Ⅱ. INTERNATIONAL ACTIVITIES

International Academic Exchange and Cooperation of the Faculty of Agriculture, Kyoto University

Collaboration with Foreign Guest Professors

Collaboration with foreign guest professors during April, 2006 and March, 2007 is shown in Table 1. The collaboration reports written by guest professors were attached at the end of this section.

International Cooperation and Overseas Activities

In recent years, international cooperation and overseas activities are actively carried out and many professors and students make research works abroad with foreign researchers. Please refer to "A-4. International cooperation and overseas activities" in each laboratory in "III. Research and educational activities" for the detail.

International student exchange program

We cooperated to organize one of the subjects of liberal arts education, "International Exchange Program", in which first or second grade students in various faculties are dispatched to a foreign country or foreign students are accepted for about 2 weeks for experiencing international exchange. We supported one of the subjects, "Transfiguring Southeast Asia –Environment, Life activity and Society–". In this year, 14 students were accepted from Kasetsart University, Thailand during the period from 9th to 23rd May. We implemented a special lecture and field trips on 15th and 19th May.

International Office and its activities in 2006

The International Office was established in June 1985 as an office to handle wide-ranged issues related to foreign students and research fellows at the Faculty. The number of foreign students by country in 2006 is shown in Table 2.

Major activities of the Office besides its regular tasks are as follows.:

a) Orientation and welcome party

On the 7th of April the orientation and acquaintance session was held for newly enrolled foreign students. Associate Professor Nawata, a member of the University Committee for International Academic Exchange, administrative staffs of the Faculty, and an executive of the Kyoto University Cooperative gave guidance to the new comers on various aspects of the campus life. A welcome party was held thereafter at a co-op restaurant, "HOKUTO" of the North campus, in which about 80 students and staffs participated.

b) One-day study bus tour

The one-day study bus tour was organized using the school bus of Kyoto University. We visited Glicopia Kobe, Municipal Kobe Winery on May 18th. This year we also had an autumn bus tour. We visit Kansai-kan of the National Diet Library, Tea Research Institute, Flower Center in Keihan-na city on October 24th. About 15-20 foreign students participated and studied Japanese culture.

c) Summer study trip

The study trip was organized to visit Mt. Norikura, Kamikochi and Takayama city on July 24—26. Total 16 students and staffs participated in this trip. Unfortunately, because of the

heavy rain at the first day of the trip, the Norikura Skyline was closed. Instead of going to the top of Mt. Norikura, we went to Kamikochi. Azusa River in Kamikochi which usually has a beautiful stream was very muddy. After that we visited Hidanosato in Takayama city. We looked around the Japanese old houses, Gassho-tsukuri. Everybody enjoyed very much and made a lot of friends.

d) Newsletter

Since 1988 the office has been publishing the newsletter biannually. This year, the 38th and 39th issues were published in September and March. About 3,000 copies each were delivered to all the students and staffs of the Faculty, visiting research scholars, foreign alumni residing in different countries (see Table 3), the members of the Supporters' Association for International Academic Exchange of the Faculty of Agriculture, and various Faculties, institutes, centers and other offices in the campus.

e) Newspapers, periodicals and books purchased

Three newspapers (one English, one Chinese and one Korean) and several periodicals (2 in foreign language and 9 in Japanese) are subscribed. We have many books of studying Japanese language, Japanese culture and sightseeing.

f) Japanese language class

The Japanese language class (beginner's, intermediate and advanced courses) was started in April, 1996. About 30 foreign students and researchers attended the class this year.

g) World cooking class

Since 2004 the office has held World cooking class once a month except holiday seasons. This year we had 8 cooking classes; Myanmar (Apr. 28th), Peru (May 19th), Sudan (Jun. 16th), Thailand (Sep. 19th), India (Oct. 31st), Philippine (Dec. 1st), Iran (Jan. 30th), Indonesia (March 14). About 20 – 30 researchers, students, foreign students participated in each class. They enjoyed tasting of each country food.

h) Pre-counseling room

We started a pre-counseling room once a week from October, 2002. The object of our pre-counseling room is to release pressures of foreign students and to reduce their loneliness before they have serious problems. We were consulted about some problems for studying and Japanese daily life of foreign students.

i) Football game & Barbecue party

We had 5th World friendly Football game & Barbecue Party on July 8th. About 60 students and researchers enjoyed playing football. After football games we had a Barbecue party and foreign and Japanese students enjoyed the party together.

j) Correspondence to inquiries

The Office answered a number of inquiries for admission from different countries.

Membership of the Supporters' Association for International Academic Exchange

International Academic Exchange of the Faculty of Agriculture comprises both academic and administrative staffs of the Faculty. The membership of the Association was renewed in July of this year. There are 124 individuals and 1 group in the membership list at the end of December. The activities of International Office are partially supported by the fund. A part of purchase of foreign newspapers and journals for the saloon is also made by this fund.

Table 1　Collaboration with Foreign Guest Professors

Name	Nationality	Affiliation	Research Title
Jonathan B. Laronne	Israel	Ben Gurion University of the Negev	Study on sediment yield and discharge with monitoring data
Pradya　Somboon	Thailand	Chiang Mai University	Ecological studies on the insect/mite vectors of emerging infectious diseases in agro- and urban environments
Andrei Shutov	Moldova	State University of Moldova	Studies on molecular evolution of seed storage proteins
Muhammad A. Arshad	Canada	University of Alberta	Studies on land ecosystem management for sustainable rural development
Ian Davis	United Kingdom	Coventry University	Building resilient communities and human settlements with a specific focus on environment and development
Ke-Sheng Cheng	Taiwan	National Taiwan University	Application of remote sensing & geostatistics for regional environments

Table 2　Number of foreign students by country (2006)

Country	UG	MC	DC	OT	ST	Country	UG	MC	DC	OT	ST
Argentina		2			2	Laos			1		1
Bangladesh			2	2	4	Mali				1	1
Bhutan		1			1	Myanmar		1			1
Brazil		1	2		3	Nepal		1	1		2
Canada		1			1	New Zealand			1		1
China	8	9	18	5	40	Nigeria		1			1
Ghana			1		1	Peru		1			1
Honduras			1		1	Philippines			1		1
India			2		2	Sudan			1		1
Indonesia		2	7		9	Taiwan			2	1	3
Kenya			1		1	Thailand		1	2		3
Korea	2		9	1	12	U.S.A.			1		1
Kyrgyzstan			1		1	Zambia				1	1
						Total	10	21	54	11	96

Note) UG:Undergraduate, MC:Master Course, DC:Doctor Course, OT:Others, ST:Sub-total

Table 3　Number of foreign alumni by country of residence

Bangladesh	6	Japan	22	Poland	1
Belgium	1	Kenya	2	Spain	1
Brazil	6	Korea	56	Sri Lanka	6
Bulgaria	3	Laos	1	Switzerland	1
Canada	1	Malaysia	3	Taiwan	18
Chili	3	Mexico	5	Tanzania	4
China	34	Myanmar	6	Thailand	52
Egypt	4	Nepal	2	Turkey	3
France	2	Netherlands	2	U.S.A.	14
Ghana	1	Pakistan	1	Vietnam	2
India	3	Paraguay	1	Yugoslavia	1
Indonesia	50	Peru	1	Zaire	1
Iran	2	Philippines	10		
				Total	332

Study on sediment yield and discharge with monitoring data

By: Jonathan B. Laronne, Ph.D.
(Ben Gurion University of the Negev, Israel)
Invited Period: October 4, 2005 – October 3, 2006
Div. of Forest Science, Laboratory of Erosion Control
(Host Professor: Prof. **Takahisa Mizuyama**)

The main objective of this stay has been to collaborate with Kyoto University scientists, primarily with Prof. Takahisa Mizuyama. The research collaboration centered on the monitoring and study of coarse sediment transport (bedload) in mountain rivers. The monitoing and understanding of bedload transport is of primary concern to the Japanese society and its Nature, as it is to other parts of the world. With abundant high-intensity rainfall, steep slopes, erodible soils and unstable ground due to volcanic eruptions and earthquakes, very large waves of bedload sediment are moved by river floods. These are often deposited downstream, giving rise to an increase in the level of the riverbed with resultant increase in flood hazard. River channel instability also occurs.

Unlike the monitoring of other river water quality parameters, such as suspended sediment concentration or most solutes, bedload monitoring has been difficult to undertake without disturbing the flow, with the resultant effect on the parameter to be monitored. It cannot be undertaken accurately because bedload discharge considerably varies spatio-temporally. Moreover, direct sampling or monitoring is time-consuming, expensive and dangerous. Under Professors Sawai, Miyamoto and in the past decade mostly Mizuyama, a Japanese sensor has been developed to unobtrusively, automatically, continuously and indirectly monitor bedload discharge. The sensing is acoustic, using a pipe located transversely along a river bed at a Sabo dam or other stable installation. The experience was gained through laboratory flume experimentations and recent deployment of the sensor in selected mountainous rivers throughout central Honshu. An essential element of the deployment has been the import by Prof. Mizuyama of a separate, well-proven technique termed the Birkbeck slot bedload sampler, which had been developed and perfected by Prof. Ian Reid and my group. The sampler is required for calibration of the Japanese acoustic sensor under prototype, field conditions. Limited calibration was undertaken prior to my arrival.

Prof. Mizuyama and I have worked steadily during my stay to perfect calibration procedures. These have been introduced to Miwa Yamaguchi (M1), who, as part of her thesis, has been summarizing the calibration methodology. To perfect the calibration approach and methodology, travelling throughout Honshu has been undertaken to all the principal river sites where the sensor has (or will at the Osawa River near Mt. Fuji) be deployed, therein meeting with the local Sabo engineers. Separate reports were prepared for each Sabo Office with recommendations for more accurate deployment and more meaningful data analysis. Visits have included the following: the Ashi-arai-tani and Hirudani (Hodaka Mountains), Nishi-takiga-tani and Sumiyoshi (Rokko Mountains), Joganzi, Abe, Osawa, Uonogawa and Yotagiri Rivers.

An entire year at Professor Mizuyama's Erosion Control Laboratory of Kyoto University has been spent, much of it analyzing hydrophone and pit data primarily from the Ashi-arai-tani and the Nishi-takiga-tani and also flume experiments. Most relevantly, much of this effort was directed to determine the extent to which the Japanese hydrophone, hereafter termed the Mizuyama hydrophone, may be calibrated well against pit bedload discharges. During this year we have managed to determine that:

1) For medium bedload discharges (about 0.01-0.1 kg/ms) the hydrophone may be well calibrated;
2) It is more difficult but at times possible to meaningfully calibrate the sensor for very low bedload discharges, especially if only sand-sized bedload is in motion; and
3) It is possible to calibrate the sensor for very high discharges (> 1 kg/ms) in big floods.

In fact, it appears that we are not very far from reaching a methodology that will enable the use of the hydrophone for bedload monitoring in many Sabo dams in Japanese and in international rivers. However, careful calibration is absolutely necessary. To ensure that the promising

technology developed at Kyoto University will be thoroughly discussed and reviewed, I am preparing 2 papers with Prof. Mizuyama on its calibration and potential. One will be submitted to an international journal and the other has been invited and will be presented at the international workshop which John Gray (US Geolgical Survey, Wash DC), Jeff Marr (St Anthony Falls Hydraulic Labs) and I will be convening in April, 2007 in Minneapolis.

I have had considerable help from staff at the Laboratory of Erosion Control, most specifically form Prof. Yoshifumi Satofuka. At the DPRI Hodaka Experimental Site, Professor Toyoaki Sawada has been invaluable in introducing me to the Hodaka installations, logistic help and hospitality.

During my stay at Kyoto University I presented a talk coauthored with Mizuyama, Satofuka and others at the Japanese Society of Erosion Control and Engineering (Wakayama) and also at the annual European Geophysical Union Conference (Vienna), have attended a conference of the Japanese Society of Civil Engineers and a day-seminar at the DPRI, and have given seminar talks at the Laboratory of Erosion Control (three times), the School of Agriculture, Korea Forest Service, Niigata and Hokkaido Universities. I have also given a one semester course for the School of Forestry and DPRI graduate students.

It has been a fruitful year and I thank the University of Kyoto, Professor Yazawa, the Dean of the School of Agriculture and Professor Takahisa Mizuyama for inviting me this challenging scientific research. I hope to return and continue being part of the examination and planning of this endeavour.

September 1, 2006

Jonathan B. Laronne date

Ecological studies on the insect/mite vectors of emerging infectious diseases in agro and urban environments

By: Pradya Somboon, Ph.D.
(Chiang Mai University, Thailand)
Invited Period: March 1, 2006 – August 31, 2006
Div. of Environmental Science and Technology,
Lab. of Ecological Information
(Host Professor: Prof. **Akio Takafuji**)

Introduction

The objectives of the present study are to determine the prevalence of mosquito species and their role in transmission of avian malaria in urban area of Kyoto city. Avian *Plasmodium* is transmitted most commonly by Culicine mosquitoes, especially *Culex* and *Aedes* (Diptera: Culicidae). The parasite does not appear to be pathogenic in birds that have evolved with the parasite, often causing no signs. However, it causes varying degrees of pathology and can cause high mortalities in species of birds that have not evolved with the parasite. These susceptible species come from areas without the vector, such as very cold, dry, or windy environments, such as penguins. Avian malaria in penguins is commonly caused by *Plasmodium relictum* and *P. elongatum.* It is the highest cause of mortality in outdoor penguin exhibits and causes 50% or greater mortality in untreated juvenile and adult penguins when first exposed to the vector. Malaria in penguins is characterized by acute onset and death, often without any premonitory signs of illness. Avian malaria could be introduced through imports of infected birds, or via migrating wild birds. No study on the avian malaria transmission in Kyoto has been carried out.

Materials and Methods

Mosquitoes were collected in the Kyoto Municipal Zoo by using ten dry-ice traps and two gravid traps, twice a month from April to August 2006. They were set in late afternoon and collected in the next morning. The collected mosquitoes were killed by chloroform and identified to species by morphological examination. The same species were pooled and preserved in 99% ethyl alcohol in microcentrifuge tubes. They were sent to Dr. K. Murata, Nihon University for determination of *Plasmodium* infection by using a PCR technique.

Results and Discussion

A total of 1,180 female mosquitoes consisting of 7 identifiable and 1 unknown species were collected (see Table). *Culex pipiens* group (probably *Cx. pallens*) and *Aedes albopictus* were equally the most common species being 92.7% of the total. The density of mosquitoes was low in April and May, but high in July to August when the collection was ended. It is noted that the gravid traps were more effective than the dry-ice traps in collecting *Ochlerotatus japonicus.* The mosquito specimens have been sent to Dr. Murata for testing the prevalence of malarial parasite, but the result is not yet available. Recently, *Cx. pipiens* group, *Ae. albopictus* and *Lutzia vorax* collected in a zoo in central Japan have been found positive for malaria parasite.

Table. Summary of female mosquitoes collected by using dry-ice traps and gravid traps in Kyoto Municipal Zoo, April to August 2006

Species	Dry-ice trap						Gravid trap					Total
	Apr	May	Jun	Jul	Aug		Apr	May	Jun	Jul	Aug	
Culex pipiens gr.	2	13	113	86	124		1	12	77	57	81	566
Aedes albopictus			23	80	323		1	2	19	15	65	528
Ochlerotatus japonicus		2	2	1	3			13	27	16	6	70
Tripteriodes bambusa			4	1								5
Armigeres subalbatus			1	1							1	3
Lutzia vorax										1	5	6
Orthopodomyia anopheloides			1									1
unknown				1								
												1,180

Studies on molecular evolution of seed storage proteins

By: Andrei Shutov, Ph.D.
(State University of Moldova, Moldova)
Invited Period: March 1, 2006 – May 31, 2006
Div. of Agronomy & Horticultural Science,
Lab. of Food Quality Design and Development
(Host Professor: Prof. **Shigeru Utsumi**)

On research stay of Prof. Dr. Andrei Shutov from Laboratory of Plant Biochemistry, State University of Moldova, employed in Graduate School of Agriculture, Kyoto University during the period March 1, 2006 - May 31, 2006 as a Visiting Research Scholar (Kyoto University Visiting Professor) in charge of "Studies on molecular evolution of seed storage proteins"

Mobilization of storage proteins in germinating seeds and proteolytic enzymes responsible for the process as well as evolutionary pathway of seed storage proteins have been extensively studied in the State University of Moldova. In parallel, X-ray structures of major seed proteins that are essential for human nutrition have been successfully studied in the Kyoto University. Combination of these two fields due to joined efforts of Moldavian and Japanese scientists is expected to be helpful for understanding of structure-function relation of seed storage proteins, and for improvement of nutritional quality of plant food proteins using molecular biology tools. Aiming to define topics for co-operation between universities in Kyoto and Chisinau, an introductory lecture "Seed storage globulins: evolution and structure-function relation" was given as a combination of recent results obtained by three scientific groups involved in the field, namely those from Kyoto and Chisinau universities and from Institute of Plant Genetics and Crop Plant Research (Gatersleben, Germany). Co-operation between these groups started *de facto* from common publication [1] and from expression in *E. coli* a cDNA coding MVP, a storage globulin-like protein from fern spores [2].

Experimental and theoretical investigations carried out in cooperation with the group of Prof. Utsumi during my stay in Kyoto University concern following fields.

1. Detection of cleavage points of phaseolin, *Phaseolus vulgaris* 7S globulin, generated by endogenous Asn-specific proteinase legumain and by endogenous low-specific papain-like enzyme. Following cleavage points have been proved via N-terminal sequencing of phaseolin high-molecular mass fragments separated by SDS-PAGE: N220-T221 (legumin action), R4-E5 and S216-K217 (action of papain-like enzyme). Detachment of short peptides from C-termini of the high-molecular mass fragments was also found. Limited proteolysis of phaseolin due to concerted action of above-mentioned enzymes was shown to play a regulatory role in its further unlimited degradation in germinating seeds [3]. Isolation, crystallization and X-ray analysis of phaseolin structure altered due to *in vitro* and *in vivo* limited proteolysis is in progress.

2. Isolation and crystallization of soybean basic 7S globulin (Bg7S). Following purification scheme was used for isolation of Bg7S and separation of its isoforms. Extensive washing of soybean meal by water to remove large amounts of storage and non-storage proteins followed by Bg7S extraction with a buffer pH 9 containing NaCl. Filtration of the extract through a Q Sepharose column equilibrated with the same buffer resulting in removal of almost all contaminating proteins. Final purification of Bg7S and separation of its isoforms Bg7S-1 and Bg7S-2 was achieved by SP Sepharose chromatography at pH 5. It was shown that Bg7S exists as a monomer at pH 4.5 and as a dimer at pH 8. Interestingly, Bg7S isolated from cotyledons of 4-day old seedlings exists as a tetramer. One of purified Bg7S's, which was proved to be Bg7S-2 (dbj|BAB91077) via N-terminal sequencing of its chains, was crystallized from ammonium sulphate solution in slightly acid pH range. Obtained crystals diffracted X-rays to a resolution limit of 3.5 Å. Further growing of larger crystals for higher resolution is in progress.

3. Evolution of Bg7S structure and function. Using Bg7S-2 amino acid sequence as a query for BLAST search, we found in addition to Bg7Ss several proteins divided into four sequence clusters, and analysed relevant literature available. For each cluster, we restricted sequence set used for multiple alignment and evolutionary analysis only to well-characterized proteins and their closest orthologs. Remarkably, almost all selected proteins are similarly sized and reveal homology along

almost total-length sequences. Using TREECON program package [4] and aspartic proteinase from fungi *Rhizomucor miehei* (pdb|2RMP) as an outgroup sequence we reconstructed putative evolutionary pathway Bg7S (Fig. 1) that can be described as follows.

An ancestral pepsin-like proteinase exemplified by extant aspartic proteinase from *Nepenthes distillatoria* [5] and its closest relatives is suggested to be formed at an early step of diversification of eukaryotes. Transition of ancient aspartic proteinase into xyloglucan-specific *endo*-β-glucanase inhibitor proteins (XEGIPs) consisted in lost of proteolytic activity and formation of structural basis for XEG inhibition [6]. Dicot XEGIPs exemplified by carrot extracellular dermal glycoprotein (EDGP) [7] probably reflect further evolutionary step. The EDGP-like XEGIPs gave rise to closely similar Bg7S's and conglutins γ (Cγ) from lupin seeds. Common characteristics of Bg/Cγ as XEGIP-related proteins are their capacity to bind to specific proteins or peptides and their enhanced expression when the plant is exposed to a stressful stimulus such as heat shock.

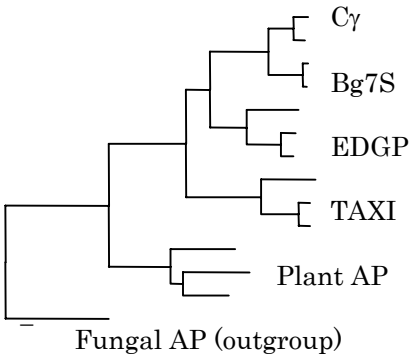

Fig. 1. Putative evolutionary pathway of soybean basic 7S globulins (cluster Bg7S). Other clusters: Cγ, *L. albus* and *L. angustifolius* conglutin γ orthologs; EDGP, *D. carota* extracellular dermal glycoprotein and related *endo*-β-glucanase inhibitor proteins XEGIPs from *Lycopersicon* and *Nicotiana*; TAXI, *T. aestivum*, *H. vulgare* and *S. cereale* XEGIPs; Plant AP, aspartic proteinases from *Nepenthes*, *A. thaliana* and *O. sativa*. Fungal AP, *Rhizomucor miehei* aspartic proteinase. For the tree construction, 386 alignment positions covering all secondary structures of *Triticum* TAXI (pdb|1T6G) and *Rhizomucor* AP (pdb|2RMP) have been used.

Analysis of literature indicate that Bg7S represents an interesting subject for further investigation in terms both of its X-ray structure and function, and of its possible practical application. First and most important point is that Bg7S has protein kinase activity, which corresponds to about two thirds of the tyrosine kinase activity of the rat insulin receptor. The activity of Bg7S is stimulated by leginsulin, soybean hormone-like 4-kD peptide [8]. Therefore, Bg was suggested to be a part of the plant cellular signal transduction system. Second, functional distinction of dicot XEGIPs and Bg7S is not obvious. Although carrot EDGP and Bg7S belong to different plant orders, they are highly similar to each other suggesting similar folding; they both are dermal proteins capable to bind leginsulin. Thus, dicot XEGIPs as well as Bg7S might be involved both in plant's defense and signal transduction systems. Third, folding patterns of functionally distinct fungal AP and *Triticum* TAXI are similar [6], but might be different from those of carrot EDGP [7] in the N-terminal Cys-rich region. Thus, the results of X-ray analysis of Bg7S crystals should be a third structural milestone for description of successive development of protein function from proteolytic to protein kinase activity.

Finally, Bg7S is a protein rich in sulfur containing amino acids, which are deficient in 11S and 7S globulins abundant in soybean seeds. A relatively high level of Bg7S accumulation directed to protein bodies can be achieved using 11S or 7S gene promoters and C-terminal sorting signals from respective storage globulin sequences [9].

References

1. Adachi M. et al., *J. Agric. Food Chem. 51*, 4633-4639, 2003.
2. Shutov A.D. et al., *Eur. J. Biochem. 252*, 79-89, 1998.
3. Zakharov A. et al., *J. Exp. Bot. 55*, 2241-2249, 2004.
4. Van de Peer Y., De Wachter R. *Comp. Appl. Biosci. 10*, 569-570, 1994.
5. Athauda S.B. et al., *Biochem. J. 381*, 295-306, 2004.
6. Sansen S. et al. *J Biol Chem. 279*, 36022-36028.
7. Shang C. et al. *Biochemistry 43*, 6281-6292, 2004.
8. Watanabe Y. et al., *Eur. J. Biochem. 224*, 167-172, 1994.
9. Maruyama N. et al. *Plant Cell 18*, 1253-1273, 2006.

Studies on land ecosystem management for sustainable rural development

By: Dr. M (Charlie) A. Arshad, Ph.D.
(University of Alberta, Edmonton, Canada)
Invited Period: March 20, 2006 – June 30, 2006
Div. of Environmental Science and Technology,
Lab. of Comparative Agricultural Science
(Host Professor: Associate Prof. **Ueru Tanaka**)

I left Edmonton, Canada, on March 18 and arrived at Kansai airport on March 19, 2006. Upon arrival, I was met by my Host Professor, Dr.Ueru Tanaka who accompanied me in the train to Kyoto. I spend the night in a hotel and the following day, Dr.Tanaka took me to the Kyoto University International House in Shugakuin on March 20. He then took me to the Foreign Student Advisor's Office and I gave the necessary receipts for my travel expenses to Ms Katsuko Morita. The same afternoon, I was introduced to the Dean, Dr. Susumu Yazawa, and the Vice-Dean, Dr. Takashi Endo, of the Faculty of Agriculture. After signing the formal contract, I was given the keys to Agriculture Building and my office S250. I attended the faculty meeting on April 30 and was formally introduced to the faculty members by the Vice Dean, Dr. Takashi Endo. I gave my final lecture on June 22, 2006 and was presented with a framed certificate and other gifts to commemorate my lecture as a Visiting Professor.

My major responsibility as a Visiting Professor at the graduate School of agriculture was to teach a course entitled "Land Use and Ecosystem Management" to post-graduate students in the Faculty of Agriculture. My lectures commenced on April 10, 2006 and ended June 22, 2006. The number of students attending the class ranged from 8 to 13, averaging around 10 students except on June 22 when some 40 students and staff attended the special lecture entitled "Management Strategies for Ecosystem Health and Agricultural Sustainability".

The material covered in lectures included:
-Natural and managed ecosystems, with changes induced by human activities (with emphasis on agro-ecosystems). Discussion was focused on the impacts of various land use systems on the health and functioning of the ecosystems; the extent and causes of ecosystem degradation, the impact of different land uses on their production functions and effects on human well being.
Recent Report 'Millennium Assessment (MA) of Ecosystems' released by the UN and its findings (ecosystem services, consequences of ecosystem change, ecosystem for human well-being) was discussed with a focus on the major findings of the four working groups: ecosystem changes in the last 50 years; gains and losses from ecosystem changes; ecosystem prospects for the next 50 years and reversing ecosystem degradation.
Land use effects on soil quality: Definition of soil quality, factors affecting soil quality, criteria to evaluate soil quality, assessments of soil indicators, inter-dependence of indicators were the main topics covered. Discussion included the key indicators to assess changes in soil quality, threshold levels for sustainability indicators, critical limits to monitor soil quality, soil quality indices and evaluating sustainability of farming systems, technologies and policies.
How various crop and range management systems enhance soil quality and sustainability in different ecoregions was discussed, with examples and case studies that degrade or improve ecosystem health.
With keen interest shown by many students in soil and range management issues, a lecture entitled 'soil-plant-animal' relationship in a semi-arid rangeland of Kenya was given with emphasis on the role of mound building termites in soil development and plant productivity and diversity. The discussion focused on how Macrotermes alter soil physical and chemical properties as well as the vegetation structure.
Students were encouraged to write their research proposals in English and make presentation in the class. It was a useful exercise for them to prepare and improve their writing and oral presentation skill.

Field visits and seminars: A seminar "Tillage Effects on Soil Properties and Crop Production in

Northwestern Canada" was presented at Hokkaido University. Some 25 students and staff attended the seminar and a brief discussion on pros and cons of conservation tillage took place after the seminar. Discussions were also held with Professor Ryusuke Hatano and his graduate students on their research in greenhouse gas emissions, N-cycling and nutrient management. Following the visit to Hokkaido University the host professor Dr. Tanaka organized a field trip to various farms around Furano to see the cropping systems. Also, visited the soil museum and observed landscape changes resulting from volcanic activities. This trip provided us with the opportunity for discussions and exchanging views on land use and management of ecosystems.

A field trip was also made to Keisen, Fukuoka to visit integrated rice and duck farming by Mr.Takao Furuno. In a 3-ha family farm, Mr. Furuno has demonstrated how the 'aigamo' paddy field can be made self-maintaining, well- balanced and self-propagating ecosystem. He has authored the book 'The Power of Duck' and is now experimenting with direct-seeding of upland rice. The visit and the field discussion was immensely useful and provided the opportunity of exchanging views on environmentally friendly as well as productive farming systems.

Providing editorial assistance: A significant amount of time was spent on meeting graduate students to discuss their research project and help them write presentations and manuscripts for publications. Apart from discussion during the lectures, numerous meetings with individual students were held in the afternoons on one-to-one basis when some shy and reluctant students were able to express their ideas more freely. In fact, I too benefited from this interaction immensely. I also found that most graduate students at Kyoto University are very hard working and are committed to excel in order to uphold the reputation of their respective labs.
I also reviewed and made editorial changes in manuscripts written by staff in the Graduate School of Global Environmental Studies.

Review article "Land use effects on soil and water quality": I was invited by one of journal editors to write a review article on land use effects on soil and water quality. Since my host professor, Dr. Tanaka has a wide experience in this area in several Asian and African countries I requested his assistance and collaboration in providing relevant data from his overseas work for the manuscript and join me as a co-author in this review (and he gladly agreed). We hope to complete the manuscript within the next two months. Also, we will continue our collaboration after I return to Canada.

Building resilient communities and human settlements with a specific focus on environment and development

By: Ian Davis, Ph.D.
(Coventry University, United Kingdom)
Invited Period: July 1, 2006 – September 30, 2006
(Div. of Environmental Science and Technology,
Lab. of Comparative Agricultural Science)
(Host Professor: Prof. **Takashi Endo**)

Purpose of Visiting Professorship

From July1st to September 30th 2006 I was a Visiting Professor in the Faculty of Agriculture, Kyoto University. This twelve week study and teaching period was rich and varied and covered the full range of my experience, current research interests and personal concerns. My work involved studying, teaching, lecturing, writing, listening, participating and recording architecture through paintings and photographs. This occurred in the following areas:

Teaching

1. To engage with post graduate students undertaking Masters Courses as well as PhD programmes, to encourage and assist them in their studies whenever I had any relevant experiences to share with them. This work involved reading students dissertations, one-to-one tutorials and attendance at student seminar presentations.
2. To provide a formal lecture within the Department of Agriculture on the topic of *'Challenges to Sustainable Development from Disasters'*
3. To lead seminars for students on the topics of *'Disaster Recovery'* and *'Models of Disaster Management'*
4. To participate in an International Disaster Risk Management workshop in Kyoto University on the topic of *'Participatory Urban Risk Management'*
5. To collaborate with Professor Masami Kobayashi (the Graduate School of Global Environmental Studies) and provide a lecture to his Urban Design undergraduate students on the topic of *'The functions of Disaster Shelter in pre and post-disaster contexts'*

Research

6. To collaborate with Professor Rajib Shaw (GSGES) and Ueru Tanaka (GSGES/Graduate School of Agriculture) in an area of mutual academic and professional interest: *'Community Based Disaster Risk Management'* (CBDRM). This link resulted in field visits with post graduate students to Hue in Vietnam and to visit Saijo City (Ehime-ken) to examine a rich diversity of Public Awareness activities to protect communities from flooding, typhoons and earthquakes.
7. To visit current and historical flood defences in the region of Mount Fuji in a study tour hosted by JICA.

Collaboration with Colleagues

8. To establish contact with two centres of disaster related studies with Kyoto University: Professor Charles Scawthorn's seismic research lab and the Disaster Prevention Research Institute (DPRI) under the direction of Professor Norio Okada's in the Uji Campus of the University . Lectures provided in these centres were on the topics of *'Disaster Recovery'* and *'Models of Disaster Management'*
9. To contribute, through round table discussions, lectures and seminars with various Centres of Disaster Management within Japan, such as the Asian Disaster Research Centre (ADRC) and the International Disaster Recovery Platform (IRP) both based in Kobe and JICA in Tokyo. Lectures provided in these centres were on the topics of '*The role of the Private Sector in Disaster Management', 'Models of Disaster Management'* and '*Building Resilience to Disaster Impact at the Community Level"*
10. Participation in two international Video Conferences on the topics of '*Urban Risk Management'* and *'Livelihood Recovery following the Tsunami in Sri Lanka and India'.*

Leisure Activity

11. Aside from the above activities I was able to follow a special interest, as an architect and amateur artist, in the historical architecture of Kyoto and surrounding centres. This enabled me to study the unique and wonderful temples, palaces, and gardens in the region and seek (inevitably with strictly limited success) to document their splendour in drawings, paintings and photographs. This interest involved a memorable water colour and drawing joint activity with colleagues and students linked to a picnic in Arashiyama on the night before my departure.

Results of Visiting Professorship

1. Ongoing links with post-graduate students
2. Current participation with Professor Tanaka and Professor Shaw in a joint international research project on behalf of JICA and World Bank on Community Based Disaster Risk Management
3. Joint academic publications growing from the visit with Professor Rajib Shaw.
4. Anticipated placement of a Ghanaian Post-Doc student: Dr. Titus Kuuyour, who recently successfully undertook his doctorate under my supervision, to undertake further research work on the *'Protection of Critical Facilities from Seismic Impact'* within the laboratory of Professor Charles Scawthorne
5. Collection of research material whilst present in Kyoto on the subject of *'Learning from Disaster Recovery'* for a current book being written on behalf of the International Recovery Platform

Acknowledgements

To conclude, may I express my gratitude to many colleagues and friends who welcomed me and made my stay so productive and personally rewarding.

I would like to express sincere thanks to the Faculty of Agriculture in the University of Kyoto for kindly inviting me to become a Visiting Professor during the period July-October 2006. I particularly wish to thank Professor Ueru Tanaka and his colleagues for kindly making such efficient arrangements for my stay in the University. In addition I wish to thank the Dean of the Faculty of Agriculture and his colleagues for their warm hospitality that they generously extended to me during my stay in Japan.

Finally, I also wish to thank Professor Rajib Shaw, his colleagues and students in the Graduate School of Global Environmental Studies for their kindness and support as well as intellectual stimulation that I gained from working closely with them in this vibrant and internationally recognised department with its vital global leadership role in Disaster Risk Management.