5. Conclusion

- Along with water pollutants constraints, GRP can get steady development if we introduce new technology and comprehensive policies;
- Combined economic development with environmental protection, the optimal policy can be achieved.
- Sewage treatment coverage can increase from 72% in 2009 to **96%** in 2020;

Reclaimed water recycle rate can also reach **55%**;

Reclaimed water can substitute **20%** of clean water resources;

Choices of Water Resources by the People in Relation with Water Borne Diseases in Kathmandu, Nepal

Banu Yasin

Master's Program in Environmental Sciences, Graduate School Life and Environmental Science, University of Tsukuba, Japan

Janu200@hotmail.com

Nepal has abundant fresh water resources but still its capital city; Kathmandu has faced chronic drinking water problems for a long time. Kathmandu has more than 3 million people demanding 320 million liters of water per day. The resident's of the capital city of Nepal, a country with abundant water resources, have to wait for hours and hours to get a pitcher full of water. Even the water they get after waiting for many hours is not safe and clean enough to drink directly or use for cooking. The population in Kathmandu is increasing along with the increase in demand for water but supply is unchanged. Why is there such big gap between supply and demand? Despite being rich in water resources Nepal's urban population are facing water problems. Due to insufficient water distribution people have to collect drinking water from unsafe surface sources outside the home; the water may become contaminated after collection, either during transport or after storage in the home. Even municipal piped well water is unsafe because of inadequately maintained pipes, low pressure, intermittent delivery, and lack of chlorination and clandestine connections. The research will target different income groups in Kathmandu valley. The research will try to find out the choice of water and the quality of drinking water used by the different communities of Kathmandu Valley Nepal, and of local knowledge of water quality and water born diseases.

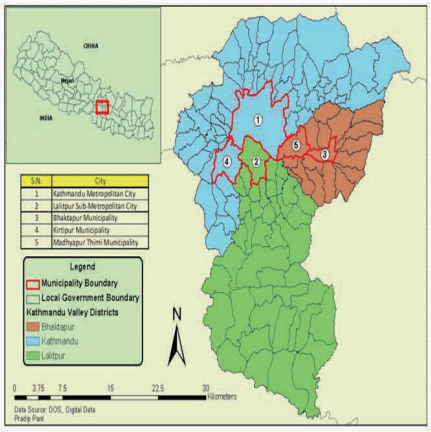
Key words: - contamination, water borne disease, chlorination, clandestine.

Choices of water resources by the people in relation with water borne diseases in Kathmandu, Nepal

Banu Yasin (201221201)
Graduate School Life and Environmental Science
Master Program in Environmental Science
University of Tsukuba, Japan

Introduction:

-Kathmandu is the Capital city of Nepal. More than 3 million people are living in the capital city.
-The Maximum elevation of Capital city is 1100-2700 m.¥
- Nepal is divided into 75 districts. In capital city, three districts are included – Kathmandu, Bhaktapur and Lalitpur



Introduction

- The total demand of water in Kathmandu is estimated 320 million liters per day.
- In dry season, supply of water is 88.8 million liters per day
  In wet season, supply of water is 90 million liters per day
- Most of the people depend on the water resource either groundwater, tube wells, shallow wells, stone spouts or private tankers
- The water distributed by Government has not been treated properly, so, large number of water borne diseases are raising in every year.
- More than 22% of the under 5 years population has been suffered from various water born diseases every year.
- Based on the economic situation of people in capital city, they have several choices using water resources.

Research Objective

- To identify the status of water supply in the Kathmandu City.
- To know about the consequences of water borne diseases in relation with choice of water resources.
- To know about the choices of people due to their perception to buy water.
- To know about the current strategies of government for the development of water resources in Kathmandu city.
- To make policy and recommendations and strategies for the improvement of water resources and its quality.

Methodology

- Research will be based on qualitative and quantitative method
- Some questionnaire will be conducted to the people of study area to identify the actual people's choice in water resources.
- The secondary data will collect from various publications such as National Planning Commission, the Central Bureau of Statistics of Nepal, and different government body of Nepal.
- The collected data will be analyzed by regression line and identify the correlation between water resources and dependent variables.

Expected results and conclusion

- I think choice of water resources depend on the economic condition of people.
- Economically vulnerable people will no way to use safe water which makes more water borne diseases in near future.
- My research on water borne victims can help to predict the future trend on water borne disease in the city.
- Being the capital city of Nepal and population concentration, more or more people will suffer from water borne diseases.

The Destruction of Geosmin Using Titanium Dioxide Photocatalysis

Xiaocun Lin

Master's Program in Environmental Sciences, Graduate School Life and Environmental Science, University of Tsukuba, Japan

rinxiaochun@yahoo.co.jp

Introduction: Geosmin (GSM) are bicyclic tertiary alcohols produced by microorganisms, namely actinomycetes and cyanobacteria. GSM are reported to cause an earthy-muddy taint. GSM has long been recognized as a significant problem in drinking water although it is non-toxic. A number of water treatment strategies have been investigated to remove GSM from water, such as the application of algaecides, microbial biodegradation, granular activated carbon (GAC) and ozonation. But they all have their own shortfalls.

Objective: The rapid destruction of GSM using TiO2 photocatalysis will be undertaken. The best condition will be investigated.

Experiment:
Materials: Nano-scale TiO2, UV lamp
Analytical method: GC-MS, SPME
Factors: PH, concentrations of GSM, type of TiO2, irradiating time

Contents

1. Introduction
2. Objective
3. Research plan
4. Experiment

Introduction(GSM)

Bicyclic tertiary alcohol

↓ Produced by

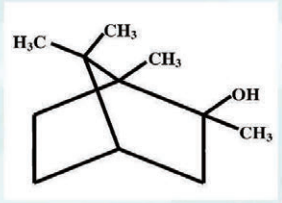
Actinomycetes and Cyanobacteria

↓ Pollutation

Earthy-muddy taint

↓

A significant problem



Geosmin(GSM)

Introduction(treatment strategies)

1,Application of algaecides

Lysis/pollution of coppor/copper tolerant cyanobacteria

2,Microbial biodegradation

Relatively slow

3,Granular activated carbon (GAC)

Under study

4,Advanced Oxidation Technology

Ozonation and TiO2 photocatalysis

Objective

- TiO_2 photocatalysis has been successfully used to destroy a wide range of organic contaminants.
- Demonstrate the rapid destruction of GSM using TiO_2.

Research Plan

- Demonstration

  If it is possible to destruct GSM using TiO_2 photocatalysis efficiently.

- Investigation

  Which kind of TiO_2 photocatalysis and under what kind of condition shows the highest efficiency.

- Expectation

  If it is possible to create fixed-bed reactor in small size which can be used in domestic.

Experiment

- Photocatalysis
  - ◆ The concentrations of GSM examined represent levels of environmental significance to the aquaculture industry.
  - ◆ Samples will be irradiated by UV light.
  - ◆ TiO_2 will be removed by centrifugation prior to quantification by GC–MS。
- Analytical method
  - ◆ GSM will be extracted from aqueous solution using the solid-phase microextraction (SPME) procedure.

❖factors ⟹ PH, concentrations of GSM,type of TiO_2, irradiating time

Antidiabetic Activity of Aqueous Extracts from the Stem of Actinidia Kolomikta in Diabetic Rats

Yu Liu

Master's Program in Environmental Sciences, Graduate School Life and Environmental Science, University of Tsukuba, Japan

Jamliu0229@hotmail.com

Background: Diabetes mellitus is a metabolic disorder resulting from a defect in insulin secretion, insulin action or both. Insulin deficiency in turn leads to chronic hyperglycemia with disturbances of carbohydrates, fat and protein metabolism. Globally, the estimated incidence of diabetes and projection for year 2030, as given by International Diabetes Federation is 350 million.

Preparation of Animals: Healthy Wistar rats between 2 and 3 months of age, and weighing 180–200 g will be used for the study. Animals will be maintained under the environmental conditions at a temperature of 22°C , 45-55% relative humidity for 12h each dark and light cycle and fed with a standard rats pellet diet. Rats will be made diabetic by a single dose of STZ at 60 mg/ kg bw. The blood glucose level will be checked before and 72h after STZ injection after 72h.

Expected results: The extract from Actinidia kolomikta is expected to show a dose-dependant activity of antidiabetic effects. The antidiabetic effects of Actinidia kolomikta are expected to be similar to the standard antidiabetic drug glibenclamide.

Antidiabetic activity of aqueous extracts from the stem of *Actinidia kolomikta* in diabetic rats

Graduate School of Life and Environmental Sciences
Master's Program in Environmental Sciences
M 1 Liu Yu

Objective

- To determine the antidiabetic effects of the extracts of *Actinidia kolomikta* in diabetic rats.

Indices to determine

- Blood glucose level
- Body weight
- Serum insulin level

Experimental design

- Preparation of plant material

The dried stem of *Actinidia kolomikta*(200g) is powdered and defat with 750ml petroleum ether for 2-3h in a Soxhlet apparatus. Then extract with water (100° C) for 1h. The extract is dry with Freeze Drying Technique and stored in a dessicator for further experiments.

Experimental design

- Preparation of Animals

Healthy Wistar rats between 2 and 3 months of age, and weighing 180–200 g will be used for the study. Animals will be maintained under the environmental conditions with temperature of 22° C , 45-55% relative humidity for 12h each dark and light cycle and feed with a standard pellet rats diet.

Rats will be made diabetic by a single dose of STZ at 60 mg/ kg bw. The blood glucose level will be checked before and 72h after STZ injection. After 72h, only those animals which shows blood glucose levels higher than 250 mg/dL will be selected and used for the study.

Experimental design

Group	Treatment
1 Negative control	Distilled water
2 Ak1	Extract 50mg/kg bw
3 Ak2	Extract 100mg/kg bw
4 GB	Glibenclamide 5mg/kg bw
5 Positive control	Non-diabetic rats

Expected results

- The extract from *Actinidia kolomikta* is expected to show a dose-dependant activity of antidiabetic effects.
- The antidiabetic effects of *Actinidia kolomikta* is expected to be similar to the standard antidiabetic drug glibenclamide.

Towards an Integrated Municipal Solid Waste Management in Jordan: A Life Cycle Assessment Study in Amman City

Mahdi IKHLAYEL

Master's Program in Environmental Sciences, Graduate School Life and Environmental Science, University of Tsukuba, Japan

mahdi.ikhlayel@gmail.com

This research analyzes the Municipal Solid Waste Management (MSWM) in Jordan from cradle to grave and is based on life cycle assessment (LCA) techniques. The goal is to achieve a sustainable waste management system that is environmentally effective, socially acceptable and economically affordable. In order to achieve this goal, different alternative waste management scenarios were carefully designed and modeled based on specific waste collection and treatment technologies used. Through LCA techniques, the overall environmental burden associated with each scenario was estimated, comprehensively evaluated and compared to the existing modeled waste management system (the baseline scenario). The initial results show that integrated waste management scenarios based on the concept of sustainability would potentially minimize environmental impacts, increase recycling levels and decrease the amount of final disposal waste. This research will address such aspects in order to achieve the promotion of an environmentally sound waste management system from lessons learned through Japan's experience.

Keywords: Waste Management, Municipal Solid Waste, Life Cycle Assessment, Global Warming Potential

Towards sustainable municipal solid waste management in Jordan: a life cycle assessment study in Amman City

Mahdi IKHLAYEL
Graduate School of Life and Environmental Sciences,
University of Tsukuba, Japan

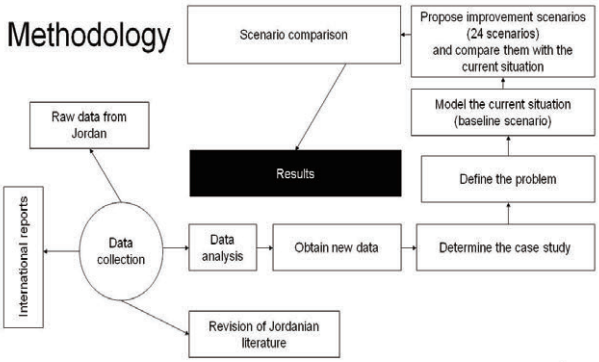
August 10, 2012

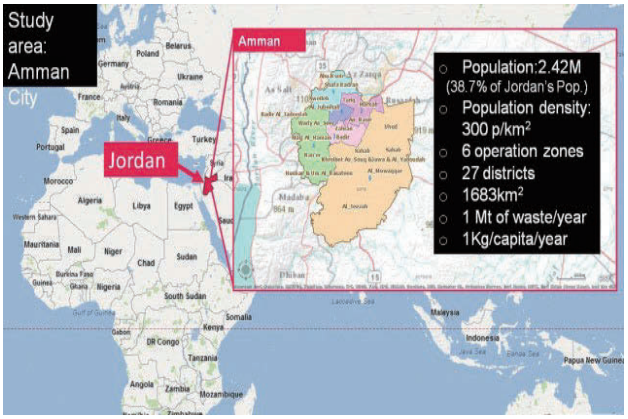
Objective

- To analyze the Municipal Solid Waste Management (MSWM) in Jordan from the cradle to grave, based on life cycle assessment (LCA) techniques.
- The goal is to achieve a sustainable waste management system that is environmentally effective, socially acceptable and economically affordable based on specific environmental indicators

1. Global Warming Potential (CO_2 and CH_4 emissions)
2. Acidification potential
3. Ground water pollution from landfill
4. Recycling credits, and final disposal waste

Methodology





Initial results

- The initial results show that integrated waste management scenarios that are based on the concept of sustainability would potentially minimize environmental impacts, increase recycling levels and decrease the amount of final disposal waste.
- Waste separation if applied at source would increase the recycling potential up to 25 percent compared with recycling without sorting.

Conclusion

- The waste management issue as an environmental problem in Jordan was analyzed and the main problems were defined.
- The methodology is based on collecting and analyzing data, then modeling the current situation.
- A possible 24 improvement scenarios were modeled and compared with the baseline scenario.
- The research can help the decision makers or people engaged in the waste management in Jordan to identify the best scenario that is applicable for Amman city.

Solid Waste Management in Kathmandu City

SINGH Rajeev Kumar

Master's Program in Environmental Sciences, Graduate School Life and Environmental Science, University of Tsukuba, Japan

tsukubaraj@gmail.com

Kathmandu metropolitan city (KMC) is the urban core of the Kathmandu Valley that consists of two sister cities; Lalitpur to the south and Bhaktapur to the east. It is located in a bowl shaped valley at an elevation of 1400 meters above the sea level. Out of all the disposed waste, the management of solid waste has been one of the biggest problems in Kathmandu Valley.

Government and private sectors are trying their best to manage the solid waste but lack of strict rules and regulations; high illiteracy rate, insufficient funds, lack of new technologies and lack of highly skilled man power are the major causes of improper disposal of solid waste in Kathmandu Valley. The management system of solid waste in Kathmandu city lacks efficiency and effectiveness in collection, separation, storage and transportation sections. Sometimes the solid waste is not collected for weeks and even months resulting in a serious impact on the health of the residents of Kathmandu due to strikes or waste collecting vehicles being garaged.

As most of the solid waste generated in Kathmandu city consists of organic matter, which can be treated biologically in order to manage organic waste more efficiently. In addition, the research will also try to use information related to Geographical Information System (GIS) to find out a cost efficient waste collection route for the transportation of waste to landfill.

Keywords: waste management, Organic waste, Modern landfill sites

Introduction

Kathmandu metropolitan city (KMC)
Capital city of Nepal
Inside Bowl shaped valley
Area:50.76 km2 (CBS, 2001)

Population:
121,019 people(CBS,1961) | 1081845 people (CBS, 2001).

1,740,977 (CBS,2011)

Online website called Smart Ranger defines the solid waste- "the useless and unwanted products in the solid state derived from the activities of and discarded by society"

Research Objective

Can the use of Biological waste treatment of the organic waste be the effective way of solid waste management

Will the awareness and education of citizen help in the proper management of solid waste?

Can use of GIS be possible and effective in country like Nepal?

Methodology

- Visits to different government and private organizations: secondary data and relevant facts and information.
- Collection of primary data
- Different online data base, online journals and different websites

Expected Result

- Better solid waste management in the Kathmandu city
- Healthier environment
- Minimized amount of municipal waste
- Better living standard of the people
- Higher waste collection
- Generation of energy and fertilizer which can be used for our benefit
- Awareness among people regarding waste.

Recommendation and Conclusion

- Biological treatment of organic waste.
  -reduce volume
  -destruction of pathogen
  -stabilization of the waste
- production of bio gas for energy use
- Use of bio plastic –encouraged (bio- degradable)
- Burning solid waste-electricity is produced
  outcome-ash is produced-decomposed in the landfill
- Construction of Modern landfill

Reference:

- Kathmandu metropolitan city; Kathmandu Metropolitan City. Retrieved June 14, 2011 from http://www.kathmandu.gov.np/
- (B.Dangi, R.Pretz, Urynowicz, & Kenneth G.Gerow, 2010) Municipal solid waste generation in Kathmandu, Nepal, Retrieved June 17, 2011 from Journal of Environmental Management 92 (2011) 240-249
- (R. Alam , M.A.I. Chowdhury, G.M.J. Hasan, B. Karanjit, L.R. Shrestha) Generation, storage, collection and transportation of municipal solid waste – A case study in the city of Kathmandu, capital of Nepal, Retrieved June 24,2011 from Journal of Science Direct waste management 28(2008)1088-1097
- Mohan B. Dangi , Christopher r. Pretz, Michael A. Urynowicz,Kenneth G.Gerow, J.M. Reddy,2010. Municipal solid waste generation in Kathmandu, Nepal. Journal of Environmental Management 92(2011)240-249
- http://www.eastwestcenter.org/fileadmin/resources/seminars/Urbanization_Seminar/Kathmandu_Valley_Brief_for_EWC___KMC_Workshop__Feb_2009_.pdf

Assessing the Role of Medicinal Plants in the Livelihoods of the Rainforest Dwellers and Biodiversity Conservation: in the linteraction between Traditional Medicine and Primary Health Care

Miki Toda

Doctoral Program in Sustainable Environmental Studies, Graduate School Life and Environmental Science, University of Tsukuba, Japan

miki@elstyle.jp

People in every culture have used medicinal plants since ancient times. They have provided not only a wide range of subsistence, but also cultural benefits. Today, 80% of people in developing countries still rely on plant-based medicines and many studies show that medicinal plants are an important source of income for rural people in developing nations. This study identifies that the use of medicinal plants by people in the Peruvian Amazon within the context of recent increases in the market demand of certain medicinal plants and the dissemination of primary health care via conventional medicine, in order to investigate its effect on their livelihoods and biodiversity conservation of medicinal plants. It also looks at if and how traditional knowledge of the use of medicinal plants is maintained.

Keywords: medicinal plants, rainforest conservation, primary health care, livelihoods, traditional knowledge

Assessing the role of medicinal plants in the livelihoods of the rainforest dwellers and biodiversity conservation: In the interaction between traditional medicine and primary health care.

Miki Toda
Sustainable Environmental Studies
The graduate school of Life and Environmental Science
University of Tsukuba

Supervisor: Prof. Misa Masuda

Background: Medicinal Plants - MPs

Medicinal Plants: MPs

- Provide a wide range of subsistence and cultural benefits (Otieno et al. 2011), and significant source of income for rural people in developing countries. (Hamilton 2004)

80% of population in developing countries relies on plant based drugs. (FAO)

Global market of herbal medicine: US$23 Billion (van Andel & Havinga 2008)

Global sales of herbal products: US$60 Billion in 2002. (WHO 2003)

Chang Mai Declaration in 1988 (van Seters 1995) (International Consultation on Conservation of Medicinal Plants by WHO/IUCN/WWF. Health for all by year 2000)

- Recognized MPs are essential in primary health care.
- International organizations (WWF, IUCN etc.) committed to support for conservation of MPs.

-Due to the demand from pharmaceutical firms and natural & health orientation in cosmetics & supplements, etc.
-Resource for 25% of medical drugs

✓ Potential of big cash for the locals
✓ Potential for over-exploitation

Areas of previous studies on MPs

- Non- Timber Forests Products: Valuation, Commercialization (Peters et al. 1989, Balick & Mendelsohn 1991, Pearce & Puroshothaman 1993, Mendelsohn & Balick 1995, Hersch-Martinez 1995, Rawal 1995, Shanley & Luz 2003, Williams et al. 2000, Vodouhe et al. 2008)
- Conservation: Sustainable harvesting (Wiersum 2004, Wiersum et al. 2006, Schippmann et al. 2006, Kitula 2007, Kathe 2008, Dahlberg & Trygger 2009,
- Importance in Livelihoods: Indigenous use (Kala et al. 2004, Lawrence 2005, Chowdhury & Koike 2010)

Background » Research Questions & Methodology » Study Field

Research questions and Methodology

Conservation | MPs | Health

Traditional Knowledge

Research Focus

Research Questions

#1: How are MPs used in given communities in the Peruvian Amazon?
#2: How does the access to health care system affect the use of MPs?
#3: How are the traditional knowledge maintained?
#4: How does the use of MPs affect maintain biodiversity of MPs?

Research Methodology

- Field survey: Questionnaire and Interview
- Statistical data analysis
- Indicator development for livelihoods assessment

Background » Research Questions & Methodology » Study Field

Study Field: Peru, Madre de Dios Department

Nations OnLine Project: http://www.nationsonline.org/oneworld/

Madre de Dios Department

- ✓ Existence of local native association:
- FENAMAD (Madre de Dios River Native Federation) =28 Native Communities
- ✓ Existence of catalogue of Medicinal plants:
- Community led health program/ botanical garden
- Participatory forest management (Cruz et al. 2007))
- Extensive enthnobotanical study (Alexiades 1999)

Madre de Dios Department

Population: 109,555 Area: 85,182.63 km²
Density: 1.3/Km² Elevation: 3932 – 183m
Temperature: 21 – 38 ℃ Precipitation: 3000mm
Poverty rate: 36.7% % of Peru GDP: 0.37%
Economy: agriculture, gold mining, ecotourism
(Census 2007, Gobierno Regional Madre de Dios. WS)

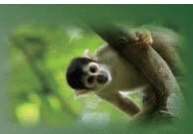
Peru

- ✓ Health expenditure : 4.6% of GDP
- ✓ Disparities in rich & poor and urban & rural
- ✓ Health care system does not sufficiently cover rural area
- ✓ About 60% of indigenous people have no access to health facilities
- ✓ Promoting MPs, making lists and botanical garden

(CIA The World Fact: Peru, Centro Nacional de Salud Intercultural, Nacional de Estadística e Informática 2007)

Background » Research Questions & Methodology » Study Field

Thank you for your attention!



References

Alexiades, M. N. 1999. *Ethnobotany of the Ese Eja: Plants, Health, and Change in an Amazonian Society*. PH, D Thesis, The City University of New York.
Balick, M. J. and Mendelsohn, R. 1991. Assessing the Economic Value of Traditional Medicines from Tropical Rain Forests. Conservation Biology 6 (1)
Central Intelligence Agency, *The World Fact: Peru*, https://www.cia.gov/library/publications/the-world-factbook/geos/pe.html#top
Centro Nacional de Salud Intercultural. In *Ministerio de Salud, Instituto Nacional de Salud*. http://www.ins.gob.pe/portal/home-censi/
Chowdhury, M. S. H. and Koike, M. 2010. Therapeutic use of plants by local communities in and around Rema-Kalenga Wildlife Sanctuary: implications for protected area management in Bangladesh. Agroforestry Systems 80 pp. 241-257.
Cruz, M. P., Payaba H. M. and Veitch, C. 2007. Plan de Manejo Comunal en Las Comunidades Nativas del Manu. Centro EORI and Oxford University.
Dahlberg, A. C. and Trygger, S. B. (2009) Indigenous Medicine and Primary Health Care: The importance of Lay Knowledge and Use of Medicinal Plants in Rural South Africa, *Human Ecology* 37.
Food and Agriculture Organization. (FAO) *Trade in Medicinal Plants*. http://www.fao.org/docrep/008/af285e/af285e00.HTM
Gobierno Regional Madre de Dios http://www.regionmadrededios.gob.pe/goremad/
Godoy, R., Lubowski, R. and Markandya, A. 1993. A Method for the Economic Valuation of Non-Timber Tropical Forest Products. *Economic Botany* 47(3) pp.220-233
Hamilton, A. C. 2004. Medicinal plants, conservation and livelihoods. *Biodiversity and Conservation* 13 pp.1477-1517.
Hersch-Martínez, P. 1995. Commercialization of Wild Medicinal Plants From Southwest Puebla, Mexico. Economic Botany 49(2) pp. 197-206.
Kala, C. P., Farooquee, N. A. and Dhar, U. 2004. Prioritization of medicinal plants on the basis of available knowledge, existing practices and use value status in Uttaranchal, India. Biodiversity and Conservation 13 pp. 453-469.
Kathe, W. 2006. Revision of the 'Guidelines on the Conservatio of Medicinal Plants' by WHO, IUCN WWF and TRFFIC. In Bogers, R. J., Craker, L. E. and Lange, D. (Eds), *Medicinal and Aromatic Plants*. Springer, Netherlands.
Kitula, R. A. 2007. Use of medicinal plants for human health in Udzungwa Mountains Forests: a case study of New Dabaga Ulongambi Forest Reserve, Tanzania. *Journal of Ethnobiology and Ethnomedicine* 3(7).
Lawrence, A., Phillips, O. L., Reategui Ismodes, A., Lopez, M., Ross, S., Wood, D. and Farfan, A. J. Local values for harvested forest plants in Mare de Dios, Peru: towards a more contextualised interpretation of quantitative ethnobotanical data. *Biodiversity and Conservation* 14. 45-79.
Mendelsohn, R. and Balick, M. J. 1995. The Value of Undiscovered Pharmaceuticals in Tropical Forests. Economic Botany 49(2) pp. 223-228.
Otieno, J. N., Magadula, J. J., Kakudidi, E., Kirimhuzya, C., Orodho, J. and Okemo, P. 2011. Use of ethnobotanical criteria for conservation assessment of plants used for respiratory diseases in Lake Victoria region, Tanzania. *International Journal of Biodiversity and Conservation* 3(11) pp. 610-617.
Pearce, D. and Proshothaman, S 1993. Protecting Biological Diversity: The Economic Value of Pharmaceutical Plants. Centre for Social and Economic Research on the Global Environment, Norwich UK
Peters, C. M., Gentry, A. H. and Mendelsohn, R. O. 1989. Valuation of An Amazonian Rainforest. *Nature* 339 pp.655-6.
Shanley, P. and Luz, L. 2003. The Impacts of Forest Degradation on Medicinal Plant Use and Implications for Health Care in Eastern Amazonia. BioScience 53(6).
van Andel, T. and Havinga, R. 2008. Sustainability aspects of commercial medicinal plant harvesting in Suriname. *Forest Ecology and Management* 256 pp.1540-1545.
van Seters. 1995. Forest based medicines in traditional and cosmopolitan health care. In *Medicinal plants for conservation and health care*.
Food and Agriculture Organization. Rome.
Vodouhe, F. G., Coulibaly, O., Assogbadjo, A. E. and Sinsin, B. 2008. Medicinal plant commercialization in Benin: An analysis of profit distribution equity across supply chain actors and its effect on the sustainable use of harvested species. *Journal of Medicinal Plants Research* 2(11) pp. 331-340.
Wiersum, F. 1999. Understanding Diversity in NTFP Management: A Neglected Issue in NTFP Research. Seminar Proceedings. NTFP research in the Tropenbos programme. Tropenbos International.
Wiersum, K. F. 2004. Forest Garden as an 'intermediate' land-usesystem in the nature-culture contiuum: Characteristics and future potential. *Agroforestry Systems* 61 123-134.
Williams, V. L., Balkwill, K. and witkowski, E. T. F. 2000. Unraveling the Commercial Market for Medicinal Plants and Plant Parts on the Witwatersrand, South Africa. *Economic Botany* 54(3) pp. 310-327.
World Health Organization. 2003. *WHO guidelines on good agricultural and collection practices for medicinal plants (GACP)*. World Health Organization. Geneva.

Human Health Reaction toward Environmental Atmospheric Electrophile

Yuto Hamajima

Master's Program in Environmental Sciences, Graduate School Life and Environmental Science, University of Tsukuba, Japan

S1221172@u.tsukuba.ac.jp

During four years of college, I studied environmental science and its basic ideas, methods of physics, chemistry and biology that can contribute to a local area's environmental sustainability. The study I would like to introduce is the human body reaction toward an environmental electrophile that is relatively abundant in industrial areas. The air-related pollutants such as naphthalene or more specifically, 1,2NQ which is the main topic researched in our laboratory, are said to attack human cell bodies via many different vectors. The microarray data of Miura et al, who is also a graduate student from our university, suggested the target molecule of naphtaquinone is OPN, the secreted protein that usually plays a role in repairing the tissue of injured bones. When the naphtaquinone or other ortho-quinones attacks the osteopontin, the protein, we have hypothesized that this molecule will turn into carcinogenic molecule that creates side effects in our body. In order to identify whether the hypothesis is right or wrong, we are currently conducting an experiment using the BEAS-2B cell to know what kind of function they have. Because we know that the 1,2NQ are contained in not only the atmospheric pollutant, but also in the tobacco smoke, the exposure to human throat cells is more drastic than to other body cells. I believe this research will reveal other aspects of human body reaction and the dose effect of naphthalene.

Key words: Osteopontin, 1,2 NQ, Borderline, cell body reaction, BEAS-2B cell

Human health reaction toward environmental atmospheric electrophile

University of Tsukuba, Environmental Deplomatic Leader Program 1st year Master
Yuto Hamajima

Background - Microarray Analysis

- During the microarray analysis with ortho quinone exposed BEAS-2B cell, increased proteins were measured
- The most increased protein was OPN,

Top 5 Increased protein measures	1,2-NQ
1. Secreted phosphoprotein 1 (OPN)	112.04
2. Calcium channel, voltage-dependent, L type alpha 1F subunit (CACNA1F)	68.8
3. Acyl-CoA synthetase, medium-chain family member 1 (ACSM1)	50.07

Miura T. et al, 12/10/2010

The OPN is said to relate with bone structuring, wound healing and cancer related reactions

Hypothesis and Methods

- During the atmospheric electrophile exposure, the OPN inside our body may increase
- The OPN has possibility in causing mal-effects inside our body
- We use BEAS-2B cell and expose ortho quinone, especially the 1,2-NQ naphtaquinone in order to demonstrate the toxicity research
- Identification of limit in electrophile exposure that human cell can endure

Study area

- Human health
  - When human body are exposed to toxic, harm causing electrophile, the body reacts with proteins and chemicals inside our body
  - Small amount of secreted proteins, chemicals can increase immunity
  - The study of this area may distinguish the borderline of benefit and toxicity of chemicals

Expected Results

- By experimenting the BEAS-2B cell, and ortho quinone relations, we may develop new regulated amount of specific electophile causing chemical agents
- This border may also have possibility to distinguish the usefulness of toxic chemicals

Conclusion

- The environmental change may cause risks toward human health
- The research may explain the proper dose of chemicals inside our body to develop immunization that fits the changes in environment

3

International Seminar (II)

Lectures by EDL and HUAF professors

Assessment of Assimilative Capacity of Dong Ba River Branch, Hue City

Hoang Ngoc Tuong Van

Institute of Resources, Environment and Biotechnology – Hue University (IREB)

Mathematical basic and modified Streeter - Phelps equations were applied to calculate the maximum allowable BOD load discharged into the Dong Ba River branch to assess its assimilative capacity (AC) according to two different scenarios. Assimilative capacity of the two sections of Dong Ba River during the rainy season is much higher than in the two scenarios of the dry season. In addition, outputs of the Streeter-Phelps model (represented by travel time and distance to critical sag, deficit at critical sag) indicate that it is necessary to consider nitrification (NBOD) and SOD (benthic/sediment oxygen demand) when applying the Streeter-Phelps equation. Moreover, the authors have conducted the calculation of actual BOD load from various sources of wastewater discharged into these sections and the actual BOD load is much lower than the maximum allowed. This indicates that Dong Ba River is still able to receive organic pollutants without violating its best-designated condition.

Keywords: Streeter - Phelps, assimilative capacity, NBOD, SOD, Dong Ba.

ASSESSMENT OF ASSIMILATIVE CAPACITY OF DONG BA RIVER BRANCH, HUE CITY

MSc. Hoang Ngoc Tuong Van
Institute of Resources, Environment and Biotechnology – Hue University (IREB)
A part of Ministerial Project, Code B2010-DHH09-06

RATIONALE

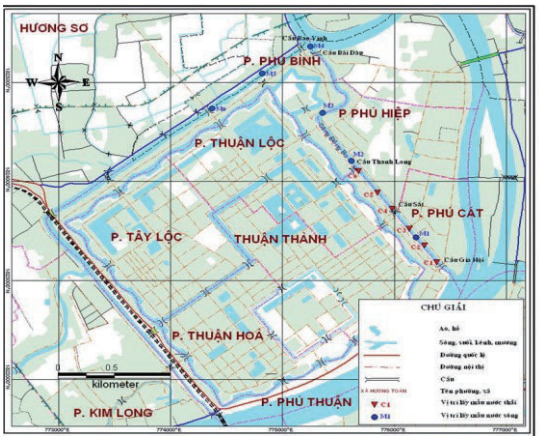
- Dong Ba river is the tributary of Huong river flowing through Hue city. Previously, together with Bach Yen branch, they were in the hydro system of the Hue citadel and played an important role in the circulation of water between the Citadel and the outside.
- Yet, urban population has increased rapidly, the two branches of this river have become places to receive waste from daily activities of Hue residents, Dong Ba and Phu Binh market, sewage and especially from slum-boat.

Slum-boat or fishing-boat dwellers before August, 2010

Dong Ba river branch

RATIONALE

- There have been many articles warning of river water quality, especially the river flowing Hue city. Yet, few topics and projects study its assimilative capacity (AC) to provide warnings and forecasting of pollution levels in order to propose maximum allowable discharge.
- Thomas' transformation of the initial Streeter-Phelps, modified Streeter-Phelps developed by ADEM and the monograph for its solution proposed by Fair et al (1968) were been applied to study AC. The study helps assess the impact of waste sources on river water quality and is the necessary information for sustainable development planning.



RESEARCH METHOD

- Basic Streeter - Phelps equation combined with the monograph of Fair et al (1968) was used to estimate the maximum BOD_u load input into the rivers while its DO level is maintained above a specified minimum level and calculate AC.
- Critical time and critical point (t_c and x_c) of the basic and modified Streeter - Phelps equation were calculated, then compare these parameters together to determine whether the necessity to consider nitrification and sediment oxygen demand (SOD) or not.

1. Basic Streeter - Phelps equation

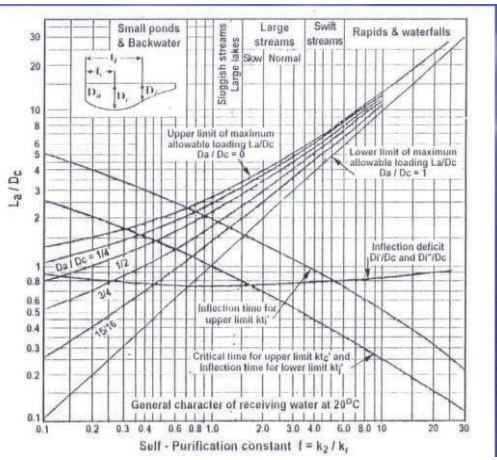
$$D = \frac{K_1 L_0}{K_2 - K_1}\left(e^{-K_1 t} - e^{-K_2 t}\right) + D_a e^{-K_2 t}$$

* Dissolved oxygen deficit and critical time:

$$D_c = \frac{K_1}{K_2} L_a e^{-K_1 t_c} \quad (2);$$

$$t_c = \frac{1}{K_2 - K_1} \ln\left[\frac{K_2}{K_1}\left(1 - D_0 \frac{K_2 - K_1}{K_1 L_a}\right)\right] \quad (3)$$

- D (mg/l): DO deficit at the transition when the substrate is all utilized
- L_a (mg/l): the concentration of BOD_u just prior to the discharge point.
- L_a (mg/l): allowable concentration of BOD_u just after the discharge point
- D_0 (mg/l): initial DO deficit.
- C_a: the initial DO (prior or just after the discharge point).
- C_c: the critical (minimum acceptable) DO. C_c is normally set by the standards applicable in the study area. In this study, C_c is set by level A2, QCVN 08:2008/BTNMT.
- K_1 (day^{-1}): BOD_u removal rate constant
- K_2 (day^{-1}): re-aeration rate constant
- t: travel time, calculating from the equation x/v, in which x: distance and v: velocity



Fair monograph

Definition of the Model Inputs

- Q_r (m^3/s): the river water flow rate, defined from hydrological data and reflecting minimum flow during the dry (usually summer) season. In this study, Q_r is determined by the minimum monthly mean monitoring data of Huong river in the period 2003 - 2010 and Q_r = 15 m^3/s (June, 2003).
- Q_w (m^3/s): the waste water flow rate (required only in cases of Q_w is significant in relation to Q_r, otherwise Q_w can be assumed to be zero).
- D_c (mg/l): the critical DO deficit, $D_c = C_s - C_c$
- D_a (mg/l): the initial DO deficit, $D_a = C_s - C_a$

Calculation Procedure

- C_s (mg/l): the saturation concentration of DO in water.
- L_a/D_c ratio, obtained from the monograph of Fair et al (1968) as function of f and D_a/D_c.
- L_a: the allowable concentration of BOD_u just after the discharge point, $L_a = D_c (L_a/D_c)$;
- f: Self-purification constant, $f = K_2/K_1$.
- Bu, the maximum allowable BODu load discharge at the river, from Equation:

  $B_u = 24 \times 3600 \times ((Q_r+Q_w)L_a - Q_r L_p)/1000$ (kg/day) (4)
- AC, assimilative capacity, from Equation:

  $AC = 24 \times 3600 \times L_a \times Q_r/1000$ (kg/day) (5)

2. Modified Streeter - Phelps equation

- One water quality model sometimes used by the Alabama Department of Environmental Management (ADEM) is a steady-state model relating dissolved oxygen concentration in a flowing stream to carbonaceous biochemical oxygen demand (CBOD), nitrogenous biochemical oxygen demand (NBOD), sediment oxygen demand (SOD) and re-aeration.
- The model allows the loading of CBOD, NBOD and SOD to the stream to be partitioned among different land uses (nonpoint sources) and wastewater treatment facilities (point sources).
- Equation (6) shows the Streeter-Phelps relationship with the additional components to account for nitrification and SOD.

2. Modified Streeter - Phelps equation

$$D=\frac{K_1L_0}{K_2-K_1}\left(e^{-K_1t}-e^{-K_2t}\right)+\frac{K_3N_0}{K_2-K_3}\left(e^{-K_3t}-e^{-K_2t}\right)+\frac{SOD}{K_2H}(1-e^{-K_2t})+D_0e^{-K_2t}$$

D = dissolved oxygen deficit at time t, mg/l ;
L_0 = initial CBOD, mg/l
N_0 = initial NBOD, mg/l (NBOD = NH_3-N x 4.57)
D_0 = initial dissolved oxygen deficit, mg/l
K_1 = CBOD decay rate, 1/day, K_1 = 0.23;
K_2 = re-aeration rate, 1/day
K_3 = nitrification rate, 1/day, $K_{3,20}$ = 0.25;
SOD = sediment oxygen demand, g O_2/ft^2/day, SOD = 0.5g/ft^2.day
H = average stream depth, ft;
t = time, days

RESULTS AND DISCUSSION

- Dong Ba river is divided the rivers into these following sections :
  - DB1: the part of river, from Dong Ba market to Thanh Long bridge, most of main drainage are gathered here.
  - DB2: section from Thanh Long bridge to Bao Vinh confluent, receiving wastewater mainly from people living along river banks, a few main drainage.
- Maximum allowable BOD and AC according to two different scenarios were calculated:
  - Maximum scenario: wastewater generated from urban sewage, market, industry and 70% runoff;
  - Medium scenario: wastewater generated from urban sewage, market, industry and 30% runoff.

Input and output data	Symbol	Unit	DB1		DB2	
			Dry season	Rainy season	Dry season	Rainy season
Temperature of river water	T	(°C)	32	28	31	28
Initial DO (prior to discharge point)	C_o	mg/l	6.0	6.1	6.2	6.3
Critical DO	C_c	mg/l	5.0	5.0	5.0	5.0
Saturation DO at T°C	C_s	mg/l	7.30	7.82	7.43	7.82
$D_o = C_s - C_o$	D_o	mg/l	2.30	2.82	2.43	2.82
$D_o = C_s - C_o$	D_o	mg/l	1.43	1.72	1.23	1.52
Carbonaceous CBOD decay rate at T°C	$K_{1(T)}$	day^{-1}	0.23	0.23	0.23	0.23
Reaction rate T°C	$K_{2(T)}$	day^{-1}	0.33	0.35	0.28	0.34
BOD_5 water river		mg/l	1.75	1.65	1.85	1.65
BOD_u	L_o	mg/l	2.56	2.41	2.71	2.41
River flow rate	Q_s	m^3/day	1296000	1296000	1296000	1296000
Discharge flow rate	Q_w	m^3/day	36924(a)	105871	15053	32290
			113602(b)	181116	67913	85150
Self-purification	$f = K_2/K_1$		1.43	1.52	1.22	1.48
D_o/D_c	D_o/Dc		0.59	0.61	0.51	0.54
L_o/D_o according to the monograph of Fair	L_o/D_o		2.4	2.3	2.5	2.4
$L_o = D_o(L_o/D_o)$	L_o		5.52	6.49	6.08	6.77
Maximum allowable BOD_u	B_u	kg/day	3840(a)	5306	4368	5652
			3862(b)	5326	4382	5666
Assimilative Capacity (AC)	AC	kg/day	7154	8405	7874	8772

Annotation: (a): medium scenario, (b): maximum scenario.

Comparing the actual BOD with maximum allowable BOD discharged into the river

Input data	Symbol	Unit	DB1		DB2	
			Dry season	Rainy season	Dry season	Rainy season
Maximum allowable BOD_u	B_u	kg/day	3840(a)	5306	4368	5652
			3862(b)	5326	4382	5666
Assimilative Capacity (AC)	AC	kg/day	7154	8405	7874	8772
The maximum actual BOD		kg/day	204(a)	298	73	108
			462(b)	663	243	285

- The fact is that the DO level is more than 5 mg/l, meeting the National Technical Guidance QCVN 08:2008/BTNMT (level A2), BOD_u allowed to discharge into these rivers are less than 3862 kg/day and 4382 kg/day (dry season) and 5326 kg/day, 5666 kg/day (rainy season), respectively to DB1 and DB2.
- However, the real discharge into these rivers is less than the maximum allowable. It means that they are able to receive organic pollutants within their assimilative capacity.

Values of t_c, x_c and D_x, C_x at the end of the study sections

Input data	Symbol	Unit	DB1		DB2	
			Dry season	Rainy season	Dry season	Rainy season
Critical time	t_c	day	2.9	2.8	3.2	2.9
Velocity	v	m/day	8640	16416	9504	24192
Critical distance	x_c	km	27.1	46.7	29.9	56.7
Length of the river	x	km	1.5	1.5	1.3	1.3
DO deficit at x, km	D_x	mg/l	1.5	1.8	1.3	1.5
DO at x, km	C_x	mg/l	5.8	6.1	6.2	6.3

Input data of the modified Streeter - Phelps model by season

Parameters	Unit	DB1		DB2	
		Dry season	Rainy season	Dry season	Rainy season
Temperature	°C	32	28	31	28
Depth	m	2.85	3.20	3.3	3.75
Velocity	m/s	0.10	0.19	0.11	0.28
K_1,t°C	day^{-1}	0.23	0.23	0.23	0.23
K_2, t°C	day^{-1}	0.33	0.35	0.28	0.34
K_3, t°C	day^{-1}	0.61	0.61	0.59	0.59
SOD, t°C	$g/m^2.day$	0.98	0.77	0.96	0.79
BOD_u	mg/l	2.56	2.41	2.71	2.41
NBOD, N_0	mg/l	0.75	0.74	0.93	0.97
CBOD, L_0	mg/l	1.90	1.75	1.88	1.52
D_0	mg/l	1.43	1.72	1.23	1.52

Values of A, B, C constant are assigned by these following equations in the modified Streeter - Phelps model:

$$A = \frac{K_1 L_0}{K_2 - K_1} \qquad B = \frac{K_3 N_0}{K_2 - K_3} \qquad C = \frac{SOD}{K_2 H}$$

Table 5: Input values of the modified Streeter- Phelps model

Constant	Value by season					
	Dry season	Rainy season	Dry season	Rainy season	Dry season	Rainy season
A	4.36	3.35	8.66	3.17	2.25	5.34
B	-1.64	-1.74	-1.76	-2.29	-3.74	-2.01
C	1.04	0.69	1.04	0.62	0.93	0.82

Replace these constants into equation 6 and solve equations using mathematical software Algebrator 4.0.1, we obtain x_c and t_c as following table:

Output data	Symbol	Unit	DB1		DB2	
			Dry season	Rainy season	Dry season	Rainy season
Time criticial	t_c	day	0.35	0.71	0.27	0.85
Distance critical	x_c	km	3.04	11.73	2.55	20.54
Length of the river	x	km	1.5	1.5	1.3	1.3

- According to the calculations, critical time and distance in rainy season is higher than that of the dry. Yet, these values calculated by different scenarios do not have a significant difference.
- Calculated critical distances are more than the actual length of the river. It means that organic pollutants is not decomposed completely when coming out of the river and can receive additional organic compounds within its self-purification to maintain the minimum acceptable DO.
- Compared to the results calculated by the basic ST model, time critical and distance critical of the modified model are much smaller than the basic (4-11 times). It means that the modified model reflects better the actual condition of the river and thus it is necessary to consider nitrification (NBOD) and sediment oxygen demand (SOD) when applying ST to evaluate AC of a river.

Conclusion

- Maximum allowable BOD discharged into the river in order to maintain the minimum acceptable dissolved oxygen concentration in the rainy season is higher than the dry. Its values calculated by different scenarios do not cause great difference.
- The actual BOD load discharged into the river is much lower than the maximum allowable discharged into rivers and waste load of section DB1 is greater than DB2. It means that these sections are capable of receiving organic pollutants discharged within their assimilative capacity.
- Calculation results of critical time and distance by basic and modified Streeter-Phelps models show that the modified model describes better the condition of the river. Its value of critical time and distance are less than the basic model many times. So, it should be applied the modified model when considering the assimilative capacity of a river.

Environment Challenges and Policies in Thang Giang – Cau Hai Lagoon

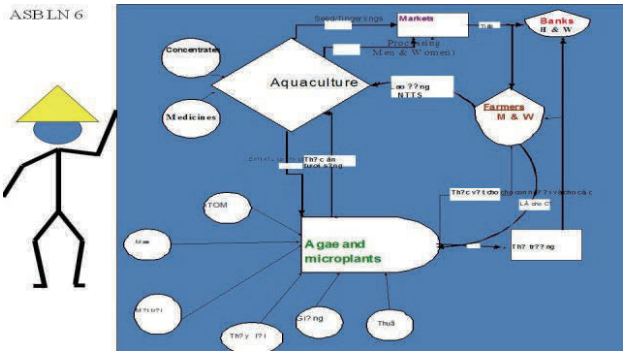
Nguyen Quang Linh

Faculty of Fisheries, Hue University of Agriculture and Forestry

Systems

- "A system is an entity with a purpose, that maintains its existence and functions as a whole through the interaction of its part"
- Or "A system is an integrated whole with characteristic features resulting from the relations between its components"
- "A system is a set of interating elements that form an integrated whole"
- A system can be considered as a system if it reacts as a whole on changes from outside the system.

1



A system has:

- Boundaries
- Subsystems or components
- Complex relations between components
- Is dynamic (changing in time)
- Is always part of another system

Type of systems:

- Closed systems
- Open systems
- Technical systems
- Biological systems
- Social systems

4

Two approaches in research:

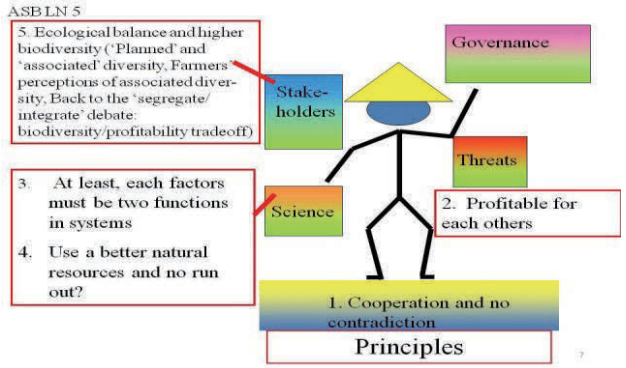
- Analytic
  - Isolates and concentrates on elements
  - Precision of details
  - Know – how
  - Modify one variable at a time
  - Leads to discipline-oriented education
- Systemic
  - Unifies and concentrates on the interaction between elements
  - Global perception
  - Know–how
  - Modifies groups of variables simultaneously
  - Leads to multidisciplinary education

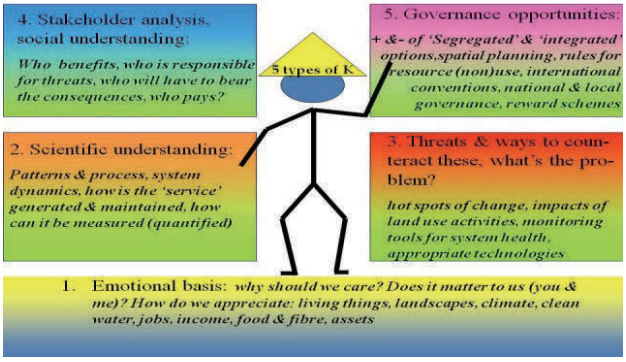
5

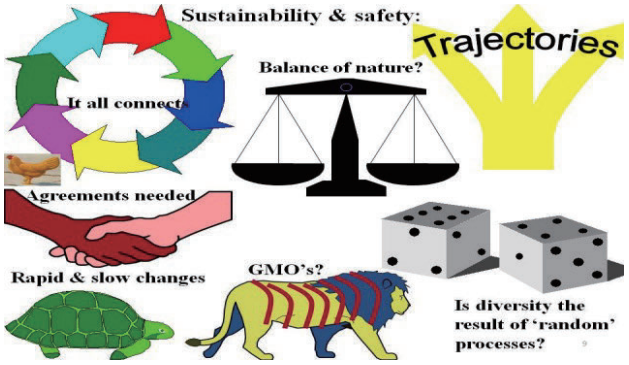
Ecosystems

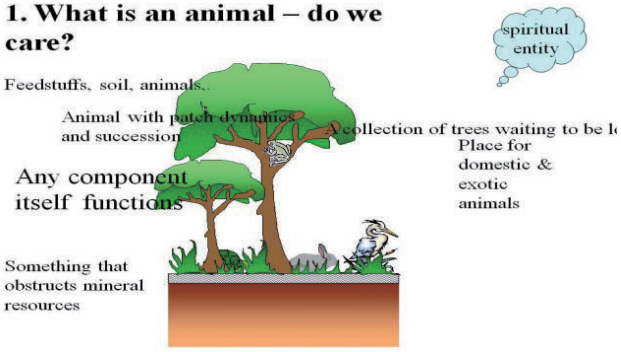
- Living systems
- Components:
  - Producers
  - Consumers
  - Reducers
- Properties
  - Homeostasis
  - Cybernetics
  - Feedback

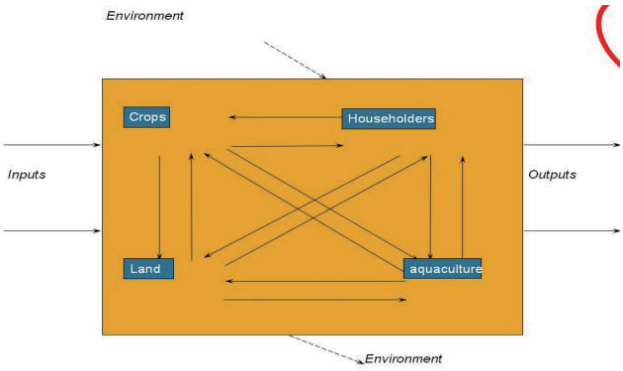
6

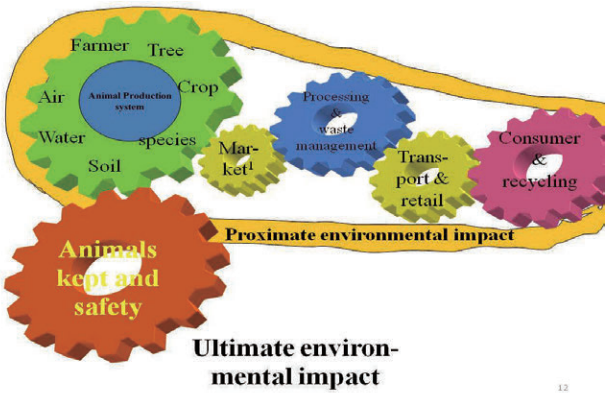

ASB LN 5
5. Ecological balance and higher biodiversity ('Planned' and 'associated' diversity, Farmers' perceptions of associated diversity, Back to the 'segregate/integrate' debate: biodiversity/profitability tradeoff)
Stake-holders
Governance
Threats
3. At least, each factors must be two functions in systems
4. Use a better natural resources and no run out?
Science
2. Profitable for each others
1. Cooperation and no contradiction
Principles

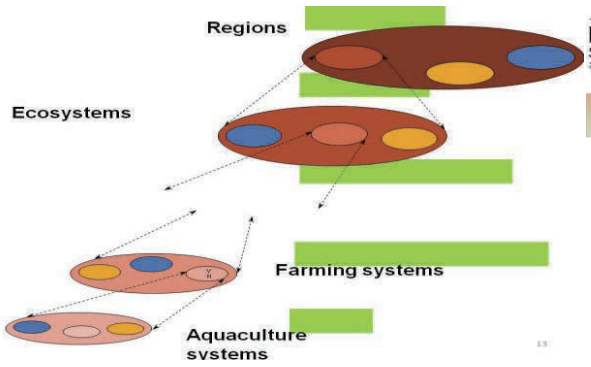

4. Stakeholder analysis, social understanding:
Who benefits, who is responsible for threats, who will have to bear the consequences, who pays?
5 types of K
5. Governance opportunities:
+ &- of 'Segregated' & 'integrated' options, spatial planning, rules for resource (non)use, international conventions, national & local governance, reward schemes
2. Scientific understanding:
Patterns & process, system dynamics, how is the 'service' generated & maintained, how can it be measured (quantified)
3. Threats & ways to counteract these, what's the problem?
hot spots of change, impacts of land use activities, monitoring tools for system health, appropriate technologies
1. Emotional basis: why should we care? Does it matter to us (you & me)? How do we appreciate: living things, landscapes, climate, clean water, jobs, income, food & fibre, assets

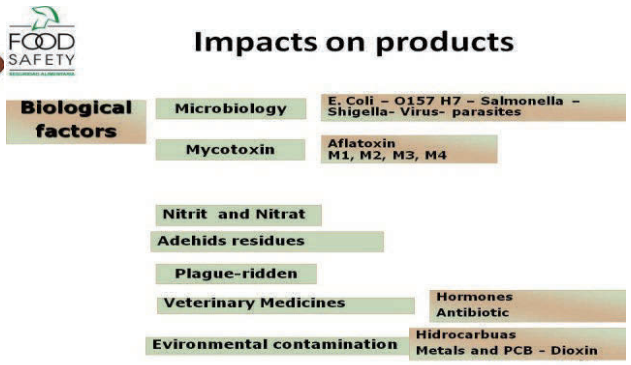

Sustainability & safety:
Trajectories
Balance of nature?
It all connects
Agreements needed
Rapid & slow changes
GMO's?
Is diversity the result of 'random' processes?

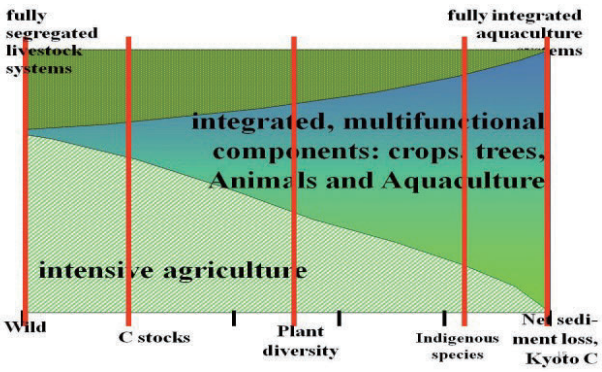

1. What is an animal – do we care?
spiritual entity
Feedstuffs, soil, animals..
Animal with patch dynamics and succession
Collection of trees waiting to be l
Place for domestic & exotic animals
Any component itself functions
Something that obstructs mineral resources

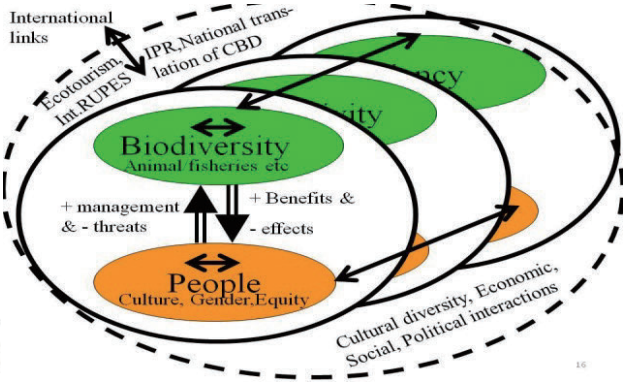

Environment
Crops
Householders
Inputs
Outputs
Land
aquaculture
Environment


Farmer
Tree
Air
Crop
Animal Production system
Water
species
Soil
Mar-ket
Processing & waste management
Trans-port & retail
Consumer & recycling
Proximate environmental impact
Animals kept and safety
Ultimate environ-mental impact









Criteria for sustainable production systems

1. Ecological balance
2. Economic efficiency
3. Suitable for society
4. Technologies should be updated and applied
5. Equinity

Standards for sustainability

1. Environmental aspects (manure and urine treatment, slaughterhouse residues, herd management)
2. Production
3. Bio-resources management
4. Research and technical applications
5. Policies
6. Human health

Community-based Management at Tam Giang – Cau Hai Lagoon Systems

NGO THI HUONG GIANG

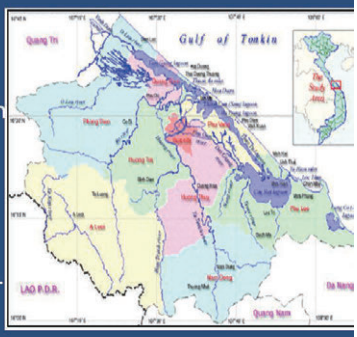
Institute of Resources, Environment and Biotechnology – Hue University (IREB)

huonggiang@gmail.com

CONTENTS

TAM GIANG –CAU HAI LAGOON SYSTEM INTRODUCTION

- Tam Giang – Cau Hai which is the largest lagoon in the Southeast Asia lies on the coast of Central Vietnam.
- Length: 70 km
- Area: 22,000 ha
- Population: 300000 – 350000 residents



Why they need Community-based Lagoon Management?

- To improve the lagoon's environment and resource in order to develop sustainably economic for local residents.
- To give the rights and obligations as well as rise up community awareness.
- To support establishing professional community organizations and cooperatives.
- To enhance local management activities effectively and enforcedly

➢ To protect and develop sustainably environment and aquatic resources

What is community - based management?

- Concept: Community-Based Management (CBM) relies on local stakeholders to carry out the research, design and implementation of management. This style of management can be used for social means.
- CBM is used as a way to create sustainability by including all stakeholders in land management practices.
- It strives to consider each member's needs to arrive at best solutions fit for the community.

"Who" have been carried out this activity?

1. CSSH - Hue Center for Social Sciences & Humanities

- Period: 1/2006 – 12/2012
- Execution units : SFIC 04
- Donor : ICCO of Holland
- Objectives:
  - Raise residents' capacity and build co-management model at commune level
  - Raise gender awareness, gender equality and women's roles in production and in protection environment and natural resources
  - Enhance and develop the action groups for child rights

"Who" have been carried out this activity?

2. Integrated Management of Sea, Islands and Lagoons

- Period: 01/2010 - 12/2030
- Execution units: Department of Sea, Island and Lagoon
- Donor: Thua Thien Hue Committee
- Objectives:
  - Propagation and dissemination of policies and legislation on Sea Island and Lagoon
  - Effective exploitation of the benefits, economic potential sea, island and lagoon

"Who" have been carried out this activity?

3. Environmental Protection to contribute protecting the Lagoon resources

- Period: 01/2010 - 12/2030
- Execution units: Department of Environmental Protection
- Donor: Thua Thien Hue Committee
- Objectives:
  - Management, protection of environment
  - Monitoring water quality of the lagoon

"Who" have been carried out this activity?

4. Planning and Developing Tourism

- Period: 01/2010 - 12/2030
- Execution units: Department of Culture, Sport and Tourism
- Donor: Thua Thien Hue Committee
- Objectives:
  - Diversify the type and products of tourism associated with the tourism activities of local communities
  - Develop tourism into key economic sectors of the TG - CH lagoon

"Who" have been carried out this activity?

5. Fisheries management

- Period: 01/2010 - 12/2030
- Execution units: Department of Exploitation and Protection of Fisheries Resources
- Donor: Thua Thien Hue Committee
- Objectives:
  - Management of vessels and fishing gear
  - Law enforcement on the exploitation and protection of fisheries resources

"Who" have been carried out this activity?

6. IMOLA – Integrated Management of Lagoon Activities

- Period: from 8/2005
- Execution unit: IMOLA
- Donor: FAO, the Italian government and the Vietnamese government
- Objectives:
  - Find out the status of resources and activities of fishermen as well as lagoon management activities
  - Raise capacity of management and Construct plan of lagoon management
  - Popularize knowledge, new discoveries about the lagoon

"Who" have been carried out this activity?

7. Sustainable tourism development associated with biodiversity conservation and livelihood improvement in TG - CH Lagoon in TTH

- Period: 01/2010 – 12/2010
- Execution units : CSRD
- Donor: IUNC (International Union for Conservation of Nature)
- Objectives:
  - Raise awareness of local people
  - Increase the household income from activities related to tourism in the project area
  - Enhance linking stakeholders in the management of local tourism, Construction of eco-tourism

"Who" have been carried out this activity?

8. Disaster Risk Mitigation and adaptation to community-based variable

- Project: Center of Sustainable Rural Development (SRD)
- Period: 01/2010 – 12/2011
- Donor: Caritas (Australia)
- Objectives:
  - Strengthen reduction of disaster risk and climate change through a sustainable method for management community-based of disaster risk

"Who" have been carried out this activity?

9. NAV - Nordic Assistance to Vietnam

- Period: 01/1997 - 12/2010
- Execution units: NAV (Nordic Assistance to Vietnam)
- Donor: NAV
- Objectives:
  - Educate action of aquatic resource protection
  - Promote decentralization of water surface management

"Who" have been carried out this activity?

10. Community Livelihood Development

- Period: 07/2009 - 12/2011
- Execution units: Research centers and community development, the Fisheries of Thua Thien Hue province (RCCD)
- Donor: GEF (Global Environment Facility)
- Objectives:
  - Conservation of nursery, spawning and biodiversity and combined with sustainable exploitation of lagoon resources

"Who" have been carried out this activity?

11. The Fisheries Sector Program Support II (FSPS II) – Thua Thien Hue

- Period: 01/2003 - 12/2011
- Execution unit: Ministry of Agriculture and Rural Development
- Donor: The Danish government
- Objectives:
  - Strengthening of Fisheries Administration
  - Strengthening of Capture Fisheries Management and Development of Sustainable Aquaculture
  - Strengthening of Post-harvest and Marketing

"Who" have been carried out this activity?

12. Rosa Luxemburg Stiftung Vietnam

- Period: from 2002
- Execution unit: Rosa Luxemburg Stiftung Vietnam
- Donor: German Federal Ministry for Economic Cooperation and Development (BMZ)
- Objectives:
  - Promoting sustainable development by environmental awareness building and environmental education
  - Support to humanitarian projects – poverty alleviation and just and equal community and regional development

SOME RESULTS OF COMMUNITY- BASED MANAGEMENT

1. Tam Giang – Cau Hai Marine Protected Areas

8 fishery protection zones with a total area of strictly protected over 217 hectares

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

2. Fisheries Associations establishing

- Development of fishing areas
- Promote state policies to protect aquatic resources and environment
- Extension, including technology transfer and training
- Mobilization of resources for individuals and organizations for fisheries sector
- A legal representative for the members

➢ 31 fisheries associations at 20 lagoon communes

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

3. Promoting Community Center

- To provide updated information and services about fishery, aquaculture and socio-economic
- The promoting community centers was built at 9 communes: Loc Binh, Vinh Hien, Vinh Phu, Phu Xuan, Phu Thanh, Hai Duong, Huong Phong, Quang Phuoc, Quang Cong

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

4. Staketraps system disposing

- Clearancing 590 staketraps systems
- Disposing 411 systems

➢ To get more and enlarge waterways, environmental water quality is improved, aquatic resources are conserved.

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

5. Fish sanctuary contributing

- "common house" for aquatic animal
- The leading example, to maintain natural fish refuge
- Favorable environment for reproduction, growth and safety
- Performance models of fish sanctuary in Nay lagoon, in TG – CH lagoon at Vinh Hung, Loc Binh commune.

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

6. Safety community-based Farming

- Controlled factors: variety, location, water quality, regime, managed care, drugs and chemicals, process implementation
- Implementation process adopted standard: GAP and BMP
- Models: Vinh Hung, Dien Loc commune

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

7. Results of recovering lagoon environment and resource

- The lagoon is more open, environment is improved, aquatic resources are restore gradually.
- The production of seaweed, algae and seagrass is three times as much as that than before.
- The duration of exploiting one sort of carp lasted over a month and the eel yield increased 10 times compared to 2010
- In exploitive season (July to September), fish production from exploitation increased of ten times higher than the previous years.

SOME RESULTS OF COMMUNITY-BASED MANAGEMENT

7. Results of recovering lagoon environment and resources

- Reduce 1500 households fishing illegally by career changing.
- 217 ha water surface area of stick protection which form the nursery, spawning protected zones.
- The yield of natural fish and crab seed is up 1.5 times

Environment and Human Health – Key Role of Public Health –

Naomi WAKASUGI

Graduate School of Life and Environmental Sciences, University of Tsukuba, Ibaraki, Japan

nwakasu@envr.tsukuba.ac.jp

Environment directly concerns human health, since the biophysical environment of the Earth such as air, water and food support human life at every second. What then put environment at risk? We learned that human activity itself can endanger our precious environment. Serious tragedies such as Dioxin victims from the Viet Nam war, Minamata disease caused by industrial methyl-mercury pollution and very recently Fukushima nuclear pollution in Japan are man-made disasters whether intentional or not.

Another man-made threat to the environment could be climate change by global warming which we observed gradually in recent decades. The global environmental crises that threatens the lives and survival of human beings are just beginning to surface. Like a silent tsunami, it could cause a major public health crisis on a global scale that can strike without warning. Human health problems are expected to increase in various ways, such as respiratory diseases and cancers triggered by air pollution, spread of starvation and malnutrition due to food shortage, diarrheal diseases caused by contaminated water, infectious diseases due to quantitative and qualitative changes in microorganisms, and a rising number of vulnerable populations such as 'environmental refugees'. World Health Organization (WHO) estimated the health problems that might be related to climate change as: the annual death toll of 1.2 million from air pollution, 2.2 million from diarrheal diseases due to poor sanitary and water condition, 3.5 million from malnutrition, 60 thousand to natural disasters, 800 thousand from war and violence, and on top of these, 12 million due to infectious diseases, which are responsible for a quarter of the world's annual human fatalities. This fact urges careful research over how fast and how severely these figures will increase from now on.

Health impacts from environmental changes likely cannot be eliminated, and might appear differently, reflecting the vulnerability of each country and each individual. It is important that we take countermeasures to mitigate health impacts as much as possible. The public health approach might be essential for this purpose since it is not limited to medical/biological aspects but encompasses socio/economic and political viewpoints, and puts importance on looking at population rather than individuals, and to prevention rather than treatment of diseases after they occurred. Public health is not only to observe the situation but also to investigate the solution and policies.

筑波大学 University of Tsukuba

戦略推進費 Strategic Funds for the Promotion of Science and Technology

Environment and Human Health

-Key role of Public Health-

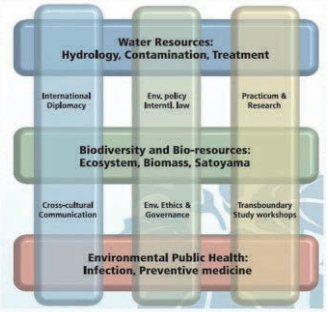
Environmental Diplomatic Leader (EDL) Education Program

Naomi WAKASUGI M.D, Ph.D.
Professor, Graduate School of Life and Environmental Sciences,
University of Tsukuba

What's EDL?

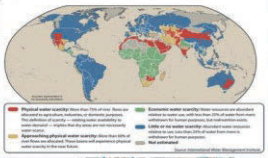
- Prioritized "Graduate level education program to produce ***International Environment Leaders***"
- Supported by Strategic Funds for the Promotion of Science and Technology, Ministry of Education , Japan (January, 2008)
- 17 universities have been adopted from 2008 to 2011
  Budget scale: 700,000 to 800,000 USD/year/program
- **Tsukuba Univ. 's EDL(2009-2014).**

With emphasis on integrated multi-disciplnary education, Water, Bio, and Health issues.

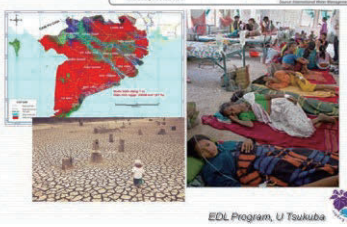


EDL Program, U Tsukuba

Environmental problems are rapidly increasing at global and local levels



Water Scarcity
Climate change
Infectious diseases
Energy crisis……



EDL Program, U Tsukuba

What are expected for an Environmental Diplomatic Leader?

Environmental Specialist
Water environment, Water resources/ Bio-resources, bio-diversity / Global health

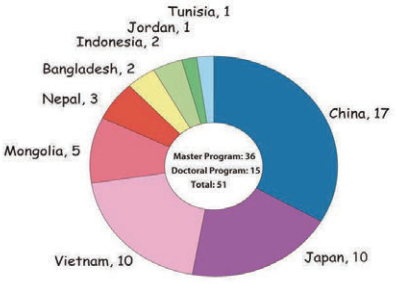
EDL

Diplomatic Ability
Comprehensive perspective / Communication skill / Negotiation

Leadership
Justice / Vocation / Management

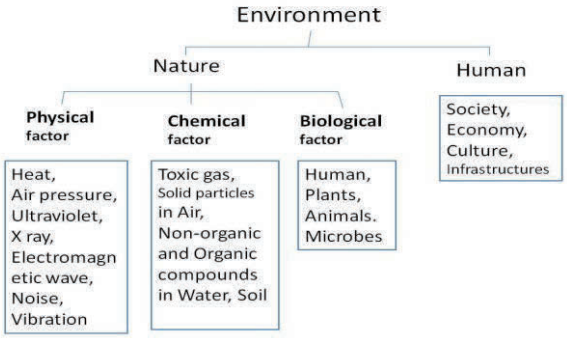
EDL Program, U Tsukuba

Students of various nationalities and research fields



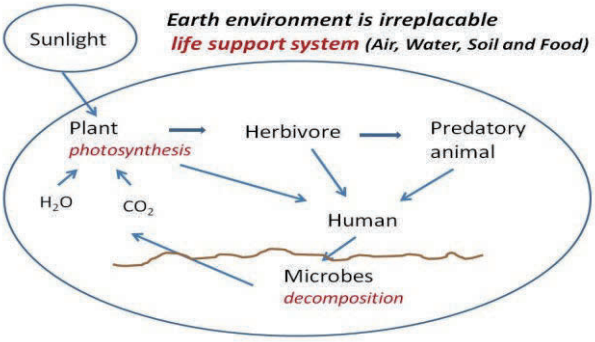
- Forest management
- Water borne disease
- Climate change impact on agriculture
- Waste management
- Population issue
- Analysis of groundwater flow etc.

As of 1 August 2012



Environment

1. Household
2. Occupational
3. Community
4. Regional
5. Global
6. (Cross-scale)



Our body

- **We are "Life" composed with organic substance. Multicellular eukaryote.**
  As *definition of Life* "Dynamic equilibrium"
  closed biochemical system, replication/reproduction
  Metabolism
- **Start from one fertilized egg containing his/her genome (Blueprint of life) , differentiate and replicate to 60 trillion cells of 200 different type of cells composing our body.**
  - ***Human genome*** *(read completely in 2003)*
    3 billion DNA base pair stored on 24 chromosome (22autosomal pairs and X, Y)

One person needs
Air : 15m^3 a day
Water: 2-3 litres a day
Food: ～2000 Kcal a day

Environment concerns directly Human Health.
Environmental crisis =Global public health crisis


Air


Food


Water


Disease

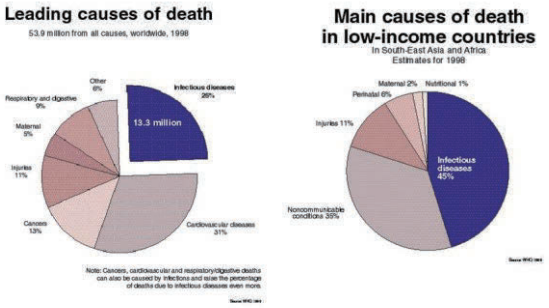

Shelter

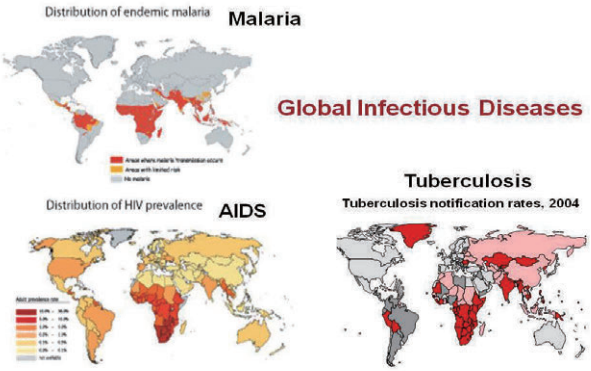
Climate change : Estimated impact to Human health

- **Air**
  High air temperature increase air pollution,
  Causing ***1.2 million/ year*** *deaths mainly by increasing mortality from cardiovascular and respiratory diseases.*
  Heat wave; 70,000 excess deaths (Europe 2003)
- **Water**
  People under water stress(Heavy rain・Flood) increase from ***1.5 billion(1990) to 3-6 billion(2050)*** , on the other hand , Drought increase ***10-30 fold by 2090***
  → Water contamination and worsening sanitation
  → Diarrheal diseases increase → ***2.2 million death***
- **Food**
  Crop yields decrease (by up to 50% by 2020 in some african countries) → aggravate ***malnutrition*** of people which currently causes ***3.5 million deaths /year*** by intensifying vulnerability to diseases especially infectious diseases.
- **Disaster**
  Whether-related disaster increase→ ***60,000 deaths***
- **"Environmental refugee"**
  100 million people a year loose their shelter by Sea level rise by 2080. Conflict and violence increase.
- **Diseases (Infectious diseases)**
  1.2 million deaths (one quarter of world deaths) from infectious diseases will be modified and increased.

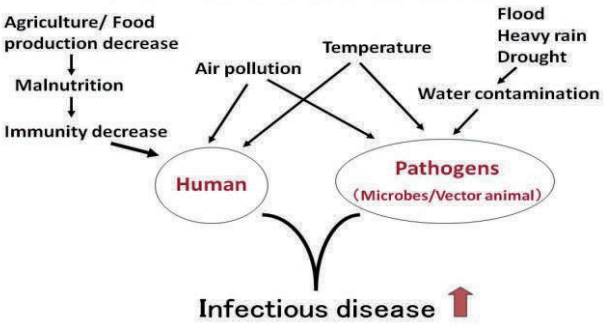
WHO 2009

Importance of Infectious Diseases

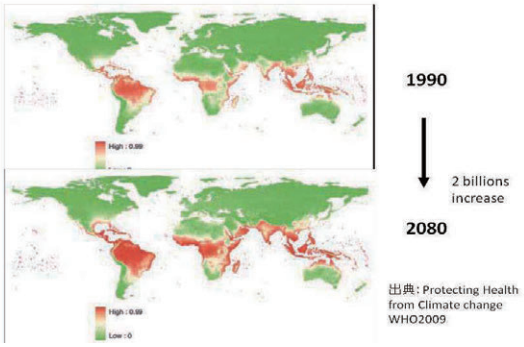




How Environment modify Infectious disease?



Estimated increase of Dengue Fever cases



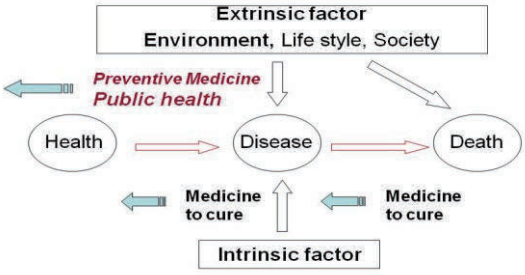
Health impact of climate change might reflect preexisting vulnerability.

Economic gap and Health gap in the world

	GNP (US$/person)	Life expectancy (Y)	Infant Moraliy Rate (/1000)	Under 5 Mortality rate (/1000)	Maternal mortality rate (/10000 birth)	Adult literacy rate (%)
Developed countries	26214	74	5	7	13	99
Developing countries	1154	62	62	90	440	70
LLDC	277	51	95	158	890	49

WHO, UNICEF,WB,UNESCO. 2002

The role of Public Health



Public Health is

- To think human health in the context of ***community or whole society*** and take not only ***medical but also social*** measures to reduce harm and to promote health of people.
- It deals with ***preventive*** rather than curative aspects of health

  It deals with ***population-level,*** rather than individual-level health issues
- The science and art of preventing disease, prolonging life and promoting health ***through the organized efforts and informed choices of society***, organizations, public and private, communities and individuals.

(1920,Winslow)

Classic of Public Health success Cholera in 1854

On the cholera outbreak in London in1854, he identified the cause as polluted water supply by making cluster map of victims and succeeded to cease the epidemic.

Dr.John Snow's Cholera Map
1854 Soho London

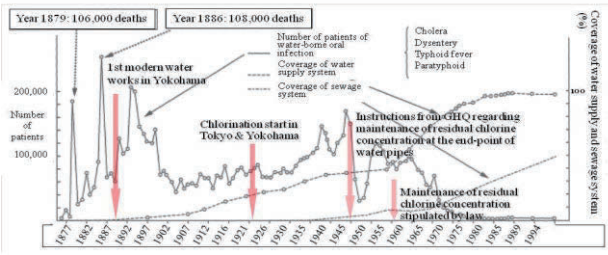
It was 30 years before Koch discovered *Vibrio cholerae* as pathogen of cholera.

Water company	Population(1851)	Death	Death rate
Southwark	167,654	844	0.5%
Lambeth	19,133	18	0.09%

The first ever in history success of eradication of Infectious disease with human hands.

- **Small pox :**
  Jenner succeeded prevention using "Vaccinia"(1798)
  But still there were 50 million patients a year in 1950's.
- **WHO launched an intensified plan to eradicate smallpox in 1967.**
  Mass vaccination (National Immunization day, school vaccination etc)
  + Active finding patients and containment.
- **.....And finally declared eradication of smallpox in 1980.**
- Since 1978 smallpox vaccination has been stopped.
  Although eradication programme spent a lot of money, a huge amount of vaccine cost was and is being saved since then.

Public Health Improvement and Water Supply in Japan (by Prof. Hashizume (Tama Univ))



Decrease of waterborne infectious diseases associated with Increase of safe water supply coverage

(Source: Water Supply Division, Ministry of Health, Labor and Welfare)

22

Result of Global Effort against AIDS

		Estimated need	Number of people on treatment	ART coverage (%)	PMTCT coverage (%)
3 by 5	2003	5.9 million	400,000	7%	9%
	2006	6.8 million	1,650,000	24%	28%
U.Access	2008		3,000,000	52%	
	2009 december		5,254,000	36% of CD4<350*	45%

* ART needing population increased from 10.1 to 14.6 million after revised guideline for ART of WHO in 2009.

Environmental leaders can save human life through their own work in the context of Public Health

- Four million deaths of children could be saved by preventing environmental risks (UNICEF/WHO)
- Human lives are lost by air pollution (1.2 million), water contamination (2.2 million), food shortage (3.5 million) and infectious diseases (12 million) per year (Source: WHO)

EDL Program, U Tsukuba

Acknowledgements

First and foremost, we would like to thank Professor Naoko Kaida, Professor Naomi Wakasugi and Professor Rie Murakami for making the internship successful. We would also like to thank MONRE, JICA Vietnam Office, WHO Vietnam Pasture Institute Nha Trang Faculty of Fisheries, HUAF for providing information and guidance during our internship. Also, we would like to take this opportunity to thank Environmental Diplomatic Leader Education (EDL) Program for offering this internship to Vietnam. It gave us an opportunity to learn many things related to health and environment in Vietnam by visiting different organizations and participating in various activities. In addition, we would like to thank Mr. Nguyen Trung Thuan for helping and guiding us at MONRE. We also would like to thank Dang Nguyet Anh and Ha Thang for guiding us at Nha Trang and Hue respectively. Finally, we would also like to thank JDS fellows in Vietnam for making the JDS-EDL reunion seminar successful. Without the help of the people mentioned above, we would have faced many difficulties during the internship.