Annual Report of JDS Program
in
Department of Bioresource and Bioenvironmental Sciences
Graduate School, Kyushu University

Vol.7 (2009)

1. Introduction

Japan's Grant Aid for Human Resources Development Scholarship (JDS) Program is to provide opportunities for academic research at Japanese higher educational institutions under the Grant Aid assistance by Government of Japan. The objective of this program is to support the respective Government in its efforts to facilitate its own plans for human resource development mainly for capacity building and institutional building, and thereby extend and enhance the bilateral relationship with Japan.

The JDS Program targets young government officers for public sector, researchers, business people and others with the potential to play leadership roles in their specialties after return to each country as well as to become leaders in their homeland in the 21st century.

The JDS Program started in the Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University in 2001 and 32 students have graduated for those five years. In the 2008 school year, the graduate school has a total enrollment of 20 JDS students (11 of first year and 9 of second year students). They belong to the International Development Research Course. The JDS students are also studying in their laboratories for preparing of their Master thesis and attending the lectures conducted in English.

Scientific tour for JDS students was started in December 2003. The aims of these tours are to promote a greater understanding of policy, circumstances and technologies of Japanese agriculture. This annual report contains the scientific tour reports and research or campus life reports from JDS students.

2. List of JDS Students

Name	Nationality	Major Subject	Supervisor
Nguyen Quoc Thien	Vietnam	Horticultural Science	Hiroshi OHKUBO, Professor
Daw Yadanar Khin Latt	Myanmar	Tropical Crops and Environment	Kazuo OGATA, Professor
Pham Thi Lan Phuong	Vietnam	Food Hygienic Chemistry	Takahisa MIYAMOTO, Professor
Khounsaknalath Sithyphone	LAO PDR	Nutrition Chemistry	Takafumi GOTOH, Associate Professor
Nguyen Hung Cuong	Vietnam	Agricultural Policy	Shoichi ITO, Professor
Bounnad Chandaworn	LAO PDR	Agricultural Policy	Shoichi ITO, Professor
Nem Nei Lhing	Myanmar	Farm Management	Teruaki NANSEKI, Professor
Win Pa Pa Soe	Myanmar	Food Marketing	Susumu FUKUDA, Professor
Vongvisouk, Thoumthone	LAO PDR	Forest Management	Shigejiro YOSHIDA, Professor
Vongphachanh Souphinh	LAO PDR	Environmental Life Economics	Mitsuyasu YABE, Assistant Professor
May Lwin Oo	Myanmar	Environmental Life Economics	Mitsuyasu YABE, Assistant Professor
Khin Me Me Ko	Myanmar	Agricultural Policy	Shoichi ITO, Professor
Nilar Aung	Myanmar	Agricultural Policy	Shoichi ITO, Professor
Aung Ko Latt	Myanmar	Farm Management	Teruaki NANSEKI, Professor
Yin Lon	Myanmar	Farm Management	Teruaki NANSEKI, Professor
Nan Khine Su Thwin	Myanmar	Food Industrial System Analysis	Taiji YOSHIDA, Professor
Pham Van Tra	Vietnam	Food Marketing	Susumu FUKUDA, Professor
Bounthavy Khamphone	LAO PDR	Forest Policy	Noriko SATO, Professor
Ong Thi Anh Phuong	Vietnam	Microbial Genetics	Toshihisa OHSHIMA, Professor
Hoang Van Nam	Vietnam	Plant Genetics	Hikaru SATO, Professor

3. Overview of International Development Research Course

The Graduate School of Bioresource and Bioenvironmental Sciences regards the role of agricultural sciences to overcome issues related to global food and the environment and to contribute to worldwide progress in maintaining a stable supply of food and materials, conservation of the environment, and promotion of health and welfare. To fulfill this, the School includes leading researchers and specialists highly knowledgeable in the fields of life science, environmental science and socio-economics.

The International Development Research Course aims to build on the capacity of the above fields for international students from developed and developing countries whose aim is to contribute to worldwide sustainable development. The Master's program emphasizes the acquirement of synthetic and practical abilities.

4. Description of the Program

Students will be awarded the Master of Science (M.Sc) on completion of a satisfactory thesis. Students are also required to complete a four-semester course over a two-year period. The course consists of lectures, practicals, seminars, and tutorials. Students must obtain 30 credits with a minimum pass grade of 60 %.

5. Qualification Requirements of Applicants for JDS student (Master's Course in 2009)

Note: As for further information, you should refer to guidelines for JDS applicants and the application form of the course.

(1) **Academic Requirements:** Applicants must hold a Bachelor's degree (or equivalent) awarded by a postgraduate school outside Japan or expect to receive a Bachelor's degree by September 30, 2009.

(2) **Health:** Certified as both physically

and mentally healthy by a qualified and recognized physician.

(3) **Language:** Non-native English speakers must possess a sufficiently high official English qualification such as TOEFL, TOEIC, or the Cambridge Certificate.

6. JDS Scientific Tour

To disseminate knowledge and information on agricultural technologies and politics, JDS scientific tour was carried out as follows:

Date: May 24 (Sun), 2009 (AM9:00 - PM5:00)

・Planting Rice in Tanada Patty Fields (Ukiha town, Fukuoka)

Date: July 18 (Sat), 2009 (AM9:00 - PM5:00)

・Integrated Rice and Duck farming (Mr. Takao FURUNO's Farm, Keisen town, Fukuoka)

7. Reports from JDS Students

Vongphachanh Souphinh

I am a Lao JDS fellow 2008, the first year Master student in the Environmental Life Economic Laboratory, Department of Agricultural and Resource Economics, Kyushu University.

Here! There are some part of life and Lesson learn in Kyushu University, JAPAN

Actually, snow it not too cold, I can survive ha ha ha!

I have never thought that I would have chance to study in JAPAN, but now I am here at Kyushu University, one of the famous University in Japan.

I often said with friends while studied bachelor degree at National University of Laos-NUOL. “I didn’t want to study in Japan because it has a lot of snow and the weather is very cold”. But it is not true; it is only word that can comfort me. What the fact is! Amm.... It’s not easy to pass examination for studying in Japan.

Right now, I gain some experiences from studying in Kyushu University and living in Fukuoka including academic subjects, communication and living style in modern country as Japan. The most impressive thing for me is internet and information access because many academic papers are available, I can find easily from internet that Kyushu University provide for students.

The most wonderful field trip to me is visiting Takao FURUNO’s rice field because this trip brings me home and on the way go and come back I have no car sick. This trip made me realize that even doing rice farm can be a famous person and can get Nobel Prize “Never ever give-up” is the slogan for successful person. I hope after come back my country I will have chance to share this experience with Lao farmers.

What did I act when getting a book from my friends for JDS Field trip?

Aha! Processing duck in the rice field when I read the cover page of a book “The Power of Duck” then I said “Oi...! In my home town I had seen a lot”. And while reading book my mind was divided in to two parts and conflicted each other. One part said Ahm....nothing interested in, but other side of my brain was told me this book may tell something good and may be differently from my home town “read it read it” I continue reading, I really like this book because it contain background , method, stages, technologies, strength and constrains of integrated Rice and duck farming.

So I really thank you to Professor Mitsuyasu Yabe that gives me and all JDS fellows’ opportunity to learn many things from outdoor activities. I would like to thank to Japanese government, Japanese citizens and JICE that always support and provide good opportunity to Lao citizen to studying in Japan.

Again I would like to thank my professor Mitsuyasu Yabe（矢部光穂）who is often take care of my studying and guide

me each stage of doing thesis, I really appreciate his contribute and valuable time .

May Lwin Oo

One Year Memorable Experience in Japan

Everyone has their own dreams and desire in their lives. Since I was a child, I had a strong desire to go to Japan, a beautiful country. Now my dream came true. I had a chance not only to go to Japan but also to study under Japan's Grant Aid for Human Resources Development Scholarship (JDS) Program. I left my country on June 30, 2008 and this is the first time for me going abroad. I was so excited on my whole trip and arrived in Japan on July 1st .After I arrived in Osaka, I stayed and took orientation course on Japanese Economy and Business, Japanese Politics and Administration, Japanese Society and Culture, and so on for one week .In Osaka, we visited to Todai Ji Temple and Kiyomizu Temple. We also visited Kyoto City Disaster Prevention Center and learned about disaster prevention. We also had a chance to visit Kodai Yuzen-En Gallery House and enjoyed making our own folding fan souvenir. At that time, we studied a magnificent work of dying art with marvelous colors and patterns spread over the kimono, the Japanese national costume.

After one week, I moved to Kitakyushu to study Japanese Language for two months. And I am really interested in Japanese Language. All of the teachers in Kitakyushu JICE Centre are good-natured and kind-hearted. We learned not only Japanese language but also Japanese culture. Sometimes we took study trip near our study area around. Before we left Kitakyushu, we visited Museum and enjoy Japanese culture, such as Ikebana, Wasshoi Summer Festival and Hanabi.

On 1st of October, I moved again to Fukuoka and my student life began at the famous Kyushu University. At the moment, I am a master student supervised by Associate Professor Dr. Mitsuyasu Yabe from Environmental Life Economics Laboratory under the Department of Agricultural and Resource Economics, Faculty of Agriculture. At this university, they provide opportunity for international students to learn Japanese language so that students like me could continue learning Japanese language. Although my Japanese is poor, as much as I can I tried to communicate some of my Japanese friends and international students in Japanese.

Living abroad is not easy and full of challenges and I'm very thankful to JICE for lending their hands in time of need. I'm also grateful to my Myanmar seniors and friends in my lab and international students who always help me when I am need in help. Their kindness will be always treasured in my heart and mind.

I have been in Japan for more than one year now and within these days; I have attended many lectures and classes which significantly improve my knowledge. Moreover, JICE had arranged JDS study tours which gave valuable

knowledge to me, such as integrated rice and duck farming, rice planting tour and high land farm and ecotourism (Kuju and Hita area).I really enjoyed these JDS one day study trips. Among of these, rice planting tour had made me to remember of my undergraduate student life in Myanamr.Beside studying, I spent my leisure time by visiting around Fukuoka, Okinawa and enjoying Japanese traditional festivals.

One year is already over since I came last year in June and one more year to come before I finish my study here in Japan. Besides enjoying Japanese culture and foods, I had made a lot of friends which come from myriad of backgrounds. And I have unforgettable experience on snowing day and beautiful cherry blossom. How memorable life in one year was!

Khin Me Me Ko

My daily and academic life in Japan!!!!!!!!!!

I am one of Myanmar JDS fellows' 2008 attending master courses of Agricultural Economics at Department of Agricultural Resource Economics, Kyushu University. Being selected as one among successful JDS candidates, it is great occasion for me to study in this one of the best universities in Japan.

First of all, in terms of daily life, overhead one year living in Japan, Fukuoka city, it is worthwhile and completely different from my homeland, Myanmar. At the beginning, because of different conditions like culture, life style, food, transportation system, communication, etc..., I felt tired and sick of living here. Moreover, I really miss my family and country. Sooner or later , I start to get used to such kind of things through learning the way Japanese people live , especially by home stay program; spending more time with Japanese friends and people travelling; study trips; shopping; communicating and so on. More specially, JICE keeps assisting me along the way I am going to the Master degree here, such as provision of basic Japanese language, culture, politics, and arrangement of stay in dormitory as well as in an apartment, and making comfort when any problems come eventually. Up to nowadays, with Tatami room style, seasons with respective beautiful aspects, food, people, and very nice night view of city, very beautiful places rich in natural and cultural setting and so on, living in Japan becomes my good habits which I have never forgotten.

After that, my academic life has put side by side the daily life. When being first day in the university, particularly in my laboratory and study room, I make a lot of friends who are from different corners of the world and each of them is friendly and helpful. We are keen on to assist each other, learn from each other about a little experience and languages (mother tongue, Japanese and English). More than that, we always share happy time with each other by organizing friendly meals through which we enjoy as in a family. Thus, helping each other is very important for our further progress and then step forwards to the success. In case of me as an example, I could not accomplish all the procedures in the university if there is no support and aids from them. Besides this, lectures are very interesting and useful for me in improving my capacity and ability in agricultural field. Professors given by the lectures are very helpful. In case of my professor Shoichi Ito is very serious in my study, but very friendly and helpful. In every discussion and presentation session, I always get his valuable comments and guidance in order to improve what I am learning.

Furthermore, I have grasped a lot of knowledge from symposium "Global Scope and Asian Potential-Prospects for

rice and fish" held in Recent Hotel in Fukuoka was organized by Prof. Shoichi Ito, my supervisor. During the symposium session, Dr. Eric J. Wailes, from US gave the presentation about International Rice Baseline Projections, 2008-2018. With his interesting topic, I have learnt the global rice economy must be kept strong, and research, trade and productivity growth will be promoted so as to improve the welfare of rice producers and consumers in the future.

While studying in Kyushu University, I have an opportunity to learn not only the lectures from this university but also special lectures from others, namely Tsukuba, Arkansas and Hohenheim. In addition, I attended English Communication class, such as Creative speaking, Conversation, and English Presentation, which was set up by Kyushu University. With study in this university, I would say that I get much of an impression of it. I really would like to describe more and more my life in the university but this would be everlasting thing.

Finally, I would like to express that Japan is not only beautiful country but a highly advanced country as well. A part from its physical and technological leading innovation, its richness in cultural history, the people of Japan are polite, helpful, self-disciplined, hard-working, responsible and fully committed to what they have done. Additionally, studying in this country, Kyushu University brings me a lot of professional knowledge and expertise so as to contribute to poverty reduction and home country development upon my return.

Nilar Aung

Exciting and enjoyable experiences of a student life in Kyushu University, Fukuoka in Japan

I have been studying at Agricultural Policy Laboratory under the supervision of Professor Dr. Shoichi Ito, Department of Agricultural and Resource Economics, Faculty of Agriculture in Kyushu University since October, 2008. When I was selected as a Japan's Grant Aid for Human Resources Development Scholarship (JDS) fellow last year, I felt a little bit worried about daily life in Japan. I thought about a student life in Japan; "How is life in Japan?", "How can I enjoy without understanding Japanese language in Japan?" But when I arrived at Japan I understood that I worried too much because Japan International Cooperation Center (JICE) arranged for us thoroughly and carefully.

We arrived at Osaka, on 31st July, 2008. First of all, instructors explained economy, culture and policy and lifestyle of Japan for ten days in Osaka. In these days, I and other JDS students got a chance to visit to Kyoto and Nara. After ten days, we moved to Kitakyushu and we learned basic Japanese language in there for two and half months. During these days, we participated in Million Dance Festival in Kokura with JICA team and enjoyed fireworks after dancing. This is first time for me to see wonderful Japanese firework festival. After studying Japanese, we moved to Fukuoka and started our student life in Kyushu University. I am sure that

we all are more confident to start studying in Kyushu University and feel more comfortable with communicating in Japanese with Japanese people.

Student life in Kyushu University is very interesting and enjoyable for me because we all are able not only to study but also to enjoy life helping each other. My first impression is that my professor and associate professor, students from my laboratory warmly welcomed me in the first day. My tutor, seniors, and colleagues are very helpful and kind. Their kindness and help make me convenient in my first days in Campus life. In the first year, I attended not only the special lectures which were conducted by Japanese professor for international students but also other special courses which were conducted by foreign professors. I also attended Japanese language and English proficiency classes such as English communication class, presentation class and academic writing class. In my Laboratory, there is a seminar in every week and students have to make presentation alternatively with respect to their researches. Active participation of the students at the seminar is very helpful for our researches. Moreover, after every presentation, Professors give comments and guidance on our topics. We, all students in our lab suggest each other very friendly and frankly concerning presentation.

Moreover, I got a chance to attend the 2009 Annual Meeting of the Agricultural Economics Society of Japan (AESJ) which was held in Kasuga Campus of The University of Tsukuba from 28th to 30th in March. Symposiums, Meetings and paper presentations were included in it. The first symposium was held on 28th and the topic was “Global Fluctuation of Food Prices and Japanese Agriculture”. A special session was carried on the second day of the Meeting. The Japan - China - South Korea Joint Symposium was held on 30th which was the last day of the Meeting. The topic was “Global Rise in Food Prices and Agriculture / Food in East Asia. Many researchers and students from different Universities presented about their researches respectively.

In addition, there are also various trips arranged by different Association. I enjoyed study trips which were arranged by JDS program such as field trip to Aso Mountain and University farm, field trip to beautiful terrace paddy field and trip to Organic Rice Farm using Duck in Iizuka city. I got many chance to learn Japanese agriculture. I also joined summer trip to Okinawa arranged by Fukuoka Oversea Students Association (FOSA). I visited many famous places including Nakagusuku and Suri Castle which is one of the World Heritage Sites in Okinawa. Furthermore, I got a great opportunity to see KABUKI which is Japanese classical drama in Nakagawamachi. There was a good chance to learn Japanese culture through home stay program. I am very pleased to study in Kyushu University because I gained not only advanced technology but also a chance to exchange tradition and culture with Japanese people and other international students.

Finally, I would like to express my profound thanks to Japanese Government and JDS program for giving me an opportunity to study in Japan. My experiences in Japan are memorable and valuable. It is a great moment for me. I obtained advanced knowledge concerning agricultural policy and could experience different cultures studying with students from different countries. We could exchange our knowledge as well. We all can experience different cultures and traditions studying at Kyushu University in

Japan I am really grateful to JICE which help us enthusiastically throughout the scholarship program. I highly appreciate the JDS program and JICA providing me with financial support.

Aung Ko Latt

One Year Living Experiences and Studying Life in Japan as one of Kyushu University Students under JDS Program

As I am first year Master Student of the JDS program (2008-2010) and after staying one year in Japan, I have to say and mention many valuable and enjoyable experiences, knowledge, etc. But, here, I will say some of them only. Everything what we see, what we learn, what we gain and what we try is very strange and useful for our life and then if we try our best, it will be very useful not only for us but also for our respective countries. I think it is one of the objectives of JDS program to support the respective developing country government by targeting young government officers for public sector, researchers, business people and others.

Firstly, I would like to express my sincere thanks to Japanese Government and JDS program and to my mother ministry, Ministry of Agriculture and Irrigation, Myanmar and to Kyushu University Academic Board for giving very big opportunity to study in Kyushu University which is one of the famous and historic universities in Japan. Honestly, I would like to say that it look like a dream for us to study here and to be one of Kyushu University Students under JDS program. But, after being one of students of Kyushu University under JDS program, we knew that how we are lucky person!

Before leaving from Myanmar to study in Japan, some of my friends who have already been to Japan recommended me to study Japanese Language in my country for surviving in Japan. But, some of my friends who already studied in Japan as students of JDS program informed me that I don't need to study Japanese Language in our country. First, I doubted for these information. But, later, when I saw the arrangements and plans which were laid down by the JDS coordinators and staff for us, doubtless to say no need to study Japanese Language in my country because they watched us as children and arranged all things what they thought needed for us.

The first place we arrived to Japan is what a beautiful Airport, Kansai. When the plane landed to the airport, we felt that our plane was running on the water because we only saw water from the windows of plane. We amazed it. Later, we knew that it is an artificial island airport. Under the good arrangements of the JICA Center-OSIC, we visited to Kiyomizuhera, Todaiji in Kyoto and Nara. Although we only stayed at OSIC for a short time for about two weeks, it was enjoyable for us.

And then, we moved to Kitakyushu JICA Center in order to study Japanese language. We were very lucky again because we met with very kind hearted and very patient teachers. They taught very patiently to some JDS students who didn't know even あ , い , う , え , お and somebody who didn't do homework regularly. I thought that I had to study Japanese language only at JICA Kitakyushu Center. But, we had chance to study some Japanese culture and Japanese life style by talking with some Japanese volunteers and some high school students, by participating with JICA team in Million Dance Festival and Hanabi Festival and by visiting around Kitakyushu City.

After staying at Kitakyushu for about 2 months and half, we moved to Fukuoka and started our Master Course in Kyushu University which is our main objective for why we came to Japan. I had been studying at Laboratory of Farm Management. I got warmly welcome and many helps from

our professors, Japanese students and other international students. They, including my tutor, support and help me a lot with hospitable and friendly.

For my studying in Kyushu University, I could follow the lectures because all of professors are very kind and good at teaching. Moreover, I can study very well with the help of text books, references, journals from the Kyushu University Library and she also gives online learning services. While I am studying my master course, I could study Japanese Language continuously as a great opportunity. During nearly one year studying in University, I had great chance to join so many Scientific Study Tours aiming to promote a greater understanding of policy, circumstances and technologies of Japanese Agriculture. We joined tour trip to High Land Farm and Ecotourism (Aso, Kuju and Hita Area), Planting rice in terrace paddy field and an old town surrounded white walls and Integrated Rice and Duck farming (Mr. Takao FURUNO's Farm), etc. I also attended a conference which was held in Tsukuba University and I got some information for my research from that conference. One of unforgettable trips was Summer Trips to Okinawa organized by FOSA (Fukuoka Overseas Students Association). It is look like most of my country places. We could see and buy some tropical fruits which are not available in Fukuoka. Also, we touched with subtropical weather which is very near to my country and it caused us to miss our home country and we felt that we were in our home country just a moment.

Now, I am still studying research thesis for my master degree under the supervision of Professor Dr. Teruaki Nanseki, Associate Professor Dr. Kazuhiko Hotta, and Assistant Professor Dr. Shoji Shinkai. They are very kind hearted, very helpful and very friendly. We always have open discussion in researches and I got a lot of guidance and comments on my study. My interest research is that generally, we know about the situations of farmers in our country. But, we need to study their productive ability on their respective crops production as academic research. Both major areas of economics, microeconomics and macroeconomics have application on agriculture. So, the problems of production on individual farms are also important and I would like to study the farmers' productive efficiency on their respective crops production in Myanmar.

I think that I have one more chance to write about my research in detail in the next year Annual Report of JDS program in Graduate School of Bioresource and Bioenvironmental Sciences, Kyushu University.

Yin Lon

My Student's Life in Kyushu University, Japan

I am a first year master student studying at the Laboratory of Farm Management under the Japanese Grant Aid for Human Resource Development Scholarship (JDS) program. The objective of this program is to support human resource development mainly for capacity building and institutional building for developing countries, and to extend and enhance the bilateral relationship with Japan. I am very proud of being a student in Kyushu University which is one of the prestigious universities in Japan.

The first day of my life in Japan started when I arrived at Kansai International Airport on 1st July, 2008. It is Japan's second important international airport, located on a man-made island about 50 km south of Osaka. During our stay in Osaka, I went to Kiyomizudera ("Pure Water Temple") which is located in the wooded hills of eastern Kyoto and offers visitors a nice view over the city from its famous wooden terrace, and Todaiji temple, one of Japan's most famous and historically significant temple and Japan's largest Buddha Statue (Daibutsu), in Nara city. After two weeks, I moved to JICA Center, Kita Kyushu to learn Japanese language course for two months. Japanese teachers were very kind and they not only taught Japanese language but also Japanese culture and their life style. The most memorable activity while I was staying in Kita Kyushu was participating in Washoi Million Dance Festival with JICA Center group and watching fireworks (hanabi).

My student's life in Kyushu University started when I moved to Fukuoka City in October, 2008. I got a warmly welcome from professors and students in my laboratory. In the first semester, International Development lectures were offered by excellent professors from various fields. There is a big university library which provides comprehensive academic resources to support

for diverse studying, teaching and research activities. I have been studying at the Laboratory of Farm Management under the supervision of Professor Dr. Teruaki NANSEKI, Associate Professor Dr. Kazuhiko HOTTA, and Assistant Professor Dr. Shoji SHINKAI. In case of research work, seminar is held weekly in our laboratory. All students have to join that seminar and some students give presentations about their research works and research findings. Professors, Japanese students and senior international students in our laboratory are very kind and helpful. As far as I know Japanese people are so polite that they avoid speaking frankly, believing it discourteous. They will generally avoid a direct statement that might offend. Seldom do they give a direct "no". And they do not give answers or make statements that feel disappoint the listener. I would like to share to all of you some Japanese culture I experienced. If you're with a dinner party and receive drinks, wait before raising the glass to your lips. Everyone will be served, and someone will take the lead, make a speech, raise his drink, and yell "kampai!"(cheers). At most Japanese restaurants you will receive a small wet cloth. Use this to wash your hands before eating, then carefully fold it and set it aside on the table. Do not use it as a napkin, or to touch any part of your face. Slurping noodles or making loud noises while eating is OK! In fact, slurping hot food like ramen is polite; to show you are enjoying it. Moreover, there is no tipping in any situation in Japan-restaurants, etc. To tip someone is actually a little insulting; the services you've asked for are covered by the price given, so why pay more? In all Japanese homes, take off your shoes at the entrance and usually a rack will be provided to store your shoes, and pair of guest slippers will be sitting nearby. Public bathhouses are alive and well in Japan. *Onsen* or hot springs, are very popular as weekend excursion resorts. There are so many cultures which are different from our culture.

Besides studying, we can take part in many activities such as trips organized by the international student association, sports, and festivals, etc. We can also participate in JDS scientific tours to study technologies of Japanese agriculture. We went to Mt. Aso, Kumamoto prefecture, study trip on "electric power generation using wild grass" R & D project and dairy farm. And we went to terrace paddy field (Tanada) in Ukiha city to participate in planting rice with Japanese families. Moreover, we went to Agricultural Development and Extension Center and Integrated Rice and Duck Farming in Izuka city. It was an interesting study trip and gave us a lot of knowledge: how ducks use their power in rice fields for higher production without chemicals. In addition to lectures, I continued learning Japanese language in Kyushu University for my daily life as well as for communication with Japanese friends.

Finally, study life in Kyushu University is full of new knowledge and experiences. I am sure I can contribute my knowledge and experiences to the development of our country. I would like to express my sincere thanks to the Japanese government and JDS program for giving me a chance to study in Kyushu University.

Nan Khine Su Thwin

My Study Life and Research in Kyushu University, Japan

I am Myanmar JDS fellow (2008), belong to Laboratory of quantitative economics of food industry, Department of Agricultural and resource economics, Faculty of Agriculture, Kyushu University.

Firstly, I would like to describe about my lovely laboratory. There are only six people, two teachers, two master students and two PhD students in my laboratory. I get great help from my professor and associated professor. The name of my professor is Prof: Taiji Yoshida and the name of my associated professor is Prof: Koshi Maeda. Both of them are helpful. Whenever I have questions, they explain to me clearly and patiently. They guide me not only in my research but also in my problems that I faced in my daily life. All of the students in my laboratory are guys. I found that Japanese guys are a little bit shy. They don't dare to talk with me firstly. At that time, my Japanese is very poor to talk with them. So I faced many problems in communication in the previous time. I felt lonely and I wanted to go back to my country quickly. But shortly later that, I know they are very kind and helpful to me. They assist me all of my Japanese language homework. Really, they are my Japanese language teachers. My Japanese language is surprisingly increased during a shot period. This is because of them. Now our communication is very smooth. More than that, I am not good at calculation. They also instruct me in that work. I am poor at computer. They help me every time when I meet computer problems. They also advice me how to stay and study in Japan. Nowadays, the people in my laboratory are my new family members in Japan. I am very happy in studying together with them.

Secondly, I would like to talk about my study research. The title of my research is "A study on situation of Myanmar economy based on a new estimated Input-Output table of Myanmar (2000-2001)". Input-output analysis describes and explains

the level of each sector of the given national economy in terms of its relationship to the corresponding levels of activities in all other sectors. It is the quantitative process for examining the complicated interdependence within the production system of economy. Input-output table are usually complied for every few year in most country. In Myanmar, the last input-output table was constructed in 1994-95.We have no input-output table constructed after 2000.Now we need urgently to constructed input-output table for recent year to understand the current picture of sectoral development of Myanmar. To apply the input-output analysis in the economy, the first is to draw out input-output table. So 1985-86 input-output table was used as base. Armed with technical coefficient (1985-86) input-output table 2000 was formed. And also used RAS method (by Richard Stone in UK) for adjusting new table. The new table shows increase in transaction value in 2000.In analyzing input-output table, technical coefficient in 2000 was analyzed. The induced domestic production and import of each sector were presented. The comparison between Myanmar and Japan economy were formed. Generally ups and down of the coefficient corresponding various reasons in each individual structure is no rapid change in technology of various economic structures. They are partly influenced by price changes. After that I will continue to study the effect of changes in final demand in sector to GDP of the country. And also analyze key sector approach. After analyzing my research, I will focus on key sectors of the economy and I can suggest our government to give investment priority to these sectors.

Everybody dreams in their whole life. As for me, my biggest dream is to visit to Japan. Because I love snow and cherry very much. I heard that Japan is the most beautiful country of snow and cherry blossom in the world. I have never been to

abroad. Fortunately, Japan is the first foreign country I have been. Although my dream is to visit to Japan only, I have an opportunity to study for two years in Japan. How am I lucky! So I really thank a lot to Japanese Government and Japan International Cooperation Agency for giving much kind support to my study through Japan's Grand Aid for Human Resource Development Scholarship program.

Pham Van Tra

Campus life

It has been one year since we JDS students first arrived in Japan. It is not a very long time but we could experience many things in campus as well as through daily life.

Life in campus is quite interesting to me, personally. I have chances to be in class with students from different countries. We study together many subjects. It is especially interesting when we have discussion about a subject. Every student is encouraged to speak out their idea or solution. Through the discussion, we can have a wider view of the problem. I think it is very useful for me.

It has been one year since we JDS students first arrived in Japan. It is not a very long time but we could experience many things in campus as well as through daily life.

Life in campus is quite interesting to me, personally. I have chances to be in class with students from different countries. We study together many subjects. It is especially interesting when we have discussion about a subject. Every student is encouraged to speak out their idea or solution. Through the discussion, we can have a wider view of the problem. I think it is very useful for me.

We also have chances to go to factories, fields and so on through off-campus -study- tours for most of the subject. Through these tours, we can observe the real situation of agriculture industry of Japan.

However, there is one thing most of the JDS students expect to be improve. That is the Module Subject design. At the first semester, the students have to study 5 of the 6 subjects from different sciences, like Soil Science, Genetics, Food Science, etc. Because of this class design, the students have to study many subjects that completely different from their field of research. This really costs time of the students. We hope that the class design will soon be improved so that the students can study the subjects that are more closely related to the field they are interested.

Daily life in Japan

Thank to more than 4 month Japanese training in home country and JICA Center, the language has helped me a lot in daily life, from shopping to dining out, from catching bus to train, ... every thing needs Japanese language. Especially, the language also helps to create the relationship with Japanese people and exploring their culture. These things help me to understand more about Japan and make my life here more interesting.

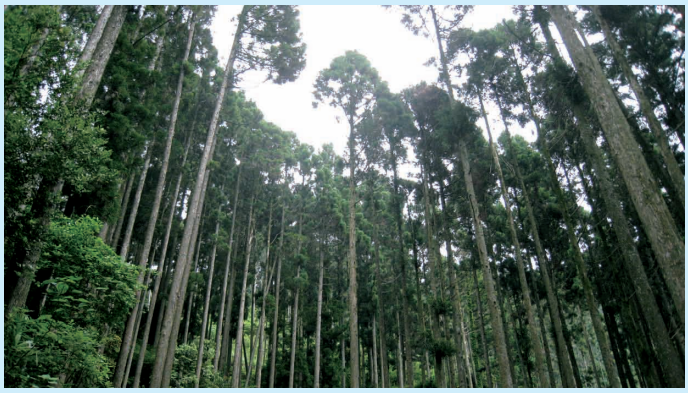
Believe me, there are many disadvantages if you live in Japan without Japanese language ability.

Also thank to the JDS tour programs, I have chances to visit many places around Kyushu area to discover the nature and the culture here. I have also traveled to many landscapes around Japan. Through these tours, I know more about Japan, the people from different regions, different festival and beautiful landscapes. If you are a new comer, I recommend you to travel as much as you can. You will find that you can learn something from the place you visit.

Bounthavy Khamphone

Participation with Forestry Policy Field Trip Practice at Hita City Forest Owners' Association

During April 7, 2009, Forestry Policy Laboratory had organized the field excursion for students who have been studying on the forestry policy issue such as bachelor and master students. This field trip practice is very useful for students which aim to enhance knowledge and skills for them in term of the forestry policy issues. They understand the context of the implementation model of the forestry development and management among stakeholders in the local level about plantation process as well as forest owners' association, the linkages between logging and market; utilize the wood for furniture and housing and including the participation of farmers in agriculture and forestry development in the mountainous areas. I was one of those students who had opportunity to participate with the field excursion and visited Hita City Forest Owners' Association; it is one of successful forest owners' associations in Kyushu area. This page I want to introduce some concerned issues which related to forestry development process of the association the detail as follows:



After Japanese Government has created the convenient condition for the Owner's Association which related to the forestry development particularly in the concreted law on implementation of the forestry management, then the owner's association had contributed to develop the forestry development process in the rural area, especially Hita City Forest Owners' Association is one of associations for plantation in Kyushu Prefecture, the aim of this owner's association which focused on the economic development and improvement among the stakeholders who have affiliation with the association such as local saw mills which belong some villagers who live in Hita city. This association had contributed in the forest resource conservation and improved the environment in Hita city.

The owner's association has log classification system which utilized high technology in their processing then distribute to each local private saw mills in Hita city. The association coordinates with the stakeholders such as private saw mills in local area closely, even though they faced with log price problem in 2008 to 2009, there are some private saw mills that they faced with the economic crisis in the region, so this is one problem which affecting on their business implementation but they had strived to solve the problem with the concerned sectors especially among the private saw mill groups successfully. The association had contributed in the economic value and social development processes in that area, local workers can gain experience and higher income from the association.

The forestry policy field trip practice is one of the most important activities to enhance my knowledge and skills about the forestry development processes among stakeholders in Japan, especially agriculture and forestry development models in the local area. Japan government had paid much

attention to create the convenient factors to the functional organizations in all levels such as wood industries, plantation units, wood markets and developed the linkages between the producer groups and consumer group in the domestic area and abroad. The Japanese wood industries and plantation models had focused on the participation of the functional organizations and stakeholders. It had performed to know that the roles and responsibilities of the stakeholders who related to those field works are the main key to contribute in the socioeconomic development processes in the local area, Japanese forestry development is not only focus on the term of socioeconomic development but also maintain the environment issues in the local area. Forest is renewable resources in the nature which there are many stakeholders are interested to utilize the wood products for the construction, paper production, energy and wood power and so on. *May I acknowledge and appreciate the useful guidance which given by Professor Sato NORIKO and Ph.D. Assistant Professor Katsuhisa KOHROKI in the Forestry Policy Laboratory, school of Agriculture, Kyushu University who had led the forestry policy field trip practice. I would like to express my thanks to Hita City Forest Owners' Association that had took care the field trip practice. My thanks also to all participants who had participated in the field trip practice.*

Ong Thi Anh Phuong

AN INTERESTING EXCURSION OF KYUDAI JDS FELLOWS TO THE FARM OF TAKAO FURUNO - AN AMAZING FARMER

It has been nearly one year since I came to study in Kyushu University following the JDS program. Kyushu University, the largest national university on the Kyushu Island, has a long history of nearly one hundred years and very famous for agriculture in Japan. How wonderful is it when becoming a student of Faculty of Agriculture of this university!

Through the time I have studied here in this university, I had many excursions, were held by the professors of the Faculty, to many farms in Kyushu Island. From these field trips, I had chances to view Japanese developed and modern agriculture, and could compare something between Japanese and Vietnamese agriculture. There are many interesting things came from the real Japanese agriculture life that the agriculture of my country should learn so that we can manage to obtain the development of agriculture like Japanese farmers have done.

Currently, I spent a wonderful and impressive day in a farm of a famous farmer named Takao Furuno who has dedicated his life to developing and fine-tuning a comprehensive technique of organic rice and duck farming that has helped rice farmers throughout Asia when joined in the Duckling Farming field trip. He has developed an "ecological and economical" solution to rising not only rice but also vegetables and fruits. This gave me a deep impression with his organic farming products which free either chemicals or fertilizers. Until now his method already spreads around the world and in Vietnam - my country also. After

we arrived there, at first we heard Takao Furuno explain his method and he also talked about his travels to many countries, especially to Asia countries, to teach and share the knowledge about how to produce the safe crops. We visited his large fields combine between aigamo-rice-paddy and duck feeding after he had finished presenting his amazing lessons. More happily, we had a lunch from his farming products together and we also kept talking about the safest crops.

I was so fascinated by this trip, and it made me widened the knowledge from the practical agriculture have been doing every day by laborious farmers. Furthermore, I think that it is very important that the students can enhance the knowledge not only in university but also in actual agricultural activities through these excursions.

Hoang Van Nam

JAPANESE IMPRESSIONS AND THE STORY OF A GAIKOKUJIN

Far beyond my imagination about the life here, Japan and its culture are totally amazing and have left indescribable impressions on me. I would say, so far within one year living here, experiencing and witnessing the fact of what is really going on in the country of Samurai knights, I have been attracted by its charming, mystery and diversity in culture and life, totally amazing! Besides, I just have realized that living here is not only the way to enjoy the new culture but also the way to challenge myself to know how far I can go.

Still deep in my mind, I clearly remembered the time just right before leaving my country for Japan, when I known that this time must be a chance I expected, a chance for change, changing in experience, viewpoint and knowledge, I felt so excited and ready for a big fulcrum for my future life. As a matter of fact, even Japan and my country - Vietnam are located in East Asia and we do have lots of things in common regarding to race and religion..., on the other hand, we own many distinctive characteristics in culture, customs and so forth. As the result, at the beginning of preparation, some people warned me about culture shock, language barrier and things I should take into account which I would cope while living in Japan. Actually, I am a pretty adaptive person, not easy to get bored therefore in most cases I feel comfortable in changing places and able to keep going. Fortunately, everything has been going well so far and I am just amazingly surprising by here - Japan!

This time I want to come up with two of my stories those related closely to my life as a foreigner with the title of “oversea student/ryugakusei” in Japan and Kyushu University, Fukuoka. First comes with my impressions on Japan, and next I will show you my definition of “being Gaikokujin” in this beautiful country, from what I experienced here through nearly one year more or less.

Impressive Japan

To begin with, I want to tell you my impressions on Japanese culture. I could say Japan and its culture have left really deep impressions on me since the day I came here. In my opinion, Japanese culture is distinctive by its mystery, charming and diversity. Mysterious because the more I live here, the more interesting and more surprising I find. Undoubtedly, it is so charming, beautiful as the picture of Japanese girl in the Kimono I have seen and really diversified by its numerous festivities and colorful characteristics. Honestly, what I love the most would be Hahami, kind of flower viewing, being enjoyed by most of Japanese in the whole country and foreigners settled down here. It recalled me about the flower and the ways people behold flower in Vietnam back in the time I was there. Obviously, we have many kinds of flowers as well as seasonal flowers such as flamboyant flower, Queen crape myrtle... which flare up sky every summer. However, in Japan when spring comes and sakura flower starts blooming, incredibly, that flowers are everywhere, I have never ever seen such amazing scenery, really colorful and natural. In any town or village in Japan, I could see many cherry blossom trees planted in the parks, temples and boulevards. People also noticeably changed their behavior and habit! What I

saw was that people celebrated cheerfully, they went to famous places such as temples, Shinto shrines and parks, sat under the trees for flower viewing, partying with family, friends and colleagues. The fact that, cherry blossom just lasts for about one week therefore that moment seemed to be very precious to everyone. Like any foreigner, I felt so excited for such occasion, really enjoyed the time taking lunchbox and gathered together in a small garden inside Hakozaki campus with our professor and laboratory members. Even some sunny days, my professor took everyone by his car to a cherry blossom park about 30 minutes far from campus, just for lunch time. At that time, everybody talked about "sakura no hana" therefore such opportunity was really helpful for me as a foreigner since many questions came up and I just found the right persons and the right time to get them cleared up. Again, here, the first time I known about Yozakura (night cherry blossom viewing), made me curious and noticed that how Japanese people feel an affinity for the transience of the cherry blossom and respect for the transitory beauty by viewing the flower in the moonlight or flickering light from paper covered lamps.

In addition, Japanese tea ceremony and calligraphy also impressed me very much. I felt a distinctive Japanese atmosphere when the day with my Japanese friends, Joe-san and Mako-chan, coming to Joe's tea ceremony house to drink Japanese tea. It was a spring rainy day and the tea room was decorated with ikebana, some calligraphic papers and outside cherry blossoms profusely blooming which we could see from the view of the window. I really was enchanted by tea ceremony's spirit which my friend taught me at a presentation on tea ceremony. It said that the spirit of tea ceremony is composed of four elements Wa（和）harmony, Kei（敬）respect, Sei（清）purity and Jyaku（寂）tranquility. So interesting! Equally, Japanese calligraphy attracted me by its sophistication and really drove me eager to learn more Japanese characters in order to practice calligraphy. Definitively, for those who use the Roman letters in writing, it is hard to believe that characters convey the images and as beautiful as a paintings. I really appreciated the moment I have words in Kanji written by my friend, such as 家庭円満 (meaning peaceful family) and my name（南）and still keep them as the memories of Japanese life.

As the development and modernization, traditional values sometimes are fallen into oblivion along the time since people are busy and unintentionally forget their sophisticated cultural values. What I actually witnessing and being impressed here prove that in Japan, tradition still has been conserved and developed respectfully and that traditional and modern values together exist.

The story of a Gaikokujin

Second story has to do with my definition of Gaikokujin in Japan. What I am going to tell you had been started not here in Japan but Vietnam. I still remember a very noticeable story in some paper I read, actually a warning from a foreigner who had been living in Japan for couple of years to the newcomers on the attitude of Japanese people and Japanese society towards foreigners. Accordingly, it was said that everything starts from the title of foreigner in Japanese, namely Gaikokujin (外 国 人) or briefly Gaijin (外人). Obviously as the name, it means "gai- 外 " outside, foreign and not Japanese!!! Since you are outsiders, Japanese consider you not as them so that they tend to treat you in the way some people feel uncomfortable with. A little bit worried about that situation at first but later on it was faded away by my friends' encouragements and my determination and then everything had been replaced by excitement about new voyage.

Honestly speaking, coming here with expectation of a young person and being a Gaikokujin, I have found that Japan is such a good place to study and get training. In general, I highly appreciate Japanese supporting system, it is just really helpful and "Gaikokujin - friendly". As a JDS scholar, we have been supported by Japan International Cooperation Center (JICE) from the day we were selected, a full care system and extremely good for us. Frequently, JICE coordinators keep providing us information, trainings kindly and carefully. Thanks to them, we have had good background of Japanese, knowledge of city of Fukuoka as well as campus life in Kyushu University and get ready to give the best attempt for every chance we cope.

Secondly, being a Gaikokujin here means you can get consulting, supporting from Kyushu University International Student Office, which I think very helpful for oversea students. The most wonderful thing I would say is tutor system, which you will get advice and help from a Japanese senior who can

speak English and Japanese (of course!). The system supports you for first six months in academic matters as well as daily matters caused by language barrier, administrative procedures and so forth. In my case, it has been working well until now hence I have learned a lot from my tutor and he seem to be excellent at guiding and tutoring Gaikokujin! Equally interesting, being a gaikokujin in Kyushu University, I have many Japanese and international friends who shared memorable moments such as Japanese classes, JDS tours and Hakata Dontaku festival... Those moments were good chances to make good friendships and somewhat helped me enjoy the campus life not by books and experiments.

What is more, how is about being a Gaikokujin in Japan when you meet Japanese people? I have attended home-stay program and lived in a Japanese young family with two cute son and daughter in Fukuoka. Furthermore, I am studying in the field of agriculture and sometimes we went to the farms to visit farmers, their fields and agricultural systems in Kyushu. And in reality, all members of our laboratory are Japanese and we sometimes communicate in Japanese language. In most cases, when I talked with them (Japanese people) I never felt as an outsider because they made me involved in the talking by asking about my country and respecting my culture very much. With them, I felt pretty comfortable to talk in Japanese and more motivated to polish my language. In general, regardless of some language misunderstandings, I consider Japanese people very hospitable and kindly, they do care much about how to make their guests feel really at home.

One year passed and still half way to go, as I said previously that I am the guy who not easy to get bored and I am sure that will never happen to me at least within coming year since it is in Japan! “A year starts by the spring and a life starts by the youth!” I strongly believe that the time I spending here will be a spring of my life and really the chance I need and thought about, a chance to change!

My dearly friends, you might read this before coming to Japan, being here or even already backed your country, in any case, I surely think that we all want to thank Japan for the chances it gave us, its supports and its dedications for the development for the world’s tomorrow. I thank you too for sticking with me to read this message and may you all always happy and enthusiastic to contribute to your home country.

Nguyen Quoc Thien

Production of virus-free bulblets in Hakata lily (*Lilium brownii var. colchesteri*)

[Purpose] Hakata lily (*Lilium brownii var. colchesteri*) has been cultivated as an ornamental plant widely in Japan for about 400 years (Okubo, 2006). Since the species shows strong self-incompatibility (Shimizu, 1971), it has been propagated asexually along with increase in morbidity by virus diseases. Virus infection causes distorted and twisted growth in leaves, color breaking in the flowers and concentric brown ring patterns on bulb scales in Hakata lily. In this study, the production of virus-free bulblets was attempted in Hakata lily by means of meristematic culture.

[Materials and Methods]

Meristematic culture

Bulbs were collected in Korea, and they were grown in greenhouse in Kyushu University. *In vitro* shoots were obtained from bulb scales of these plants for meristematic culture. Meristems derived from these shoots were cultured on MS medium supplemented with 2.2 μM BA and 2.9 μM IAA. The MS medium including 50μM DHT (2, 4-dioxohexa-hydro-1, 3, 5-triazine), an antiviral chemical, was used for next meristematic culture. Virus-free bulblets were subcultured and transferred to the greenhouse.

Detection of viruses

Virus infections were confirmed in donor plants and bulblets regenerated from meristematic culture by RT-PCR technique. Total RNA was extracted from the leaves using RNeasy Plant Mini Kit (Qiagen), and then RT-PCR was performed using RNA PCR Kit (AMV Ver. 3.0, Takara Bio). Each specific primer was designed on the basis of sequence of *Lily virus X* (LVX), *Lily symptomless virus* (LSV), *Cucumber mosaic virus* (CMV) and *Lily mottle virus* (LMoV). PCR products were electrophoresed in 1.5% agarose gels.

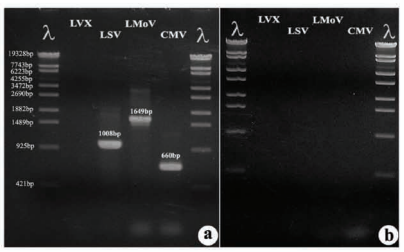


Fig. 1 Detection of viruses LVX, LSV, LMoV and CMV from leaves in **(a)** donor plants, **(b)** virus-free bulblets.

[Results and Discussion] Infections with three kinds of viruses, LSV, CMV and LMoV, were confirmed from leaves using RT-PCR method (Fig. 1a). Regenerated bulblets were still infected with at least one kind of viruses, LSV or LMoV in the

first meristematic culture on MS medium. LSV was eliminated completely in meristematic culture of these bulblets on MS medium supplemented with DHT, whereas it showed a weak effect on LMoV elimination (Fig. 1b). Virus-free bulblets were successfully established. These plants were transferred to new medium and were multiplied by *in vitro* scaling. The virus-free bulblets were transferred to soil and grown under green house condition after rooting. It was concluded that virus-free Hakata lily was obtained by means of meristematic culture on the medium supplemented with the antiviral chemical - DHT.

Daw Yadanar Khin Latt

Study on effects of *Sesbania rostrata* on the growth and yield of rice

I have almost completed my Master Course at Kyushu University. I would like, first, to express my sincere appreciation to my Professors Dr. Kazuo Ogata at Tropical Crops and Environment, and Dr. Takeo Yamakawa at the Laboratory of Plant Nutrition for providing me an excellent studying environment and for excellent guidance, vital instructions, patience and encouragement on my research experiments. In addition, I would like to send my great thanks to the Japan International Cooperation Agency (JICA) for financing my research study through the Japan International Cooperation Centre (JICE). Without their supports, this study would have not been possible. Here, I would like to show a brief of my study on the effects of Sesbania rostrata on the growth and yield of rice.

Introduction

Cropping systems with leguminous plants as green manure are probably the most efficient ones since the N input to the soil is directly related to the amount of N_2 fixed by the legume. Green manuring with an N_2-fixing legume crop can meet a substantial portion of the rice N requirement and provide organic matter to wetland rice soils to maintain soil fertility. The stem-nodulating tropical legume *Sesbania rostrata* is a promising green manure species for low input rice-farming systems in lowland areas. However, its success as biofertilizer depends on its biomass production and N_2 fixation. Organic-N fertilizers in the form of flood-tolerant and leguminous *S. rostrata* can be useful alternatives to resource-poor rice farmers if applied as green manure. The present study aims to examine the accumulation of fixed N_2 by this green manure and their effects on the performance and yield of rice.

Materials and Methods

Experiment I

Firstly, root and/or stem nodulation, nitrogen fixation (acetylene-reducing activity), growth and N uptake by *S. rostrata* as affected by inoculation site were studied in a pot experiment. Four treatments were included: (1) Seed inoculation; (2) Stem inoculation; (3) Seed and stem inoculation; and (4) No inoculation. For seed inoculation treatment, seeds were inoculated by applying 5 mL cell suspension on each seed at sowing. Stems will be inoculated by spraying cell suspension (cell density: 10^9 cells mL^{-1}) on the aerial portion of each plant on 30 days after sowing. Then, the BNF ability was estimated by using acetylene reduction assay.

Experiment II

In the second experiment, the effects of S. rostrata green manure on the growth, yield and nitrogen accumulation

of rice were studied in the pots. Two times of stem inoculation were done on 20 and 30 days after sowing of S. rostrata. Sixty days after sowing, S. rostrata was cut into small pieces and shoots and roots were incorporated into rice soils. Green manure treatments (2 and 4 plants pot-1) were compared to urea treatments (40 and 80 kg N ha-1) and no application treatment.

Results and Discussions

Experiment I

Stem inoculation treatment significantly increased plant dry weight, N accumulation and acetylene reduction (nitrogen fixation) activity of *S. rostrata* than seed inoculation, seed and stem inoculation and no inoculation treatments (Table 1). It is evident from these results that stem inoculation of *S. rostrata* is needed in order to produce a high biomass and accumulate a large amount of N.

Table 1. Effects of *Azorhizobium caulinodans* inoculation on nodulation, total plant dry weight, N accumulation and ARA of *S. rostrata* on 60 days after sowing

Treatment	Total nodules number plant^{-1}	Dry weight of nodules (g plant^{-1})	Total plant dry weight (g plant^{-1})	N (mg plant^{-1})	ARA (μmol C_2H_4 g^{-1} nodule dry weight hr^{-1})
Seed inoculation	95 a	0.25 a	4.79 ab	140.96 ab	12.74 ab
Stem inoculation	141a	0.36 a	6.39 a	187.92a	20.52 a
Seed and stem inoculation	81 a	0.19 a	3.31 b	97.51 b	12.64 b
No inoculation	76 a	0.22 a	3.24 b	78.64 b	4.35 b

The same letters within columns are not significantly different using Tukey-Kramer HSD test (P<0.05).

Experiment II

The response of rice to green manure and urea application is shown in Table 2. Green manure treatments increased dry matter weight and grain weight significantly over urea treatments and no application treatments. All green manure treatments increased N uptake of the plant. It can be concluded that incorporation of green manure legumes can add large amount of biologically fixed N to rice soils. The present study suggests that the effective utilization of the biomass produced by the stem-nodulating *S. rostrata* would be an economically viable component of integrated nutrient management for increasing the yield components and yield of rice per unit area.

Table 2. Dry matter weight, grain yield and nutrient accumulation of rice as affected by incorporation of *S. rostrata* and urea

Treatment	Total dry weight (g plant^{-1})	Grain weight (g plant^{-1})	Total accumulation (mg plant^{-1})		
			N	P	K
C-cont.	9.31 c	2.66 b	71.26 d	22.33 d	151.15 c
CGM-I	30.87 a	14.86 a	281.26 b	64.81 abcd	383.01 b
CGM-II	33.93 a	17.04 a	288.73 b	87.08 ab	538.97 a
P-cont.	9.88 c	2.40 b	80.71 cd	19.60 d	159.56 c
PGM-I	31.42 a	15.41 a	314.95 ab	102.16 a	561.90 a
PGM-II	34.45 a	13.68 a	356.03 a	75.47 abc	605.43 a
High-U	17.1 b	5.32 b	134.21 c	36.40 bcd	230.46 c
Low-U	12.85 bc	6.09 b	124.95 cd	32.23 cd	182.88 c
NA	8.33 c	3.56 b	86.4 cd	21.97 d	131.17 c

The same letters indicate not significantly different using Tukey-Kramer HSD (Honestly Significant Difference) test (P<0.05).

Pham Thi Lan Phuong

Studies on control pathogens in seafood

Introduction

International pressures to document food origins and demonstrate safety of the products have been increasing recent years. Access to international markets is no longer simply a matter of a country or an enterprise having a good reputation for high food quality. Likewise, there are demands to ensure quality and safety of seafood using grade standards, company or customer specifications, etc. Impressive new technology acts as a pathogen-killing step in the processing of many species of seafood is required.

In recent years, **chlorine dioxide (ClO_2)** especially **chlorine dioxide delivery agents** have been used as an extremely effective and powerful biocide. Unlike chlorine, its effectiveness is not pH dependent, it does not form carcinogenic disinfectant by-products (THMs and HAAs), and it is more effective at lower dosing levels.

Therefore this study focused on study the antibacterial effect of ClO_2 on some food poisoning bacteria and its application for microbiological control of seafood. Besides, the bactericidal effect of **Sodium Chlorite ($NaClO_2$) and the mixture of $NaClO_2$ and GRAS acid** (Generally Recognized As Safe acid) was also evaluated on some bacteria including *Listeria monocytogenes* and *Escherichia coli* sp. in order to compare with the effect of ClO_2.

Material and method

Pathogenic including food poising bacteria were treated with different concentrations of $NaClO_2$, mixture of $NaClO_2$ for 60 min and ClO_2 for 5 min to determine the Minimal Bactericidal Concentration of these disinfectants against bacteria by using RABIT system (Rapid Automated Bacterial Impedance Technique) for detection the growth of bacteria after treatment.

Consequently, to control the bacteria in food effectively, we identified the microflora of three types of Vietnamese shrimps (frozen Black Tiger shrimps headless tail on, frozen Black Tiger shrimps peeled tail on, and raw Black Tiger shrimps) by using biochemical tests, Ripo printer and 16S rRNA sequencing.

After identification of microflora of shrimps, we determined the MBC of ClO_2 on these predominant bacteria.

Finally, Baname shrimps which were bought in local supermarket were treated with 25 ppm ClO_2 for 1, 2, 5, and 10 min. Shrimps were also treated with Sodium hyperchlorite (NaClO), the most commonly used sterilization, in order to compared with the bactericidal effect of ClO_2.

Results and discussion

Sodium Chlorite ($NaClO_2$) was active at 0.1% and 0.2% on *Listeria monocytogenes* No. 185, *E.coli* O157:H7 (VT1, VT2) and *E.coli* IFO 3301 while it was not on *Bacillus cereus* No. 55 even at the concentration of 0.2% (Table 1.)

Table 1. Minimal Bactericidal Concentration of $NaClO_2$

Strain	Inoculum (CFU/ml)	Detection of bacteria in RABIT SYSTEM						
		Concentration of $NaClO_2$ (%)						
		0.20%	0.10%	0.05%	0.01%	0.005%	0.0025%	0%
L. monocytogenes No. 185	2.256×10^6	N(*)	N	G (**)	G	G	G	G
E. coli O157:H7 (VT1, VT2)	1.316×10^6	N	N	G	G	G	G	G
E. coli IFO 3301	4.57×10^5	N	N	G	G	G	G	G
B. cereus No.55	4.64×10^5	G	G	G	G	G	G	G

(*) N : There was no detection of the growth of bacteria by RABIT system.
(**) G: There was a detection of the growth of bacteria by RABIT system.

Sodium Chlorite ($NaClO_2$) was effective at 0.001% in **combination with 0.1% citric acid** on *Listerichia monocytogenes* No. 185, *E.coli* O157: H7 (VT1, VT2) and *E.coli* IFO 3301. However for the practically available for the sterilization of food, in combination with 0.1% citric acid, $NaClO_2$ concentration was suggested to be 0.025% $NaClO_2$ for *Listerichia monocytogenes* No.185 and 0.005% $NaClO_2$ for *E.coli* O157 : H7 (VT1, VT2) and *E.coli* IFO 3301. (Table 1.)

Table 2. Minimal Bactericidal Concentration (MBC) of the mixture of $NaClO_2$ and citric acid

Bacteria	Inoculum (CFU/ml)	MIC of $NaClO_2$ (%)					
		Concentration of citric acid (%)					
		0	0.01	0.05	0.1	0.5	1
***Listeria monocytogens*No. 185**	**3.0×10^6**	0.05	0.05	0.025	0.001	0.001	0.001
***E. coli*IFO 3301**	**4.13×10^5**	0.05	0.001	0.001	0.001	0.001	0.001
***E. coli* O157:H7 (VT1, VT2)**	**1.44×10^6**	0.025	0.001	0.001	0.001	0.001	0.001

Chlorine Dioxide (ClO_2) was very effective bacterial disinfectant. It works against a wide variety of bacteria at low concentrations. It was found that 25 ppm ClO_2 had sufficient bactericidal effect on almost all food-poisoning bacteria (table 3.)

Table 3. Minimal Bactericidal Concentration of ClO_2

Strains	MBC of ClO_2 (ppm)
Bacillus cereus No.55	No effect
Escherichia coli sp.	6.25
Lactobacillus plantrum	6.25
Listeria sp.	12.5
Pseudomonas aeruginosa	12.5
Salmonella sp.	25
Staphylococcus aureus	25
Vibrio sp.	12.5
Vibrio vulnificus	No effect

The predominant bacteria in Vietnamese frozen Black Tiger shrimps headless tail on were *Exiguobacterium* sp. (85%) and *Bacillus* sp. (10%) but those in Black Tiger shrimps peeled tail on were *Staphylococcus* sp. *Kytococcus* sp. (70%) and *Micrococcus* sp. (13%) were predominant in Vietnamese raw shrimps. As the resuts, 12.5 ppm ClO_2 was the MBC of almost these kinds of bacteria.

The results of treatment Baname shrimps with 25 ppm ClO_2 showed that at purchase, initial viable counts of Baname shrimps ranged from 10^5 to 10^6 CFU/g. The counts reduced gradually by treatment with 25 ppm ClO_2 as the treatment time increased from 1 to 5 min, achieving an approximate 1 log reduction at 5 min. Treatment for 10 min caused the change of color of the shrimps' muscle which exposed directly to the ClO_2 solution.

By treatment with 200 ppm NaClO for 5 min, viable counts of shrimps decreased only to 1/4 of the initial counts. Compared with the 200 ppm NaClO treatment, 25 ppm ClO_2 treatment was effective for sterilization of shrimps headless tail on.

Conclusion

Chlorine dioxide was extremely effective and powerful dioxide. It worked against a variety of organism at low concentration in a shorter time compared with other disinfectant. ClO_2 has potential to apply on other food such as vegetable, meat, brewery, raw seafood.

Khounsaknalath Sithyphone

AN INTERDISCIPLINARY RESEARCH FOR REDUCING THE USE OF IMPORTED GRAIN FEED IN BEEF PRODUCTION SYSTEMS IN JAPAN

In Japan, cattle are mainly fed with grain feed (concentrate) to produce marbled beef that is quite valuable in the beef market. Japanese beef farmers need cheaper and larger quantities of grain feed. Japan imports a large amount of food and

animal feed annually. In 2007, total feed imported into Japan was 24,067,440 million tons, including 4,492,143 million tons for beef cattle. The price of compound feed has increased 58% since late 2006; therefore, overall feed demand combined with increasing prices have hurt most Japanese livestock producers, especially beef cattle farmers. These issues have resulted in higher prices for locally-produced beef. An attempt to diminish the utilization of imported grain feed in Japan has revealed two main potential strategies, domestic grass and eco-feed utilization. Three experiments were conducted to examine these strategies, including (1) an evaluation of grass-fed beef feeding systems in terms of feed cost, palatability and environmental impacts, (2) an investigation of the willingness of consumers to pay for grass-fed beef feeding systems and (3) an evaluation of the effectiveness of eco-feed utilization in a beef fattening program.

Experiment I: Three different feed systems were used "to compare feed cost, palatability and environmental impacts among groups of animals." Japanese Black cattle (n = 20) were divided into three groups based on feed, including concentrate (HC, n = 6), high hay (HH, n = 7) and grass-only fed (Gof, n = 7) groups. The feed cost was the sum of costs paid for feed intake times the price per kilogram of feeds. The palatability of roast beef was determined by a taste panel that assessed HH beef and Gof beef. Environmental impacts were calculated by multiplying the percentage of beef yield accounted from animal life weight in each feeding stage and quantity of CO_2 emissions by 1 kg of Japanese beef at retail store. Significance among means was assessed by ANOVA and frequencies in descriptive analysis. The results showed that the feed cost of the HH and Gof feeding systems were reduced by 60% and 78%, respectively, compared with HC ($P < 0.01$). In the panel test, 47.5% and 50% of panelists confirmed "Extremely delicious" and "Delicious," respectively, for HH beef compared with 62.5% and 15%, respectively, for Gof beef. The amount of environmental impact in each feeding system was 9.32, 6.10 and 2.01 tons of CO_2 equivalents (eq) for the HC, HH and Gof systems, respectively. ***Experiment II***: Consumers' willingness to pay for the grass-fed beef feeding system was assessed with specific aims "to investigate consumers' behavior, influence factors, knowledge of Japanese beef production system and market price for Q beef-HH and Q beef-Gof." A mail survey was conducted in Fukuoka, Kurume and Dazaifu in Fukuoka Prefecture. The Contingent Valuation Method (CVM) was used to elicit willingness to pay (WTP), and data were analyzed in the Tobit model by the econometric software program "LIMDEP". The output indicated that the majority and average percentage of consumers' behavior in the study positively represented general consumers' behavior. Safety was the most important factor influencing consumers' willingness to pay, while the majority (65%) of consumers did not know anything about the Japanese beef production system. Consumers were willing to pay for both Q beef-HH and Q beef-Gof at a price around ¥506 and ¥491 per 100 grams accordingly. ***Experiment III***: The effectiveness of eco-feed utilization was assessed "to compare body growth and carcass quality and to identify the effectiveness of the utilization of eco-feed in beef muscle of longissimus thoracis during the fattening period." Effectiveness was based on analysis of "Okara" by an enzyme derived from Bacillus subtilis var. natto (under copyright) in a beef fattening program. Ten animals were used in conventional (steers, n = 6) and eco-feed (steers, n = 2; heifers, n = 2) groups. In group two, an average of 40% fattening concentrates was substituted with eco-feed. After 26 months, animals were slaughtered, and data from the carcass report was gathered. Samples were taken from the *longissimus thoracis* muscle in carcasses and then stained according to histochemical techniques. Afterward, myofiber types were classified as I, IIA and IIB. Diameter and distribution of myofiber types were measured and compared for significant differences based on t-tests. It was found that the body growth and carcass quality in both groups did not differ ($P > 0.05$) in all categories. The composition of myofiber type I in steers (40%) in the conventional group was larger than steers (25%) and

heifers (29%) in the eco-feed group ($P < 0.01$). However, the diameter of myofiber types IIA and IIB were larger in the eco-feed group than those in the conventional group ($P < 0.01$), which were approximately the same size.

In conclusion, the HH feeding system as a potential, was better than the Gof as an economical system while producing lower environmental impacts and having impressive taste. HH and Gof were named "Q beef" feeding systems. In this study, consumers were willing to pay a sufficient market price for Q beef-HH and Q beef-Gof. With reference to the market price, this can be beneficial for all beef traders. The most important obstacle for both types of Q beef compared with the current beef grading system is to classify the auction sale price. The other potential feeding system, the utilization of eco-feed, did not affect body growth, with almost the same carcass quality as the commercial fattening program by concentrate feed. Histochemical properties were slightly better in eco-feed animals in terms of quality beef grade. These studies clearly show the benefits of and potential to reduce the use of foreign feed in Japan. However, to create a market for this Q beef, the balance between price for consumers and production costs has to be considered. Results of the three studies show that these strategies can be developed into more unique systems for Japanese beef production systems. These feeding systems should be introduced into the beef industry as options for beef consumers in terms of safety, taste, price, health and environmental care.

Nguyen Hung Cuong

Laboratory of Agricultural Policy

I would like to take this great opportunity to express my sincere gratefulness to my Professors, Dr. Shoichi Ito and Dr. Hiroshi Isoda for their excellent instructions and guidance during my two-year study. And, I also would like to send my great thanks to JICE who has been faithfully providing me good cares and financial supports. I would not be able to complete my study if I do not have helps and assistances from students in the laboratory and my dear friends. Thank you very much for what you have done for me.

Summary of my study on "Characteristics of International Grain Price Movements under the High Oil Prices: Toward Policy Implications"

Daily prices of rice, corn, wheat and soybeans all made their high records which were equivalent to increases of around 120 percent for the first three commodities and 85 percent for soybeans starting from early July 2007. Then, these prices have started dropping since the second half of 2008. Record high prices of the grains were made at different times and the magnitudes varied depending upon the commodities. However, a uniformed trend of price movements for all crops did exist. Crude oil prices showed the same trend since they also escalated and reached the record high at US$145.29/barrel on July 3, 2008. Many researchers and economists considered oil prices as a factor contributing to price fluctuations of the grains, however none of them pointed out how much the oil price variations affected the grain prices. This study attempts to quantify the relationships between prices of the grains and oil. Furthermore, this study would analyze the characteristics of the grain price movements.

Time series daily price data of the grains and oil were collected in the period from July 2nd, 2007 to March 31st, 2009 from Chicago Board of Trade and New York Mercantile Exchange, respectively. Dickey-Fuller tests, Vector Autoregression (VAR), Johansen approach and Vector Error Correction Model (VECM) were methodologies employed in the same order to quantify the long-run relationships between time series variables. Dummy variables were also included in the models to reflect other factors besides crude oil prices affecting the variations of the grain prices.

Prices of the grains have been linked together since they were substitutes with one another in terms of uses as food and feed and crop land. As a result, a change in prices of one commodity may lead to changes in prices of other substitutive and competitive crops. Economic growths with increase in disposable incomes which have been causing changes in dietary patterns towards more meat consumption in developing countries and the U.S. policy on bio-fuel productions were two key factors to the rise of grain prices.

The Johansen tests indicated that there was one cointegrating relation for each case of rice, corn, wheat, and soybean prices with oil prices. These results proved that there were long-run relationships between prices of these four grains and oil. The cointegrating coefficients are shown in table 1 that prices of rice, corn, and wheat increased 8.22 cent/cwt, 2.71 cent/bu, 2.00 cent/bu, respectively, when oil prices increased by one dollar a barrel; and price elasticity of soybeans to changes in oil prices is 0.604. Price elasticities can tell which grains respond more in magnitude to the changes in oil prices. Furthermore, VECM also reported the speeds of adjustment (ECT(-1)) by which each grain prices' deviations from the long-run equilibrium were corrected gradually.

According to the price elasticities, prices of corn, soybeans and rice responded more to the changes in prices of oil than prices of wheat. Dramatic increases in corn and soybean uses for bio-fuel production together with the current bio-fuel subsidy programs and mandate of 15 billion gallons of ethanol by 2015 by the U.S., oil prices will have continued impacts on prices of the food grains.

Table 1: Results derived from VECM

Panel A: Error correction terms in VECM				
Variables	Rice (cent/cwt)	Corn (cent/bu)	Wheat (cent/bu)	Soybeans (cent/bu)
Crude oil	8.22***	2.71***	2.00**	0.604***
Price elasticity[3)]	*0.465*	*0.505*	*0.228*	*0.604*
Constant	862***	273***	688***	4.19***
ECT(-1)	-0.0586***	-0.0427***	-0.0629**	0.00564
Panel B: Coefficients of exogenous variables in VECM				
Variables	ΔRice	ΔCorn	ΔWheat	ΔSoybeans
DRICQ	-18.9***			
SDMEP	0.274***			
SDVXB	0.549***			
DTHS	16.5**			
RTDCRNQ		-0.708***		
SDAWLFS		0.0652***		
RTDWHTQ			-1.13***	
SDJ_APR08			0.0762	
DEXRSTR			43.3***	
SDLFSLA				0.000202
SDRDEM				0.000227

*Note: The asterisks *, ** and *** denote significance levels at 10, 5 and 1 percent, respectively.*
Exogenous variables used to reflect other factors besides oil prices to the fluctuations of grain prices are all dummy variables of different types; they are intercept dummies, slope dummies, and trend dummies.

The grain prices remain relatively high, the Asian grain exporting countries should establish larger size of agricultural production to make it more profitable, available for trade, and useable for bio-fuel productions. Rising demand as a factor for grain price spikes, expansions of agricultural production are important to respond to that. The U.S. subsidies to bio-fuel productions which have been getting smaller may be a pressure to the farmers in order to substantially cut down their production costs.

Bounnad Chandaworn

Impacts of Rice Prices on Household' Incomes of Rice Farmers: A Case Study of Santhong District in Laos

I. Introduction

Rice is the main product and staple food in Laos. It accounts for 80% of the area crop planted, 80% of the total workforce and about 35.4% of the household consumption expenditures (LECSIII 2003/2004). Therefore, rice production and consumption is dominant in the country' s economy. The price of rice is a key factor determining the structure of incentives to farmers and the consumption pattern of the Lao people (Worner William, 1997). The stabilization of price of rice will affect its economy. The fluctuations in rice prices result in fluctuations in the general price index, which in turn changes the real income level, thus demonstrating that economic conditions are tied to the price of rice (Lee Wan-chi, 1977).

Global agricultural commodity prices rose by 24% in average in 2007 and by 54% in the first quarter of 2008 (FAO 2008). Rising food prices have both negative and positive impacts on peoples' livelihoods, and opinions among experts and scholars are widely divided. Several studies of the World Bank have revealed that rising rice prices increase poverty in many countries (World Bank, 2006b; and Tsimpo Clarence and Wodon Quentin, 2008). However, McCulloch Neil, 2008 argued that higher rice prices ensure food security by encouraging production as well as boosting economy in rural areas. In 2007 the rice prices in the study area increased by 21% in average compared to 2006. This increase in rice prices might have influenced

people's livelihoods in the study area.

II. Methodology

Various methods were used to analyze the impacts of rice prices on household incomes of the rice farmers including descriptive analysis to give general information on household characteristics, rice prices and household incomes of the rice farmers. Then the Net Benefit Ratio (NBR) which was used to determine whether farmers would lose or gain from the increased rice price. Furthermore, the estimation of the rice production costs was used to identify the profit farmers received from their rice production. Finally, multiple regression analysis was employed to quantify factors influencing household incomes of the rice farmers in the study area.

Table 1: Results from the Net Benefit Ratio

	Rice production value as percentage of income (VPR)	Rice consumption value as percentage of income (VCR)	Net sales of rice as percentage of income (NBR)	Net sellers of rice	Zero net position in rice	Net buyers of rice
	Average percentage			Percent of households		
Total (n=102)	**49.10**	**27.28**	**21.82**	**72.55**	**4.90**	**22.25**
Phialat Village (n=52)	47.15	25.35	21.80	38.24	3.92	8.82
Thannakham Village (n=50)	51.71	29.87	21.84	34.31	0.98	13.73
Income groups (annual income)						
<10 million Kip (n=17)	**71.22**	**80.43**	**-9.21**	8.82	0.00	7.48
>10-20 million Kip (n=40)	58.44	40.38	18.05	26.47	1.96	10.78
>20-30 million Kip (n=29)	47.84	25.31	22.53	22.55	1.96	3.92
>30 million Kip (n=16)	**41.29**	**13.83**	**27.46**	14.71	0.98	0.00

III. Results and Discussion.

The calculation of the Net Benefit Ratio (NBR) (Table 1) shows that the rice farmers in the study area have a positive NBR (at 21.82% on average). As many as 72.55% of the farmers are net rice sellers and will certainly gain from increased rice prices. The result also shows that only 4.90% of the farmers have a zero net NBR. In this group, the farmers will neither lose nor gain from the increased price of rice because they are self-sufficient rice farmers. However, about 22.25% of the farmers are net buyers of rice. This means that the higher the rice price, the more it negatively affects their household income. The analysis of NBR according to income groups also shows that the lower the household income the lower the NBR, because poorer families are likely to spend larger portions of household incomes on rice as it is the cheapest source of food. The wealthier families, on the other hand, spend less income on rice compared to the poor.

Moreover, the estimation of rice production costs and profits (Table 2) shows that the production cost for tractor-owning farmers is about US$512.06/ha, which gives an average total production output of about 2.69 tons/ha and the current farm gate price of US$238.49 tons/ha, making a net profit of about US$129.49/ha. The average production cost for the tractor-hiring farmers is about US$573.56/ha. The average total production output is 2.57tons/ha, making about US$39.36/ha of net profit. Because of high production costs, the increased rice prices provide a small amount of profit to the rice farmers.

The empirical analysis (Table 3) shows that there is a positive relationship between rice prices and per capita household incomes since an increase of one Kip of the rice price will significantly raise a per capita household income of the rice farmers by 574 Kip (US$0.05) in Phialat, 404 Kip (US$0.04) in Thanakham and 572 Kip (US$ 0.05) on average for the two villages. This may be because rice prices are a very important factor for the economy of the farmers in the study area and rice accounts for 49% of the total household income which is considered to be a large portion. Besides the rice price variable, other factors contributing to a rise in per capita household income include household head education, total land holding, hand-tractor, household access to irrigation and off-farm income. While the household dependency ratio shows an inverse relationship with

per capita household incomes, an increase in household dependents definitely reduces per capita household income.

Table 2: Results from rice production costs and profits

No.	Description	Tractor-owned farmers (n=76)	Tractor-hired farmers (n=26)
A	Labor cost for land preparation (US$)	29.22	13.83
B	Labor cost for planting (US$)	110.95	117.32
C	Harvesting cost (US$)	188.97	181.92
D	Input cost (US$)	164.13	94.14
E	Land tax (US$)	4.17	4.17
F	Tractor depreciation and tractor hired (US$)*	14.61	162.18
G	**Total costs US$/ha = (A+B+C+D+E+F)**	**512.06**	**573.56**
H	Average Production (ton/ha)	2.69	2.57
I	Selling price US$/ton)	238.49	238.49
J	Gross revenue US$/ha = H*I	641.55	612.93
K	**Net profit US$/ha=(J-G)**	**129.49**	**39.36**

* Tractor depreciation for tractor-owned farmers and tractor hired for tractor-hired farmers

Table3: Results from the multiple regression analysis.

Dependent variable: Per Capita annual income (million Kip)			
Independent variable	**Phialat**	**Thanakham**	**Total**
Constant	-1.09	1.07	0.03
	(-0.79)	(1.31)	(0.04)
Rice price	$5.74*10^{-4}$*	$4.04*10^{-4}$**	$5.72*10^{-4}$***
	(1.85)	(2.04)	(3.27)
Household head education	0.84***	0.55**	0.61***
	(3.72)	(2.59)	(4.03)
Household dependency ratio (%)	-0.01	-0.03**	-0.02*
	(-0.65)	(-2.61)	(-1.81)
Total land holding	0.78***	0.47***	0.61***
	(7.46)	(5.00)	(8.53)
Hand tractors	1.29**	1.14**	1.04**
	(2.06)	(2.31)	(2.58)
Access to irrigation	2.19***	1.99**	2.49***
	(3.23)	(2.57)	(5.05)
Off-farm job	2.12***	1.23**	1.6***
	(3.45)	(2.40)	(4.01)
No. of observation	**N=52**	**N=50**	**N=102**
R-Squared	**0.78**	**0.73**	**0.73**
Adjusted R-Squared	**0.74**	**0.68**	**0.71**

IV. Conclusion and Policy implications

Even though all analyses show increased rice prices increase household incomes of the rice farmers, most farmers in the study area are small-scale farmers, and their profit, is therefore small as the costs of production are so high and the quantities sold are small. Applying the economic production, optimizing the labor used and improving fertilizer management, providing technical knowledge such as post-harvesting techniques to farmers to maintain the grain quality, would increase their profit. Moreover, expanding irrigation systems will allow farmers to cultivate rice during the dry season, and establishing rice producers' groups so that farmers can communicate price information and improve price negotiation with rice traders will benefit farmers an increase their profit. All the above recommendations should contribute to expanding rice production and increasing surpluses for marketing, whilst reducing the cost of production. They should assist farmers in the area improving their living standards and reducing poverty.

Nem Nei Lhing

An Impact Assessment of the Performance of PACT Microfinance Program on Rural Households: A Case Study of Dry Zone Area in Central Myanmar

I. Introduction

About three billions people, half of the world's population, are living on the income of less than two dollars a day. Poverty remains a matter of growing concern in many developing countries of the world. One study in 2006 showed that the ratio of the income between the 5% richest and 5% poorest of the population was 74 to 1, as compared to the ratio in 1960, which was 30 to 1. To enhance international development, the United Nations Organization (UNO) has introduced eight millennium development goals which aimed to eradicate poverty by half by 2015. Microfinance (MF) has been known to be important towards the promotion of community development and poverty alleviation goals through the provision of small loans to low income individuals, households and enterprises. UNO has significantly acknowledged MF as a tool to alleviate poverty in developing countries. Therefore, to achieve the millennium development goals, MF program has been identified as one of the essential tools to reduce the poverty rate. This study examined the impact of the performance of PACT (Private Agency Collaborating Together) MF program in rural area of Myanmar.

II. Problem Statement and Objectives

In Myanmar, local community, especially the poor and vulnerable in rural areas, have no capabilities to enable them to come out from the poverty level. Poor peoples who have limited resources, are in need for access to loan in order to invest for their daily income earning activity such as agriculture, livestock, forestry and so on based on their skills and knowledge. If this group of community is neglected, they have to rely on natural resources which ultimately will cause environmental degradation and make them to become poorer. In order to address these issues, there are three main objectives in this research. First, the demographic and socio-economic characteristics of the clients and non-clients of the loan system in Myanmar are compared. Second, to study the impact of PACT MF program on clients of changes in earned income, investment, technology, education, saving, food intake, clothing, and health aspects of the Clients. Finally, the research wants to investigate the determinants or influencing factors on taking microfinance program.

III. Research Methodology

To achieve the research objectives, both primary and secondary data were collected. For primary data, survey was conducted in six villages of Kyaukpadaung Township in dry zone area (October 2008). Random sampling method was used to select 162 households, and they were interviewed by face-to-face. Among the whole sample, 102 respondents were taking loan (clients) and 60 respondents were not taking loan (non-clients). Descriptive analysis was used to identify the demographic and socio-economic characteristics of the respondents. A logistic regression model was used to investigate the determinants factors on taking loans.

IV. Result and Discussion

According to the descriptive analysis result, most of the respondents who participated in the MF program (clients) were young, single and higher educated female. More than

half of the clients could spend their money on their livelihoods such as housing condition, food intake, furniture, and health facilities with increasing rate. Regarding to the results of household income and education, which variables also showed increasing rate however the percentages are still lower than the above categories. For non-clients, procedure too complicated, fear of legal actions and missed the program information are the major three reasons for not participating in the program. The empirical results of the logistic regression analysis showed that the respondents who are female, single, younger people, higher educational level, small family size and small scale of land holding size more willing wanted to join in taking loans. The probability of taking loan was also influenced by increasing number of crops, established new business and higher adoption of technology. Regarding to the household income and participating in village activities, these variables, increase or decrease have no significant affect on taking loan.

V. Conclusion and Recommendation

In conclusion, it is perceived that MF program brings positive impacts to the living standards, empowerment and poverty alleviation among the poor people especially in the rural area of Myanmar. However, the increasing of family income and education are still not much higher than the other items. Therefore, PACT MF program should be introduced income generating activities and effective education program which open up more income-earning opportunities for the clients especially in the non-farm sector. Regarding to the reasons for not participating, PACT MF is suggested to collaborate with extension services to develop information program in order to disseminate the information to as many people as possible and also the program should be made easier in terms of loan procedures, legal action. More information on the advantage of taking loans should be made in order to attract peoples to join the program.

Win Pa Pa Soe

A Study of Oilseed Crops and Edible Oil Marketing in Myanmar

I. Introduction and Problem Statement

Edible oil is the next most important item in Myanmar diet and nutritional requirements after rice. Oilseed crops play a vital role based on Myanmar's high consumption of cooking oil compared to neighboring countries. Efficient marketing system for oilseed crops and edible oil markets in Myanmar is an important means not only for raising income level of farmers which is below poverty levels but also for the consumers' satisfaction. However, in the current domestic marketing of oilseed crops and edible oil sub-sector, price uncertainty can decrease market efficiency, responses and productivity. A very inadequate road infrastructure and network, un-transparency of market and price information and lack of the consistency of weighing measurement lead to an imperfectly functioning marketing system. Moreover, it is increasingly recognized that the formulation of market-enhancing policies to increase the performance of local market requires a better understanding of how the market functions. Aggregate market performance is better understood by studying the level of market integration that exits between markets.

II. Objectives

The general objective of this study is to gather information on the function of Myanmar edible oil and oilseed crops market in order to provide basis for improving the performance of oilseed crops and edible oil marketing system. The specific objectives are:

(1) To understand the operation of existing marketing channel from producers to consumer of edible oil and oilseed crops;

(2) To estimate the marketing costs and margins along oilseed crops marketing channels by surveying the behavior and functions of market intermediaries;

(3) To study the extent of market integration, and understand how it has been effective to efficient oilseed crops and edible oil marketing system.

III. Data and Methodology

In order to get the detailed information along the marketing channel, the primary data were collected by conducting survey in the major oilseed crops producing area of Central Region of Myanmar, Mandalay, Magway and Sagaing with the help of well-prepared questionnaire. This study analyzes the market integration and price transmission among the markets of edible oil and oilseed crops. The monthly wholesale price data (from 2002 to 2007) of groundnut and sesame for oilseed crops and palm oil, sesame oil and groundnut oil were used. These data were collected from the Market Information Service, Ministry of agriculture and Irrigation, Myanmar.

Three econometric models were used in this study to assess the geographical integration of the markets. Johansen's multiple co-integration tests is used to test for long run market integration. Dynamics of short-run price responses are examined by using vector error correction model (VECM). The direction of causality in oilseed crops and edible oil prices was examined using the Granger causality test.

IV. Results and Discussion

Marketing channel and margin analysis showed that the millers occupied the largest bargaining power between the buyers and sellers in the study area. So as to avoid imbalance in bargaining power between buyers and sellers in the study areas, it is necessary to promote market infrastructure, exchange market information and cooperative institution in these areas.

The results from the Johansen co-integration test indicated that the markets in the producing area were highly integrated in the long run equilibrium. By examining the short-run price adjustment by Vector Error Correction Model, it could be found that almost all markets reacted on the long-run co-integration equations and most of the markets deviated from long run equilibrium. Evidence on market integration analysis showed that although the results of long run market performance was good for all oilseed crops and edible oil markets, but there is disequilibrium in the short run market integration. The causality test provided mixed results. In most cases, causality is unidirectional which indicated that there is no evidence of the existence of a central market for oilseed crops and edible oil sector in Myanmar.

The imperfection of market integration would be attributed to imperfect market information and asymmetric price transmission on market conditions. It can be suggested that if market infrastructure including transportation, communication facilities and market information are highly improved, the efficiency of market would be better.

V. Policy Implications

The government should pay attention to the development of oilseed crops and edible oil distribution system by enhancing the knowledge of intermediaries through marketing extension service. In addition, there is an urgent need to provide the market infrastructure, accurate and efficient market information system and marketing institution which lead to the lower marketing costs and margins. To get transparent price transmission, it should be promoted not only for transportation and communication facilities but also for the economic activities of marketing participants. Moreover, it is also important to design the ultimate goal and the right directions for the enhancement of marketing efficiency for the edible oil sub-sector of Myanmar.

Thoumthone Vongvisouk

Forest Inventory in Yakushima "The World Heritage", in Southern Part of Kagoshima Prefecture, Japan.

Laboratory of Forest Management under the Department of Forest Product Sciences of the Faculty of Agriculture of Kyushu University has experienced in forestry research not only in Japan, but also in oversea countries such the Southeast Asia countries. In Japan, there are many field research sites set by the Laboratory of Forest Management. These are including field research sites in Kirishima, Yakozaki, Yakushima, and so forth. After term break of each year, students belong to the Laboratory of Forest Management have opportunities to join field research with professors and senior researchers. This is very great opportunities for students to learn technical forest inventory from seniors and professors. I am very proud of being a student of the Laboratory of Forest Management because I have chance to work closely with my professors and my seniors not only for technical forest inventory, but also scientific research techniques. Also, all members of the Laboratory of Forest Management including professors, students (Japanese and foreign students), post-doctor candidates, and administration staffs are very kind and friendly.

Since I have become a student of the Laboratory of Forest Management, I have many chances not only for conducting field work, but also attending internal and international workshops related to worldwide forest management. Here, I would like to share some of my field work experiences gained from field forest inventory in Yakushima Island located in the southern part of Kagoshimar prefecture of Japan.

Yakushima is exhibiting a rich flora with some 1,900 species and sub-species, this includes ancient specimen of the Japanese cedar (sugi). The Japanese cedars have been found in the range of the elevation about 700-1,400 meters above from average of sea level. The oldest Japanese cedars are over than 1,000 years old which are known as "Yaku-sugi" cedars and for those younger Japanese cedars are called "Ko-sugi" or tiny cedars. The unique of the island also a remnant of warm temperate ancient forest which attracts forest scientists conduct research in the island. Laboratory of Forest Management is also interested in setting permanent plots for scientific research in the island for more than 20 years.

The purpose of this time field work is for measuring the annual ring of the fallen Japanese cedars in the permanent plots. The collected data is used for master thesis of a Japanese student in the Laboratory of Forest Management. Not only that student benefited from this time field work, but other students (Japanese and foreign students) have also learnt how to measure annual ring of death trees in our permanent sample plots. After field work, all collected annual rings have been counted for estimating the age of each measured death trees. All students who join this field work have learnt the way of estimation the age of fallen Japanese cedars by counting the annual ring.

Couple with learning academic matters from my course-works at Kyushu University, I have also learnt forest management expertise from joining various workshops, conferences, and field works in Japan. Some of these experiences will be suitable to apply for development my teaching materials at the Faculty of Forestry of the National University of Laos upon completion my master degree from Kyushu University.

8. LIST of Subjects and Supervising Professors for on international Development Research Course (Academic Year 2008)

Division	Laboratory	Professor	Associate Professor	Assistant Professor
Applied Genetics and Pest Management				
Bioresources and Management	Bioresources and Management		Keiji TAKASU	
Genetics and Plant Breeding	Plant Breeding	Atsushi YOSHIMURA	Hideshi YASUI	
	Silkworm	Yutaka KAWAGUCHI	Takahiro KUSAKABE	Jae Man LEE
Plant Pathology and Pesticide Science	Plant Pathology	Kenichi TSUCHIYA	Naruto FURUYA	Minoru TAKESHITA
	Pesticide Science	Eiichi KUWANO	Akinori HIRASHIMA	Naotaka YAMADA
Zoology and Entomology	Entomology	Osamu TADAUCHI	Satoshi KAMITANI	
	Zoology	Hiroshi IIDA		Takane KANEKO
Biological Control	Insect Pathology and Microbial Control	Susumu SHIMIZU	Chisa YASUNAGA-AOKI	Kazuhiro IIYAMA
	Insect Natural Enemies	Masami TAKAGI	Takatoshi UENO	Midori TUDA
Plant Resources				
Applied Plant Science	Applied Plant Science	Shoji YAMASHITA	Etsuko NISHIMOTO	
Agricultural Botany	Crop Science	Mari IWAYA-INOUE	Takashi YUASA	
	Horticultural Science	Hiroshi OKUBO	Akira WAKANA	Michikazu HIRAMATSU
Soil Science and Plant Production	Soil Chemistry	Shin-Ichiro WADA		Yuki MORI
	Soil Biology & Biochemistry	Kenji SAKAI	Sadao KAWAGUCHI	
	Plant Nutrition	Ken MATSUOKA	Takeo YAMAKAWA	Masamichi KIKUCHI
	Plant Production Physiology	Osamu UENO	Kazuyuki SAITOU	Takuya ARAKI
	Plant Metabolic Physiology			Michito TSUYAMA
Agricultural Ecology (University Farm)	Agricultural Ecology (University Farm)	Kei NAKAJI	Toshihiro MOCHIZUKI	Kaori SAKAI
			Yukio OZAKI	
Environmental Control for Biology (Biotron Institute)	Environmental Control for Biology (Biotron Institute)	Jiro CHIKUSHI	Satoshi YOSHIDA	Toshihiko EGUCHI
			Kazutoshi SAEKI	Eriko YASUNAGA
Tropical Crops & Environment (Institute of Tropical Agriculture)	Tropical Crops & Environment (Institute of Tropical Agriculture)	Kazuo OGATA		Satoru MATSUMOTO
Bioscience and Biotechnology				
Applied Biological Regulation Technology	Applied Biological Regulation Technology	Masahiro OKAMOTO	Taizo HANAI	Hiroyuki HAMADA
Applied Biological Chemistry	Biochemistry	Makoto KIMURA	Yoshimitsu KAKUTA	Takashi NAKASHIMA
	Nutrition Chemistry	Katsumi IMAIZUMI	Masao SATO	
	Food Chemistry	Koji YAMADA	Hirofumi TACHIBANA	Michiko NONAKA
	Chemistry & Technology of Animal Production	Yoshihide IKEUCHI	Ryuichi TATSUMI	Wataru MIZUNOYA
Food Biotechnology	Food Analysis	Kiyoshi MATSUMOTO	Toshiro MATSUI	
	Food Process & Engineering	Mitsuya SHIMODA	Noriyuki IGURA	Seiji NOMA
	Food Hygienic Chemistry	Takahisa MIYAMOTO	Ken-ichi HONJOH	
Microbial Science and Technology	Applied Microbiology	Kaoru TAKEGAWA	Sadazo YOSHINO	
	Microbial Technology	Kenji SONOMOTO	Jiro NAKAYAMA	Takeshi ZENDO
Future Creation Microbiology			Masatoshi GOTO	Taiki FUTAGAMI
Marine Biological Chemistry	Marine Biochemistry	Miki NAKAO	Tomonori SOMAMOTO	
	Marine Resource Chemistry	Makoto ITO	Nozomu OKINO	
	Marine Environmental Science		Yuji OSHIMA	Yohei SHIMASAKI
Aquatic Biomonitoring and Environment			Ik Joon KANG	Junya MOROISHI
Animal and Marine Bioresource Sciences				
Advanced Animal and Marine Bioresources	Advanced Animal and Marine Bioresources		Hironori ANDO	
Animal Scinence	Functional Anatomy	Shoji TABATA		Shotaro NISHIMURA
	Reproductive Physiology	Masa-aki HATTORI	Nobuhiko YAMAUCHI	Tomoki SOH
	Animal Feed Science	Mitsuhiro FURUSE	Masataka SHIMOJO	
	Animal Production and Ecology		Takafumi GOTOH	Yutaka NAKANO
Marine Bioresources	Marine Biology	Michiya MATSUYAMA	Tatsusuke TAKEDA	Akihiko YAMAGUCHI
	Fisheries Biology	Shigeo KAWAGUCHI	Noritaka MOCHIOKA	
Fish Production Technology	Fishery Research	Michiyasu YOSHIKUNI	Shin OIKAWA	Norio ONIKURA

Division	Laboratory	Professor	Associate Professor	Assistant Professor
Agricultu al and Resource Economics				
International Agricultural Resource Economics and Business Administration	Environmental Life Economics		Mitsuyasu YABE	Goshi SATO
	Agricultural Policy	Shoichi ITO	Hiroshi ISODA	
	Farm Management	Teruaki NANSEKI	Kazuhiko HOTTA	Shoji SHINKAI
	Advanced International Development of Agriculture			
Industrial Organization of Agribusiness	Food Industrial System Analysis	Taiji YOSHIDA	Koshi MAEDA	
	Food Marketing	Susumu FUKUDA		
Bioproduction Environmental Sciences				
Bioproduction and Environmental Information Science	Bioproduction and Environmental Information Science		Yasumaru HIRAI	
Regional Environment Science	Irrigation & Water Utilization		Tetsuro FUKUDA	Kozue YUGE
				Atsushi MARUI
	Drainage & Water Environment	Kazuaki HIRAMATSU	Masayoshi HARADA	
	Environmental Soil Engineering	Masami OHTSUBO	Takahiro HIGASHI	Motohei KANAYAMA
	Applied Meteorology	Masaharu KITANO		Kenji WAKIMIZU
Bioproduction System Science	Bioproduction Engineering	Eiji INOUE	Takashi OKAYASU	Muneshi MITSUOKA
	Postharvest Science	Toshitaka UCHINO	Fumihiko TANAKA	Daisuke HAMANAKA
Forest and Forest Products Sciences				
Systematic Forest and Forest Products Science	Systematic Forest & Forest Products Science	Ryuichiro KONDO	Yuji TSUTSUMI	Kuniyoshi SHIMIZU
Forest Environment and Management Science	Forest Management	Shigejiro YOSHIDA	Nobuya MIZOUE	
	Erosion Control		Tetsuya KUBOTA	
	Forest Policy	Noriko SATO		Katsuhisa KOHROKI
Forest Bioscience	Silviculture	Susumu SHIRAISHI	Koichiro GYOKUSEN	Kotaro SAKUTA
	Forest Chemistry and Biochemistry	Ken-ichi KURODA	Toshihiro ONA	Koki FUJITA
	Wood Science	Kazuyuki ODA	Junji MATSUMURA	Masumi HASEGAWA
Biomaterial Science	Bioresources Chemistry	Hiroyuki WARIISHI	Takuya KITAOKA	Hirofumi ICHINOSE
	Biomacromolecular Materials	Mitsuhiro MORITA	Daisuke TATSUMI	
	Wood Material Technology		Noboru FUJIMOTO	
	Biomaterial Design	Tetuso KONDO		
Forest Ecosphere Management (University Forest)	Forest Ecosystem Management	Kyoichi OTSUKI	Takao SETSU	Masaaki CHIWA
			Tomo'omi KUMAGAMI	Hikaru KOMATSU
			Atsushi KUME	
	Forest Resource Management	Shoji OHGA		Naoaki TASHIRO
			Shinya KOGA	Yasuhiro UTSUMI
			Tsutomu ENOKI	Takuo HISHI
Genetic Resources Technology				
Genetic and Protein Engineering	Molecular Gene Technology	Satoru KUHARA	Kosuke TASHIRO	Shigeru MUTA
	Protein Chemistry & Engineering	Yoshizumi ISHINO		Takeshi YAMAGAMI
	Cellular Regulation Technology	Sanetaka SHIRAHATA	Yoshinori KATAKURA	Kiichiro TERUYA
	Bio-Process Design	Fumihide SHIRAISHI		
	Metabolic Regulation Research	Shigeki FURUYA		
Applied Genetic Resources	Silkworm Genetics	Yoichi ASO	Yutaka BANNO	Koji YAMAMOTO
	Plant Genetics	Hikaru SATOH	Toshihiro KUMAMARU	
	Microbial Genetics	Toshihisa OHSHIMA	Toshio HARA	
			Katsumi DOI (Senior Assistant Prof.)	
Foreign student support and international affairs			Mako NAKAMURA (Senior Assistant Prof.)	

9. Curriculum of International Development Research Course (Master's Course)

The Graduate School of Bioresource and Bioenvironmental Sciences runs two graduate education programs: the standard course and the special course. The special course, which focuses on International Development Research, is aimed at international students. The International Development Research Course follows a two-semester system, starting in October with the autumn term followed by the spring term, unlike the standard course which is taught in Japanese and commences in April.

(1) **Thesis work will be carried out in English.** Since the course is aimed at international students, all thesis work is carried out in English.

(2) Students are expected to learn the Japanese Language during the course of their studies, and while not compulsory, this is aimed at bettering communication during daily life.

(3) Thesis should be based on research conducted during the course, and on completion, should be submitted to the Division of Agriculture, the Graduate School of Bioresource and Bioenvironmental Sciences at Kyushu University. If the examiners' requirements are satisfied, an appropriate degree will be awarded.

Students will be awarded the Master of Science (M.Sc) on completion of a satisfactory thesis. Students are also required to complete a four-semester course over a two-year period.

The course consists of lectures, practicals, seminars, and tutorials. Students must obtain 30 credits with a minimum pass grade of 60 %. The Master's course curriculum is presented in Table 1.

Table 1. The Master's Course Curriculum

Code*	Subjects	Credit	Term**			
			Ⅰ (A)	Ⅱ (S)	Ⅲ (A)	Ⅳ (S)
C01	Master's Thesis Research Ⅰ	6	6			
C02	Master's Thesis Research Ⅱ	6			6	
C03	Seminar in Specified Field Ⅰ	2	2			
C04	Seminar in Specified Field Ⅱ	2		2		
C05	Seminar in Specified Field Ⅲ	2			2	
	(Subtotal)	(18)				
M01	Fundamentals of Agricultural Sciences	2	2			
M02	Biological Resources: Utilization and Conservation	2	2			
M03	Soil and Water Environment	2	2			
M04	International Rural Development	2	2			
M05	Advanced Technology in Agriculture	2			2	
M06	Food Science and Food Systems	2			2	
M07	Special Lecture on International Development Ⅰ	1			1	
M08	Special Lecture on International Development Ⅱ	1			1	
	(Subtotal)	(10)				
S01	Applied Genetics and Pest Management	2		2		
S02	Plant Resources	2		2		
S03	Bioscience and Biotechnology	2		2		
S04	Animal and Marine Bioresource Science	2		2		
S05	Agricultural and Resource Economics	2		2		
S06	Bioproduction and Environmental Science	2		2		
S07	Forest and Forest Production Science	2		2		
S08	Genetic Resource Technology	2		2		
	(Subtotal)	(2)				
	Total	30				

*C: compulsory subjects = 5 subjects (18 credit units); M: module subjects = 5 subjects (10 credit units) selected from a total of 8; S: specialized subjects = compulsory and particular to each department (2 credit units).

** A = Autumn term; S = Spring term

An outline of the Master's course subjects is given in Table2. Compulsory subjects consist of the thesis (12 credits) and laboratory seminars (6 credits); module subjects of 5 subjects from a total of at least 8 (10 credits); and specialized subjects of one specific subject (2 credits) given by the department to which the student belongs.

Table 2. Preponderant features of the Master's course subjects

	Aim	Lecture methods	Choice	Professors	Required
Compulsory subjects	Research practice	Conventional form	5 subjects	Laboratory Prof.	5 (18 credits)
Module subjects	Improvement of basic academic abilities focusing on agricultural administration and rural development	Block module	8 subjects	Special team	5 (10 credits)
	Cross-cutting or interdisciplinary research				
Specialized subjects	Improvement of expertise	Block module	8 subjects	Your Depts.	1 (2 credits)

Table 3. An Outline of the Module Subjects

Code	Subject	Specification	Relevant Departments
M01	Fundamentals of Agricultural Sciences	Fundamentals of Agriculture and rural development (Biostatistics, etc.)	All
M02	Biological Resources: Utilization and Conservation	Fundamental sciences necessary for maintaining biodiversity and sustainable utilization of biological resources	Applied Genetics and Pest Management, Plant Resources, Animal and Marine Bioresource Science, Forest and Forest Products Science, etc.
M03	Soil and Water Environments in Agriculture	Irrigation, drainage, reclamation engineering, and the control of water resources	Plant Resources, Agricultural and Resource Economics, Bioproduction Environmental Science, Forest and Forest Products Science, etc.
M04	International Rural Development	Fundamentals and practical research on international rural development	Plant Resources, Agricultural and Resource Economics, Bioproduction Environmental Science, Forest and Forest Products Science, etc.
M05	Advanced Technology in Agriculture	Agricultural life sciences and biotechnology	Applied Genetics and Pest Management, Bioscience and Biotechnology, Animal and Marine Bioresource Science, Genetic Resources Technology, etc.
M06	Food Safety and Security	Science, technology and economics related to food safety and security	Bioscience and Biotechnology, Agricultural and Resource Economics, Bioproduction Environmental Science, etc.
M07	Special Lecture on International Development I	Special lecture (Technical communication, etc.)	Adjunct professors
M08	Special Lecture on International Development II	Special lecture (Wide-ranging issues related to international development strategies, etc.)	Adjunct professors

Lectures are given in a **block module format**. Each semester comprises three blocks, each of which includes 1 to 2 module subjects. A brief outline of the various module subjects is provided in Table 3.

The topic of the thesis research is specified after discussion with your supervisor. Students **must submit their master thesis in English** to the appropriate examination board in the department consisting the teaching staff.

Students are required to give an **oral presentation of the thesis during the spring semester of the second year. A committee will evaluate overall performance based on a report by the department committee**. Satisfactory performance will lead to an award of the Master of Science from Kyushu University.

10. Acknowledgement

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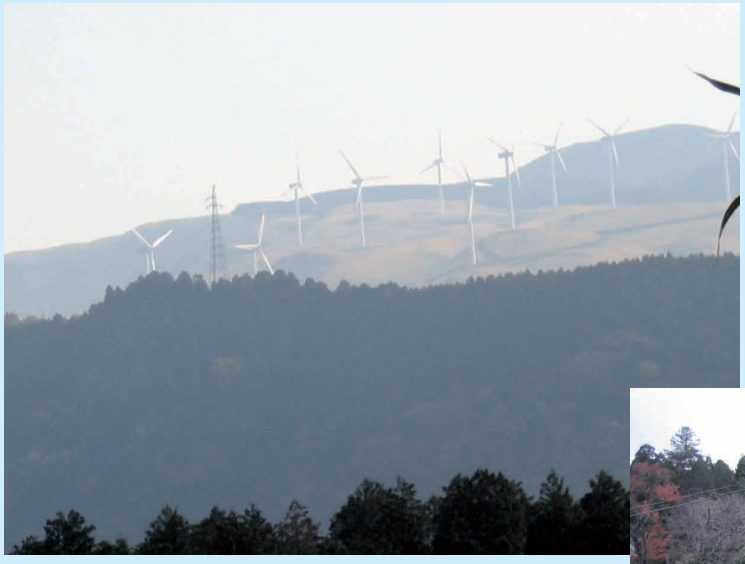

Editted by **the Special Committee for JDS program**
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