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## Research Activities

### ● Full-Research

<b>Project No.</b>	<b>C-04 (Project leader: SHIRAIWA Takayuki)</b>	<b>p. 4</b>
<b>Project Name</b>	Human Activities in Northeastern Asia and their Impact on Biological Productivity in the North Pacific Ocean	
<b>Project No.</b>	<b>C-05 (Project leader: TANIGUCHI Makoto)</b>	<b>p. 12</b>
<b>Project Name</b>	Human Impacts on Urban Subsurface Environments	
<b>Project No.</b>	<b>C-06 (Project leader: KAWABATA Zen'ichiro)</b>	<b>p. 20</b>
<b>Project Name</b>	Effects of Environmental Change on the Interactions between Pathogens and Humans	
<b>Project No.</b>	<b>C-07 (Project leader: INOUE Gen)</b>	<b>p. 26</b>
<b>Project Name</b>	Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments	
<b>Project No.</b>	<b>D-02 (Project leader: YUMOTO Takakazu)</b>	<b>p. 29</b>
<b>Project Name</b>	A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago	
<b>Project No.</b>	<b>D-03 (Project leader: OKUMIYA Kiyohito)</b>	<b>p. 37</b>
<b>Project Name</b>	Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in "Highland Civilizations"	
<b>Project No.</b>	<b>D-04 (Project leader: YAMAMURA Norio)</b>	<b>p. 42</b>
<b>Project Name</b>	Collapse and Restoration of Ecosystem Networks with Human Activity	
<b>Project No.</b>	<b>E-04 (Project leader: UMETSU Chieko)</b>	<b>p. 51</b>
<b>Project Name</b>	Vulnerability and Resilience of Social-Ecological Systems	
<b>Project No.</b>	<b>H-02 (Project leader: SATO Yo-Ichiro)</b>	<b>p. 56</b>
<b>Project Name</b>	Agriculture and Environment Interactions in Eurasia: Past, Present and Future — A ten-thousand-year history	
<b>Project No.</b>	<b>H-03 (Project leader: OSADA Toshiki)</b>	<b>p. 61</b>
<b>Project Name</b>	Environmental Change and the Indus Civilization	
<b>Project No.</b>	<b>H-04 (Project leader: UCHIYAMA Junzo)</b>	<b>p. 67</b>
<b>Project Name</b>	Neolithisation and Modernisation: Landscape History on East Asian Inland Seas	
<b>Project No.</b>	<b>R-03 (Project leader: KUBOTA Jumpei)</b>	<b>p. 82</b>
<b>Project Name</b>	Historical Interactions between Multi-Cultural Societies and the Natural Environment in a Semi-Arid Region in Central Eurasia	
<b>Project No.</b>	<b>R-04 (Project leader: MOJI Kazuhiko)</b>	<b>p. 87</b>
<b>Project Name</b>	Environmental Change and Infectious Disease in Tropical Asia	

- Project No.** R-05 (**Project leader: NAWATA Hiroshi**) **p. 95**  
**Project Name** A Study of Human Subsistence Ecosystems in Arab Societies:  
 To Combat Livelihood Degradation for the Post-oil Era

### ●Pre-Research

- Project No.** PR (**Project leader: MURAMATSU Shin**) **p. 106**  
**Project Name** Megacities and the Global Environment

### ●Feasibility Study

- Project No.** FS (**FS Proposer: UNO Takao**) **p. 111**  
**Project Name** An Environmental History of Nomads and Farmers in Central Asia

- Project No.** FS (**FS Proposer: HAYASHIDA Sachiko**) **p. 113**  
**Project Name** Atmospheric Methane and Agriculture in Monsoon Asia

- Project No.** FS (**FS Proposer: SUDA Kazuhiro**) **p. 114**  
**Project Name** Development, Migration, Environmental Change and Human Health in Malaysia

- Project No.** FS (**FS Proposer: SATO Tadashi**) **p. 117**  
**Project Name** Genetic Pollution, Farming Ecosystems and New Energy Crops in Tropical Asia

- Project No.** FS (**FS Proposer: TANAKA Hiroki**) **p. 122**  
**Project Name** Agricultural and Hydrological Cycles in the Changjiang Basin

- Project No.** FS (**FS Proposer: KADA Ryohei**) **p. 127**  
**Project Name** Managing Environmental Risks for Sustainable Food and Health in Watershed Planning  
 in Southeast Asia

- Project No.** FS (**FS Proposer: ISHIKAWA Satoshi**) **p. 130**  
**Project Name** Ecosystems and Social Sustainability in Coastal Southeast Asia

### ●Incubation Study

**p. 133**

ARAYA Kunio (Graduate School of Social and Cultural Studies, Kyushu University)

Impact of Recent Human Activities on the Insect Fauna in Asia

IEDA Osamu (Slavic Research Center, Hokkaido University)

Environment and Public Sphere in the Changing Slavic Eurasia: Comparative Studies on Regional Water Systems

OKUDA Toshinori (Graduate School of Integrated Arts and Sciences, Hiroshima University)

Effects of local governance and landuse changes on the degradation and resilience of ecosystem services in tropics

KIMURA Eiichi (Aichi Medical University)

A study on relationship between ecological biodiversity and human well-being in the Pacific Island Countries

TANAKA Ueru (Graduate School of Global Environmental Studies, Kyoto University)

Approaches to Cope with Desertification in semi-arid sub-Saharan Africa

FUKUI Kiichi (Graduate School of Engineering, Osaka University)

Global greenization: its contemplation and practice

**Stage: FR**

**Project No.: C-04**

**Project Name: Human Activities in Northeastern Asia and Their Impact on the Biological Productivity in North Pacific Ocean**

**Abbreviated Title: Amur-Okhotsk Project**

**Project Leader: SHIRAIWA, Takayuki**

**Research Axis: Circulation**

**URL: <http://www.chikyu.ac.jp/AMORE/>**

**Key Words: fish-breeding forest, land-use, land surface disturbance, material circulation, dissolved iron, phytoplankton, Sea of Okhotsk, Amur river, Oyashio current, Asian dust**

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### ■ Research Subject and Objectives

a) The objective of the project is to elucidate the role of the Amur River in primary productivity in the Sea of Okhotsk and Oyashio region and then evaluate possible human impacts such as land surface disturbances in the Amur River basin on the marine ecosystem of the ocean. In this study, we attempt to answer 1) how dissolved iron is transported from the Amur River basin to the Sea of Okhotsk and Oyashio region, 2) to what extent the supply of dissolved iron regulates the primary production in these open waters, 3) how the land surface disturbances affect the material circulation in the Amur-Okhotsk system, 4) how human activity will impact the system in the future, and 5) how we can conserve this transboundary system. By answering these five questions, we will be able to propose a new global environmental concept, the “giant” fish-breeding forest (GFBF), in which there are physical and humanistic interactions between upstream and downstream, and determine a way of conserving the system in a cooperative effort among China, Russia, Mongolia and Japan.

The Amur-Okhotsk Project attempts to create a new global environmental concept, referred to as the GFBF, by expanding the traditional Japanese idea of Uotsuki-Rin (fish-breeding forest). This idea relates the upstream forest with the coastal ecosystem both physically and conceptually. The GFBF and its impacted area encompass nearly 4 million km<sup>2</sup>. This includes parts of Mongolia, China and Russia as well as Russian and Japanese exclusive economic zones and international waters. The area has been the source of extreme political tension since the middle of the 19th century and there has been little transboundary cooperation. This situation has resulted in the Amur River becoming one of the most seriously polluted waters in Russia.

The GFBF hypothesis presents new perspectives for global environmental issues: an ecological linkage between the continent and open sea, the relating of less-dependent stakeholders in the system, and finding environmental common ground across complex international boundaries. Multidisciplinary approaches are indispensable in studying and conserving the GFBF because stakeholders need to understand how to achieve a sustainable marine ecosystem in the Sea of Okhotsk and Oyashio region without limiting human activity on land.

We believe the GFBF can be a test bed for global environmental problems in general. Connecting less-dependent stakeholders could be a first step in coping with complicated environmental issues. We attempt to visualize socio-economic relationships within the GFBF system to demonstrate how stakeholders are related to each other unconsciously. Establishment of the concept will help bring together societies that have been separated for many years by political tension.

b) The physical structure of the GFBF was jointly studied by collaborators in the fields of biogeochemistry, geography, hydrology, climatology, glaciology and oceanography. The economic flow, land-use background, and conservation strategies of the system were studied by scientists in the fields of forest management, agronomy, economic geography, international law and politics.

This project comprises 10 research groups headed by group leaders (GLs). The project leader and 10 group leaders constitute the board of the project. In addition to individual group meetings, at least

one project meeting has been held each year to discuss cross-disciplinary issues. Daily communications and discussion have been carried out through an Internet mailing list. The themes/tasks of each research group are as follows. Group 1 (GL: Dr. Kay I Ohshima): physical oceanographic conditions of the Sea of Okhotsk and the northern North Pacific; Group 2 (GL: Dr. Takeshi Nakatsuka): geochemical and biological conditions of the Sea of Okhotsk and the northern North Pacific; Group 3 (GL: Dr. Seiya Nagao): transport of biogeochemical materials from the Amur River to the Sea of Okhotsk; Group 4 (GL: Dr. Hideaki Shibata): biogeochemical transportation from the terrestrial ecosystem to the Amur River; Group 5 (GL: Dr. Hiroaki Kakizawa): background of anthropogenic impacts in the Amur River basin; Group 6 (GL: Dr. Shigeko Haruyama): spatial and historical monitoring of land-use changes in the Amur River basin; Group 7 (GL: Dr. Sumito Matoba): estimation of the atmospheric transportation of terrestrial material; Group 8 (GL: Dr. Takeo Onishi): numerical modelling of basin-scale hydrology and iron transportation; Group 9 (GLs: Drs. Hiroyuki Matsuda and Fumio Mitsudera): numerical modelling of primary production in the Sea of Okhotsk and the northern North Pacific; Group 10 (GL: Mr. Yasunori Hanamatsu): conservation strategy for the GFBB.

c) Three major achievements have been made in the Amur Okhotsk Project.

1. Iron-bound material and ecological linkages from the Amur River basin to the Oyashio region via the Sea of Okhotsk were finally quantified by 1) observations of the spatiotemporal distribution of dissolved iron in various parts of the Amur River basin, 2) monthly monitoring of dissolved iron concentrations and discharges at Khabarovsk and Bogorodskoe, 3) observations of the temporal distributions of dissolved iron in the lower reach, mouth, and estuarial area of the Amur River, 4) measurements of dissolved iron in the Sea of Okhotsk and Oyashio region, and 5) measurements of the atmospheric iron input to the Oyashio region. It was found that approximately 40% of the dissolved iron necessary to support phytoplankton production in the Oyashio region was transported through the GFBB system. The remaining 60% was microbially recycled iron originally provided by intermediate water and atmospheric input.

2. It was found that there are two current threats to the GFBB system: global warming and human impacts on land surfaces. The former is most clearly indicated by the decreasing trend of sea ice production in the Sea of Okhotsk in recent decades and its impact on the ocean and material circulation in the northern North Pacific. The latter is illustrated by the decreasing trend of iron discharge from the Amur River basin to the Sea of Okhotsk due mainly to the reclamation of wetland to form paddy fields and dry land.

3. The Amur Okhotsk Consortium was established in 2009 as a multinational academic network to discuss the conservation and sustainable use of the GFBB. Japanese, Chinese and Russian members will hold a joint meeting every two years and exchange ideas, information and data routinely via the Internet between meetings.

### ■ Progress and Results in 2009

Major achievements of the Amur Okhotsk Project (2005–2009) are described by answering the five essential questions of the project.

#### 1) How is dissolved iron transported from the Amur River basin to the Sea of Okhotsk and Oyashio region?

Average annual fluxes of total and dissolved iron were estimated in various parts of the GFBB and they confirmed the continuity of iron transportation from the land surfaces of the Amur River basin to the surface water of the Oyashio region (Fig. 1). The natural wetlands with gentle slope located at middle and lower part of Amur basin was major source of dissolved iron from terrestrial zone to Amur river.

In the upstream forested basin, dissolved iron in soil was mainly transported with dissolved organic

carbon (DOC) rather than as Fe(II) and Fe(III). The riparian zone near the stream channel is an important source of iron owing to its wet and anaerobic condition increasing the DOC concentration and dissolving iron in soil and groundwater.

In the natural wetlands, the dissolved Fe concentration is around  $1 \text{ mg Fe L}^{-1}$  in the surface water and much higher (sometimes more than  $10 \text{ mg Fe L}^{-1}$ ) in soil interstitial waters, having a seasonal variation with maxima in summer. The dissolved Fe concentration observed for a number of rivers and agricultural drainage waters of the Sanjiang plain when not frozen has an average of approximately  $1 \text{ mg Fe L}^{-1}$  and varies considerably according to the condition of the watershed. Dissolved Fe is dominantly present as complexed forms in soil water, river water and agricultural drainage water, in which humic substances play an important role in the transportation of iron as a complex ligand.

As a result,  $1.1 \pm 0.7 \times 10^{11} \text{ g/yr}$  of dissolved iron is transported to the estuarial area from the Amur River annually. Approximately 95% of the dissolved iron coagulates at Amur-Liman (the estuarial area) and Sakhalin Bay. There are two pathways of iron transportation from the estuarial area to the Oyashio region: 1) surface transportation of total iron and 2) transportation with the North Pacific Intermediate Water (NPIW). The former supports primary production in the Sea of Okhotsk while the latter supports primary production in the Oyashio region. It is estimated that approximately  $1.2\text{--}1.5 \times 10^8 \text{ g/yr}$  of total iron is provided by the atmosphere and NPIW in the Oyashio region.

## **2) To what extent does the supply of dissolved iron regulate primary production in the open waters?**

It was found that of the iron used by the spring bloom in the Oyashio region, 40% is provided through the GBBF system and 60% is recycled through microbial processes. We are not yet certain about the relative importance of atmospherically derived iron to primary production in the Oyashio region because of its temporal sporadicity, spatial unevenness and insoluble nature. In spite of this uncertainty, it is reasonably concluded that the iron controls phytoplankton growth in the Oyashio region because phytoplankton growth ceases under iron limitation at all high nitrate concentrations.

It is yet uncertain to what extent the supply of dissolved iron regulates primary production in the open waters. This is due mainly to a lack of sufficient observational data on both annual changes in the dissolved iron flux and the biomass in the Oyashio region. To determine the role of the dissolved iron, we used a three-dimensional coupled ecosystem physical model that includes the effect of iron on the Sea of Okhotsk. We hypothesized that four processes supply iron to sea water: atmospheric loading, input from the Amur River, dissolution from sediments and regeneration by zooplankton and bacteria. We simulated one year, from 1 January 2001 to 31 December 2001. As a result, the model taking iron into account agreed well with the observation. However, we are not yet able to simulate the time series of the iron impact, since the model cannot simulate the NPIW, which we believe is the most important current in the transportation of riverine iron from the Amur River.

## **3) How do land surface disturbances affect material circulation in the Amur-Okhotsk system?**

The impact of land-use change on iron discharge was studied in experimental plots of upland fields and paddy fields on the Sanjiang plain, which were converted from natural wetlands several decades ago (Fig. 2). Soil in the upland fields was found to remain in an oxidized condition throughout the year, implying the absence of iron discharge. In paddy fields, surface water and soil water had dissolved Fe concentrations somewhat lower than those of natural wetlands, but importantly, the controlled water discharge due to agricultural management is considered to largely lower the iron discharge.

Paddy fields on the Sanjiang plain are irrigated with ground water in most cases. The strikingly high concentration of dissolved iron (largely in the form of  $\text{Fe}^{2+}$ ) might indicate an additional iron source. However, elevated contents of amorphous iron oxides in the upper soil layer in paddy fields were found to adequately account for the calculated total amount of iron supplied by the irrigation of ground water since the rice paddy conversion on the Sanjiang plain, suggesting an almost complete retention of



iron added by the ground water. Considering the irrigation and the controlled water discharge described above, it is concluded that iron discharge may be much less for paddy fields than for natural wetlands.

Monitoring data indicate that the concentration of dissolved iron in the Naoli River, which runs across the Sanjiang plain, has been consistently decreasing in recent decades. The observation of a peat layer, except in hilly areas, suggests a predominance of wetlands on the Sanjiang plain in the pristine age. However, a survey of the ground water table demonstrated that the current ground water levels were greatly lowered in most regions owing to reclamation by water drainage. It is likely that the land previously dominated by wetlands has been becoming steadily drier on the Sanjiang plain, which has reduced the Fe discharge as mentioned above.

Land-use and historical changes in the Amur River basin were visualized by various temporal and spatial mappings. We compiled land-use maps for both the 1930s and 2000 for the whole Amur River basin. Changes in the most recent 19 years were analyzed using Pathfinder AVHRR Land datasets and satellite remote-sensing techniques. The results show significant changes on the Sanjiang plain in which approximately 10,000 km<sup>2</sup> of wetland was reclaimed as paddy fields from 1980 to 2000. Aerial changes of Russian forest were not significant but the quality of the forest is considered to be deteriorating mainly owing to frequent forest fires and poor management.

Such land-use changes were caused by various factors. According to analyses of the underlying causes of the degradation of forest resources in Khabarovsk Krai and systems are identified as the major causes of forest degradation. The rapid increase in timber exports to China and poor forest policy are considered to accelerate forest degradation. On the Sanjiang plain, there was rapid development of paddy fields in accordance with governmental policy. Farm management has improved, but a lack of water has become a serious issue and the excessive pumping of ground water has caused the rapid lowering of the ground water table on the Sanjiang plain.

#### **4) How will human activity impact the system in the future?**

We attempted to develop a numerical hydro-geochemical model with special emphasis on iron dynamics for the Amur River basin. The accuracy of the calculated discharge and dissolved iron concentration are sufficient at a time resolution of one month during the period from 1980 to 1990. Using the model, the effect of land cover change on dissolved iron productivity was evaluated. The results of numerical experiments suggest that 50% conversion of remaining wetlands to agricultural lands might decrease the dissolved iron flux by more than 10% (Fig. 3).

#### **5) How can we conserve this transboundary system?**

The key problem in conservation is how to establish a multilateral cooperative framework for the GFBF system. There have already been some bilateral frameworks, including the formal joint-monitoring program between China and Russia after the Songhua River accident involving a petrochemical company in the Chinese province of Jiling in 2005, and the cooperative program on the research, conservation and sustainable use of the ecosystems in the Sea of Okhotsk signed by Russia and Japan in 2009. However, there has been no multilateral governmental framework concerning the GFBF system. At this stage, joint-monitoring, data exchange and mutual

communication at an academic level are necessary as a starting point for the protection of the GFBF system. For this purpose, we established the Amur Okhotsk Consortium as a multinational academic network to discuss the conservation and sustainable use of the GFBF (Fig. 4). The network can be thought of as comprising “epistemic communities”; Peter Haas proposed that such networks of knowledge-based experts could help states identify their interests, frame issues for collective debate, propose specific policies, and identify salient points for negotiations. Our attempt is motivated by the history of the environmental protection of the Baltic Sea from marine pollution for over 30 years.

On the other hand, we have analysed existing international and domestic laws and policies that seem to be applicable for the conservation of the GFBF system. A future conservation framework would incorporate them as useful components. The results

show that while environmental factors in GFBB have already been partially regulated by international and national laws and policies, these management regimes have been established and implemented independently, and they sometimes overlap or conflict; therefore, they are not appropriate for the conservation of the whole GFBB system. We conclude that it is important to coordinate and strengthen existing laws and policies in an integrated manner to manage this system consistently and effectively (Fig. 5).

## ○Co-Researchers

### Project leader

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### Group 1: Physical oceanographic conditions

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**Group 7: Estimate of atmospheric transports of terrestrial materials.**

- UEMATSU, Mitsuo ( Ocean Research Institute, Univ. of Tokyo, Professor, deposition of various materials from atmosphere )

- MATOBA, Sumito ( Institute of Low Temperature Science, Hokkaido Univ., Assistant Professor, historical changes of iron deposition by means of ice core analysis )

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**Group 8: Natural variability of the hydro-metrological and hydro-chemical conditions.**

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- KIM, Vladimir. ( Institute of Water and Ecological Problems, FEBRAS, Hydrologist, geochemical analysis on waters from Amur river )
- BAKLANOV, Peter Ya. ( Pacific Institute of Geography, FEBRAS, Director, economic geographical analysis on Amur river basin )
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- EMORSHIN, VICTOR V. ( Pacific Institute of Geography, FEBRAS, GIS-Center. Head, Geographical Information System )
- MISHINA, Natalia. ( Pacific Institute of Geography, FEBRAS, Scientific Researcher, land-use changes and the analysis on material flows in the far east )
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- GAVRILOV, Alexandr V. ( ROSHYDROMET, Head of administration, hydro-geochemical monitoring in the Amur river )
- VOLKOV, Yuri N. ( Far Eastern Hydrometeorological Research Institute, Director, oceanographic observations in the Sea of Okhotsk )
- YAROSLAV, D. Muravyev. ( Institute of Volcanology Seismology, Director of the Institute, ice core drilling in Kamchatka )
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#### ■ Future Themes

**Stage: FR**

**Project No.: C-05**

**Project Name: Human Impacts on Urban Subsurface Environments**

**Abbreviated Title: Urban Subsurface Environment**

**Project Leader: TANIGUCHI, Makoto**

**Research Axis: Circulation**

**URL: <http://www.chikyu.ac.jp/USE/>**

**Key Words: subsurface environment, groundwater, urbanization, heat island, contamination, subsurface thermal anomaly, development stage of the city**

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## ■ Research Subject and Objectives

### 1. Research Objectives

Securing water resources and preventing contamination of water caused by human activities in urban areas are global environmental issues in the 21st century. Heat island phenomena caused by human activities is also a big environmental problem in addition to global warming. These global environmental issues which are caused by urbanization, should be addressed strongly and prevented as population and density increases occur rapidly in urban areas.

Most global environmental studies have long been focused on the environmental issues above ground, such as air pollution, global warming, seawater pollution, and decrease in biodiversity. Subsurface environmental issues are also important for human life in the present and future, but have been largely ignored because of the invisibility of the phenomena and difficulty of evaluations.

Subsurface environmental problems such as subsidence due to excessive pumping and groundwater contamination, have occurred repeatedly in Asian major cities with a time lag depending on the development stage of urbanization. Therefore, we may be able to assess future scenarios if we can evaluate the relationships between subsurface environmental problems and the development stage of the city.

### 2. Research Content

This project deals with: (1) Relationships between the development stages of the cities and subsurface environmental problems which will be assessed by socio-economic analyses and reconstructions of urban areas using historical records; (2) Serious problems in subsurface environments and changes in reliable water resources which will be studied after evaluations of groundwater flow systems and changes in groundwater storage using hydrogeochemical data and in-situ/satellite-GRACE gravity data; (3) Evaluation of accumulation of materials (contaminants) in subsurface and their transport from land to ocean including groundwater pathways using chemical analyses of subsurface water, sediments and tracers; and (4) Subsurface thermal contamination due to the "heat island" effect in urban areas by reconstruction of surface temperature history and urban meteorological analyses.

Tokyo, Osaka, Bangkok, and Jakarta are targeted as main study cities, and Taipei, Manila and Seoul are selected as secondary study cities, depending on the four sub-themes. The project will focus on the urban subsurface environments however, we will treat the problems on a basin scale, because subsurface water, heat, and material transports are interconnected on this scale. We will assess the relationships between subsurface environmental changes and human activities during the past 100 years.

## ■ Progress and Results in 2009

### Outline of results

(1) Field surveys on subsurface environment in targeted cities have been made, and monitoring of

subsurface environments at 7 cities (Bangkok, Jakarta, Manila, Seoul, Taipei, Tokyo and Osaka) has been going on.

(2) Assessments of natural and social data in each city, and a database based on GIS have been made. Land cover/use maps based on GIS with 0.5 km mesh have been made at three development stages (1930' s, 1970' s, and 2000' s) of seven cities.

(3) International Symposium, HydroChange2008, has been organized by RIHN, with IAHS and GWSP, and the book "From Headwater to the Ocean" has been published by CRC press (679 pp).

(4) Studies on cross cutting theme such as religion-groundwater relationships have been made in Bangkok and Jakarta. The relationships between groundwater discharge and elevation of the religious facilities and soil have been investigated.

(5) Interim results of the project have been published by special issue of STOTEN (Science of the Total Environment, Elsevier) including one overview and 15 original papers.

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### ■ Future Themes

- (1) New approaches on the relationship between law/institution and groundwater (private water) /surface water (public water) have been started. Integration of the chronology of the document and database will be made.
- (2) New working groups on integrated model and indicators will integrate the status of social economics, water resources, environmental loads, and policy on subsurface environment.
- (3) Land cover/use data based on GIS at three ages (1930' s, 1970' s and 2000' s) in 7 cities will be used for evaluating groundwater recharge rate, thermal storage in aquifer, and subsurface contamination.

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- Umezawa Y., T. Komatsu, M. Yamamuro and I. Koike Aug, 2009 Physical and topographic factors affecting suspended particulate matter composition in a shallow tropical estuary. *Marine Environmental Research* 68 :59-70. (reviewed).
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## Research Presentations

### 【Oral Presentation】

- Mitsuyo Saito The process and potential of nitrate attenuation in the aquifers with different scale of flow system. AGU Fall Meeting, December 2009, .
- Hideki Hamamoto Reconstruction of the thermal environment evolution from subsurface temperature distribution in large cities in East Asia. AGU Fall Meeting, December 2009, Sanfransisco, USA.
- Makoto Taniguchi Human impacts on Urban Subsurface Environment. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Tomoyo Toyota Long-term urban economic development and water demand in Asian megacities. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Tsuyoshi Imai Urbanization and sewerage system development: lessons and challenges in Asian megacities. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Akihisa Yoshikosi Urban Development and Water Environment Changes in Asia. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Gayl D. NESS Asian Urbanization and its Environments. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
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- Noriyuki Momoshima A Method for Groundwater Dating using Anthropogenic Radionuclide of  $^{85}\text{Kr}$ . The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
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- Takashi Hasegawa Long-term trends of terrestrial water storage in south-east Australia. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
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- Jun Nishijima Repeat Gravity Measurement for Groundwater level monitoring -An Application to the Shallow Groundwater Level Monitoring-. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Yoichi Fukuda Monitoring Groundwater Variations Using Precise Gravimetry on Land and from Space. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Oranuj LORPHENSRI Review of Groundwater Management and Land Subsidence in Bangkok. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Robert DELINOM Groundwater quality degradation based on stable isotope and nitrate content in Jakarta Basin. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Makoto Kagabu The process of changing groundwater age in Jakarta area. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Tsutomu Yamanaka Disturbance of Groundwater Flow System due to Excessive Pumping. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Rachmat FAJAR LUBIS Human Impact on Subsurface Thermal Regime in Jakarta, Indonesia. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Makoto Yamano Evolution of the Subsurface Thermal Environment in Urban Areas -Studies in Large Cities in East Asia. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- William C. BURNETT Detecting Groundwater Inputs into Bangkok Canals via Radon and Thoron Measurement. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Chih-Chieh SU The existence of submarine groundwater discharge off the Southwestern Taiwan and its possible role in submarine landslide geohazards. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Satoshi Nakada Effect of nearshore bathymetry on submarine groundwater discharge. The 3rd International Symposium in Taiwan, November 2009, .
- Mitsuyo Saito Evaluation of nitrate attenuation potential on the aquifers of developing Asian megacities. The 3rd International Symposium in Taiwan, November 2009, .
- Takahiro Hosono The status of groundwater quality and pollution mechanism in the Asian metropolitan areas. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Yu Umezawa Reconstruction of the Anthropogenic Pollution History in Asian Megacities Based on the Characteristics of Organic Matter and Heavy Metals in the Sediment Core Sampled in the Adjacent Bays. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Shin-ichi Onodera Groundwater and Soil Pollutions Status in Asian Subsurface Environment. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Shinji Kaneko Long-term urbanization and subsurface environmental changes in Asian megacities: Stage model with DPSIR framework. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.

- Chieh Hung CHEN Comparisons between air and subsurface temperatures in Taiwan for the past century: a global warming perspective. The 3rd International Symposium in Taiwa, November 2009, Taipei, Taiwan.
- Hideki Hamamoto Reconstruction of the thermal environment evolution from subsurface temperature distribution in Bangkok. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Akinobu Miyakoshi Evaluation of the subsurface thermal environment in the Tokyo metropolitan area - Urban subsurface heat island-. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Jun Shimada Chemical and physical evidences in the groundwater aquifer caused by the groundwater over-pumping and their countermeasures in the major Asian coastal cities. The 3rd International Symposium in Taiwan, November 2009, .
- Akio Yamashita Comparative analysis of land use distributions and changes in Asian mega cities. The 3rd International Symposium in Taiwan, November 2009, Taipei, Taiwan.
- Takahiro Hosaono The NA (nitrate-arsenic) boundary as an important concept in aquatic environmental studies. RIHN 4th International Symposium, November 2009, .
- Makoto Taniguchi Changes in the reliance on groundwater versus surface water resources in Asian cities. 8th IAHS Scientific Assembly and 37th IAH Congress, September 2009, Hyderabad, Indo.
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**Stage: FR**

**Project No.: C-06**

**Project Name: Effects of Environmental Change on the Interactions between Pathogens and Humans**

**Abbreviated Title: Environmental Diseases**

**Project Leader: KAWABATA, Zen' ichiro**

**Research Axis: Circulation**

**URL: <http://www.chikyu.ac.jp/z/>**

**Key Words: Freshwater ecosystem, Environmental alterations, Koi herpes virus (KHV) disease, Human life, Interactions, Model**

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## ■ Research Subject and Objectives Research Objectives and Topics

### Objectives

Infectious disease has become a significant global environmental problem. This study investigates the emergence and spread of Koi Herpes Virus (KHV) in Lake Biwa, Japan. KHV is a pathogen responsible for episodic mass mortality of common carp (*Cyprinus carpio carpio*) since the late 1990s. The common carp is the original domesticated aquaculture species, and an important source of protein today.

This study has three main objectives: (1) To describe Koi Herpes Virus disease ecology, including: the specific links between anthropogenic changes to freshwater ecosystems and the emergence and spread of KHV disease; the impacts of KHV disease on local ecosystem services; the social and cultural attempts to address KHV disease; and the environmental changes associated with human adaptation; (2) To describe a general model of linkage between environments, pathogens and humans; (3) To suggest how interactions between pathogen and humans may be modified in order to mitigate the human and environmental damages associated with infectious diseases.

### Research Methods and Organization

Field surveys are conducted at Lake Biwa, Japan, and Lake Erhai, China. Laboratory work is undertaken at RIHN.

Our project is organized into five research groups, plus executive and advisory groups, as follows:

The Human Alterations Group investigates the effects of anthropogenic environmental alteration on the emergence

and spread of KHV and the behavior of its host *Cyprinus carpio carpio*.

The Pathogen and Host Ecology Group defines the biology and ecology of KHV and carp, and so describes the environmental factors involved in KHV infection and transmission.

The Ecosystem Impacts Group examines the process of infection and the effects of KHV disease on ecosystem

functions such as material cycling.

The Economics and Culture Group investigates the losses associated with KHV disease, including of ecosystem

services or other economic and cultural phenomena, and describes the social attempts to redress those losses.

The Feedback Group examines the human response to losses caused by KHV disease, and the environmental change associated with this response.

The Executive Group coordinates the activities of each group and develops the model of pathogen-human interactions.

Finally, an Advisory Group composed of recognized experts in relevant fields makes suggestions in order to

improve the research.

**Perception and contribution to global environmental problems**

Field surveys are being conducted primarily at Lake Biwa, Japan, where researchers from various disciplines and fishermen have accumulated much data, and at Lake Erhai, China. China is responsible for almost the entire global carp production. Lake Erhai is an inland lake in China that has never experienced an outbreak of KHV. We will create a model to predict the outbreak and spread of KHV in Lake Biwa by accumulating and synthesizing both new and existing data from Lake Biwa. The model will be applied to Lake Erhai to provide suggestions for how to manage the lake to lessen the probability of an outbreak of KHV disease. The practical application of this model to such an important region is critical to attenuating the global problem of KHV disease. The Lake Biwa model will be modified to apply to other infectious diseases in other areas, to suggest environments that might prevent the outbreak and spread of infectious disease, and to demonstrate how to facilitate the safe coexistence of humans and pathogens.

### ■ Progress and Results in 2009 Main results to date

- 1) We found that water temperature on gentle gradient lakeshores is more spatially and temporally variable than on steep banks constructed by humans. This result suggests that gentle shores can provide a wider range of thermal conditions that allows fish to fine-tune their (everyday) thermoregulatory behavior, acclimate efficiently to (longer-term) changes in water temperature, and generally alleviate stresses associated with unfavorable water temperatures and so reduce susceptibility to KHV (Yamanaka et al. 2010).
- 2) We established a method to measure KHV presence in natural water (Minamoto et al., 2009a; Honjo et al., 2010) and found that in the five years since its presence was first documented, KHV has spread throughout Lake Biwa (Fig. 4) (Minamoto et al., 2009b).
- 3) Telemetry tracking of carp behavior revealed that carp favor warmer water temperatures. This finding was incorporated into our mathematical model predicting KHV disease outbreaks.
- 4) We found no evidence of KHV antibodies in carp smaller than 30cm, while 54% of carp larger than 30cm were KHV positive. Of antibody-positive individuals, 44% contracted KHV by polymerase chain reaction (PCR), strongly suggesting that those surviving carp become KHV carriers. A few individuals were positive by PCR but negative for antibodies, indicating recent infection. These results suggest that transmission of KHV is still occurring within the native common carp population in Lake Biwa (Uchii, et al., 2009).
- 5) We developed a non-invasive method (i.e. a method that does not require handling fish) to quantify how water conditions stress carp. This method indicates that changes in water temperature do stress carp.
- 6) In Lake Erhai we found a pattern of gradient and water temperature conditions similar to those of Lake Biwa. The similarity indicates Lake Biwa can serve as a model for other lakes.
- 7) At national and international conferences, we have presented our findings on the linkages between environment, pathogen and humans, and emphasized their importance to the prevention and control of infectious disease.

### ○ Co-Researchers

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- HONJO, Mie ( Research Institute for Humanity and Nature, Research Fellow, Detection of KHV )
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- NAIMAN, Robert ( University of Washington, Professor, Fish Habitat )
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- SHIRAE, Yusuke ( Graduate School of Human and Environmental Studies, Kyoto University, Graduate student, Model for Economical Effects )

### ■ Future Themes Scheduled Research Activities in 2010

- 1) Develop a method to quantitatively detect KHV in sediment, organisms and other elements in



aquatic ecosystems.

- 2) Clarify the distribution of infectious KHV in Lake Biwa.
- 3) Develop a micro-device to measure the quantity and infectivity of KHV *in situ*.
- 4) Determine the environmental factors involved in KHV dynamics and infectivity.
- 5) Use outdoor experimental tanks to define optimum water temperature for carp.
- 6) Describe the environmental characteristics of the places where KHV and carp interact, and clarify the behavior of the KHV-infected carp in order to reveal the locations where infection likely occurs.
- 7) Conduct controlled experiments to reveal the relationship between water temperature and carp stress and susceptibility to KHV.
- 8) Demonstrate the ecological effects of carp species composition in experimental ponds.
- 9) Evaluate the cultural and nutritional value of carp as a human food.
- 10) Assess the economic and cultural impacts of carp die-offs.
- 11) Create a preliminary model of the interactions between environmental change, KHV and humans.
- 12) Survey the spatial and temporal distribution of water temperature in Lake Erhai in order to establish the applicability of Lake Biwa findings to Lake Erhai.
- 13) Describe the common parameters of KHV and other infectious diseases.
- 14) Promote collaboration with the DIVERSITAS program of international biodiversity science.
- 15) Develop a set of recommendations to prevent or minimize the emergence and spread of infectious diseases.

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- Nishiura H, Kakehashi M and Inaba H Jun, 2009 Two critical issues in quantitative modeling of communicable diseases: Inference of unobservables and dependent happening. Chowell G, Hyman JM, Bettencourt LMA, Castillo-Chavez C (Eds) (ed.) Mathematical and Statistical Estimation Approaches in Epidemiology. Springer, Dordrecht Heidelberg London New York, pp.35.

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- Minamoto, T., Honjo, M. N., Kawabata, Z. Nov, 2009 Seasonal Distribution of Cyprinid Herpesvirus 3 in Lake Biwa, Japan. *Applied and Environmental Microbiology* 75(21) :6900-6904. DOI:10.1128/AEM.01411-09. (reviewed).
- Uchii, K., Matsui, K., Iida, T., and Zen'ichiro Kawabata. Oct, 2009 Distribution of the introduced cyprinid herpesvirus 3 in a wild population of common carp. *Cyprinus carpio L. Journal of Fish Diseases* 32(10) :857-864. DOI:10.1111/j.1365-2761.2009.01064.x. (reviewed).
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- Chen XC, Wang XD, Kong HN, Wu DY, He SB, and Kawabata Z. 2009 Seasonal variation of mixing depths and its influence on phytoplankton dynamics in the Zeya reservoir, China,. *Limnology* .
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- Chen XC, Kong HN, He SB, Wu DY, Li CJ, and Huang XC. 2009 Reducing harmful algae in raw water by light-shading. *Process Biochemistry* 44(357) :360.

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- Uchii, K., and Kawabata, Z. Oct, 2009 Biological invasion of a fish pathogen, cyprinid herpesvirus 3, into Japanese freshwater ecosystems.. *Japanese Journal of Limnology* 70(3) :267-272. (in Japanese) (reviewed).

### **Research Presentations**

#### **【Oral Presentation】**

- Uchii, K., Telschow, A., and Kawabata, Z. Transmission mechanism of a viral pathogen through host reproductive behavior. 57th Annual Meeting of Japanese Society of Japan, Mar 15, 2010–Mar 20, 2010, Tokyo. (in Japanese)
- Honjo, M. N., Minamoto, T., and Kawabata, Z. Detection and quantification of cyprinid herpesvirus-3 (CyHV-3) from sediments in lake and pond. . The 57th Annual Meeting of The Japanese Society of Ecology, Mar 15, 2010–Mar 20, 2010, Meguro-ku, Tokyo.. (in Japanese)
- Minamoto, T., Honjo, M. N., Uchii, K., Yamanaka, H., Suzuki, A. A., Kohmatsu, Y., Yonekura, R., Omori, K., Itayama T., Tanaka N., Asano, K., Sirae, Y., Okuda, N., Kawabata, Z. Interactions between koi herpesvirus and humans. (in Symposium S12: Linkage among environmental alteration, infectious diseases and humans) . The 57th Annual Meeting of the Ecological Society of Japan, Mar 15, 2010–Mar 20, 2010, Meguro, Tokyo, Japan. (in Japanese)
- Minamoto, T., Honjo, M. N., Kawabata, Z. Dynamics of the cyprinid herpesvirus 3 in Lake Biwa, . The 74th Annual Meeting of the Japanese Society of Limnology, Sep 15, 2009–Sep 17, 2009, Oita City, Japan. (in Japanese)
- Yamanaka, H., Sogabe, A., Omori, K., Minamoto, T., Uchii, K., Honjo, M., Suzuki, A., Kohmatsu, Y., Kawabata, Z. Active thermoregulation and its seasonal change of common carp. The 74th Annual Meeting of the Japanese Society of Limnology, Sep 15, 2009–Sep 17, 2009, Oita City, Japan. (in Japanese)
- Yamanaka Hiroki \*, Sogabe Atsushi ., Omori Koji., Minamoto Toshifumi., Uchii Kimiko., Honjo Mie N., Suzuki Alata A., Kohmatsu Yukihiro ., and Kawabata Zen' ichiro. Seasonality of behavioral thermoregulation in common carp: potential effects on the onset of Koi Herpesvirus disease. The Japanese Society of Limnology 74th annual meeting, Sep 14, 2009–Sep 17, 2009, Oita. (in Japanese)
- Yamamura, N., Telschow, A., Uchii, K., and Kawabata, Z. A basic equation for population dynamics with destruction of breeding habitats and its application to outbreak of KHV disease.. 19th Annual Meeting of Japanese Society for Mathematical Biology, Sep 09, 2009–Sep 11, 2009, Tokyo. (in Japanese)
- T. Ichijo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid Detection of Respiratory Active Mycobacteria by Auramine O-CTC double staining. 30th Annual Congress European Society of Mycobacteriology, Jul 05, 2009–Jul 08, 2009, Porto, Portugal.
- Uchii, K. Establishment of cyprinid herpesvirus 3 in a wild population of common carp in Lake Biwa.. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08, 2009, Kyoto.
- Minamoto, T., Honjo, M. N., Kawabata, Z. Seasonal distribution of cyprinid herpesvirus 3 in Lake Biwa. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08, 2009, Kyoto, Japan.

#### **【Poster Presentation】**

- T. Ichijo, Y. Izumi, N. Yamaguchi, M. Nasu Auramine O-CTC double staining as a method for rapid detection of respiring Mycobacteria. The 130th Annual Meeting of the Pharmaceutical Society of Japan, Mar 28, 2010–Mar 30, 2010, Okayama. (in Japanese)
- T. Ichijo, A. Hiramatsu, T. Kenzaka, T. Baba, N. Yamaguchi, M. Nasu Diversity of Legionella pneumophila in aquatic environments. The 130th Annual Meeting of the Pharmaceutical Society of Japan, Mar 28, 2010–Mar 30, 2010, Okayama. (in Japanese)
- T. Ichijo, N. Yamaguchi, M. Nasu Rapid detection of respiratory active nontuberculous mycobacteria by Auramine e O-CTC double staining. The 83rd Annual Meeting of Japanese Society for Bacteriology, Mar 27, 2010–Mar 29, 2010, Yokohama, Kanagawa. (in Japanese)
- N. Yamaguchi, M. Nasu Relationship between bacteria and human in aquatic environments. The 83rd Annual Meeting of Japanese Society for Bacteriology, Mar 27, 2010–Mar 29, 2010, Yokohama, Kanagawa. (in Japanese)
- T. Ichijo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid detection of respiratory active Mycobacteria by Auramine O - CTC double staining. 25th JSME Annual Meeting, Nov 21, 2009–Nov 23, 2009, Higashi-Hiroshima, Hiroshima. (in Japanese)
- T. Ichijo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid detection of respiratory active non-tuberculous mycobacteria by Auramine O-CTC double staining. Forum 2009: Pharmaceutical Health Science and Environmental Toxicology, Nov 05, 2009–Nov 06, 2009, Ginowan, Okinawa. (in Japanese)
- T. Ichijo, T. Baba, N. Inoue, T. Kenzaka, N. Yamaguchi, M. Nasu Diversity of Legionella pneumophila isolated from aquatic environments determined by genotyping. 62nd Annual Meeting of Japanese Society of Hot Spring Sciences, Sep 09, 2009–Sep 10, 2009, Kyoto. (in Japanese)
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- Minamoto, T., Honjo, N. M., Uchii, K., Yamanaka, H., Suzuki, A. A., Kohmatsu, Y., Kawabata, Z. Detection of koi herpesvirus DNA from natural river water. International Symposium on Environmental Change, Pathogens, and Human Linkages, Jun 11, 2009, Kyoto.
- T. Ichijo, T. Kenzaka, N. Inoue, A. Hiramatsu, T. Baba, N. Yamaguchi, M. Nasu Genetic Difference of Legionella pneumophila Isolates between from Natural and from Anthropogenic Environments. 109th American Society for Microbiology General Meeting, May 17, 2009–May 22, 2009, Philadelphia, PA, USA..

**【Invited Lecture / Honorary Lecture / Panelist】**

- N. Yamaguchi, M. Nasu Relationship between bacteria and human in aquatic environments. The 83rd Annual Meeting of Japanese Society for Bacteriology, Mar 27, 2010–Mar 29, 2010, Yokohama, Kanagawa. (in Japanese)
- M. Nasu, T. Ichijo Environmental diseases. 57th Annual Meeting of Ecological Society of Japan, Mar 15, 2010–Mar 20, 2010, Meguro, Tokyo. (in Japanese)
- Kakehashi M Infectious diseases induced by human activities: Pandemic influenza, BSE and drug resistant bacteria. Symposium: The connection between environmental change, infectious diseases and humans, The Annual Meeting of the Ecological Society of Japan, Mar 15, 2010–Mar 20, 2010, Tokyo. (in Japanese)
- Tomoaki Itayama Aquatic environment and new technologies in Japan. The second International Conference with the Subject: Attaining Security of Fisheries and Aquatic Resources. , Dec 08, 2009–Dec 10, 2009, Maejo University, Chiangmai Thailand. Key note presentation.

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**Stage: FR**

**Project No.: C-07**

**Project Name: Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem with an Emphasis on Water Environment**

**Project Leader: INOUE, Gen**

**Research Axis: Circulation**

**URL: <http://www.chikyu.ac.jp/siberia/>**

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### ■ Research Subject and Objectives

Siberia is one of the areas where global warming will be most evident. Perceivable changes in the ecosystem and the cryosphere, such as the increase of winter temperature, shift up of snow melting season, or, snow precipitation increase, are expected. They have already been reported in recent years. Such climate changes will cause the long-term change of permafrost dynamics, vegetation dynamics, water cycle, carbon cycle, and consequently the positive feedback to the climate change. Especially, the impact of climate change appears drastically in regional scale. The regional climate change damages to the agriculture, forestry, stock farming, and social infrastructure such as buildings and roads through the flood and weakening of ground. We observed the decline of forest due to the humidification of soil, the damage to the forest due to the insect pest as they come to serve through a winter, and the exposure of permafrost due to the grooving of land by flood called as "Ovlahgi".

This research project seeks to elucidate three aspects from both the natural and the human social science perspectives. These three points are (1) the characteristics of the water and carbon cycles, including the driving forces of their annual variation and predictions into the near future, (2) the capability of multi-ethnic population to adapt to the changes who have the historically unique social systems, and (3) the feedback of water and carbon cycle changes and the people's activities to the climate.

### ■ Progress and Results in 2009

In this fiscal year, several sub-group meetings and a domestic workshop with all Japanese members participated were held. In summer, more than half of Japanese members visited Russia to discuss the cooperation and to get information or data.

The activities of each group are as follows:

#### 1) The Siberia bird's eye group (Group 1)

- Flood due to river ice jams in the Lena River was inspected from Landsat satellite data. Timing, water level, and the flow rate of the river ice blocks were estimated.
- Studies of carbon cycle have been started using ASTER and MODIS satellite data by means of BEAMS algorithm. Atmospheric carbon dioxide and methane concentrations derived from GOSAT satellite were tried to use independently in the algorithm.
- Strategy to use the GOSAT data to retrieve sink and source distribution in Siberia has been discussed. A research scientist was assigned to do this job.
- Since forest fires are expected to increase in Siberia, the use of GOSAT data to identify the emission rate of carbon dioxide and methane has been discussed.

#### 2) The water cycle and ecosystem interactions study group (Group 2)

- Understanding the responses of the forest ecosystem to the past (100 year schedule) climate change were started using isotope analyses of tree rings.
- A new monitoring tower was successfully constructed and meteorological / hydrological measurements

were started at Ust' Maya, located around 500 km to the south-east of the existing monitoring tower at Yakutsk. Because annual precipitation at the new site is 1.5 times greater than that at Yakutsk, we can compare the surface fluxes of heat, water vapor, and carbon dioxide to detect forest ecosystem responses in conjunction with precipitation amount.

- Estimation of the Lena River discharge using a hydrological cycle model, in which land surface models and runoff models combined, was carried out.

### 3) The human ecology group (Group 3)

- Main task of the influence of global warming on the society was confirmed in the sub-group meeting.

- Field studies revealed that availability of drinking water (stored as ice in winter), availability of bio-fuels (mainly wood), pasture, land productivity, and patterns of animal reproduction for huntings are changing.

- The exposure of permafrost due to the grooving of land by flood called as "Ovlahgi" was investigated with the research group 2 and with a researcher of the Melnikov Permafrost Institute, Siberian Branch of the Russian Academy of Sciences.

- It was revealed that the number of wild and domestic reindeer has dramatically declined in recent years. Mounting devices on wild reindeer were prepared to monitor reindeer tracks using satellite positioning systems. The problem of data collection was discussed with Russian partners.

### 4) Common research targets

- At the domestic workshop held from 5 to 6 December 2009, fruitful discussion of whole groups were held and the common research targets were focused on the water and cryospheric environment changes related with the frequent flood.

## ○Co-Researchers

- ◎ INOUE Gen ( Research Institute for Humanity and Nature, Professor, Management of Project )
- YAMAGUCHI Yasushi ( Nagoya University, Professor, Analysis of the changes in the land cover using satellite data )
- SASAI Takahiro ( Nagoya University, Assistant Professor, Analysis of carbon exchanges using the terrestrial biosphere model )
- MAKSYUTOV Shamil ( National Institute for Environment Studies, Chief Researcher, Carbon budget estimation from GOSAT and other observation data )
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- ALEXANDROV Georigi ( National Institute for Environment Studies, NIES Fellow, Impact of global warming )
- KANZAWA Hiroshi ( Nagoya University, Professor, Scenario of global warming in Siberia )
- SAKAI Tohru ( Research Institute for Humanity and Nature, Researcher, Remote sensing )
- KOBAYASHI Nakako ( Research Institute for Humanity and Nature, Researcher, Data analysis of GOSAT to evaluate CO<sub>2</sub>/CH<sub>4</sub> emission from wild fire )
- KIM Heonsook ( Research Institute for Humanity and Nature, Researcher, Inverse model analysis of GOSAT data )
- OHTA Takeshi ( Nagoya University, Professor, Analysis of water energy and carbon cycles in forests, water balance analysis in a basin scale )
- HIYAMA Tetsuya ( Nagoya University, Associate Professor, Analyses of sub-surface water and basin-scale water budget )
- KOTANI Ayumi ( Nagoya University, Assistant Professor, Analysis of atmospheric boundary layer and forest responses to environmental changes )
- SUGIMOTO Atsuko ( Hokkaido University, Professor, Reconstruction of past changes in environment and vegetation activity )
- KODAMA Yuji ( Hokkaido University, Assistant Professor, Analysis of snow accumulation processes )
- YAMAZAKI Takeshi ( Tohoku University, Associate Professor, Analysis of land surface processes using a land surface model )
- YONENOBU Hitoshi ( Naruto University of Education, Associate Professor, Reconstruction of past tree

- grow rate and past climate )
- HATTA Shigemi ( Tomakomai National College of Technology, Associate Professor, Runoff analyses for continental-scale river basin )
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- OKUMURA Makoto ( Tohoku University, Professor, Survey and analysis of the history and technology of transportation in East Siberia )
- FUJIWARA Junko ( Research Institute for Humanity and Nature, Researcher, Cultural anthropology focusing to shamanism )
- YOSHIDA Atsushi ( Chiba University, Professor, Analysis in Relationship between Subsistence System Patterns and Environmental Changes in West Siberia )
- NAKATA Atsushi ( Hokkaido Museum of Northern Peoples, Curator, Analysis in Relationship between Subsistence System Patterns and Environmental Changes in Southern Siberia )
- IKEDA Tohru ( Hokkaido University, Professor, Animal resource use and environmental analysis in Eastern Siberia )
- TATSUZAWA Shiro ( Hokkaido University, Assistant Professor, Ecological study of wild/domestic reindeer in Eastern Siberia )
- EHARA Sayuri ( Hokkaido University, Ph.D Candidate, Environmental recognition of Sakha people in Eastern Siberia )
- IGNAT' EVE Vanda B. ( Humanitarian Research Institute, Sakha Republic Science Academy, Professor, Sociological survey and relational analysis of society and development in Sakha Republic. )
- SARDANA Boyakova ( Humanitarian Research Institute, Sakha Republic Science Academy, Professor, History of Infrastructure and Transportation System in East Siberia )
- NAGAYAMA Yukari ( Research Institute for Languages and Cultures of Asia and Africa, Tokyo, Post-doctoral researcher, Environmental recognition of native people in Eastern Siberia )

### ■ Future Themes

Climate change and social change intersect in complex ways and are often difficult to predict. We believe that the human dimension of climate change in Siberia is an important factor, because human reaction to changing environments has the potential to exacerbate, or perhaps mitigate, negative impacts. Analysis of difference in social response to environmental change will improve understanding of social-ecological fragility and vulnerability.

**Stage:** FR

**Project No.:** D-02

**Project Name:** A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago

**Project Leader:** YUMOTO, Takakazu

**Research Axis:** Diversity

**URL:** <http://www.chikyu.ac.jp/retto/retto.htm>

## ■ Research Subject and Objectives

### *Research objectives and background*

The Japanese Archipelago extends over 3000 km from North to South, and includes subarctic, cool temperate, warm temperate and subtropical climatic zones. It is evident that, even during the global environmental changes that have taken place over the past 100,000 years, these various climatic zones were present. As a result, the characteristics of the natural environment and the human subsistence activities within the Japanese Archipelago varied greatly, as did the relationships between nature and human activity. Under the influence of climatic change and human activities, the distributions of individual species of plants and animals in the Japanese Archipelago and its surrounding land masses have been constantly changing. Populations of plants and animals have repeatedly divided, expanded and diminished in response to changes in the availability of suitable habitat. Where suitable habitat was not available, the species became extinct.

The knowledge and skills that humans have developed concerning individual species can be considered to contain both the idea that biological resources should be used in a sustainable way, and the desire to harvest without fear of exhausting the resources. Although ethnological research has highlighted phenomena such as public management of lands and resources, and environmental preservation through limited harvest, it is still unclear when, in which region and among whom the philosophy of preservation was put into practice, or under which social conditions it became an influential way of thinking. Throughout the period of human habitation, the Japanese Archipelago has been blessed with a warm climate and abundant rainfall, and consequently abundant biological resources. But what is the history of overuse and exhaustion of those resources? And how did individual species fare in this historical process? These are the central issues of the present project.

The three main problems to be investigated here are as follows.

- 1) How did new subsistence/economic systems (human-nature relationships concerning food, shelter, clothing, tools, fuel, fodder, fertilisers, medicine, rituals) emerge and spread?
- 2) How were these subsistence/economic systems maintained, and how and why did they end? What kind of social system (social structure, economic foundation, system of spatial organisation, technical system, perception of nature) supported the subsistence/economic system, and, after it ends, how does the social system change?

What becomes of the biological resources that were connected to the system after it ends? Do they become entirely extinct or remain as relics?

Significance as a RIHN project

(1) Reconstructing Japanese history from an unprecedented point of view in the following three respects.

1) Taking the climatic changes over the last tens of thousands of years as an axis, the project will examine both the history of the living organisms and human history, interpreting history as the sum total of all human-nature relationship vectors in all the periods (for example, the *Satoyama*, a traditional rural agro-ecosystem which has established in early modern Japan).

2) By comparative analysis of the social and economic factors that shaped and supported the human-nature relationships in each of six climatically and historically different regions of the Japanese Archipelago, the project will explicate the connections between those regions. At that we understand the

present-day biota in each of the regions as a result of the history of the division, relocation and local overall extinction of species. 3) From the point of view of human ecology and using materials such as archaeological remains, historical records, and oral tradition, we will attempt to reconstruct the network of natural resource usage in each of the regions in each period. Based on the results of this analysis, we aim to identify the main cause of change in human-nature relationships, and to verify the extent to which the concept of using biological resources in unsustainable ways existed in each period.

(2) Building a theoretical method for reconstructing the history of human beings based on the interaction with the environment using a trans-disciplinary approach. The project attempts to establish a new research method, which can be applied in other regions, by explicating the mechanisms underlying human culture and environmental issues through an approach which is wide, both in its time and space scale, and which takes into account both the impact that natural environment has on the formation and change of human cultures, and the influence that human activities exert on the natural environment.

(3) Proposing some guidelines for avoiding future threats to the environment. By understanding the long-term impact that human activities have on the natural environment through the change in subsistence/economic systems, it is possible to predict the future environmental dangers, e.g. the loss of biological diversity, and to propose a realistic policy for handling them.

### ■ Progress and Results in 2009

Outcomes of the project as a whole

- 1) A series of chronological charts of environmental history for each district is being compiled from epoch-making events on environmental issues and policy changes on resource managements. It will be completed by adding data of estimated vegetation changes (based on pollen analysis) and population change (based on historical demography). More than 6000 chronological data were compiled as a database in Hu-Time (time-sequence data base).
- 2) The word "wise use" has been examined from various aspects in several workshops. Consequently, it is defined as knowledge and skills which have been able to use the regenerable natural resources without exhausting, and to obtain ecosystem services (provisioning, regulating, cultural, and supporting, *in sensu* Millennium Ecosystem Assessment (2005)) in sustainable ways. Examples of "wise use" and "unwise use" from each district are being sorted out and categorized by identifying which multi-layered governance (e.g. community, local government, national government, international organization) took an initiative role, and according to what kind of incentive it concerned to. Each chronological datum was notified as a character of a particular layer of environmental governance.
- 3) Paleo-ecosystem WG and Plant geography WG held a cooperative workshop to combine each achievement. One of their outcomes is to identify the refuges for warm temperate plants and cold temperate plants in Last Glacial Maximum. The results were presented in a symposium of Japanese Society of Botany. Based on the discussion then, an estimated vegetation map in Last Glacial Maximum in Japan Archipelago (including Sakhalin) is now preparing for publication.
- 4) Analyses on old bones have been conducted, focusing to the comparison among Jomon period (high self-sufficiency, by hunting and gathering), Edo period (high self-sufficiency, by developed agriculture with national-wide trade) and Present (low self-sufficiency, food supported by international trade). In Jomon period, three human populations; Hokkaido, Honshu-Kyushu, and Okinawa were recognized as different groups based on dietary: Hokkaido population depended on sea mammals or fish in high trophic level; Honshu-Kyushu population depended on C3 plant materials; and Okinawa population depended on fish and mollusks in lagoon. Even in Edo period, three different groups still existed. But those differences have disappeared in the Present population.

Outcomes of each working group

- 1) Paleo-ecosystem WG: Data of pollen analysis in Japan from various authors are being compiled to register in Global Pollen Database. Comparative pollen analysis is undergoing dated back to Last Interglacial Period in Lake Biwa, Kamiyoshi Basin, and the Osaka Group in Kinki region, and revealing the human



activities and vegetation changes. Symposia were held in the annual meetings of Ecological Society of Japan and of The Japanese Association of Historical Botany.

2) Plant geography WG: Plants from various climate zones were selected and analyzed by DNA makers. Especially, nuclear DNA markers have successively developed on *Persea thunbergii* as a climax species and *Zanthoxylum ailanthoides* as a pioneer species in warm temperate zone where less information is available.

3) Old human bone WG: Stable isotope analysis on present human based on hair was conducted to reveal the more-dependency on meats than on fish, and the extreme vegetarian lifestyle for some subjects. Also, stable isotope analysis of the collagen from old human bone of Edo Period revealed the considerable regional variations of food intake: from coastal fish to millets which produced in slash-and-burn cultivation.

4) Sakhalin WG: The locality known as Cyurui where molartooth of Naumann's elephants (*Palaeoloxodon naumanni*) were excavated 30 years ago was re-excavated to obtain environmental proxy as pollen and tephra.

5) Hokkaido WG: Documents, either official and private, in Shiribeshi region were examined to study the history of herring catch and destruction of forests owing to firewood and boiling fish. Governmental policy on resource managements in historical context is being analyzed.

6) Tohoku WG: The local extinction of large mammals, wolves, boars, monkeys and deer was studied based on old documents to reveal the year of extinction and its presumed reason. The present-absent map of monkeys in Edo Period, Meiji-Taisho Era, Showa 30s, the beginning of Heisei, and present in whole Tohoku region has completed.

7) Chubu WG: Documents in Edo Period were analyzed on the managements of *Osutaka-yama* (a area of the protected forest for rearing young hawks which provide to lords used for hunting birds). A lot of letters, which shows the conflicts between people who obtained the benefits from young hawks and people who wanted to log trees, was discovered.

8) Kinki WG: History of forests which have been providing timbers to old capitals (Nara, Kyoto, Osaka and others) were studied, and the exhausting of large trees, conflicts between lords and villagers, and the developments of transportation were related to each other. Domestic use of timber as housing in a village was studied by breaking down an old house, and the size and species of each timber were analyzed intensively to reveal the forest use surrounding the village.

9) Kyushu WG: Fire which maintains grassland in Aso and Kuju was analyzed by documents which recorded the ceremony of lord's hunting by firing. Also, a boring core analysis on pollen, tephra, plant opal revealed that the fire and grassland was observed before Akahoya tephra (ca. BP 6300).

10) Okinawa WG: Excavation of bone accumulation and documental works revealed that the extinction of dugong (*Dugong dugong*) in Yaeyama Islands was occurred by over-killed in Meiji Era, after the end of sustainable managements by Shuri Dynasty which monopolized the resource use.

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### ■ Future Themes

- 1) We will complete the chronological data base used by Hu-Time.
- 2) We will complete a scheme of socio-ecological conditions which discriminate whether they lead sustainable use of regenerable resource or not.
- 3) We will publish 6 volumes of Japanese books on Japanese Environmental History "Japanese Nature

modified by Human Activities” . Over 90 papers were already written by project members.

4) We will present our results and conclusion in RIHN international symposium which will be held in October, 2010 (five or six related papers will be published as one volume in RIHN series in English by Springer) as well as a satellite program of CBD (Convention of Biodiversity) COP10 in Nagoya.

5) We will organize several workshops and symposium for local people.

## Books

### 【Authored/Co-authored】

- Kojima, K. 2009 From Emishi to Ainu. Yoshikawa-Kohbun-kan, Bunkyo, Tokyo, 181pp. (in Japanese)

## Editing

### 【Editing / Co-editing】

- Ankei, Y., Moriguchi, M. (ed.) Feb, 2010 Grace from Paddy Fields. Border Ink, Naha, Okinawa, 110pp. (in Japanese)
- Hayaishi, S., Toguchi, K. (ed.) Feb, 2010 Grace from Sea and Mountains. Border Ink, Naha, Okinawa, 110pp. (in Japanese)
- Ikeya, K. (ed.) 2009 Questions from the Environmental History: What is the Symbiotic Relation between Human and Nature?. Iwanami-shoten, Chiyoda, Tokyo, 367pp. (in Japanese)

## Papers

### 【Original Articles】

- Yumoto, T. Mar, 2010 Why the Japanese Archipelago is one of biodiversity hotspots?. *Seibutsukagaku* 61 :117-125. (in Japanese) (reviewed).
- Miyabuchi, Y. and Terada, A. 2009 Subaqueous geothermal activity revealed by lacustrine sediments of the acidic Nakadake crater lake, Aso Volcano, Japan. . *Journal of Volcanology and Geothermal Research* 187 :140-145. (reviewed).

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**Stage:** FR

**Project No.:** D-03

**Project Name:** Human Life, Aging and Disease in High-Altitude Environments: Physio-medical, Ecological and Cultural Adaptation in “Highland Civilizations”

**Project Leader:** OKUMIYA, Kiyohito

**Research Axis:** Diversity

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### ■ Research Subject and Objectives

#### Research Objectives:

We intend to explore new perspectives regarding how people live in high-altitude environments where oxygen levels are low and natural resources are limited. We focus on aging problems and lifestyle-related diseases because we regard these as manifestations of global environmental issues in the human body. We aim to clarify “highland civilization”, as defined by ecological and cultural adaptations to high-altitude environments, physiological adaptations, and how recent changes in lifestyle have affected quality of life (QOL) amongst the elderly. We also propose a model of human-nature interactions in “highland civilization.”

#### Background:

In humans, acute lack of oxygen causes irreversible brain damage within five minutes. In highland areas, humans have adapted to the physiological, ecological and cultural challenges of high altitude environments, which include low oxygen levels and scarce food sources, over many generations (Aldenderfer 2003) (Baker 1978) (Beall 2006) (Rivera 2007). “Highland civilization” embodies both ecological and cultural adaptations and it has been reported that elderly highlanders have a high subjective QOL (Yamamoto 2008) (Matsubayashi 2009). In recent decades, modern lifestyle changes have impacted highland life. Whilst highland life has become more convenient with increased food supplies, it is estimated that lifestyle-related diseases such as myocardial infarction or diabetes will increase as a result. Any increase in cardio-respiratory disease may have greater impact in a low oxygen environment. In this project, we will study the influence of these lifestyle changes over several decades on QOL among elderly highlanders.

#### Significance for “Global Environmental Issues” :

Environmental changes associated with human activities are actualized on a global scale. Improvements in diet and medicine have increased the average life span, and with this, an increase in age-related diseases including lifestyle-related diseases. Lifestyle-related diseases are age-related diseases influenced by lifestyle, such as eating habits, activity level, sleep patterns, smoking and alcohol consumption. Reconsidering lifestyles that encourage lifestyle-related diseases may be incidentally coupled with rethinking lifestyles that impact the environment, such as activities that may contribute to pollution and global warming.

This research explores a fundamental message regarding global environmental problems based on aspects of lifestyle-related diseases and QOL in the elderly. Our project is compatible with RIHN’s mission to integrate the humanities and science by investigating QOL, lifestyle and environments within various disciplines, including geography, agriculture, anthropology, meteorology, ecology, economics and medicine. The Himalaya-Tibet area is the strategic investigation site. In 2007, the IPCC reported that this area exceeds the global average for temperature increase and the severe glacial retreat is globally important. Additionally, the decreasing water supply to the lower stream is an additional concern. We have set an automated weather station (AWS) in Ladakh and started providing information to the public.

### ■ Progress and Results in 2009

#### a) Outcomes of the project as a whole

1) Changes in lifestyles under pressure from economic changes have brought about increases in the

prevalence of lifestyle-related diseases and change of aging phenomena.

- 2) Increase in the prevalence of diabetes mellitus was strongly associated with increases in hemoglobin levels caused by adaptation to hypoxia
- 3) Lifestyle-related diseases and aging are influenced by the interrelationships between long-term adaptation to the environment and recent use of the environment, accumulated in the human body.
- 4) High subjective QOL assessments were found in Tibetan people notwithstanding higher prevalence of disabling conditions compared with Japanese populations.

#### **b) Outcomes in the three study agenda streams**

##### **(1) To explore how humans have adapted to high-altitude environments physiologically, ecologically and culturally.**

Oxygen saturation, hemoglobin concentration (the primary conveyer of oxygen in the blood), Cardio Ankle Vascular Index (CAVI) (atherosclerosis), pulmonary blood pressures (as indicators of dilatation and blood flow to promote oxygen circulation), respiratory functions (intake of oxygen) and oxidative stress were examined as indicators of physiological adaptation to thin air. Those factors were strongly associated with prevalence of lifestyle-related diseases and acceleration of aging (Okumiya 2009) (Matsubayashi 2009) (Okumiya 2010, in press) (Sakamoto 2009).

Qinghai, Ladakh and Arunachal Pradesh are three areas with different ecological and socioeconomic conditions and patterns of livelihood. All are in the Himalaya-Tibet region: (i) the Ladakh region in India, where people live in oases in the desert with agro-pastoral linkages but where the community is now changing under the increasing influence of a market economy. Many young people are moving to rural areas. Altitude: 2900-4600 m asl. (ii) Arunachal Pradesh State in India, where villages are surrounded by forest and live by prototypical subsistence farming with the utilization of natural resource in different altitude under less influence of a market economy. (Ando, Inamura, Kosaka. Living in Himalaya 2010 in press) (Figure 2) Movement of people to urban area is scarce. (200-4000 m asl). (Takeda 2007) (iii) Qinghai Province in China, where the highland grasslands support both the agricultural Han people and the pastoral Tibetan people (Haiyan county) (3000-3700 m asl). Yushu in Qinghai is the trade center in the wide pastoral area and the lifestyle here has changed by urban settlement (Okumiya 2010, in press).

We equipped an automatic weather station at Domkar village and installed 5 temperature/humidity sensors in the Ladakh area from June 2009. Variations in local weather conditions were clarified. We developed a fine resolution climatological profile in the region using a combination of these local meteorological data and satellite data (Figure 3) (Yatagai 2009).

##### **(2) To determine the health status of elderly highlanders, and explore possible factors associated with lifestyle-related diseases in this population.**

Han people had more hypertension and obesity than Tibetan people, associated with higher hemoglobin concentrations in Han Chinese, regarded as different ways of adapting to hypoxia. Even in Tibetan people there was a strong association between glucose intolerance (diabetes/pre-diabetes), obesity and polycythemia (increased hemoglobin) – an indicator of hypoxic maladaptation (Figure 4). There were higher prevalences of atherosclerosis and high pulmonary blood pressures in people with higher hemoglobin in Ladakh. There were also higher prevalence of obesity and hypertension in people with higher hemoglobin in Yushu. (Okumiya, 2010 in press)

The prevalence of glucose intolerance and hypertension were much higher in Yushu than in Haiyan in Qinghai. Changes in lifestyle patterns by settlement and urbanization may accelerate increases in prevalence of lifestyle-related diseases.

The prevalence of diabetes in Ladakh was as low as in Haiyan but impaired glucose tolerance (pre-diabetes) was as high as in Yushu and higher than in Haiyan. The thrifty gene/phenotype hypothesis (Schulz 2006) (Okumiya 2007) may help to explain some of the differences seen. In Ladakh, we found that there were higher rates of diabetes in people with high economic status and change of food habit. In



Himalaya regions at high altitude, after rapid changes in lifestyle, long adaptation to hypoxia and low nutrition may have accelerated the onset and aggravation of diabetes. This is “the Himalaya model of lifestyle-related diseases” – “diabetes acceleration hypothesis” -. (Okumiya, 2010 in press)

**(3) To investigate the impact of modern developments over the past 50 years on lifestyle and environment at high-altitudes and how these changes affect the QOL of elderly highlanders.**

People with glucose intolerance had high risk of losing independence in activities of daily livings, which is a very important contributor to subjective QOL scores. Self-rated QOL was higher in Tibetan people in rural Haiyan people than in people in urban Yushu. Even elderly people in Yushu had higher QOL scores notwithstanding higher prevalences of disabling conditions than their counterparts in Japan. High subjective QOL scores were associated with Tibetan Buddhism, family relationships and living conditions in the community. The healer of Tibetan medicine takes responsibility for primary care of sick people especially in Arunachal Pradesh. Social networks and Tibetan Buddhism may support high QOLs in the Highland Civilizations. Such mechanisms should be further explored.

In 2008, field surveys were conducted in the Ladakh region in India, Qinghai Province in China and Arunachal Pradesh State in India. In the Ladakh region, we described changes in lifestyle and environment, and the well-being of the elderly in the Domkhar area. Although the incidence of diabetes among the local people was low, it is likely that monks have a high incidence of diabetes. The well-being of some elderly highlanders was worsened by diseases that could be treated if the necessary equipment was provided. In the Haiyan County, Qinghai Province, we found a clear difference between Han people and Tibetan people in terms of physiological adaptations to a highland environment, lifestyle-related diseases and well-being of the elderly. Our results showed the high possibility of diabetes incidence according to lifestyle change in highlands, which suggested the importance of preventing this disease in highlands. Although ADL of the elderly in Qinghai Province was lower than in Tosa, Japan, the subjective satisfaction of daily life, with the exception of health, was higher in Qinghai Province than in Tosa. In Arunachal Pradesh State, we recorded the altitudinal gradients of vegetation and land-use systems from the valley bottom at 2000 m to the hilltop at 4000 m, and described characteristic subsistence of local communities. Relationships between the natural environment and subsistence systems, and the health status of the local community will be studied in the following year.

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## ■ Future Themes

In Qinghai in China, medical survey was carried out intensively and outputs were obtained more than expected, but cultural and ecological surveys are delayed by political reasons. By continuing the medical following-up and changing from hospital based to community-based checking, we will proceed to cultural and ecological examinations more smoothly with the supports of the local researchers. While, collaborative study will be continued in individual and village levels in Ladakh and Arunachal more intensively and will be started in Bhutan. Outputs by cultural and ecological examinations are somewhat delayed compared with medical outputs. As the medical outputs were obtained in the three field sites in Himalaya/Tibet, for example Himalaya model of lifestyle-related diseases, the collaborative examinations will be focused and progressed more intensively with cultural and ecological teams.

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**Stage: FR**

**Project No.: D-04**

**Project Name: Collapse and Restoration of Ecosystem Networks with Human Activity**

**Abbreviated Title: Ecosystem Networks**

**Project Leader: YAMAMURA, Norio**

**Research Axis: Diversity**

**URL: <http://www.chikyu.ac.jp/yamamura-pro/>**

**Key Words: Biodiversity, Complex adaptive system, Ecosystem networks, Minimization of uncertainty, Simulation, Social networks**

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## ■ Research Subject and Objectives

### Research Objectives

This project proposes a new concept of “ecosystem networks” that links sociological, economic, and ecological issues to solve environmental problems, especially the problem of ecosystem deterioration. The project aims to (1) clarify the mechanisms resulting in the collapse and deterioration of ecosystems and then (2) facilitate restoration and maintenance of healthier ecosystems with rich biodiversity and ecological functions while minimizing instability and uncertainty in the long term over a wide area. In addition, it will (3) provide new approaches in environmental science by extracting the characteristics of interactions between human societies and the environment, and changes in these interactions.

<Background>

Most ecosystems on the planet have been seriously degraded by human activities and are now in critical condition. This problem, which has led to the loss of biodiversity and ecosystem function, is widely accepted as one of the most serious global environmental problems. Nevertheless, most research on the issue has focused only on the direct consequences of human impacts. The collapse and deterioration (destabilization and decrease in sustainability) of ecosystems by human activities via interactions within the ecosystem network, including indirect and cascade effects, have rarely been considered. In addition, few studies have taken a social science perspective, although environmental problems are one of the consequences of the interactions between nature and human societies. The effects of social structures (e.g., changes in and globalization of economic, political, cultural, and social networks mediated by direct interactions and distribution and information systems) on ecosystems, and the effects of the resultant collapse and deterioration of ecosystems on human societies, have rarely been investigated in depth.

Unless we take complex interactions between human societies and ecosystems into consideration, we may underestimate or misunderstand the impacts of human activities on ecosystems, and thus may not implement effective measures. Therefore, in this project we propose a new concept of “ecosystem networks” to facilitate understanding and management of environmental problems.

<Need to conduct the project at Research Institute for Humanity and Nature (RIHN)>

This project combines network aspects in ecology and social sciences, which have been studied independently until now. The project framework enables us to investigate the effects of the structure of society (economic, political, and cultural networks) on the ecosystem changes caused by human activities and the effects of ecosystem changes on social structures. Such projects which explore global environmental problems from the perspective of human-ecosystem interactions are impossible within the conventional framework of distinct research fields. The approach of this project is unique, even at the Research Institute for Humanity and Nature (RIHN), but its direction is in line with a central tenet of RIHN, which holds that the root of so-called global environmental problems lies in human culture in the broadest sense, that is, the fact that humans wish to control nature. The project would be difficult to conduct anywhere other than at RIHN.

<Research methods>

The most important concept of this project is the “ecosystem network,” which has a nested structure

involving interactions among and within subsystems, including human societies. Most terrestrial ecosystems affected by human activities are a mosaic of different land covers. In the ecosystem network, the subsystems (e.g., primary forests, secondary forests, lands for shifting cultivation) form an interacting network. In addition, each subsystem consists of networks of biological interactions. Moreover, we place human society as a subsystem within the ecosystem network and regard human activities as part of the interactions within the ecosystem network.

The research areas for this project are a tropical rainforest in Southeast Asia (Sarawak, Malaysia) and a grassland in Central Asia (Mongolia). For a comparative investigation, it is essential to establish more than one research area to obtain generalizable results and discussion. In both study areas, terrestrial ecosystems are being devastated by the surge in Asian economies associated with the recent dramatic economic growth of China. Nevertheless, the lives of many people depend on natural ecosystems, and the destruction of these ecosystems results directly in dramatic changes in their lives. While the economies of both regions have similar frameworks, their ecological characteristics, such as the regeneration time of vegetation and the distribution of biomass in the ecosystems, differ.

For thousands of years, livestock have extensively grazed the grasslands of Mongolia. In recent decades, however, overgrazing by livestock, especially by the increased number of goats raised for the production of cashmere for export, has caused a serious problem in the region. Overgrazing results in excessive vegetation removal from the soil surface, alkalinizes the soil, and facilitates the growth of inedible plant species.

In Sarawak, ecosystems have changed dramatically in the last 100 years; land use has shifted from extensive agriculture in forests by indigenous people to logging in natural forests as a source of timber for export, and then to oil-palm plantations. The expansion of these plantations is thought to have brought about a sharp decrease in biodiversity and caused a reduction in or loss of ecosystem components essential to the indigenous people.

In both Sarawak and the grasslands of Mongolia, we are conducting research in three core steps: (1) Identification of area-specific problems and hypothetical ecosystem network structures closely related to the problems; (2) confirmation and evaluation of the hypothetical links through field surveys, remote sensing, literature surveys, and modeling; and (3) scenario analyses by building a few scenarios with different network structures, and evaluation of predicted ecosystem and social status using various indices. By integrating these results, we will (4) establish a general conservation theory based on the concept of ecosystem networks. The core of the theory will indicate which network structures are likely to lead to environmental problems and how we can restore the network to mitigate the problems.

<Organization>

The project is composed of three groups: one for the theoretical and modeling study and one group each for the field studies in Mongolia and Sarawak. To facilitate cooperation and discussion irrespective of research field, we do not divide the members of the field teams into subgroups; instead we have supervisors with a background in the social sciences and ecology for each study site. See the attached list for core and other members and their roles in the project.

## ■ Progress and Results in 2009

(1) Identification of environmental problems and hypothetical ecosystem network structure closely related to the problems

<Mongolia>

We found the most serious environmental problem in Mongolia to be increased degradation of pastures in areas where sustainable nomadism is difficult. Pasture degradation has been caused by overgrazing by livestock as a result of increased numbers of livestock, concentrations of livestock around cities and roadsides, and reduced migration distances of herders since the introduction of a free-market economy following democratization in the early 1990s (Fig. 1A).

In the forest-steppe zone, the overgrazing leads to dominance by grazing-tolerant plants and soil alkalization, which prevent the recovery of good pasture unless livestock grazing pressure is dramatically reduced. In the steppe and dry steppe zones, overgrazing results in the decline or local

extinction of shrubs in areas surrounding herders' places of residence and villages. Climatic drying also accelerates pasture degradation.

<Sarawak>

In Sarawak, we found the most serious environmental issues to be the declining availability of forest resources for use by indigenous people and the related reduction in biodiversity caused by the expansion of plantations. Our field research revealed that oil palm plantations cause degradation of ecosystem services received by local indigenous people, such as reduced availability of and changes in hunted animals, and loss of lands for shifting cultivation. Such problems may be associated with depopulation (Fig. 1B).

We used a geographical information system (GIS) to map the expansion of oil palm plantations and established datasets to analyze conditions associated with the development of plantations. We also gathered basic information about other government policies that may have large impacts on the lives of local people, such as the Sarawak Corridor of Renewable Energy (SCORE), which involves the construction of many dams and hydroelectric power stations in various regions of Sarawak.

## (2) Confirmation and evaluation of hypothetical links

<Mongolia>

We studied the mechanisms leading to concentrations of livestock and reductions in nomadic distances based on results of a questionnaire and field surveys. High concentrations of goats around cities and roadsides were due to the high prices obtained for cashmere in these locations. The economic state of herders also affected the degradation level: herders with a small number of livestock tended to increase their number of goats and decrease nomadic distance, both of which contribute to pasture degradation.

One important hypothesis about water cycling in the study area is that the surrounding forests and shrubs help maintain soil moisture in the pastures (Fig. 2). To test this idea, we continuously measured precipitation and soil moisture. Our data do indicate that forests of the forest-steppe zone help maintain soil moisture for a long period of time after precipitation while pastures do not. Therefore, in addition to overgrazing, deforestation by foresters and herders and destruction of tree seedlings by livestock may be serious problems that should be regulated for pasture conservation. On the other hand, in steppe and dry steppe zones, we found that shrubs, which are not the preferred food of livestock, have an important function; they constantly absorb water from deep soil, and have positive effects on the growth of herbs by controlling moisture. In areas with serious pasture degradation, high livestock density leads to grazing of shrubs, which accelerates pasture degradation (positive feedback).

<Sarawak>

Several factors were found to be responsible for the rapid expansion of plantations in Sarawak. The strongest drivers were the increasing price of palm oil due to the expected exhaustion of fossil fuels and growing demands for edible oils in the United States, India, and China. In addition, the increasing demand for bio-fuels was another important factor.

Our survey revealed that one condition of the rapid development of plantations was alliances of government and big business formed by unofficial money flow and family relationships. This may also lead to tolerance of excessive and illegal deforestation and pollution by developers and conflicts with local communities.

Another factor we have focused on is that changes in indigenous societies facilitate development of lands customarily used by indigenous people. Increases in cash incomes as well as degradation of forests drive more people from the forests to the cities, thus creating a positive feedback cycle of forest degradation. To analyze this hypothesis, we conducted questionnaire surveys in 50 villages along the Rajan and Baram rivers, two major rivers in Sarawak. Preliminary analyses support our hypothesis but additionally revealed that other factors, such as the social capital of each village, also affect the outcome of the feedback (Fig. 3).

## (3) Institutions, indices, and simulation models investigated for scenario analyses

<Mongolia>

We have considered the effects of different systems and institutions, such as the protection and planting of tree seedlings and shrubs, organization of herders' groups for common use of pasture, improvement of road transport services, and the state of development (disordered or controlled) of mining and agriculture, on the conservation and recovery of pastures with forests and shrubs.

To evaluate different scenarios, we will use various social, economic, and ecological indices, such as productivity of pastures and livestock, the price of livestock products, the household income of a herder, land value, the chance of education, income distribution produced by mine and agriculture developments, and changes in the gross domestic product and state budget.

We have begun developing numerical models to simulate the interactions between the migration behavior of herders and vegetation properties. Such a model, together with the process model for plant-soil water interactions, will be integrated into the land cover model (see Section 2) to analyze various scenarios.

<Sarawak>

We have investigated different systems and institutions, such as forest certification, bio-prospecting, and the Reducing Emissions from Deforestation and Degradation in Developing Countries (REDD) program for scenario analyses. We have analyzed the effectiveness of and problems with these systems. For example, bio-prospecting, namely the utilization of bio-resources in tropical forests to develop new medicines, has already started in Sarawak, but the high costs for pharmaceutical companies and the low rewards for traditional knowledge make the system inefficient and unsustainable.

To evaluate different scenarios, we will use variable social, economic, and ecological indices. In the case of tropical forests, biodiversity is one of the most important ecological indices. In addition to examining the effects of local vegetation on species diversity, we also conducted surveys at plots of identical vegetation with different surrounding vegetation to elucidate larger-scale effects. The results of these surveys suggest that the biodiversity of surrounding vegetation has a considerable effect, especially in species-rich primary forests.

We have begun developing land cover transition models to simulate land cover changes for the entire state of Sarawak using existing land cover GIS data and satellite remote-sensing data from the past two decades. From this, the human impacts on land cover changes will be quantified and incorporated into a mesoscale land cover model (see Section 2) with which we will analyze various scenarios.

#### (4) Establishment of conservation theory

We have just started establishing a general conservation theory for ecosystem networks on the basis of concrete case studies from Mongolia and Sarawak. Although the structure of the theory has not been clearly determined, two important points in the general theory have been isolated, i.e., two network effects in the dynamics of socio-ecological systems. The first involves ripple effects that spread through the spatial structure: for example, the migration distances of herders strongly affect vegetation and sustainability, and local biodiversity is strongly influenced by surrounding land cover. The second is positive feedbacks of interactions between ecosystems and human behaviors, leading to rapid changes called regime shifts. For example, a reduction in forest use by inhabitants decreases profits from the forest, leading to further reductions in forest use, and the likely acceptance by inhabitants of commercial logging or oil palm plantations.

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Otoda, Takashi	( Graduate School of Environmental Science, Okayama University, Graduate Student )
Satoh, Takashi	( Graduate School of Life and Environmental Sciences, University of Tsukuba, Graduate Student )
Johan B.Hj. Rahman	( Forest Research Center Sarawak, Technical Officer )
Tamura, Kenji	( Graduate School of Life and Environmental Sciences, University of Tsukuba, Associate Professor )
Nagai, Shin	( Frontier Research Center for Global Change (JAMSTEC), Technical study deputy chief )
Mohammed Mahabubur Rahman	( Graduate School of Agriculture Graduate Course, Kochi University, Graduate Student )
Morinaga, Yuichi	( Graduate School of Life and Environmental Sciences, University of Tsukuba, Graduate Student )
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Tarmiji bin Masron	( University Sains Malaysia, Senior Lecturer )

### ■ Future Themes

(1) Topics for the field researches and data analyses in FY2010-11.

<Mongolia>

- 1) Continuous measurements of climate conditions
- 2) Seasonal production and livestock-grazed biomass of herbs and shrubs
- 3) Relationships among moving distances and other characteristics of farming and the economic and social status of herders
- 4) Economic analyses of different types of livestock farming and other industries

<Sarawak>

- 1) Interactions between indigenous societies and ecosystems by a questionnaire survey
- 2) Characteristics (food web, biodiversity, ecological functions, etc.) of ecosystems under different forest covers, especially in plantations
- 3) Actual and potential economic values of land with different land cover

(2) Scenario analyses

The scenario approach has become popular in recent years. Well-known examples include those proposed by the Intergovernmental Panel on Climate Change (IPCC) for different levels of CO<sub>2</sub> emission, and those proposed by Millennium Ecosystem Assessment. In both cases, each scenario (family) assumes a set of conditions along a particular story line. We will use a similar approach. In the next two years, we will identify scenarios for analysis and evaluate them using different indices. Three provisional scenarios are as follows.

SCENARIOS

1. Business as usual

Mongolia: Land privatization progresses and further declines of trees and shrubs cause degradation of pastures. This causes a serious shortage of grasslands for stock farming and social instability.

Sarawak: A bipolarization of lands into protected areas and monocultures (plantations) causes a shortage of lands for indigenous people and abandonment of traditional cultures. It also causes serious global problems because of CO<sub>2</sub> emissions and loss of biodiversity unique to the region.

2. Infrastructure investment and development

Mongolia: This scenario includes road construction, the introduction of a cold transport system, and building of wells in pastures. These strategies may improve livestock distribution and thus reduce the overgrazing and degradation of pastures currently occurring around roads, cities, and wells because of the high livestock densities in these areas.

Sarawak: This scenario includes road construction and establishment of an efficient system of bio-prospecting. One problem in remote areas is a lack of access to facilities outside of the village where residents can sell their products and send their children to school. Our questionnaire survey revealed that such infrastructure is essential to maintaining a community in a good state. Economic

valuation of traditional knowledge may be another way to promote inheritance of this knowledge.

### 3. Changes in institutions

Mongolia: This scenario includes reinforcement of community units and establishment of protected areas. One problem in Mongolia is the lack of management bodies for pastures. One possible solution is to strengthen local communities and to allow them to manage their pastureland for sustainable use.

Sarawak: This scenario includes a forest certification system and REDD. The effects of deforestation are not included in current evaluations of the use of oil palms to decrease CO<sub>2</sub> emissions. Such oversights often lead to incorrect or inefficient strategies. REDD, a system to calculate emissions from deforestation in developing countries, may partly resolve the problem.

#### INDICES FOR SCENARIO EVALUATION

The following variables may provide useful indices for evaluating the scenarios.

##### 1. Land cover

##### 2. Variables calculated using land cover data

Biomass, carbon sequestration, biodiversity, economic values

##### 3. Variables partly independent of land cover

Traditional knowledge, water availability and quality, population distribution

### (3) Establishment of conservation theory

The key concept of our project is the “ecosystem network,” which has a nested structure involving interactions among and within subsystems, including human societies. The aim of establishing a conservation theory based on the ecosystem network is to determine the causes of environmental problems and to realize what links in the ecosystem network should be adjusted to effectively resolve the problems.

Our studies to date suggest a significant difference in the structures of the ecosystem networks of Mongolia and Sarawak. This difference is based on differences in economic properties for humans in the two ecosystems. In Mongolia, the vegetation itself (grasses) has no direct value for humans; the value is stored in livestock that feeds on the grasses. Therefore, global economics affect the inhabitants’ behavior, leading to overuse of the vegetation and degradation of the grassland. In this case, the effective response to the problem should involve changing the inhabitants’ behavior. On the other hand, in Sarawak, economic value is stored in the vegetation (trees). Therefore, enterprises and governments tend to severely develop the forests, causing both reductions in the amount of forest available to inhabitants and biodiversity loss. The effective response to this problem should involve regulation of enterprises and governments.

The ecosystem network concept may provide useful guidelines for conserving ecosystem networks in other areas where inhabitants depend strongly on natural ecosystems and where the ecosystems are being affected by economic globalization. In other words, one can investigate whether the ecosystem network of a target area is of the Mongolian type or the Sarawak type, or determine the proportional distribution of the two types within a network.

## Papers

### 【Original Articles】

- Fukuda, D., Tisen, O. B., Momose, K. and Sakai, S. 2009 Bat diversity in the vegetation mosaic around a lowland dipterocarp forest of Borneo. . Raffles Bulletin of Zoology . pp.213–221. (reviewed).
- Fujita, N., Amartuvshin, N., Yamada, Y., Matsui, K., Sakai, S. and Yamamura, N. 2009 Positive and negative effects of livestock grazing on plant diversity of Mongolian nomadic pasturelands along a slope with soil moisture gradient. . Grassland Science. pp.126–134. (reviewed).
- Kishimoto-Yamada K., Itioka T., Sakai S., Momose K., Nagamitsu T., Kaliang H., Meleng P., Chong L., Hamid Karim A.A., Yamane S., Kato M., Reid C.A.M., Nakashizuka T. and Inoue T. 2009 Population fluctuations of light-attracted chrysomelid beetles in relation to supra-annual environmental changes in a Bornean rainforest. . . Bulletin of Entomological Research, pp.217–227. (reviewed).

### 【Review Articles】

- Onuma, A. 2009 Biodiversity conservation required - Compatible with economic activities.. *Nihonkeizai-shinbun* 12.29 . (in Japanese)

## **Research Presentations**

### **【Oral Presentation】**

- Kato, Y. The relationship between wild animals and indigenous community in Malaysia: The important relation with bearded pig (*Sus Barbatus*). JSPS support program for improving graduate school education at Millennium Ecological Museum, Sep 03, 2009, Yaounde, Cameroun.

**Stage:** FR

**Project No.:** E-04

**Project Name:** Vulnerability and Resilience of Social-Ecological Systems

**Abbreviated Title:** Resilience Project

**Project Leader:** UMETSU, Chieko

**Research Axis:** ECOSOPHY

**URL:** <http://www.chikyu.ac.jp/resilience/>

**Key Words:** resilience, poverty, social-ecological system, resource management, environmental variability, vulnerability, human security, semi-arid tropics

## ■ Research Subject and Objectives

<Research Objectives>

The objective of this research is 1) to consider impacts of environmental variability on vulnerability and resilience of human activities in the semi-arid tropics; 2) to study factors affecting social-ecological systems and their recovery from shocks; 3) to analyze factors determining ability of households and communities to recover from environmental shocks and the roles of institutions in improving household resilience; and 4) to identify the factors affecting resilience of social-ecological systems and ways in which the resilience of subsistence farmers in the semi-arid tropics to environmental variability can be strengthened.

<Background>

A vicious cycle of poverty and environmental degradation, such as forest degradation and desertification, is a major cause of global environmental problems. This is especially the case in the semi-arid tropics (SAT) including Sub-Saharan Africa and South Asia, where a majority of the world's poor are concentrated. Within the SAT, communities' livelihoods depend critically on fragile and poorly endowed natural resources, and poverty and environmental degradation are widespread. People in these regions depend largely on rain-fed agriculture, and their livelihoods are vulnerable to environmental variability. Environmental resources such as vegetation and soil are also vulnerable to human activities. To surmount these environmental challenges, human society and ecosystems must be resilient to (recover quickly from) environmental shocks. Thus in this project we consider society and ecology as one social-ecological system and empirically analyze its resilience.

<How do you utilize the results of the project to help solving "global environmental issues" ?>

Through data collection, observation and analysis, our research will identify key resilience indicators able to provide ecosystem and resource management options for communities in the SAT. These results will be disseminated through workshops, conferences, working papers and peer-reviewed publications to share information with concerned governmental and non-governmental agencies and groups.

## ■ Progress and Results in 2009

During the FY2006 (PR) we focussed on establishing research collaborations with various institutions in Zambia. During the FY2007 (FR1) we prepared experimental field sites and installed monitoring equipment such as weather stations, on-farm rain gauges and soil moisture measurement devices. Comprehensive household surveys and monitoring of rainfall and crop growth commenced in November 2007. During of the FY2008 (FR2) the first cropping season of 2007/2008 was completed. During of the FY2009 (FR3), the second cropping season of 2008/2009 was completed and harvest season of the third cropping season 2009/2010 is expected to start in March/April 2010.

- For an empirical approach to resilience, we focus on the mechanism and the speed of recovery in food consumption and livelihoods of agricultural households after shocks such as drought and flooding (Figure

2). Theme 1 measures the level of decline of agricultural production through maize yields. Theme 2 observes the speed of recovery in food consumption, body weight and skinfold thickness. Theme 3 considers qualitatively under what conditions livelihoods do or do not decline, how they recover and the differential coping strategies utilized by households. Theme 4 visualizes the spatial pattern of resource use by agricultural households.

- The field experiment in Eastern Province revealed that pattern of soil nutrients release and weed growth differed according to the duration of cultivation, which in turn affected maize yield. Compared to the first year, more nutrient was released at the initial stage of maize growth and weed grew more rigorously in the second year. As a result, maize yield did not differ in both years. Field experiment in Southern Province suggested that annual variation of maize yield was influenced by topographical position of the fields. Field at the top of the slope had the better yield in the year with much rainfall, while that at the bottom of the slope had the reduced yield in the year with much rainfall.

- The 2007/08 rainfall was extraordinarily heavy, but its damage depends on household and the impact of these rainfall events depends on household characteristics based on the information from our local level precipitation data at the field level. Moreover, our household survey found a significant reduction of food consumption among households who suffered heavy rainfall. The anthropometric measurements, on the other hand, confirm a pattern of seasonal change in body weight.

- Field experiments in the Southern Province suggest that annual variation of maize yields were influenced by topographical context of the fields. In upper terrace (Site C), fields at the top of the slope had better yields in high rainfall years, while fields at the bottom of the slope had lower yields in high rainfall years.

- Based on a GIS analysis of damaged fields during the 2007/2008 rainy season, flood damages are concentrated in poorly-drained fields in lower terrace areas (Site A), steep fields in mid-escarpment (Site B), and valley bottom fields in the upper terrace area (Site C). We also measured the area of damaged fields for each household.

- After floods, farmers responded by replanting maize, shifting from maize to potato and beans, getting cash income from livestock sales, engaging in season activities such as fishery and wage labor to offset a shortfall of income, which indicated various coping mechanisms by affected households.

- We organized resilience seminars and workshops. In August, we held the 2nd Lusaka Workshop “Towards Resilience of Rural Households in Drought-prone Areas” and invited participants from Zambia and neighboring countries. In March, we organized Tsunami Workshop in Singapore.

- Project annual reports, working papers and a Japanese translation of a resilience workbook by Resilience Alliance, are all available at the project web site. [http://www.chikyu.ac.jp/resilience/publication-W\\_e.html](http://www.chikyu.ac.jp/resilience/publication-W_e.html)

- At IHDP2009 Open Meeting in Bonn, two sessions were organized by the Resilience Project. Eight project members presented at the meeting. Also three project members became members of IHDP committee and sub-committee of Science Council of Japan.

## ○Co-Researchers

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- and its succession )
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  - NARISAWA Noriko ( Graduate School of Asian and African Area Studies, Kyoto University, Graduate student (MA), Economic activities of female farmers )
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  - Mulenga, Chileshe ( University of Zambia, Senior Lecturer, Analysis of social behaviors )
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  - MATSUMURA Keiichiro ( Graduate School of Human and Environmental Studies, Kyoto University, Assistant Professor, Land tenure system and rural livelihood )
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  - Lekprichakul, Thamana ( Research Institute for Humanity and Nature, Senior Project Researcher, Household survey and analysis )
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  - YATAGAI Akiyo ( Research Institute for Humanity and Nature, Assistant Professor, Monsoon rainfall analysis )
  - Ranganathan, C.R. ( Tamilnadu Agricultural University, Professor, Economic modelling )
  - Chandrasekaran, B. ( Tamilnadu Agricultural University, Director, Rice production analysis )
  - KUME Takeshi ( Research Institute for Humanity and Nature, Senior Project Researcher, Tsunami impact study )
  - Gheethalakshmi, V. ( Tamilnadu Agricultural University, Professor, Monsoon rainfall analysis )
  - Savadogo, Kimseyinga ( University of Ouagadougou, Professor, Household data analysis )
  - Tom Evans ( Department of Economics, Indiana University, Associate Professor, Agent-based modelling )

## ■ Future Themes

For the next two years of research (FR4, FR5), we plan to conduct the following:

1. While refining the theoretical aspects of resilience, we need to consider the practical applicability of the resilience approach based on the field research.
2. Integration of the research and data should be accelerated for the common goal for analyzing resilience of the farm households qualitatively and quantitatively.
3. For FY2010 and early FY2011 weather monitoring, plot experiments, household surveys, and the accumulation, compilation and analysis of data sets will be continued.
4. The first monitored 2007/2008 cropping season was an abnormal flood year, against which the 2008/2009 cropping season should be compared.
5. Coping strategies of farm households for environmental changes will be analyzed and assessed qualitatively and quantitatively.
6. To provide feedback to the local community we provided rainfall information for the first cropping season 2007/2008 to local farmers. We will continue to do so.
7. We prepare for the RIHN International Symposium and RIHN Forum for FY2011. We also prepare for working workshop for book publication.
8. Collaboration with other international research organizations should be enhanced.
9. The concept of resilience can be applied to other RIHN project as well. We continue promoting inter-project initiatives within RIHN projects and other research groups.

## Papers

### 【Original Articles】

- Yoshimura M., Yamashita M., Okamoto M., Miyazaki H., Ishimoto Y. Oct,2009 Geospatial Information Analysis for Vulnerability and Resilience of Social- Ecological System. *Proceedings of the 30rd Asian Conference on Remote Sensing, TS20-3(CD-ROM)* .
- Yamashita M., Miyazaki H. and Yoshimura M. Oct,2009 Utilization of multi-spatial and temporal data for understanding the village level' s livelihood. *Proceedings of the 30nd Asian Conference on Remote Sensing, TS20-4(CD-ROM)* .
- Kume, Takashi, Chieko Umetsu, K. Palanisami May,2009 Impact of the December 2004 tsunami on soil, groundwater and vegetation in the Nagapattinam district, India. *Journal of Environmental Management* 90 :3147-3154. DOI:10.1016/j.jenvman.2009.05.027. (reviewed).

### 【Review Articles】

- Hanzawa, Kazuo Mar,2010 Use of Dambo Resource and Agricultural Change: 18th Years in a Village of Central Province, Zambia. *Journal of Arid Land Studies* 19(4) :579-583. (in Japanese)

## Research Presentations

### 【Oral Presentation】

- C.R.Ranganathan, Chieko Umetsu, K.Palanisami, Thamana Lekprichakul The impact of climate change on yield and yield variability and optimum land allocation for major crops in Tamil Nadu, India: An econometric approach. JASID 2009 Annual Meeting, Nov 21,2009-Nov 22,2009, Ritsumeikan Asia Pacific University, Oita.
- Yoshimura M., Yamashita M., Okamoto M., Miyazaki H., Ishimoto Y Geospatial Information Analysis for Vulnerability and Resilience of Social- Ecological System. the 30th Asian Conference on Remote Sensing, Oct 19,2009-Oct 23,2009, Beijing China.
- Yamashita M., Miyazaki H. and Yoshimura M. Utilization of multi-spatial and temporal data for understanding the village level' s livelihood. the 30th Asian Conference on Remote Sensing, Oct 19,2009-Oct 23,2009, Beijing, China.
- Lekprichakul, Thamana, Chieko Umetsu Agricultural Drought Analysis: An Oaxaca Decomposition of Malmquist Index. OR51 Annual Conference, Sep 08,2009-Sep 10,2009, University of Warwick, Warwick, UK.
- Lekprichakul, Thamana, Chieko Umetsu, Taro Yamauchi Underweight and Overweight Situation in Zambia:



Logical or Paradoxical?. WEAI 84th Annual Conference, Jun 29, 2009–Jul 03, 2009, Sheraton Vancouver Wall Centre, Vancouver, Canada.

- UMESTU, Chieko Vulnerability and Resilience of Social-Ecological Systems in Zambia. Seminar on Vulnerability and Resilience of African Rural Societies in Semi-arid Areas, May 01, 2009, JICA, Tokyo, JAPAN.
- K. Palanisami, Chieko Umetsu, Takashi Kume, M. Shantha Sheela Impact of Tsunami on the farm households of Coastal Tamilnadu State, India. IHDP 7th Open Meeting, Apr 26, 2009–Apr 30, 2009, World Conference Center, Bonn, Germany.
- Lekprichakul, Thamana Impact of 2004/2005 Drought on Zambia's Agricultural Production and Economy and Subsistent Farmers' Coping Behaviors. IHDP 7th Open Meeting, Apr 26, 2009–Apr 30, 2009, World Conference Center, Bonn, Germany.
- Kajoba, Gear Vulnerability and Resilience of Rural Society in Zambia: From the View Point of Land Tenure and Food Security. IHDP 7th Open Meeting, Apr 26, 2009–Apr 30, 2009, World Conference Center, Bonn, Germany.
- Mulenga, Chileshe Resilience of Rural Households and Communities in the Context of HIV/AIDS and Increasingly Erratic rainfall: Impact on people around Mwami Adventist Hospital, Chipata, Zambia. IHDP 7th Open Meeting, Apr 23, 2009–Apr 30, 2009, World Conference Center, Bonn, Germany.
- Sakurai, Takeshi A Natural Experiment of Demographic Pressure on Soil Fertility Management: The Case of Rural Burkina Faso. IHDP 7th Open Meeting, Apr 23, 2009–Apr 30, 2009, World Conference Center, Bonn, Germany.

#### **【Poster Presentation】**

- Ishimoto, Yudai Introduction and Infiltration of Labor migration in Sahelian Area—Case study of a village in northern part of Burkina Faso—. IHDP 7th Open Meeting, Apr 26, 2009–Apr 30, 2009, World Conference Center, Bonn, Germany.

#### **【Invited Lecture / Honororary Lecture / Panelist】**

- Lekprichakul, Thamana Chronic Under-Nutrition and Obesity in Pre-School Children of a Heavily Indebted Poor Country (HIPC): What Explains the Paradox?. Center for Contemporary Asian Studies (CCAS) and Faculty of Policy Studies, Jan 25, 2010, Doshisha University, Kyoto.

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**Stage: FR**

**Project No.: H-02**

**Project Name: Agriculture and Environment Interactions in Eurasia: Past, Present and Future -A ten-thousand-year History**

**Project Leader: SATO, Yo-Ichiro**

**Research Axis: Ecohistory**

**URL: <http://www.chikyu.ac.jp/sato-project/>**

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## ■ Research Subject and Objectives

### Aim of research

The main goal of our project is to study the history of the relationship between agriculture and environment over a period of ten thousand years. In four different climatic zones that existed in and around Eurasia in the last ten thousand years, we try to assess how the origins and development of agriculture influenced the surrounding environment. We also seek to evaluate how the environment in turn impacted on agriculture, focusing on periods of social crisis caused by the collapse of agricultural production and consequent recovery. The four climatic zones are 'monsoon', 'pasture (in Europe)', 'desert' and 'vegiculture' (Figure 1). Based on historical evidence, we focus on swidden agriculture, often criticized as having destructive effects on the environment. We evaluate the sustainability of agriculture by analyzing its history and its influence on the global environment.

### Background

Although agriculture is one of the central issues of global environmental problems, there are still many misunderstandings and lack of knowledge concerning its history, especially about its interactions with the ecosystems in which it operates. Great danger may lie ahead if we ignore this problem and continue with blind faith in the sustainability of agriculture in the future. The goal of our project is to clarify the history of relationships between agriculture and environment, focusing on periods of social collapse caused by food production failure, and to explore the means by which people survived those critical situations. We will demonstrate the mechanism of recovery of the society along chronological order. Based on these results, we hope to establish a 'general principle of collapse and recovery' through case studies in on the four different climatic zones.

## ■ Progress and Results in 2009

Our aim has been to verify the hypothesis that agriculture in different parts of Eurasia did not develop continuously without setbacks. We believe that this has been achieved. In the current fiscal year, we tried to reinterpret the historical evolution of agriculture, focusing on the 'maintenance of (especially genetic) diversity', which is the basic concept in our project. It has been traditionally believed that since the beginning of agriculture, the genetic diversity of crop decreased, thus causing various environmental problems and natural disasters. However, not only concrete data to verify that has hardly been academically presented, but also the genetic diversity has not just decreased but shown more dynamic transformation through the history. Therefore, we aimed to collect concrete data concerning changes of genetic diversity in different fields of research.

### Research achievements

#### (1) Monsoon Zone Group

(a) We conducted morphological and molecular genetic analyses of indigenous wild and cultivated rice crops from Australia and from the region between Southeast Asia and Japan (space-axis analysis). The results showed a decrease in the variety of cultivated crops, which indicates that in Monsoon cultivation, people utilized genetic diversity effectively to extend their fields. Also, the diversity of rice crops in Japan (seed size corresponds to genetic variance) increased until the Meiji Period but decreased afterwards (time-axis analysis), demonstrating that social elements and people's taste were

reflected in the choice.

(b) Research was conducted on the soil strata in Ikeshima Fukumanji site (Yao City, Osaka Prefecture) and in Maekawa site (Inakadate Village, Aomori Prefecture) (time-axis analysis). Based on the results of phytolith analysis, it was known that in both sites people had attempted to adapt to environmental changes such as flooding by introducing various crops.

(c) By examining old maps and pictures, it became clear that flooding occurred frequently in the Ikeshima Fukumanji site from the Yayoi Period to the modern era. Especially between the Middle Ages and the modern era, the cutting down of pine trees around Ikoma Mountains, where the source of the Yamato River is located, seems to have caused frequent flooding.

**As the result, it was found out that monsoon zone agriculture was not constantly developed through the history as previously discussed, but has gone through a number of collapse and recoveries using various *shinogi* (=adaptation) techniques.**

### **(2) Mugi Zone Group**

(a) We conducted pollen analyses on samples collected at two different locations of Xinjiang Uygur Autonomous Region. From the analysis of the mud-like substance coating the coffins of Xiaohe Tombs, we found the following: in the BM Period (3500–3400 years ago), there were no forests in the region but water was abundant and some types of grain were being cultivated. In the following M Period (3400–3200 years ago) the region became drier and more saline. The length and weight of wheat grains excavated from coffins show constant increase from the BM to M periods, but in the end of the M period both length and weight become varied, indicating unstable wheat production. This also shows degradation of environment from the BM to M periods. Results of pollen analysis of a soil boring sample near Rouqiang (80–100cm depth, age unknown) showed that there were no major environmental changes and that semi-shrub deserts, as can be seen today, have existed over a long period. From these results, it was assumed that human activities, especially agriculture, caused environmental changes such as desertification in this region. The need for more detailed and larger-scale analyses was also acknowledged.

(b) A cultivation experiment was conducted over 3 years in the dry region of West Asia in several regions, in order to assess the water consumption rate of different types of wheat. Rain-fed cultivation of bread wheat, Durum wheat, Emmer wheat and Einkorn wheat showed that the later the flowering season was, the lower the crop yield became. Einkorn wheat, whose flowering season was the last, hardly yielded at all. Thus we learned that the productivity difference depended largely on environmental issues such as water and temperature during the reproductive stage.

**Through the archaeological research of the Xiaohe Tomb site and experimental studies, it was verified that the Xiaohe Tomb area used to have rather rich vegetation and fauna, which enabled pasturage and cultivation of particularly water-requiring bread wheat. With the research result, our original assumption of the project: desertification (=environmental degradation) was caused by human activities rather than natural causes, was verified on concrete data. Further studies on destructive factors created by human activities, such as salinization, will be done in the final year of the project to complete the research.**

### **(3) Vegeculture Zone Group**

(a) In the Philippines, we conducted research on the origins of taro cultivation. It is believed that agriculture was introduced to the Philippines from south China and Taiwan. However, when we examined the diffusion of modern taro crops and their usage, we discovered wild and cultivated varieties that have not been reported previously. Also, a semi-wild variety seems to be widely diffused and is utilized in daily life. This suggests that the cultivation of taro began in the Philippines.

(b) Ethnographic research on tuber crop cultivation was conducted in the Eastern Highlands of Papua New Guinea, focusing on the diversity of cultivation. We learned that various types of yam and taro are being utilized and that they are used on different occasions, depending on their function and importance. People are encouraged to cultivate different types of sweet potato and no agricultural methods exist to cultivate high-value varieties intensively.

### **(4) Slash-and-burn Agriculture Group**

(a) We began to analyze historical records concerning land usage from the former Hakumine Village

(current Hakumine, Hakusan City), Ishikawa Prefecture, which date from the entire Edo Period (*Echizen kaga hakusan jūhachikamura toritsugi-moto Yamagishi Jūrōemon-ke monjo*, etc.). In this document, there are many sale agreement papers of land where slash-and-burn agriculture was practised. They are therefore important materials to learn about the reality of this technique, whose yield was usually not included in the official annual rice yield (add: accounts or figures?). The document is currently being examined, while at the same time study is being conducted on the changes of crops cultivated.

(b) The Third Slash-and-burn Agriculture Summit took place in Oita City. We demonstrated the importance of our research in connection to contemporary agricultural issues in Japan, especially in relation to the problems of intermediate and mountainous areas.

### Connection with final results

As the above-mentioned research report on taro cultivation demonstrates, there is still a strong possibility that our understanding of the historical evolution of agriculture may change further in the future. The ultimate goal of our project is to fundamentally rewrite the history of relationships between agriculture and environment and to make suggestions concerning the future of agriculture. We are confident of having made a large step towards achieving our goal, through the different achievements of this year and the establishment of contacts with researchers in a range of regions and fields at different symposia. We were also able to publish four volumes of the 'Agricultural History in Eurasian Continent' (5 vol.), the last volume of which will appear during the current fiscal year.

### Unexpected results

Some parts of our achievements were broadcast in the NHK program 'Science ZERO'. The research report from the Tian-luo-shan site in Zhejiang Province was published as the project member's achievement in Science journal. Also, an article written by one of the project members appeared in the last year's Nature Genetics journal. He currently leads international discussion about early agriculture in Monsoon Asia.

## ○Co-Researchers

### ■Project leader

◎ SATO Yo-Ichiro (RIHN, Professor)

### ■Core Members

- ISHIKAWA Ryuji (Hirosaki University, Professor, Leader: Monsoon Zone Group)
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■Future Themes

**Problems we faced during the current fiscal year and suggested solutions:**

Since the next fiscal year will be the last year of our project, we do not plan to perform any large-scale research abroad. However, since we could not conduct research in Xinjiang Uygur Autonomous Region this year, we hope to undertake it next year, if the local situation permits, even if only to a limited extent.

**Issues for next fiscal year:**

- 1) We will try to determine the factors that, after natural disasters, either allowed the continuation of agricultural activity or caused its collapse, while focusing on people' s occupation, type of disaster and power structure of each period. From this, we will establish a general principle that could inspire future agricultural activity.
- 2) In the process of (1), we will make use of photographs taken by Sven Hedin, in order to learn about paleoenvironmental change in the Xinjiang Uygur Autonomous Region. We will digitize these photographs and create a database to preserve them as cultural heritage.
- 3) Weeds, harmful insects and disease-causing organisms appeared when agricultural activity first began. These are more or less uniform beings, selected to survive in a homogeneous agricultural field. They have been eliminated by the use of chemical substances (pesticides), which also have the effect of harming or destroying the environment. The Slash-and-burn Agriculture Group, on the other hand, demonstrated that fire not only prevented the increase of weeds, harmful insects and disease-causing organisms, but also caused chemical substances, which plants could use, to increase in the soil. We plan to organize a symposium entitled 'Weeds, harmful insects and disease-causing germs' .
- 4) We will publish our achievements, which have been made public this year in the form of publications and symposia, also in English (we will also prepare a book in English). Our short-term goal is to successfully organize an exhibition at the National Museum of Nature and Science (September to November 2010), which is planned as part of our final project report. We also plan to produce a scientific publication on the domestication of plants and animals. Since agriculture is a theme closely related to our everyday life, we have organized the 'Seminar on environmental thoughts' more than twenty five times now. These results will also be published in book form.
- 5) Different knowledge related to life culture, such as agriculture and food, will largely contribute to making concrete suggestions in RIHN' s basic fields of research, whose ultimate goal is to identify advantageous ways of future human life. Therefore we hope to transfer our knowledge, based on the achievements of our project, to other projects. In this way, the research quality of the whole institute will benefit.

**Stage:** FR

**Project No.:** H-03

**Project Name:** Environmental Change and the Indus Civilization

**Abbreviated Title:** Indus Project

**Project Leader:** OSADA, Toshiki

**Research Axis:** Ecohistory

**URL:** [http://www.chikyu.ac.jp/indus/Indus\\_project/index.html](http://www.chikyu.ac.jp/indus/Indus_project/index.html)

**Key Words:** Indus civilization, human-environment interaction, Ghaggar-Hakra (Sarasvati) river, climate change, disintegration of Indus civilization networks

## ■ Research Subject and Objectives

### (1) Research objectives and Background

The Indus civilization thrived in the northwest of South Asia from 2600 BC and declined around 1900 BC. The decline here means the shift of the distribution of Indus sites and the disappearance of urban sites. This project aims to reconstruct the interrelation between the human societies and the natural environment of the Indus civilization and clarify the causes of its decline through a multidisciplinary approach.

Investigation into human-environment interaction is the key to understand environmental problems. This applies not only to those of modern societies, but to those of every civilization since the beginning of the human history. As regards the decline of the Indus civilization, some scholars consider that it was caused by local factors such as the invasion of Aryans or a great flood, while others consider that global climate change affected the whole Indus regions and triggered its decline. These hypotheses, however, have not been examined properly.

Recently past environmental problems have had attracted interests from scholars all over the world. Jared Diamond's book titled *Collapse: How Societies Choose to Fail or Succeed*, for example, examines the causes of collapse of past civilizations and tries to enhance awareness on the problems of modern civilizations. This project attempts to discover environmental problems surrounding the Indus civilization. We will reconstruct the palaeo-environment in the region through geological survey, DNA analysis, carbon dating, botanical survey, etc., and find out what kind of environmental change took place at that time. For this purpose our research teams investigate ancient climate change, avulsion of the Ghaggar River, the palaeo-coastline of Gujarat and palaeo-seismic activities in the Himalayas in the Mature Harappan period.

As regards socio-cultural aspects of the civilization, we conduct research using both archaeological and ethnological/linguistic approaches. We aim to reconstruct the social and agricultural systems of the period by analyzing various artefacts and plant and animal remains obtained directly through archaeological excavations. We also conduct field research to examine current agricultural systems in South Asia and relevant vocabulary in contemporary languages, at least part of which seem to have been inherited from the Mature Harappan period.

Other teams from different countries have attempted to organize research projects focusing on the issue of the impact of climate change on the Indus civilization, but none of them has succeeded so far due to political reasons. It is significant that for the first time in the history we could successfully combine research efforts from both India and Pakistan in our project.

### (2) Contribution to global environmental issues

It is important to study the long-term (over the last few thousand years' ) impact of climate change in South Asia which is both geographically and culturally diverse. Data obtained from our project teams will help us understand the mechanism of desertification and the impact of climate change on the contemporary civilization. In this respect, the reconstruction of the history of human-environment interaction in this region will contribute to the solution of current environmental problems.

The Ecohistory program of RIHN deals with the environmental histories of the two regions, i.e. the Green Belt and the Yellow Belt. It has had projects focusing on East Asia, South Asia, Central Asia and West Asia. South Asia, our project's focus area, is a transitional region from the Green Belt to the Yellow Belt, and it thus occupies a very important position within the program itself. The reconstruction of the ecohistory of South Asia, which we'd like to achieve, will thus make an important contribution to the reconstruction of the ecohistory of the whole area covered by the program.

### ■ Progress and Results in 2009

The focus of our project this year was the activities of PERG which was not fully operating in the previous year. Their major task was to assess the impact of environmental change (such as climate change, avulsion, and sea-level change) on the decline of the Indus civilization.

As regards climate change, they conducted core sampling at the Rara Lake in Nepal to examine climate change during the Mature Harappan period. They succeeded to obtain five core samples. They checked one of those and confirmed that the date of the oldest layer was around BP 7,500. The analysis of these samples will reveal whether or not the climate change of 4.2ka (which caused the decrease of winter rain in the Mediterranean and Mesopotamia) affected the Indus regions, and if so, to what extent. We will wait for the outcome of their analysis which is due next fiscal year.

Apart from coring, they are trying to reconstruct the sea temperatures of the Indian Ocean through coral sampling. They will examine sea surface temperatures and monsoon patterns during the Mature Harappan period, since it is known that Indian Ocean Dipole (IOD) phenomena are closely related to monsoon patterns in South Asia.

As regards avulsion, PERG had already concluded, on the basis of their field research in the previous year, that the Ghaggar River, which was described as a large river in the Rig-Veda text, was a rather small river highly affected by monsoon rains. Their findings reject the previous hypothesis that the decline of the Indus civilization was due to the drying up of the large Ghaggar-Hakra River on which the Indus agriculture was dependent. This year they will investigate whether or not a stream capture occurred at the source of the Ghaggar River in the Himalayas.

As regard sea-level change, they estimated in the previous year that the sea-level in the Mature Harappan period had been about two metres higher than the present level. They conducted field research to collect data to test this hypothesis in March this year.

MCRG has successfully concluded excavations at Farmana and Kanmer. They are now engaged in the analysis of the excavated artefacts in preparation for the publication of final reports. They did not conduct any excavation this year, but they conducted field research to collect detailed geographical information on various Indus sites (including both old and newly discovered ones) using GPS. They visited sites in Haryana and Rajasthan. SSRG is carrying out pollen and phytolith analysis on data obtained from the excavations, while ICRG continues its philological and linguistic research. They are steadily accumulating data on the Indus society and culture, which will be integrated into GIS.

The most substantial achievement this year was the success of coring by PERG. PERG members, especially those from Kochi University, used the equipments brought from Japan by ship and then by a helicopter and successfully obtained sediment core samples from the Rara Lake in Nepal (3,000 metres above sea-level). The obtained core samples arrived in Japan by ship last December. We expect that the outcome of the analysis of those samples will set an international standard on research in climate change in South Asia. They plan to present their findings in a special session on climate change and ancient civilizations at the conference of the American Geophysical Union, which will be held at Santa Fe in USA in March 2011.

Through archaeo-botanical research of our project it has become increasingly clear that the Indus regions could be divided according to the types of cultivated plants they depend on – winter crops and summer crops – and the impact of climate change differed substantially from region to region. We also started to form a new team specializing in DNA analysis on the human and animal bones found in Farmana in the previous year and the fossilized otoliths found in Gujarat this year. We plan to present the



outcome of these researches in academic conferences, and subsequently publish academic papers on them. We are sure that they will reveal some of the causes of the decline of the Indus civilization.

This year we conducted two international conferences, one in Japan and the other in India, to propagate the outcome of our research to scholars all over the world. The first one was the 13th meeting of Harvard Roundtable titled Ethnogenesis of South and General Asia (ESCA). This was organized jointly with Sato project at RIHN in May 2009. The second one was Bhuj Roundtable organized jointly with the ASI of Gujarat State Government and Rajasthan Vidyapith University in Bhuj, India, in January 2010.

We regularly publish occasional papers to present the outcome of our project. Three new volumes were published this year. They contain papers that present some of the research outcome of MCRG, such as reports on the excavation at Farmana. We also reedited and published the previous outcome of our project in two volumes through a major Indian publishing company. We consider that it is significant that scholars specializing in the Indus civilization all over the world can now have an access to the outcome of our project through these publications. In addition, the Language Atlas of South Asia, which will be the basis for the integration of all the data obtained in our project into GIS, will be completed and published by the end of this year.

A new research group specializing in DNA analysis on human and animal (esp. bovine) bones was formed this year. This is because a large amount of human and animal bones were excavated in Farmana last year. This June we invited Nilofer Shaikh, VC of Shah Abdul Latif University, Pakistan, and exchanged an MOU with the university. We had planned to start a full-scale excavation in cooperation, but to our regret, our plan did not materialize this year due to the political instability in Pakistan.

As regards Indus sites in India, we plan to conduct surveys in cooperation with M.D. University in Haryana, Rajasthan University in Rajasthan and M.S. University in Gujarat next year. We have already exchanged an MOU with each of them.

As regard the budget, we distributed a large portion of it to PERG, as the focus of our project this year is on the palaeo-environmental surveys conducted by them.

Our project has published nine volumes of Occasional papers so far. They present the outcome of our research in English. We consider that it is important to publish them through a large publisher so that they are easily accessible to those interested in the issue including scholars all over the world. As before, Manohar Publishers, a major publishing company in India, published two volumes for our project this year: Linguistics, Archaeology and the Human Past in South Asia, and Indus Civilization: Text and Context. We also made a contract with them to launch a new RIHN Indus Project Series – the first three volumes of the series would be the reedited versions of Volumes 1-3 of Current Studies of the Indus Civilization. No other RIHN projects have published so many English books, and we consider that this is a significant achievement.

We also would like to emphasize the significance of the success of core sampling at the Rara Lake in Nepal, as mentioned above. No research team in the world has so far succeeded in obtaining core samples which cover such a long duration of time (7,500 years). We await the outcome of the analysis.

In May we organized a meeting of Harvard Roundtable with Sato Project at RIHN, inviting scholars from all over the world. There were lively discussions on various issues on the Indus civilization. The papers presented in the meeting will soon be published from Harvard University.

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### ■ Future Themes

Next year is the fourth year of the full-research stage of our project. Large-scale field research was completed this year, and each research group will direct their efforts to the analysis of the obtained data and the synthesis of the outcome of such analysis. Side by side with this, we will try to gradually integrate the research outcome of each group into GIS and along a temporal axis. We will use a large portion of our budget for the analysis and synthesis of the research outcome and its publications.

MCRG are analyzing the huge data obtained from excavations at Kanmer and Farmana for publication. They plan to complete writing up a final report on the excavation of each site by the end of September 2010. They are also collecting supplementary data on other Indus sites in India and Pakistan. We expect that we will obtain a detailed picture of network between different regions of the Indus civilization including big cities.

PERG will place the first priority on the analysis of the core samples obtained from the Rara Lake. In addition, they will analyze the geological data obtained from field study in Ghaggar and Gujarat regions, followed by the analysis of fossilized otoliths obtained from Gujarat and coral samples from the Maldives. We expect that detailed data on climate change in South Asia will be obtained by the end of next year. The newly formed DNA research group, on the other hand, will continue their analysis of human and bovine bones obtained from Farmana.

SSRG will continue its research on the distribution of cultivated plants, while ICRG will continue reconstructing languages and cultures in ancient South Asia, through field study and philological research. The outcome of their research, together with the research outcome of the other groups, will be integrated to GIS.

To sum up, our efforts are now directed towards spatial and temporal synthesis of the findings of the individual research groups in order to develop a robust description of the interchange of environmental change and cultural systems during the Mature Harappan period.

### Books

#### 【Authored/Co-authored】

- Dangi, V. 2009 Linguistics, Archaeology and the Human Past. Occasional Paper, 8. RIHN, Kyoto, 111pp.

### Editing

#### 【Editing / Co-editing】

- Onishi, M., K. Inagaki (ed.) Mar, 2010 RIHN Descriptive Linguistics Series 2[Chikyuken Gengo Kijutsu Ronshu 2]. RIHN, Kyoto, 195pp. (in Japanese)
- Osada, T., A. Uesugi (ed.) 2009 Linguistics, Archaeology and the Human. Occasional Paper, 7. RIHN, Kyoto, 116pp.
- Osada, T., A. Uesugi (ed.) 2009 Linguistics, Archaeology and the Human. Occasional Paper, 9. RIHN, Kyoto, 163pp.
- Indus Project (ed.) 2009 Annual Report of Indus Project 2008. RIHN, Kyoto, 230pp. (in Japanese)
- Osada, T. (ed.) 2009 Linguistics, Archaeology and the Human Past in South Asia . Manohar, Delhi, India, 263pp.

### Research Presentations

#### 【Oral Presentation】

- Hirofumi TERAMURA and Takao UNO 3D modeling of seals and seal impressions excavated at Kanmer.. BHUJ ROUND TABLE; International Conference on Gujarat Harappans & Chalcolithic Cultures, Jan 28, 2010-Jan

31, 2010, Bhuj, Gujarat, India..

- Hirofumi TERAMURA and Takao UNO GIS applications in the Indus Project, RIHN -Case studies in progress at Kanmer and Farmana, India.. 19TH CONGRESS OF THE INDO-PACIFIC PREHISTORY ASSOCIATION, Nov 29, 2009-Dec 05, 2009, Hanoi, Vietnam..

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**Stage:** FR

**Project No.:** H-04

**Project Name:** Neolithisation and Modernisation: Landscape History on East Asian Inland Seas

**Abbreviated Title:** NEOMAP

**Project Leader:** UCHIYAMA, Junzo

**Research Axis:** Ecohistory

**URL:** <http://www.chikyu.ac.jp/neo-map/>

**Key Words:** landscape change, inland seas, Neolithisation, Modernisation, cultural landscape, landscape preservation

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## ■ Research Subject and Objectives

### 1. Research Objectives

This project aims at reconsidering the notion of “cultural landscape protection” by way of reconstructing the historical landscape (hereinafter LS) change on East-Asian inland seas during the two most notable revolutionary periods in the history of human-nature relations, i.e. Neolithisation (hereinafter NLS) and Modernisation (hereinafter MDS), through the analyses of sustenance activities, trade and mental or cultural structures (political system, art, literature, festivals etc), climatic and topographical analysis in eight regions on the shores of East-Asian Inland Sea (Japan and East China Sea). The primary goals of the project are to:

- (1) Reconstruct the changes in the naturally and culturally conditioned spheres of LS.
- (2) Explicate the functioning of inland seas as a network creating cultural unity and diversity.
- (3) Reconsider the idea of “cultural LS” in order to put the cultural LS protection policies into a new perspective. Comparing NLS and MDS processes can give us a better understanding of possible future developments and solutions to present environmental issues.

### 2. Background

Earlier, there has been an obvious tendency to see the environmental problems as caused by a complex set of natural processes, whereas the influence of human culture has often been reduced to a simplified “human factor”. Unlike other animals, humans take action towards environment also for non-functional, philosophical, aesthetic or religious motives. Therefore, as has been understood by the academic community in recent years, any successful analysis of environmental problems has to deal with human cultures in all their richness and detail. The present project aims at investigating the environmental issues from the human culture’s point of view through a holistic concept of “LS”. LS as the stage of humans’ everyday life, is a concept that includes both the visible/ physical side of the natural environment and cultural/ intellectual side, making possible a holistic analysis of the environmental problems at the stage where they arise. On the other hand, LS is made up of elements that date back to different historical layers, thus allowing us to reconstruct the historical process of emergence of the environmental issues. Belonging to the Ecohistory program of RIHN, the NEOMAP project aims at deeper understanding of the historical formation of the global environmental issues from a very long-term perspective (including prehistory) and through a multidisciplinary and international research agenda provided by the concept of LS. The research is carried out on eight key regions on the shores of East Asian Inland Seas (East China Sea and the Japan Sea), since historically, the inland sea coastal areas were densely populated and played a major role as worldwide trading spots and collision spots for various cultures and civilizations. Therefore, it can be said that these are the most suitable fields for the observation of the interactions between culture and nature.

In addition, considering that the concept of “cultural LS” has become an important issue in government and international protection programs (e.g. the nomination of national LS treasures, UNESCO World Heritage sites), it is crucial to understand the cultural formation mechanisms of protected LS and the processes that sustain them.

### 3. Topics and Methodology

#### 1) Research Areas

The project focuses mainly on the East Asian inland sea, i.e. the Japan Sea Rim and the East China Sea Rim. Historically, inland sea coastal areas were densely populated and played a major role as worldwide trading spots and collision spots for various cultures and civilizations. Throughout the duration of this research project, results will be compared to those of the LS research in the North European inland seas.

Eight research areas were chosen around the East Asian inland seas to represent the full variety of cultural and natural settings. The selected research areas are: 1. Hokuriku, 2. Biwako and 3. Northern Kyushu for mainland Japan, 4. Hokkaido and 5. Ryukyu for marginal Japan, 6. Southern Coast of Korea, 7. Northern Zhejiang for China, and 8. Primorye for Far-East Russia.

In order to foster interdisciplinarity, the work groups (hereinafter WG) are organised according to regions rather than by research subjects.

#### 2) Research Methods

As a basis for studies on both NLS and MDS, a geographical database will be created for each region for both of the periods with available cartographical data in the form of both historic and modern maps, information on the distribution and spatial structure of archaeological sites, and other related archaeological data. Land use, settlement patterns and population dynamics will be mapped on the basis of cartographic data, historical documents, pollen analyses, and other environmental and ecological datasets.

Since LS is a holistic phenomenon that entails both a cultural and a natural side, and develops through the influence of human practices and interactions of the natural environment, a large part of LS research has to be based on qualitative rather than quantitative research methods. Specific research methods would depend on each discipline and on one of the highlighted periods of study (NLS or MDS).

#### 3) Project Organisation

Eight research areas were chosen around the East Asian inland seas to represent the full variety of cultural and natural settings: Hokuriku, Biwako, Northern Kyushu, Hokkaido, Ryukyu Islands, Northern Zhejiang, Southern Coast of Korea, Primorye. In order to foster interdisciplinarity, the work-groups (hereinafter: WG) are organised according to regions rather than by research subjects. Each regional WG includes NLS and MDS researchers carrying out research in the area. It is highly recommendable that each member belongs to at least two of the WGs, in order to facilitate the comparative discussion between the area groups. Information exchange inside the project is facilitated by frequent WG meetings, two general meetings per year and other seminars and work groups. In some cases, the researchers carry out joint field work.

In addition, there are three database WGs that are responsible for the creation of the GIS database and the basic data collection (Neolithisation WG, Modernisation WG and technical GIS WG).

This project has signed memoranda and research cooperation agreements with research institutes in Korea, Russia and UK in order to promote international integrative research.

### 4. Significance as an RIHN Project

Belonging to the Ecohistory program of RIHN, the NEOMAP project aims at a deeper understanding of the historical formation of the global environmental issues from a very long term-perspective (including prehistory) and through a multidisciplinary and international research agenda provided by the concept of LS.

Using the multidisciplinary flexibility that RIHN can offer, the NEOMAP project will emphasise the role of socio-cultural systems in the functional cycle of human-nature relationships, considering that the understanding of the socio-cultural sphere is indispensable for building preservation strategies in the future. Because humans can act based on irrational motives (i.e. aesthetic, symbolic, or religious principles) in terms of their integration within a given environment, it is extremely important to

analyse the role of culture regarding modern environmental issues without simplifying human behaviour. Focusing on two major periods in history (NLS and MDS) that can be considered direct roots of modern environmental problems, the NEOMAP project will offer new insights into the mutuality of nature-culture relationships that would enable us to make predictions for future developments and clarify the historical background of LS elements that have become an object of protection. Since LS is a holistic phenomenon, its analysis requires specialised knowledge of an extremely wide panorama of academic fields. Therefore only an interdisciplinary project of considerable scale can cover the development of human-nature relationships within a larger region, and throughout several historical periods. As a fully funded and operational RIHN project, NEOMAP would have both the interdisciplinarity and the scale to offer a comprehensive analysis, uniting scholars from archaeology, modern history, geology, geography, LS engineering, anthropology, linguistics and biology.

Of the two areas targeted by the Ecohistory program of RIHN - The Asian Green Belt and Yellow Belt -, the NEOMAP project research area is included in the former. Co-operating with the project H-02 "Agriculture and Environment Interactions in Eurasia: Past, Present and Future - A Ten-Thousand-Year History -", the project hopes to contribute to a clearer understanding of the historical roots of the environmental problems in the area.

### ■ Progress and Results in 2009

In the FR3, the project members have been engaged in full scale research activities and carried out thorough field work in their designated areas. The topics that are addressed by the individual researchers in all the research groups can be divided into four major common themes. (1) The birth and expansion of agriculture; (2) LS change at waterfronts; (3) Migration and colonisation as a major force of LS change; (4) Travelling and creation of mental LS images.

As the first volume of landscape series, *Higashi Ajia Naikai bunka-ken no keikanshi to kankyou1: Mizube no tayousei* (Landscape History and Environment on the East Asian Inland Seas1: Versatile Waterfronts) was published. Monthly landscape seminar provided good opportunities for wide-ranging discussion. The project organized sessions at Society for American Archaeology (SAA), International Conference of Historical Geographers (ICHG), and some members had presentations at Centre of Excellence in Cultural Theory (CECT) in Estonia. For social activity, we collaborated with Suita city museum in Osaka for the special exhibition of natural history. Series of open class at Muromachi elementary school is an interesting educational outreach.

### ○ Co-Researchers

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## ■ Future Themes

### 1. Outcomes in Fiscal Year 2009

The project has eight regional work groups, each carrying out research in a key area of the East Asian Inland Seas. Research focuses on four umbrella topics:

- (1) The birth and expansion of agriculture.
- (2) Waterfronts, including water bodies, waterways and rice paddies.
- (3) Migration and colonisation as forces of landscape change.
- (4) Travel and creation of mental landscape images. Special attention has been paid to three following major aspects of landscape formation in the region.

#### (1) Modernisation as seen from Neolithisation

What do the landscape changes associated with Modernisation have to do with Neolithisation? It was previously thought that the “Neolithic revolution,” when agricultural societies and large-scale settlements emerged and the basic elements of modern landscapes were established, was an event that occurred in a relatively short period of time. If, however, we refer to humankind’s increasing capacity to exploit their environments compared to earlier hunter-gatherer societies, “Neolithisation” should be defined as a process of human adaptation to the natural environment since the end of the last Ice Age. As aggressive resource use and increasing regional interdependency are characteristic of the present day as well, the period of Modernisation can be seen as a climax-or intensification of-Neolithisation.

#### (2) The cultural functions of inland seas

Seas have an immeasurable impact on their surrounding landscapes. Our Hokkaido workgroup describes how inland seas enable migrations and new colonisations, transforming indigenous spiritual and sustenance landscapes and imposing new settler landscapes. Okinawa, in contrast, was positioned as an outpost of trade between

Japan and China. Its extensive coastlines and marine environments have shaped the regional landscapes from within, bringing about specific regional sustenance patterns and religious world views. At times, the maritime and continental influences interact, as in the Primorye Region, where the continental influence of Korean settlers blended with that of the new European settlers who arrived across the sea.

#### (3) The creation of mental landscape images

What is the impact of culture’s mental structures on landscapes? What do great cultural systems like religion have to do with landscape and environmental issues? We explore one instance in Japan. With the rise of Buddhism in the Nara period (AD 710-794), the killing of living beings, including animals and fish, was prohibited. Since the Middle Ages, hunting and fishing were strictly prohibited within 2 li (roughly 1.3 km) of the temples, but this area was gradually redefined according to the area directly visible from the temple. Both the ban and its gradual redefinition, have had a large impact on resource use and the natural environment of the Japanese archipelago.

### 2. Future Topics

NEOMAP scholars participate in many public events designed to increase public awareness about landscape and environmental issues. As visualization is a useful tool for making specific historical data accessible to nonacademic audiences, in the next years our publications will emphasize the creation of landscape database and atlas. Superimposing the landscapes of Neolithisation and Modernisation on one

single map can lead us to new discoveries about historical human-nature interrelationships and enhance consciousness about environmental issues. We also hold regular seminars in and outside RIHN and present our results at international workshops and symposia. NEOMAP is active in international collaboration, and has organised joint activities with scholars from Estonia, Belgium, Holland, UK and Germany.

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  - BAUSCH, Ilona “The Life Histories of Artifacts and Goods in East Asian Prehistory and History”, Shifting meanings & functions of jadeite artifacts in prehistoric Japan. Society for American Archaeology (SAA), Apr 23, 2009, Atlanta, Georgia, USA. “The Life Histories of Artifacts and Goods in East Asian Prehistory and History” .
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#### **【Poster Presentation】**

- UCHIYAMA, Junzo, BAUSCH, Ilona Beyond the landscape of “Affluent Foragers” : The role of long-distance trade among complex foragers in Jomon Japan. 1st Landscape Archaeology Conference (LAC2010), Jan 26, 2010–Jan 28, 2010, Amsterdam, The Netherlands.

- GILLAM, Christopher · NAKAMURA, Oki · MATSUMORI, Tomohiko From the Hida Mountains to Toyama Bay: Understanding Diversity and Change in Jomon Cultural Landscapes. 1st Landscape Archaeology Conference: LAC 2010, Jan 25, 2010–Jan 29, 2010, Amsterdam, Netherlands.
- NAKAMURA, Oki · MATSUMORI, Tomohiko A Site Location Analysis in Hida: Jomon People and River Valley Landscape. 10th Conference of Kansai Jomon Culture Research Association, Dec 12, 2009–Dec 13, 2009, Omi-hachiman, Shiga. (in Japanese)
- MATSUMORI, Tomohiko · NAKAMURA, Oki · KIMURA, Hiroaki A Development of Historical Research Assistance System Using GIS and RDB. Geoinformation Student Forum 2009 in Kansai, Nov 22, 2009, Kyotanabe, Kyoto. (in Japanese)
- ZEBALLOS VELARDE, Carlos Renzo The Change of The Visual and Spatial Perception of The Lakescape in Biwa, Japan, After Modernization. “Spatiality and visualisation of culture/nature relationships: theoretical aspects”, Center Of Excellence In Cultural Theory (CECT), Oct 23, 2009, Tallinn University, Estonia.

**【Invited Lecture / Honorary Lecture / Panelist】**

- POPOV, A Middle Neolithic of the Maritime Region (Primorye): Sites, Cultures, and Landscape.. Seminar for students and post-graduate students in Faculty of Arts and Letters in Tohoku University, Mar 26, 2010, Sendai, Miyagi.
- UCHIYAMA, Junzo Keikan toha nanika: keisei no chiikisei to puroseshu (What is landscape?: Its regionality and the formation process). International Symposium for the Research Project of the Japan Sea: “Lingual-scapes of the world and Japan”, Jan 23, 2010–Jan 24, 2010, Toyama. (in Japanese)
- UCHIYAMA, Junzo Harukana Mizube: Biwako no keikanshi (Landscape history on the waterfronts of Lake Biwa). Kyoto Seika University Open Class “GARDEN-04”: Water in the global era, Jan 19, 2010, COCON Karasuma, Kyoto. (in Japanese)
- TAVAREV, Andrei Paleolithic and Neolithic of the Russian Far East.. Tohoku University, Laboratory of Archaeology. Graduate Student Program Seminar, Nov 04, 2009, Sendai, Miyagi.
- UCHIYAMA, Junzo Complex strategy in Jomon Japan: a zooarchaeological perspective. Guest lecture at Leiden University, Oct 29, 2009, Leiden, The Netherlands.
- UCHIYAMA, Junzo Understanding Neolithisation of East Asian Inland Seas. Guest lecture at Tartu University, Oct 26, 2009, Tartu, Estonia.
- UCHIYAMA, Junzo Understanding Neolithisation of East Asian Inland Seas. Guest lecture at Tallinn University, Oct 21, 2009, Tallinn, Estonia.
- UCHIYAMA, Junzo Ikimono no kurashi to kankyō (Life and natural environments: The history of garbage). Special lecture at Muromachi Elementary School for the fourth grade, Oct 02, 2009, Muromachi Elementary School, Kyoto. (in Japanese)
- UCHIYAMA, Junzo Landscape Revolving around Wild Bear: A Message from Jomon. “Landscape as seen from animals and fish: Zooarchaeological Perspectives”, Open Seminar for the Special Exhibition “Tales of Nature in Suita” at Suita City Museum, Aug 08, 2009, Suita, Osaka. (in Japanese)
- NAKAJIMA, Tsuneo Landscape as seen from fish. “Landscape as seen from animals and fish: Zooarchaeological Perspectives”, Open Seminar for the Special Exhibition “Tales of Nature in Suita” at Suita City Museum, Aug 08, 2009, Suita, Osaka. (in Japanese)
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- UCHIYAMA, Junzo Neolithisation and Modernisation: Landscape History on East Asian Inland Seas. Special lecture for the Department of Information and Media. Faculty of Liberal Arts, Doshisha Women’s College of Liberal Arts, May 16, 2009, RIHN, Kyoto. (in Japanese)
- KIM, Jangsuk Neolithization in the central-western Korean prehistory. , Apr 14, 2009, National Museum

of Korea, Seoul, Korea. (Other)

**Stage:** FR

**Project No.:** R-03

**Project Name:** Historical Interactions between the Multi-cultural Societies and the Natural Environment in a Semi-arid Region in Central Eurasia

**Abbreviated Title:** Ili Project

**Project Leader:** KUBOTA, Jumpei

**Research Axis:** Resources

**URL:** <http://www.ilipro.com/index.html>

**Key Words:** arid and semi-arid region Central Eurasia ethnic groups border agriculture nomadic pastoralism historical interactions

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## ■ Research Subject and Objectives

### Background and objectives

This project examines the historical interactions of humanity and nature in the semi-arid region of Central Eurasia. Textual, archaeological and biophysical evidence is used to examine the effect of human boundaries on environments, ethnic groups, dominant patterns of subsistence, and relations between cities and their surrounding areas. The findings of this project will improve understanding of how past human activities cumulatively affected ecosystems in Central Eurasia, and how semi-arid regions can best be managed in the future.

Nomads were once the principal inhabitants of semi-arid Central Eurasia. Following the rise and fall of various ethnic groups and empires, the Yuan Dynasty took nominal control of much of Eurasia in the 13th and 14th centuries. In the 18th century, however, a national border was drawn across the region, definitely distinguishing Russia from Qing China. The inhabitants of the area subsequently experienced a great change of lifestyle, as the border and national settlement policies forced nomadic peoples out of their traditional patterns of livelihood.

This project combines analysis of historical documents, archaeological remains and natural proxies such as ice cores, lake sediment samples, tree rings and windblown deposits in order to describe how nomadic peoples and nation-states affected the natural resources and climatic conditions in the Ili River watershed in Central Eurasia. Project researchers also investigate human activities on both sides of the Russia/China border in order to describe its potential effect on contemporary environmental conditions.

### Research area and groups

Research centers on the Ili River watershed area, which extends from China to Kazakhstan, and surrounding areas, including Kyrgyzstan and Uzbekistan. Throughout human history, Central Eurasia has been a key site of interaction between individual ethnic groups inhabiting or passing through the area, and a longtime crossroads for the civilizations of East and West. In more recent times, the development policies of modern states have led to severe environmental degradation.

This project consists of two research groups. The first group uses historical documents and natural proxies to describe historical changes in both human and natural systems. The second group investigates current human activities and natural systems in order to interpret the long term significance of past human and environmental change.

## ■ Progress and Results in 2009

Initial analysis of data from Lake Balkash indicates that lake level began to decrease in the 10th century, and at the turn of the 13th century reached its lowest level in the past 2000 years. After this regression, the lake level showed rapid recovery, and remained relatively high until the modern

regression beginning in the 1960s. Other lakes in Central Eurasia, such as the Aral Sea and Lake Issyk-Kul, experienced a similar regression in medieval times, suggesting the climate then was cooler and drier. Increased human reliance on lake waters in this period could also be associated with their lower levels.

We find evidence that the establishment of a clear border between Russia and the Chinese Qing Dynasty shifted patterns of human-environmental interaction in the region. The border exposed certain areas to concentrated human activity, which, along with increasing technological capacity, clearly demonstrate human potential to cause dramatic environmental change.

The most dramatic change in long-term patterns of human and environmental interaction in semi-arid Eurasia was the shift from nomadic to sedentary societies accompanying the establishment of modern agriculture. Russia's expansion into Kazakhstan in the late 19th century, agricultural collectivization in 1929, and Khrushchev's Virgin Lands Program gradually converted Kazakhstan into a major agricultural zone. Agricultural production was pursued with little regard for environmental capacity or impact. With the collapse of the Soviet Union many farms were abandoned, reducing pressure on natural resources, and allowing some ecosystem recovery.

In China, modern development did not begin in earnest until the 1950s. China's dramatic recent growth, however, is increasing demand for natural resources and the western provinces may again be subject to centrally planned development.

Cooperation with research institutions in Kazakhstan, China and Russia has facilitated collection of a number of unusual historical documents, maps and images of the region. Several documents describe the locations and populations of different nomadic groups, and the number of animals kept by each. Of these documents and maps, those written in Manchurian have not been previously investigated because few researchers can understand the Manchurian script; we are currently engaged in their translation and analysis.

### ○Co-Researchers

- ◎ Kubota, Jumpei ( Research Institute for Humanity and Nature, Associate Professor, Project leader )
- Soma, Hidehiro ( Nara Women' s University, Professor, Analysis of Archaeological monument using satellite images )
- Endo Kunihiro, ( Nihon University, Professor, Lake sediment core Analysis )
- Fujita, Koji ( Nagoya University, Associate Professor, Ice core analysis, Glacier discharge modelling )
- Takeuchi, Nozomu ( Chiba University, Associate Professor, Ice core analysis, Glacier biology )
- Kobayashi, Osamu ( Ehime University, Associate Professor, Tree ring analysis )
- Funada, Yoshiyuki ( Tokyo university of Agriculture and Technology, Associate Professor, Tree ring analysis )
- Uyama, Tomohiko ( Hokkaido University, Professor, Historical Analysis in Kazakhstan )
- Onuma, Takahiro ( Gakusyuin University, Assistant Professor, Historical Analysis in China )
- Noda, Jin ( Toyo Bunko, JSPS Research fellow, Historical Analysis in China and Kazakhstan )
- Sugiyama, Masaaki ( Kyoto University, Professor, Historical analysis on Yuan Dynasty )
- Ono, Hiroshi ( Kyoto Tachibana University, Professor, Historical analysis on Yuan Dynasty )
- Hori, Sunao ( Konan University, Professor Emirates, Historical analysis in Central Asia )
- Kato, Yuzo ( Research Institute for Humanity and Nature, Assistant Professor, Analysis of Chinese documents )
- Chengzhi ( Research Institute for Humanity and Nature, Senior project researcher, Historical Analysis on Manchuria documents )
- Furumatsu, Takashi ( Kyoto University, Assistant Professor, Historical Analysis in China )
- Hayashi, Toshio ( Soka University, Professor, Archaeological analysis )
- Shiraishi, Norio ( Niigata University, Professor, Archaeological analysis )

- Izumi, Takura ( Kyoto University, Professor, Archaeological analysis )  
Hua, Li ( Osaka Keiho University, Professor, Historical Analysis in China )  
Miya, Noriko ( Kyoto University, Assistant Professor, Historical Analysis in China )  
Kitamura, Yoshinobu ( Tottori University, Professor, Analysis on irrigation system and agricultural system )  
Shimizu, Katsuyuki ( Tottori University, Professor, Analysis on irrigation system and agricultural system )
- Funakawa, Shinya ( Kyoto University, Professor, Soil analysis )  
Kozan, Osamu ( Kyoto University, Assistant Professor, Hydrological Modeling )  
○ Konagaya, Yuki ( National Museum of Ethnology, Professor, Analysis of Nomadic system )  
○ YOSHIDA, Setsuko ( Shikoku Gakuin University, Associate Professor, Analysis of Nomadic system )  
Nakayama, Yasunori ( Nihon University, Professor, Analysis on land use change using satellite images )  
Haraguchi, Tsuyoshi ( Osaka City University, Associate Professor, Lake sediment core Analysis, Sonic Sounding )  
Sugai Toshihiko ( University of Tokyo, Associate Professor, Lake sediment core Analysis )  
Yoshikawa, Ken ( Okayama University, Associate Professor, Analysis of arid zone ecosystem )  
Tsumimura, Maki ( Tsukuba University, Associate Professor, Hydrological analysis using Isotope date )
- Matsuyama, Hiroshi ( Tokyo Metropolitan University, Associate Professor, Precipitation, Climate change )  
Narama, Chiyuki ( Research Institute for Humanity and Nature, Project researcher, Analysis of Glacier discharge, Glacier distribution using satellite images, GIS database )  
Endo, Takahiro ( Research Institute for Humanity and Nature, Assistant Professor, Water resources management )  
Yatagai, Akiyo ( Research Institute for Humanity and Nature, Assistant Professor, Precipitation, Climate change )  
Morimoto, Yukihiro ( Kyoto University, Professor, Analysis of arid zone ecosystem )  
Natsuhara, Toshihiro ( Kyoto University, Professor, Analysis of arid zone ecosystem )  
Nobe, Koichi ( Sensyu University, Associate Professor, Analysis of policies and economy on Agriculture in Kazakhstan )  
Watanabe, Mitsuko ( Research Institute for Humanity and Nature, Project researcher, Analysis of present status, especially land use change using satellite images, GIS database )  
Oji, Toshiaki ( Ritsumeikan University, Professor, Analysis on Agricultural system )  
Nakamura, Tomoko ( Tohoku University, Research fellow, Analysis of Nomadic system and agriculture in China )  
Shinjilt ( Kumamoto University, Associate Professor, Analysis of Nomadic system in China )  
Akiyama, Tomonori ( Kyoto University, Research fellow, Analysis of water resources management )  
Abe, Kenichi ( Research Institute for Humanity and Nature, Professor, Analysis of agriculture development in Kazakhstan )  
Karl Baipakov ( Institute of Archaeology, Kazakhstan, Director, Professor, Archaeological investigation on subsistence in medieval time of Kazakhstan )  
Dimitry Voyakin ( Institute of Archaeology, Kazakhstan, Senior researcher, Archaeological investigation on subsistence in medieval time of Kazakhstan, GIS database )  
Irina Yerofeyeva ( Kazakhstan Scientific Research Institute on Problems of the Cultural Heritage on Nomads, Director, Professor, Analysis on historical documents and maps )  
Renato Sala ( Kazakhstan Scientific Research Institute on Problems of the Cultural Heritage on Nomads, Senior researcher, Archaeological investigation on settlement in medieval time of Kazakhstan, )  
Jean-Marc Deom ( Kazakhstan Scientific Research Institute on Problems of the Cultural Heritage on Nomads, Senior researcher, Development GIS database of Archaeological information )  
Bolat Aubekerov ( Institute of Geological Sciences, Kazakhstan, Professor, Lake sediment core analysis )  
Zhulduzbek Abylkhozhin ( Institute of History and Ethnology, Professor, Analysis of agriculture development in Kazakhstan )

- Roman Jashenko ( Institute of Zoology, Senior researcher, Evaluation of impacts of agricultural development in Kazakhstan )
- Vladimir Aizen ( University of Idaho, Professor, Ice core analysis, )

### ■ Future Themes

We are trying to Compile information obtained from historical texts, archaeological sites and images into a chronological GIS database that will demonstrate in graphic manner the long-term human and environmental transformations in Central Eurasia.

### Books

#### 【Chapters/Sections】

- Jumpei Kubota and Tomoko Nakamura Mar, 2010 Water issues and water saving policies in China. . Tomoya Akimich, Kazuhiko Komatsu and Yasuo Nakamura (ed.) Water and the Environment. Water and People, 1. Showa-do, Sakyo-ku, Kyoto, pp.275-304. (in Japanese)
- Jumpei Kubota Feb, 2010 Water and People in the Silkroads. Tomoya Akimichi (ed.) Water and Civilization. Showa-do, Sakyo-ku, Kyoto, pp.174-204. (in Japanese)
- Jumpei Kubota Jul, 2009 Historical changes of climate and water resources in central Eurasia. Yo-Ichiro Sato and Takashi Kurata (ed.) Agriculture and climate in desert and pasture. History of agriculture in Eurasia, 3. Rinsen Book co., Sakyo-ku, Kyoto, pp.93-140. (in Japanese)

### Editing

#### 【Editing / Co-editing】

- Jumpei Kubota (ed.) Mar, 2010 History of Central Eurasia from the 13th to 15th Century. Research Institute for Humanity and Nature, KIta-ku, Kyoto, 430pp. (in Japanese)

### Papers

#### 【Original Articles】

- Matsuyama, H. and K. Kezer 2009 Long-term variation of precipitation around Lake Balkhash in Central Asia from the end of the 19th century. *SOLA* 5 :73-76. (reviewed).
- Chengzhi (Kicengge) 2009 The Manchu Language “Of the Ula region Map” . *National Palace Museum Research Quarterly* 26(4) :1-74. (in Chinese) (reviewed).
- Narama, C., Severskiy, I., Yegorov, A. 2009 2009 Current state of glacier changes, glacial lakes, and outburst floods in the Ile Ala-Tau and Kungoy Ala-Too ranges, northern Tien Shan Mountains.. *Annals of Hokkaido Geography* 84 :22-32. (reviewed).
- Narama, C., Kondo, R., Tsukamoto, S., Kajiura, T., Duishonakunov, M., Abdrakhmatov, K. 2009 2009 Timing of glacier expansion during the Last Glacial in the inner Tien Shan, Kyrgyz Republic by OSL dating. *Quaternary International* 119 :147-156. (reviewed).
- Pachikin, K., Erokhina, O., and Funakawa, S 2009 Properties and distribution pattern of soils in Kazakhstan. *Pedologist* 53(1) :30-37. (reviewed).

### Research Presentations

#### 【Oral Presentation】

- Mitsuko WATANABE, Yuki KONAGAYA, Tomohiro AKIYANA and Jumpei KUBOTA Socialist Modernization and Historical Change of Pasturage in Almaty Region, Republic of Kazakhstan. The Study Meeting of the Association of Japanese Geographers, Spring 2010, Mar 27, 2010-Mar 28, 2010, Hosei Univ. Ciyoda-ku, Tokyo. (in Japanese)
- Narama, C., Kicengge Environmental changes in Central Asia during the last 1000 years. workshop: human activity and climate changes in Central Asia, Feb 24, 2010, RIHN, Kyoto.
- Funakawa, S., Shinjo, H., Kadono, A., and Kosaki, T Factors controlling the in situ decomposition rate of soil organic matter in different bioclimatic conditions of Eurasia. The 9th International

Conference of the East and Southeast Asia Federation of Soil Science Societies, Oct 27,2009–Oct 28,2009, Seoul Korea.

- Jumpei Kubota Effects of human activities on the hydrological processes in arid regions of Central Eurasia –a multi-disciplinary approach. International Workshop on Changes in Surface and Ground Water in the Tarim River Basin, October 2009, Xi' an, China.
- Narama, C., Duishonakunov, M., Sobr, M., Engel, Z., Cerny, M., Daiyrov, M., Kääh, A., Abdrakhmatov, K Glacier lake outburst flood in the western Zyndan glacier, Ysyk-Köl region, Kyrgyzstan on 24 July 2008. Mitigation of Natural Hazards in Mountain Areas, Sep 14,2009–Sep 18,2009, Bishkek, Kyrgyzstan.
- Jin NODA Turkistan as the capital of the “Kazakh Khanate” in the 16–19 centuries. Turko-Mongol Rulers, Cities and City-Life in Iran and the Neighboring Countries, Sep 13,2009, Institute for Advanced Studies on Asia, Univ. of Tokyo, Tokyo.
- Jumpei Kubota Effects of human activities on the hydrological processes in arid regions of Central Eurasia –a multi-disciplinary research project. International Workshop on the Northern Eurasia High Mountain Ecosystems, September 2009, Bishkek, Kyrgyzstan..
- Jumpei Kubota Historical interactions between human activities and environmental changes in arid regions of Central Eurasia. IHDP 7th Open Meeting, April 2009, Bonn, Germany.

#### **【Poster Presentation】**

- Narama, C., Kääh, A., Duishonakonov, M., Daiyrov, M Glacier lake outburst floods during 2000–2009 in the Tien Shan mountains, Central Asia. Glacier Hazards, Permafrost Hazards and GLOFs in Mountain Areas: Processes, Assessment, Prevention, Mitigation, Nov 10,2009–Nov 13,2009, Vienna, Austria.
- Narama, C., Duishonakunov, M., Kääh, A., Severskiy, I., Abdrakhmatov, K., Kubota, J Remote-sensing based analysis of glacier changes and glacial lake hazards in the outer ranges of the Tien Shan mountains. International Workshop on the Northern Eurasia Mountain Ecosystems, Sep 10,2009–Sep 13,2009, Bishkek, Kyrgyzstan.
- Narama, C., Duishonakonov, M., Kääh, A., Abdrakhmatov, K Remote-sensing based analysis of glacier change and glacier lake hazards in the outer ranges of the Tien Shan mountains. EGU, Apr 19,2009–Apr 24,2009, Vienna, Austria.

#### **【Invited Lecture / Honorary Lecture / Panelist】**

- Jumpei Kubota Historical interaction between human and the environment in arid regions of Central Eurasia. 1st International Conference “Aral: Past, Present and Future – Two Centuries of the Aral Sea Investigations, October 2009, St. Petersburg, Russia. .



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**Stage:** FR

**Project No.:** R-04

**Project Name:** Environmental Change and Infectious Disease in Tropical Asia

**Abbreviated Title:** The RIHN Ecohealth Project

**Project Leader:** MOJI, Kazuhiko

**Research Axis:** Resources

**URL:** <http://www.chikyu.ac.jp/ecohealth/>

**Key Words:** ecohealth, environmental change, infectious disease, malaria, liver fluke, filaria, leishmania, water-borne diseases, tropical monsoon Asia

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### ■ Research Subject and Objectives

**Objectives:** The RIHN ecohealth project studies the effects of human societal and environmental changes on the ecology of diseases such as malaria, dengue fever, opisthorchiasis (liver fluke infection), diarrhea disease in tropical monsoon Asia. Population increase, urbanization, deforestation, spread of wet rice cultivation, economic development, changes in life style or so-called modernization, and population migration are the factors changing the ecological relationships. The project also investigates the relation between climate changes (temperature, rainfall, flood, etc.) and infectious diseases (water-borne diseases such as cholera).

**Basic concept:** Health, wellbeing and survival of human being in the long-run are the ultimate goal of mitigation of and adaptation to global environmental changes (at least from human points of view). Health is one of the key indicators of sound environment. Without sound environment for human life and survival, human health cannot be improved and sustained. Human health must be understood ecologically rather than medically.

**Background:** Human infectious diseases is an outcome of biological interaction between pathogens and human beings. It is directly related to both the ecology of pathogens and the ecology of human beings. The ecology of pathogens is a part of the environment of human beings, while the ecology of human beings is a part of the environment of pathogens. Therefore, all the infectious disease necessarily has links with environments. Moreover, incidence of many human infectious diseases is related with non-human reservoirs and/or vectors of the pathogens. Incidence of vector-borne diseases such as malaria, for example, is related to the ecology of pathogens, vectors, and humans (and of non-human reservoirs in some species). Climate change, deforestation, expansion of wet rice fields, and other natural and social environmental changes must have a large impacts on epidemiology and endemology of infectious diseases through their impacts on their ecology. The ecological settings of human being, vectors, and pathogens have been changing very rapidly in tropical monsoon Asia because of man-made rapid environmental changes in this area. How the environmental changes in tropical monsoon Asia have effects on the endemology and epidemiology of the diseases is of interest of the RIHN ecohealth project.

**Contributions to global environmental issues:** Unlike medical control programs/projects which usually aim at short-term problem-solving approaches of infectious diseases, this project tries to understand the fundamental relations of human life and ecology of pathogens and vectors by making trans-disciplinary and integrated approaches. The project would provide a long-term view of human survival and health toward the future.

**Research methods and area:** 1) Long-term observation of a local population in Lahanam area, Songkhone district, Savannakhet province, Lao PDR by establishing Demographic Surveillance System (DSS). Since 2005 we are following about 4,500 residents. In Bangladesh, we use data from the Matlab DSS and others.

- 2) Collection and analyses of community-based information on environmental changes and health including infectious diseases.
- 3) Collection and analyses of national-based information on environmental changes and health including infectious diseases (analyses should be the district level and/or provincial level).
- 4) Discussion on global ecohealth concept.

#### **Project Organization:**

The project team can be divided into two groups; the field study group and the integration group.

**Field group** can be further divided into two major groups (Lao and Bangladesh) and small groups.

- 1) Lao team: with National Institute of Public Health and other institutions.  
 Site and theme: Savannakhet (DSS, MCH, liver fluke, malaria).  
     National level population health and policies.  
     Other small specific studies.
- 2) Bangladesh team: with ICDDR, B, IEDCR, NIPSOM and others.  
 Site and theme: Matlab, Dhaka, other area (climate and health on national level).  
     Filariasis, malaria, leishmaniasis.  
     National level infectious disease data base.
- 3) Small field teams: Vietnam, Myanmar, Indonesia (malaria).  
     Sri Lanka (diarrhoea and others).  
     China (HIV/AIDS).

#### **Integration group**

- 4) Integration team: Establishment of ecohealth view

In collaboration with other international project on ecohealth, the project tries to contribute to the establishment of concept of ecological health. At the same time, this concept must be reflected in the change of human behaviour, disease control and health promotion. Under the new concept, the project seeks to provide people with new measurements and/or tools to change the population health (like bednet score, HIV related ART-adherence score, etc.).

- 5) Study of regional environmental change and infectious diseases epidemiology

After collecting and analyzing district-level information on environmental change and infectious diseases in Lao PDR and Bangladesh, the research possibility will be studied to develop the standard method to analyze the data through the tropical Asia. And the framework to do this should be sought out.

- 6) Historical study group

This group works on some episodes between environmental and societal changes and occurrence of infectious diseases during the war in the battle field. Other historical studies are also conducted by recruiting historians of the countries studied.

- 7) Demographic study group

Demographic transition and health transition are studied in Laos and other tropical Asian countries. The decrease of each infectious disease in the course of health transition must be studied.

- 8) Agro-forestry group

Information of changes in forest and agriculture are collected, and methodology to relate it with occurrence of infectious diseases is developed.

### ■ Progress and Results in 2009

(1) Establishing Health and Demographic Surveillance System (HDSS) and the integrated study on infection with liver fluke (*Opisthorchis viverrini*) in Lahanam area, Savannakhet Province, Lao PDR. The study team focuses on which effects the changes in lifestyle accompanied by the modernization of paddy cultivation and the economic development have brought on infection with liver fluke in this area. The study team established HDSS for the first time in Laos in order to monitor the changes in the health profile of the local people for the long term. The target population reached 7,000 in 2008. The study team introduced a new data collecting method with the use of PDA in February 2010. The study team also conducted groundtruthing with reference to the satellite image of the area in 2009. The study team began to trace the daily activities of the local population with the use of the GPS and acceleration sensor along with interview. The study team also has conducted stool examination for several times to find out parasite eggs. Based on these researches, the study team proposed a hypothesis that the changes in water environment accompanied with modernization have affected the spacial distribution of both liver fluke and the vectors such as Bithynia snails and Cyprinidae fish. The study team will make an ecological survey on the intermediate hosts in 2010 in order to validate the hypothesis.

The project co-sponsored the third National Health Research Forum of Laos in October 2009. The project invited the Minister of Health of Lao PDR to Savannakhet in February 2010 to attend a consultative meeting.

(2) Study on the dynamics between malaria infection and the deforestation in Sepone district, Savannakhet Province, Lao PDR. The project aims to understand dynamic relation of malaria and deforestation in this area on the Vietnamese border. Malaria is endemic in this area. The project set up the mobile phone network which links the villages in remote mountainous area to the district hospital in order to effectively monitor the malaria infection cases in remote villages. The project is also analyzing the land coverage with the use of satellite imagery and groundtruthing. This land analysis put forward a hypothesis that a recent deforestation might affect the malaria infection dynamics among the local people. The project will focus on the relationship between the ecology of vector mosquitoes and the forest vegetation in 2010.

(3) Study of the dynamics between climate changes and infectious diseases and the database building of infectious diseases statistics on a national scale in Bangladesh. The project studies the relation between climate and infectious disease in Matlab in collaboration with ICDDR, B, Nagasaki University, and the London School of Hygiene and Tropical Medicine. The project also collaborates with the Ministry of Health of Bangladesh in the development of the national surveillance database of infectious diseases. This database will greatly help the project because we aim to understand the long-term effects of environmental changes on the health profiles. The project invited Prof. Moazzem Hossain as a RIHN foreign researcher from November 2009 to February 2010. He then resumed his previous office as the director of the Center for Disease Control of the Ministry of Health.

(4) Study in a historical perspective on the relation between development and infectious diseases in Southwestern China. The project studies the historical dynamics of infectious diseases in Yunnan Province. The historical study traces the demise of malaria and schistosomiasis japonica with reference to the disease control. The project also focuses in a current perspective on the effects of the mobile population increase accompanied with the market reform on the infectious diseases such as STD, HIV/AIDS and TB. The project collaborates with Yunnan Health and Development Research Association centered in Kunming Medical University in various field survey.

The project held three workshops in July and August 2009 in Kunming. Three counterparts from Kunming

came to RIHN to join the workshop held by RIHN Initiative for Chinese Environmental Issues in March 2010.

### ○Co-Researchers

- MOJI, Kazuhiko ( Research Institute for Humanity and Nature, Professor, Project Leader )
- MASCI-TAYLOR, Nicholas CG ( Cambridge University, Professor, Bangladesh Filariasis and STH studies )
- KOBAYASHI, Shigeo ( Kyoto University, Graduate School of Asian and African Area Studies, Professor, Agro-forestry, Agro-forestry and human security )
- IIJIMA, Wataru ( Aoyama Gakuin University Faculty of Letters, Professor, History, History of diseases and their control policies )
- KAMMURDIN, Ahmed ( Oita University Institute of Scientific Research, Associate Professor, Infectious disease )
- HASHIZUME, Masahiro ( Nagasaki university institute of tropical medicine, Assistant Professor, Infectious disease epidemiology )
- SUNAHARA, Toshihiko ( Nagasaki university institute of tropical medicine, Assistant Professor, Vector ecology, entomology, malaria study )
- YAMAMOTO, Taro ( Nagasaki university institute of tropical medicine, Professor, Integration, Ecohealth concept )
- KOBAYASHI, Jun ( Infectious disease control section, Expert service division, Bureau of International Cooperation, IMCJ, MoHLW, Japan, Head, International Health )
- BOUPHA, Boungnong ( National Institute of Public Health, Lao PDR, Director/Professor, Lao Public Health )
- KOUNNAVONG, Sengchanh ( Nagasaki University Graduate School of Biomedical Sciences, Graduate student, Maternal and child health, infectious diseases of children )
- PONGVONGSA, Tiengkham ( Savannakhet Malaria Centre, Lao PDR, Director, Malaria, Liver fluke of a sea bream )
- ISLAM, Sirajul ( ICDDR, B, Bangladesh, Department head, Environmental microbiology )
- HUNTER, Paul ( University of East Anglia, UK, Professor, Microbiology, Environmental epidemiology )
- HOSSAIN, Zakir ( NIPSOM, Bangladesh, Associate Professor, Epidemiology, Health information )
- RAHMAN, Mamudur ( IEDCR, Bangladesh, Director, Epidemiology )
- CAI, Guoxi ( RIHN, Project researcher, International Health & Public Health )
- TAKAGI, Mayumi ( RIHN, Project researcher, Literary representation )
- TSUJI, Takashi ( RIHN, Project researcher, Ecological anthropology )
- TOJO, Bunpei ( RIHN, Project researcher, Area studies )
- NISHIMOTO, Futoshi ( RIHN, Project researcher, Social anthropology )
- TOMITA, Shinsuke ( University of Tokyo Graduate School of Agricultural and Life Sciences, Assistant professor, International agriculture )
- IWASA, Mitsuhiro ( National Museum of Ethnology, Lecturer, Cultural anthropology, Medical anthropology )
- ICHIKAWA, TOMO ( Shanghai Jiao Tong University, Lecturer, History of Medicine )
- WATANABE, Chiho ( University of Tokyo Graduate School of Medicine, Professor, Environmental toxicology, Human ecology )
- MURAYAMA, Nobuko ( Niigata University of Health and Welfare, Professor, Public health nutrition )
- TAKAGI, Masahiro ( Nagasaki university institute of tropical medicine, Professor, Medical entomology )
- NAKAZAWA, Shusuke ( Nagasaki university institute of tropical medicine, Assistant Professor, Malaria )
- MAENO, Yoshimasa ( Fujita Health University, Associate professor, Malaria )
- WATANABE, Hisami ( Ryukyu University, Professor, Immunology )
- TSUZUKI, Ataru ( Nagasaki university institute of tropical medicine, Grad Student (ph. D.), Malaria )
- ABE, Tomoko ( Nagasaki university institute of tropical medicine, Grad Student (ph. D.), Malaria )
- KANO, Shigeyuki ( Research Institute International Medical Center of Japan, Director, Malaria )

- IWAGAMI, Moritoshi ( Research Institute International Medical Center of Japan, Research fellow, Malaria )
- XANGSAYARATH, Phonepadith( Nagasaki University, Grad student, Public health )
- SOURAXAY, Phommala ( National Institute of Public Health, Lao PDR, Deputy Director, Public health policy )
- PANOM, Phongmany ( Ministry of Health Savannakhet province, Lao PDR, Deputy Director, Public health )
- SAMLANE, Phompida ( Center Of Malariology, Parasitology And Entomology, Lao PDR, Director, Malaria, Parasitology )
- CRAVIOTO, Alejandro ( ICDDR, B, Bangladesh, Director/Professor, Microbiology )
- CAIRNCROSS, Sandy ( London School of Hygiene and Tropical Medicine, Professor, Tropical environment health )
- WAGATSUMA, Yukiko ( University of Tsukuba Graduate School of Comprehensive Human Sciences, Professor, Epidemiology, International health )
- HAYASHI, Taiichi ( Disaster Prevention Research Institute Kyoto University, Associate professor, Meteorology )
- TERAO, Toru ( Kagawa University, Associate professor, Meteorology )
- MURATA, Fumie ( Kochi University Research and Education Faculty, Assistant professor, Meteorology )
- TANIMURA, Susumu ( Ritsumeikan Asia Pacific University, Associate professor, Spatial epidemiology )
- GOTO, Kensuke ( Nagasaki university institute of tropical medicine, Assistant professor, Disaster information studies )
- ITO, Makoto ( Aichi Medical University School of Medicine, Associate professor, Infectious disease, Immunology )
- TOMOKAWA, Sachi ( Hiroshima University, JSPS Research fellow, Health education )
- FARUQUE, A. S. G. ( ICDDR, Bangladesh, Researcher, Clinical chemistry )
- TAMURA, Tsutae ( The Japanese Red Cross Kyusyu International College of Nursing, Grad student, Nursing science )
- NONAKA, Daisuke ( University of Tokyo Graduate School of Medicine, Grad student, International regional hygiene )
- SATO, Megumi ( Mahidol University, Grad student, Parasitology )
- KURAKAMI, Miyako ( University of Tokyo Graduate School of Medicine, Grad student, International health, Health promotion )
- SAKISAKA, Kayako ( University of Tokyo Graduate School of Medicine, Assistant professor, International health, Primary health care, Epidemiological statistics )
- AOYAGI, Kiyoshi ( Nagasaki University Graduate School of Biomedical Sciences, Professor, Hygiene and Public health )
- MORITA, Eitaro ( Non Profit Organization Asia Health and Education Fund, Secretary general, International regional hygiene )
- KITAMURA, Hitoshi ( Non Profit Organization Asia Health and Education Fund, President, International cooperation )
- YAJIMA, Aya ( University of Tokyo Graduate School of Agricultural and Life Sciences, Grad student, Environmental Hygiene )
- MORINAKA, Koichi ( Non Profit Organization Asia Health and Education Fund, Member, International medical cooperation, Project management )
- IMAI, Hideki ( University of Miyazaki Faculty of Medicine, Associate professor, Environmental health )

### ■ Future Themes

Activities scheduled in FY2010:

April:

Sepone malaria research meeting@RIHN

May:

Field survey and seminars in Yunnan, China and Laos

June:

The 6th Meeting of the Global Alliance to Eliminate Lymphatic Filariasis (GAELF)@Seoul, Korea; field survey in Yunnan and Laos

July-August:

The Third International Conference on Lao Studies@Khon Kaen, Thailand; field survey in Sepone and Lahanam; HIV/ AIDS survey in Savannakhet

August:

Ecohealth Conference@London, UK; Conference of History of Natural Disaster in China@Kunming, China; the 2nd International Conference of Neglected Tropical Disease@Dhaka, Bangladesh

September:

Sepone malaria research meeting@Fukuoka; Vietnam monkey malaria research meeting@Kyoto; field survey in Matlab, Bangladesh; survey on filariasis in northwestern Bangladesh; field survey in Sepone and Lahanam; INDEPTH Annual General Meeting@Ghana; ecohealth education research meeting@Hiroshima

October:

The 4th Lao National Health Reserch Forum@Vientiane, Laos

November:

RIHN-China Initiative Symposium on Environment and Health in Yunnan in a historical perspective@Kunming, China; Lahanam HDSS research meeting@RIHN

December:

Project Annual Meeting@RIHN; RIHN Projects Workshop

Jan-Mar 2011:

Field survey in Laos, Bangladesh and China

## Books

### 【Authored/Co-authored】

- Guoxi CAI, Hua CHEN, Zhuo ZHANG Oct,2009 A new influenza pandemic is coming. Tianjin Science and Technology Press, Tianjin, China, 135pp. (in Chinese)
- Megumi Sato May,2009 Application of the Ribosomal DNA based Copro-PCR for the Diagnosis of *Opisthorchis Viverrini* Infection in Humans. Mahidol University, Bangkok, 141 pp A thesis submitted to the Faculty of Graduate Studies, Mahidol University for the degree of Doctor of Philosophy (Tropical Medicine) on May 20, 2009.

### 【Chapters/Sections】

- Fujihara, Y., Watanabe, T., Nagano, T., Tanaka, K. and Kojiri, T. 2009 Adapting to climate change on the water resources systems of the Seyhan River Basin in Turkey.. M. Taniguchi, W.C. Burnttt, Y. Fukushima, M. Haigh & Y. Umezawa (ed.) From Headwaters to the Ocean: Hydrological Changes and Watershed Management. Taylor and Francis, pp.257-264.
- Nagano, T., Hoshikawa, K., Onishi, T., Kume, T. and Watanbe T. 2009 Long-term changes in water and salinity management in Lower Seyhan Plain, Turkey. . M. Taniguchi, W.C. Burnttt, Y. Fukushima, M. Haigh & Y. Umezawa (ed.) From Headwaters to the Ocean: Hydrological Changes and Watershed Management. Taylor and Francis, pp.313-320.
- IJIMA, W 2009 ‘Colonial Medicine and Malaria Eradication in Okinawa in the Twentieth Century: From the Colonial Model to the United States Model’ . Yip Ka-che (ed.) “Disease, Colonialism, and the State: Malaria in Modern East Asia History” . Hong Kong University Press, Hong Kong, pp.61-70.

## Papers

### 【Original Articles】

- Ahmed K, Batuwanthudawe R, Chandrasena TG, Mitui MT, Rajindrajith S, Galagoda G, Pun SB, Uchida R, Kunii O, Moji K, Abeysinghe N, Nishizono A, Nakagomi O. Nov,2009 Rotavirus infections with multiple emerging genotypes in Sri Lanka.. *Arch ViroL*. 155(1) :71-75. (reviewed).
- Guoxi CAI, Jun KANG, Zhuo ZHANG, Taro YAMAMOTO, Kaining ZHANG and Kazuhiko MOJI Oct,2009 AIDS/STD Epidemics among Cross-Border Floating Populations in South China. *Journal of International Health*

24(3) :236-236. (reviewed).

- Magafu MG, Moji K, Igumbor EU, Hashizume M, Mizota T, Komazawa O, Cai G, Yamamoto T Jul, 2009 Usefulness of highly active antiretroviral therapy on health-related quality of life of adult recipients in Tanzania. *AIDS Patient Care STDS* 23(7) :563-570. (reviewed).
- Uga S, Hoa NT, Noda S, Moji K, Cong L, Aoki Y, Rai SK, Fujimaki Y. Jun, 2009 Parasite egg contamination of vegetables from a suburban market in Hanoi, Vietnam. *Nepal Med Coll J.* 11(2) :75-78. (reviewed).
- Guoxi CAI, Jun KANG, Ling SHEN, Xiangdong MIN, Zhunyou WU, Keming ROU, Taro YAMAMOTO, Zhuo ZHANG, and Kazuhiko MOJI May, 2009 Assessment of a questionnaire used for an AIDS-related KABP survey among physicians in China. *Information, An International Interdisciplinary Journal* 12(3) :721-730. (reviewed).
- Megumi Sato, Urusa Thaenkham, Paron Dekumyoy, Jitra Waikagul 2009 Discrimination of *O. viverrini*, *C. sinensis*, *H. pumilio* and *H. taichui* using nuclear DNA-based PCR targeting ribosomal DNA ITS regions. *Acta Trop* 109 :81-83. (reviewed).
- Sato M, Sanguankiat S, Pubampen S, Kusolsuk T, Manipanich W, Waikagul J. 2009 Egg Laying Capacity of *Haplorchis taichui* (Digenea: Heterophyidae) in Humans. *Korean J Parasitol* 47 :165-168. (reviewed).
- E. Akca, J. Arocena, G. Kelling, T. Nagano, P. Degryse, J. Poblome, H. Cambel, G. Buyuk, T. Tumay and S. Kapur 2009 Firing Temperatures and Raw Material Sources of Ancient Hittite Ceramics of Asia Minor. *Trans. Ind. Ceram. Soc.* 68(1) :35-40.
- Kusmaningtyas, R., Kobayashi, S., Takeda, S. 2009 The impact of local community agricultural practices on livelihood security and forest degradation around the Tesso Nilo national park in Riau Province, Sumatra, Indonesia. *TROPICS* 18 :45-55.
- Hashizume, M., T. Terao and N. Minakawa 2009 The Indian Ocean Dipole and malaria risk in the highlands of western Kenya. *PNAS* 106 :1857-1862.
- Hayashi, T., Wagatsuma Y., Terao T., and Faruque, A.S.G. 2009 Climate Change Impact on Health: Diarrhea Diseases in Bangladesh. Abstracts of papers, International Workshop on Agriculture and Sustainable Development in Brahmaputra Basin, Assam. pp.51-54.
- Hayashi, T., Terao, T., Islam, M.N., Murata and F., Yamane, Y. 2009 Rainfall Characteristics in Northeastern Indian Subcontinent during Pre-monsoon and mature Monsoon Seasons, Several Features and Future Perspective of Weather Condition in the Northeastern Region of the Indian Subcontinent. Abstracts of papers, International Workshop on Agriculture and Sustainable Development in Brahmaputra Basin, Assam. pp.55-56.

## Research Presentations

### 【Oral Presentation】

- Bumpei, Tojo GIS and Ecohealth :Environment Change Analysis and Introducing Paperless System to Demographic Severance System. The 3rd national health research forum to support the health research systems strengthening in Laos, Oct 02, 2009-Oct 03, 2009, Champasak, Laos.
- Terao, T. Effects of Interannual Variations of SST over the Tropical Oceans on Summer Monsoon Trough and Tropical Cyclone Activity over the Western North Pacific. IAMAS, IAPSO, IACS 2009 Joint Assenbly, Jul 19, 2009-Jul 29, 2009, Montreal, Canada. (in Japanese)
- Shigeo Kobayashi, Masahiro Ichikawa, Arbert Ricse, Puth Ordenez. Human Security of local community related with non-timber forest products in Pucallpa, Peru. 第19回日本熱帯生態学会年次大会, June 2009, 堺市、大阪市大.
- Terao, T., Md. N. Islam, F. Murata, Y. Yamane and T. Hayashi Diurnal variation of rainfall intensity in pre-monsoon and monsoon over Bangladesh and the Northeastern India. 2nd International Conference on Water and Flood Management, May 15, 2009-May 17, 2009, The Bangladesh China Friendship Conference.
- Zhang Z, Moji K, Wu XN, Zhang KL, Cai GX, Ali M, Kuroiwa C, Does a Blood-born Pathogen prevention

program affect the incidence of exposure to blood?. The Unite For Sight Six Annual Global Health Conference. New Haven, Connecticut, USA, April 2009, New Haven, Connecticut, USA.

- Tomo Ichikawa “Military Medicine and Bacteriology in Modern Japan”. International convention of Asian Scholars 6 Korea (Daejon) , “Dialogue between Past and Present: Historical and Contemporary Research on the Disease Environment” , 2009, .

**【Poster Presentation】**

- Megumi Sato, Tiengkham Pongvongsa, Surapol Sanguankiat, Tipparayat Yoonuan, Nirandorn Homsuwan, Malaythong Keomoungkhoun, Inthava Phimmayoi, Sichanh Pansansy, Vongphaka Boutsyhalath, Bounngong Boupha, Kazuhiko Moji, Jitra Waikagul Diagnosis of *Opisthorchis viverrini* and *Haplorchis taichui* infections by Copro-PCR. 3rd National Health Research Forum to support the health research systems strengthening in Lao PDR, Oct 02, 2009–Oct 03, 2009, Pakse, Laos.
- Eitaro Morita, Tomo Ichikawa, Wataru Iijima Statistics on “Indo-China” during French Colonization “Annuaire statistique de l’ Indochine”. The 3rd national health research forum to support the health research systems strengthening in Laos, October 2009, Champasak, Laos.
- F.Murata, T.Terao, Y.Yamane, T.Hayashi, H.J.Syiemlieh, S.Singh, A.Habib Surface observation network for heavy rainfall around Cherrapunji, India. IAMAS(MOCA-09), July 2009, Motreal, Canada.



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**Stage:** FR

**Project No.:** R-05

**Project Name:** A Study of Human Subsistence Ecosystems in Arab Societies: To Combat Livelihood Degradation for the Post-oil Era

**Abbreviated Title:** Arab subsistence project

**Project Leader:** NAWATA, Hiroshi

**Research Axis:** Resources

**URL:** <http://www.chikyu.ac.jp/arab-subsistence/>

**Key Words:** Arab societies, Alien invasive species control, Environmental impact assessment, Human life support mechanisms, Post-oil era, Universal access to scientific data

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## ■ Research Subject and Objectives

### **Research Objectives**

This project will examine life support mechanisms and self-sufficient modes of production among Arab peoples who have survived in dryland environments for more than a millennium. Using the research results, we will propose a scientific framework to strengthen subsistence productivity and combat livelihood degradation in local Arab communities in preparation for the post-oil era.

### **Background**

Japan and oil-rich countries of the Middle East have put excessive pressures on the Earth's energy, water, and food resources. In prioritizing economic prosperity for their own benefit, these countries have exploited irreplaceable resources, such as fossil fuel and fossil water. Schemes to plant alien species have also placed stress on local ecosystems. These practices have widened social differences among the people of the Middle East at a time when we are facing a turning point in modern oil-based civilization. Current inter dependencies based on the trading of fossil fuel must change drastically to a new form of interdependency through which we build viable future societies.

Our project will focus on human subsistence ecosystems, namely life-support mechanisms and self-sufficient modes of production (hunting, gathering, fishing, herding, farming, and forestry) with low energy resource consumption. We will also re-examine advanced technology, economic development, and comprehensive measures to combat desertification. Based on our research results, we will propose a scientific framework for strengthening subsistence productivity and rehabilitating daily life in Arab societies in the post-oil era.

### **Research Methods**

Our research method consists of two main approaches: (1) analysis of subsistence ecosystems, focusing on keystone species (camels, date palm, dugong, mangrove, and coral [reef]); and (2) examination of the sustainability and fragility of Arab societies, focusing on ecotones (wadi beds, riverbanks, mountainsides, and seashores).

We will develop and implement our study of human subsistence ecosystems in Arab societies around three main areas: 1) comprehensive measures to control the alien invasive species mesquite; 2) assessment of the environmental effects of development programs in coastal zones of the arid tropics; and 3) sharing the research results to support local decision making.

Field surveys will be conducted in semi-arid lands between the River Nile and the Red Sea in Sudan, with the Red Sea coast, Butana area, and River Nile area as the main survey areas. Additional sub-survey sites will be the Sinai Peninsula in Egypt, the Red Sea coast in Saudi Arabia, and a Saharan oasis in Algeria. We will compare keystone species, ecotones, and traditional knowledge and examine differences in the sustainability of subsistence economies under site-specific conditions.

### **Project Organization**

**(1) Alien invasive species control group**

In the 1980s, mesquite (*Prosopis* spp.) was considered an ideal tree for combating desertification due to its high capacity to stabilize sand dunes, survive inhospitable environments, and provide fuel, timber, fodder, and edible pods. However, although mesquite seedlings failed to establish on sand dunes, they became well established within oases, where they lowered water tables and suppressed native vegetation. The invasion of mesquite has not only changed regional ecosystems, but has also led to livelihood degradation in local communities.

The interdisciplinary research teams will develop comprehensive measures to control this invasive species. These teams will be comprised of specialists from various backgrounds including scientists based at universities and institutions; members of nongovernmental organizations (NGOs); consultants; project managers of international organizations and development institutions; and local people with various social roles, including tribal leaders, technicians, and villagers.

**(2) Coastal zone environmental impact assessment group**

Mangrove ecosystems in the coastal zones of the arid tropics can be important sources of energy for surrounding terrestrial ecosystems. These areas are rich in biodiversity, and great potential exists for seafood and pastoral food production by reforesting mangroves to sustain fish nurseries and provide safe foraging sites. One of the most interesting aspects of food habits along the coastal zone of the arid tropics is the local dependence on hunting, gathering, and fishing of sea products (fish, shellfish, dugong, dolphin, and sea turtles). Therefore, in terms of arid land food production, we should consider the potential of sea product development as a principal element of future diets.

On the other hand, the conversion of sea water to fresh water in coastal zones presents a large development frontier. However, it may also lead to environmental degradation as highly concentrated saline water is released into the sea. Many coastal towns and cities have developed solar-powered desalination plants, which have made agriculture and forestation possible in remote areas. We will examine this issue and compile information to help guard against new environmental problems arising from development.

**(3) Support for local decision making group**

Researchers must widen the public domain for scientific findings and provide universal and equitable access to scientific data and documents. However, relatively few research results are accessible to local people in local languages, with the exception of some brochures and books published and distributed by international organizations.

This situation reduces the usefulness of research results in local decision making as well as in national policy development. Thus, to support local decision making, we plan to provide our research information through print and digital devices in Japanese (to create a bridge between Japanese and Arab societies), English (the common language of science communities), and Arabic (the common language of local communities in the study region).

**(4) Local ecosystems comparative studies group**

In human subsistence ecosystems (social ecosystems) in Arab societies, camels, date palm, dugong, mangrove, and coral (reefs) are assumed to be key stone species. These species support diverse communities, and their extinction could lead to the disappearance of other species, including even human communities. The survival of these species likely depends greatly on wise uses of combinations of environmental factors in ecotones, a socio-ecological niche in dryland environments of the Middle East.

The study group on human subsistence ecosystems in Arab societies will examine Arab communities and Islamic civilization from the viewpoint of energy flow.

**■ Progress and Results in 2009****1. International Seminar and Field Survey on Mesquite (*Prosopis* spp.) in Sudan**

We held, cosponsored by JSPS Asia/Africa Science Platform Program, the international seminar entitled “Towards a sustainable management of the noxious weeds mesquite (*Prosopis* spp.) and *Striga hermonthica* in Sub-Saharan Africa” at Sudan University of Science and Technology (SUST) in Sudan, and made a discussion with researchers and administrators who participated in the field survey and studies on the comprehensive measures to control the alien invasive species mesquite. We also began 1) to collect samples to understand physiological adaptation, regeneration mechanism, and forest structure; 2) to survey on wood fuel and charcoal making methods; 3) to identify ground truth to make distribution map using remote sensing and Geographical Information Systems; 4) to make interviews with land owners and government officials as for evaluation of on-going eradication programs, in eastern Sudan.

## 2. Field Survey on the Mangrove Forest along the Red Sea Coastline in Egypt

We have started the field survey on the mangroves along the coastline of southern Red Sea area in Egypt by the joint research with the Nature Conservation Sector, Egyptian Environmental Affairs Agency. The research topics carried out were on the following; 1) eco-physiological studies on mangroves: forests dynamics, stomatal conductance, and transpiration rate; 2) the assessment for the recent achievement of mangrove afforestation and the examination towards the suggestion for the appropriate afforestation method; 3) human impact: the influence human livestock and fisheries have on the mangrove ecosystems; 4) upon receiving permission to remove samples from the site, DNA analysis that consisted of CTAB and RAPD techniques were used to make a quantitative analysis on the relationship between geographical distance and genetic distance of *Avicennia marina* in their genetic diversity and mass.

## 3. Research on the Coral Building in the Sinai Peninsula, Egypt

We received a letter requesting immediate assistance to prevent the collapse of and to assist the restoration of the coral building sent from the Islamic-Coptic Antiquities, the Supreme Council of Antiquities, Ministry of Culture, Egypt. A five year plan for restoration and upkeep of the coral building was drawn upon based upon data collected over the years on the architectural structure and foundation of the coral buildings in the Sinai Peninsula, on the correlation with Research Institute for Islamic Archaeology and Culture. Our research result would be used as a master plan for application of conserving coral building as historical cultural heritage area in the future.

## 4. Preparation for the Field Survey in Algeria

Project members from RIHN and the Centre National de Développement des Ressources Biologiques (CNRDB) in Algeria met on 15 December, 2009, and agreed to a joint Memorandum of Understanding. The main objective of this collaboration is to clarify the human subsistence ecosystems by focusing on the date palm in Saharan oasis in Algeria.

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## ■ Future Themes

We continue to initiate full-scale field surveys in each research area in order to collect positive observed/measured data. Further issues of our project in the second year (FR2) are as follows;

1. In Sudan, according to the Implementation Agreement, concluded with SUST in 2008, we will start to conduct a full-scale field survey on the alien invasive species control, especially on biological control, chemical control, manual and mechanical control, nutritional strategy of ruminants and metabolites of gut bacteria, root system and water uptake, and utilization of pods and leaves as human food and livestock feed supplement.
2. Along the Red Sea coastlines in Saudi Arabia and Egypt, we will start to integrate the eco-physiological study on mangrove, architectural study on coral buildings, and anthropological studies on camel herding, fishing, and hunting dugongs, in order to unveil the characteristic of human subsistence ecosystems in coastal zones of the arid tropics.
3. In the Saharan oasis in Algeria, studies will be conducted on; the characteristic and change of human subsistence ecosystems in the oasis centered on the cultivation of date palms; the history of human subsistence ecosystems; and the ecological footprints.

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  - Shimada, Y. *General Presentation: Afro-Eurasian Inner Dry Land Civilizations*. The 16th Congress of The International Union of Anthropological and Ethnological Sciences, Jul 27, 2009–Jul 31, 2009, Yunnan University, Kunming, China.

- Nawata, H. *Traditional land use and livelihood in Loess Plateau before/after the 'Grain-for-Green.* The 16th Congress of The International Union of Anthropological and Ethnological Sciences, Jul 27, 2009–Jul 31, 2009, Yunnan University, Kunming, China.
- Nawata, H. *Human-camel relationships in the coastal zones of the arid tropics: A case study of the Beja on the Red Sea coast in eastern Sudan.* The 16th Congress of The International Union of Anthropological and Ethnological Sciences, Jul 27, 2009–Jul 31, 2009, Yunnan University, Kunming, China.
- Ishiyama, S. *Human mobility in the Sub-Saharan arid land: Southward Migration of Kanemubu and drought in Lake Chad region.* The 16th Congress of The International Union of Anthropological and Ethnological Sciences, Jul 27, 2009–Jul 31, 2009, Yunnan University, Kunming, China.
- Nakamura, R. *Ecological Basics in Kilwa Island, Southern Swahili Coast.* International Workshop on Afro-Eurasia Inner Dryland Civilizations, Jul 19, 2009–Jul 20, 2009, Nagoya University, Aichi, Japan.
- Ishiyama, S. *Reevaluation on human mobility of the Sub-Saharan arid land: Southward Migration of Kanemubu and drought in Lake Chad region.* Afro-Eurasia Civilizations: The 1st International Workshop, Jul 18, 2009–Jul 20, 2009, Nagoya University, Aichi, Japan.
- Nawata, H. *A Study of "Nariwai (Subsistence)" for the Post-oil Era.* The 43rd Annual Meetings, Japanese Society of Cultural Anthropology, May 31, 2009, Osaka. (in Japanese)
- Nawata, H. *Subsistence and Local Development on the Coastal Zone of the Arid Tropics.* The 43rd Annual Meeting, Japanese Society of Cultural Anthropology, May 31, 2009, Osaka. (in Japanese)
- Nakamura, R. *Mangrove Inland Sea Reagional Society: Case Study on the Kilwa Island, Swahili Coast.* The 43rd Annual Meetings, Japanese Society of Cultural Anthropology, May 30, 2009–May 31, 2009, Osaka. (in Japanese)
- Ishiyama, S. *Desertification and afforestation :A case study on sub-Saharan region.* The 43rd Annual Meetings, Japanese Society of Cultural Anthropology, May 30, 2009–May 31, 2009, Osaka. (in Japanese)
- Nawata, H. *The Problem of Mesquite in the Sudan.* The 46th Annual Meeting, Japan Association for African Studies, May 23, 2009, Toyko. (in Japanese)
- Ishiyama, S. *A study on the afforestation model program as struggle against the desertification :A case study on environmental NGO' s project in Chad-.* The 46th Annual Meeting, Japan Association for African Studies, May 23, 2009–May 24, 2009, Tokyo. (in Japanese)
- Nawata, H. *Why do We Focus on Sharing Research Results with Local Peoples?. Open Symposium "Some Issues for Sharing Research Results with Local Peoples: Focusing on Local Languages and Degital Media".* The 18th Annual Meeting, Japan Association for Nilo-Ethiopian Studies, Apr 25, 2009, Research Institute for Humanity and Nature, Kyoto, Japan. (in Japanese)
- Nawata, H. *Publishing Retrospect and Prospect of Mangrove Afforestation and Study in Dryland Environments in Arabic and English.* Open Symposium "Some Issues for Sharing Research Results with Local Peoples: Focusing on Local Languages and Degital Media", The 18th Annual Meeting, Japan Association for Nilo-Ethiopian Studies, Apr 25, 2009, Research Institute for Humanity and Nature, Kyoto, Japan. (in Japanese)
- Nawata, H. *Human-Camel Relationships on the Coastal Zone of the Arid Tropics.* The 266th Meeting "Geography and Area Studies in Human-Animal Relationships", The Human Geographical Society of Japan, Apr 18, 2009, Osaka. (in Japanese)
- Nawata, H. *How will You Live after Finishing Oil Resources?.* Open Seminar for the Public "How will You Live after Finishing Oil Resources?," Apr 17, 2009, Research Institute for Humanity and Nature, Kyoto, Japan. (in Japanese)
- Shimada, Y. *How will You Live after Finishing Oil Resources?.* Open Seminar for the Public "How will You Live after Finishing Oil Resources?," Apr 17, 2009, Research Institute for Humanity and Nature, Kyoto, Japan. (in Japanese)

**【Poster Presentation】**

- Nakamura, R. *Fish Culture in Swahili Maritime Society: Inland Sea Fishery originated in the Bantu and Open Sea Fishery originated in the Arab in Kilwa Island, Southern Tanzania Coast*. The 46th Research Meetings of Japan Association for African Studies, May 23, 2009–May 24, 2009, Tokyo University of Agriculture, Tokyo, Japan. (in Japanese)

**【Invited Lecture / Honororary Lecture / Panelist】**

- Nawata, H. *Environmental Conservation with Traditional Ecological Knowledge and Community Participation: Hima in the Middle East and Satoyama in Japan*. "Egypt-Japan Seminar on Environmental Management," Co-organized by Ain Shams University/ Japan Foundation/ Embassy of Japan, Mar 18, 2010, Cairo, Egypt.
- Nawata, H. *Environmental Conservation with Traditional Ecological Knowledge and Community Participation: Hima in the Middle East and Satoyama in Japan*. "Balancing Industrial Development and the Environment: Making the Best Use of Local Knowledge and Indigenous Practices," Co-organized by Public Commission for the Protection of Marine Resources, Environment & Wildlife. General Directorate of Environment & Wildlife Protection/ Japan Foundation/ Embassy of Japan, Mar 16, 2010, Kingdom of Bahrain.
- Hoshino, B. *Remote sensing method of alien species (plants) degradation detection*. , Dec 23, 2009, Al-Farabi Kazakh National University, Almaty.

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**Stage: PR**

**Project No.: C-08**

**Project Name: Megacities and the Global Environment**

**Project Leader: MURAMATSU, Shin**

**Research Axis: Circulation**

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## ■ Research Subject and Objectives

### a) Research objectives and background

#### i) Our cities should be Earth-friendly!

Since its beginning two million years ago, humankind has been depending upon the Earth's ecosystem for a long time as it moved from nomadic life to a settled lifestyle. Cities were born when people became alienated from direct engagement with this ecosystem due to various causes, such as natural disasters and surplus agricultural production.

As cities grew during the past six thousand years or so, this accumulated wisdom of two million years that enabled humankind to coexist with the ecosystem (i.e. "eco-knowledge") got buried at the bottom of the collective human memory. Instead, we saw the growth of "urban knowledge" that allowed people to survive the concentration of population. With the "discovery" of fossil fuel and the "invention" of the steam engine, as well as the increase of scientific knowledge about the Earth since the 19th century, our sense of awe toward the ecosystem was rapidly diminished.

Cities provide us relatively rich life-sustaining resources, benefits of concentration, and public infrastructures. However, they simultaneously impose tremendous burdens on the entire Earth environment as they consume various resources in explosive and concentrated manners in order to feed their increasing and concentrating population, which means a degradation and loss of nature and ecosystems as life-sustaining apparatuses. There is also a degradation of regenerative environmental resources and ecosystem services in the realms of water, air, and soil. And, now we are at the point where we cannot ignore its revengeful consequences. Are the cities enemies of the Earth's environment or the fundamental cause of human misery?

In 2008, the number of people living in cities finally amounted to half of the entire human population of the world. We can no longer exist without cities. The purpose of this megacity project is to approach the great questions of how to make cities Earth-friendly instead of its enemy and how to increase human welfare and future possibilities through cities.

#### ii) Megacities and "new eco-urbanity"

Especially in developing countries, many megacities—cities with a population of more than ten million—have been appearing on Earth, with the number expected to reach 27 by 2020. (fig. 1) Such megacities can be classified into the following three types: Type A megacities (such as Tokyo, New York, and Los Angeles) in developed nations, which consume a great amount of resources; Type B (Shanghai, Guangdong, Mexico City, San Paulo, Jakarta, etc.) in developing countries, which follow the consumption pattern of Type A; and Type C (Dacca, Lagos, etc.) in less developed countries, in which poverty also coexists.

This project focuses on Jakarta, one of the megacities moving toward a society of mass consumption and mass dumping. We aim to study the developmental factors and implementation of methods for political choices that should orient a city toward 1) development of methods to comprehend the urban ecosystem and the human-made system in a unified manner; 2) discovery and development of methods for benefiting from being a "latecomer" megacity; 3) critical succession of "eco-knowledge" nurtured by ecology as well

as customs, culture, and history plus a search for “urban knowledge” that integrates social, human, and natural science knowledge; and 4) realization of varied urban policies (a new “urban knowledge”). From Jakarta, we will propose a new definition of “new eco-urbanity” and apply its measures to Type B megacities. We will also study the impact of such “new eco-urbanity” policies upon Type A and Type C megacities through comparative observation of various cities, with which we hope to help solve environmental problems on a global scale.

#### **b) Research methods and organization**

##### **i) Project Methods 1: Varied and Unifying Look at Cities**

Cities do not consist of only human-made elements. But this does not mean that primeval nature remains there in situ. Cities have been constructed by human settlement and manipulation and they are still being constructed today. We will use the phrase “urban sphere” to describe the entirety of human-made elements, people who act among them, and the natural environment (underground, above ground, and sky) that support them.

Historically, people came to gather around the source of life, which is water (lakes and rivers). There, they fished and hunted as well as cultivated land, which led them to nurture political power by excess products and build defense apparatuses. They also conducted trade, created industries, constructed roads and buildings, and organized society. People, things, information, and capital started to flow in and flow out. (**fig. 2**) Thus, in order to study cities of such complex aspects and their impact upon Earth’s environment, we need to comprehend in an integrated manner the following four elements (called 3E-ICH): namely Environment and ecology; social Equity; Economy; and Institution, Culture and History. Based on this, we need to design urban future possibilities.

ii) Project Methods 2: Eco-knowledge and Integration of (social, human, and natural) scientific knowledge  
In order to deal with the defects of megacities, we need to not only adopt scientific and technological solutions but also shed light on local knowledge (eco-knowledge), with which humankind has adapted itself to the ecosystem—and also critically apply them. This project unifies multidimensional solutions (direct, indirect, and fundamental) that have been nurtured in various academic fields, especially social science, natural science, and engineering. Simultaneously, we also appreciate ecological solutions such as sprinkling water on the ground, taking a nap, and housing styles that are to be found in human customs, cultures and histories, all of which characterize our project. Furthermore, there are other pieces of knowledge to be found in the humanities, (i.e., culture, philosophy, religions, literature, and aesthetics), which can improve cities. Through the presence and significance of the humanities, one can understand immediately by observing Kyoto where RIHN is located. Part of the great significance of pursuing this project in Kyoto and sending it to the world as a powerful message from Japan resides in the fact that here we are able to fully benefit both from the latest science and technology and from the humanities knowledge nurtured by this city’s history and culture for the past 1,200 years.

##### **iii) Organization**

We will keep the research organization from last year, which consists of the coordination team, the city and earth environmental mechanism investigation team, the whole earth urban historical research team, and the management-scenario team. (**fig. 3**) Each of these four teams further pursues its research goal as the project proceeds. We have also signed a MOU with the University of Indonesia in Jakarta and Bogor Agricultural University, with which we will conduct surveys together.

#### **c) evidence of the feasibility of Full Research**

I moved from Tokyo to Kyoto to work at RIHN in April, 2009. What I have done since is described in “Achievements in the Pre-Research Period” section below. I’m excited about being a part of this research institute because 1) I can talk to professionals active in different fields dealing with global environmental issues and learn about the latest research; 2) its flat and open organization allows me to

participate in discussions of various issues; and 3) Kyoto made me realize even more deeply how history and culture is an indispensable part of a city.

Also since April 2009, I have participated in many seminars both inside and outside RIHN, met many specialists, and read a large amount of the related literature as well. After having spent thirty years studying architectural and urban history, this has turned out to be a very exciting year for me, and I was fortunate to be given opportunities to think about what had been missing in my past work and how to compensate for such gaps (i.e., interests in urban constituents other than human-made elements, knowledge concerning environmental policies, etc.). Such a realization has led to the results described in a and b above.

To speak honestly, I cannot say 100% sure whether our five-year project can achieve research results and make social contributions that would impress the whole world. However, I would like to emphasize that the direction of our research has been set and that we are ready to make a strong first step in that direction, which is an evidence of the feasibility of full research that I can present at this stage.

### ■ Progress and Results in 2009

As we are still at the PR stage this year, we have prepared ourselves for the project that will continue through the next five years by focusing on the following three points, based on suggestions from the project evaluation committee.

#### a. Enriching our eye for analyzing cities in an integrated manner

As the field of urban study has been finely divided into various subfields, we need to widen our eyes in order to analyze various urban issues and solve them in an integrated manner by participating in seminars inside and outside RIHN and interviewing various specialists.

#### b. Preliminary research for the Jakarta fieldwork

We will continue our preliminary fieldwork in Jakarta, which started in the FS stage, and also prepare a foundation for the main FR fieldwork stage.

#### c. Cooperation with domestic and foreign researchers studying Jakarta

In order to carry out our project in a smooth and comprehensive manner, we will cooperate with researchers studying Jakarta both inside and outside Japan.

#### a. Enriching our eye for analyzing cities in an integrated manner

(1) Collecting information for the integrated urban information database by the management-scenario team: We have collected information in order to build the integrated urban information database that integrates various urban aspects using GIS and allows many people to access such information easily.

(2) Widening our view field in order to comprehend cities in an integrated manner by the coordination team: We have gained new points of view to understand cities more deeply by participating in various seminars both inside and outside RIHN. For example, a RIHN international symposium "Dilemma of Boundaries" allowed us to understand the significance of underground water and urban coastal zones.

(3) Hosting the Urban Future Design seminar by the city and earth environmental mechanism investigation team: We have hosted seminars to consider the future of cities in developed nations including Japan. (It will be held twice after January 2010, with Profs. Yoshinori Hiroi and Kenya Hara as our guests.)

(4) Hosting the Whole Earth Urban Historical Seminar (5 meetings) by the whole earth urban historical research team: We will put current megacity issues in a global and historical context dating from the beginning of cities. These meetings will discuss 1) Copenhagen; 2) Pyongyang and Seoul; 3) Cities and their network observed vis-à-vis the ecosystem—About Oceanic World (November 28); 4) Teheran—A city and water (to be held in January); 5) Istanbul—Food and the city (to be held in February).

#### b. Preliminary research for the Jakarta fieldwork

(1) Collecting basic data regarding Jakarta by the management-scenario team: We have established the foundation for the Jakarta fieldwork by collecting population data of Jakarta as well as chronological data concerning the development of the city.

(2) Identifying megacity problems of Jakarta and investigation of their causes by the city and earth environmental mechanism investigation team: We have conducted research concerning the thermo-environment of Jakarta (August, 2009), food consumption (September and November, 2009), and identification of problems accompanying development (September, 2009).

(3) Interviewing domestic specialists of Jakarta by the city and earth environmental mechanism investigation team: We are talking to about ten domestic specialists of various fields who are deeply involved with Jakarta (from December 2009 to March 2010); this will allow us to identify urban problems of Jakarta and serve as a basis for an awareness survey to be conducted in Jakarta during the next academic year.

#### c. Cooperation with domestic and foreign researchers studying Jakarta

(1) Holding a seminar in Jakarta attended by the representative of each team: A seminar will be co-hosted by the University of Indonesia and Bogor Agricultural University in December. Here, six members will participate from our project, which will strengthen our future cooperation.

(2) Signing a MOU with the University of Indonesia and Bogor Agricultural University by the coordination team. This will be signed by the end of the current academic year.

(3) Cooperation with the Jakarta researcher in Japan (holding Jakarta city seminars) by the coordination team. We are holding five Jakarta city seminars together with Southeast Asia Institute of Kyoto University. The first guest speaker was Prof. Tsuyoshi Kato (“Deciphering Capital Cities of Southeast Asia (The Birth of Jakarta)”). The second was Prof. Benedict Anderson (“Post-revolutionary Jakarta: an Accessible City”), and the third was Prof. Daigaku Yamanaka (“The Climate/weather and People Traffic of the Indonesian Oceanic Continent,” December 7). The fourth and fifth seminars will be announced later.

(4) Cooperation with the Indonesian Institute of Science (LIPI) by the coordination team: We have asked Prof. Ami Mizuno, an LIPI researcher, to participate in our project.

(5) Prof. Hans Anderson visited Tokyo and exchanged opinion with us during a short research stay from May 18 to June 7, 2009; his visit was arranged by JSPS and hosted by Muramatsu Lab at Institute of Industrial Science, the University of Tokyo.

#### d. Project Public Relations

(1) “Megacity Project Annual Report 2009”

(2) Constructing the project web site:

<http://www.weuhrp.iis.u-tokyo.ac.jp/chikyuken/index.html>

#### ○Co-Researchers

- ◎ Muramatsu, Shin (Research Institute for Humanity and Nature)
- Fukami, Naoko (Institute of Oriental Culture, the University of Tokyo)
- Kato, Hironori (Institute for Research in Kyoto University)
- Kimura, Takeshi (Graduate School of Humanities and Social Science, University of Tsukuba)
- Kinoshita, Tetsuya (RIHN)
- Widodo, Johanness (School of Design and Environment, National University of Singapore)
- Yamasaki, Sekino (Dentsu Communication Institute)
- Yamashita, Yuko (Graduate School of Commerce and Management, Hitotsubashi University)
- Taniguchi, Makoto (Research Institute for Humanity and Nature)
- Muramakami, Akinobu (Graduate School of Systems and Information Engineering, University of Tsukuba)
- Kurihara, Shinji (College of Bioresource Sciences, Nihon University)
- Harashina, Koji (Iwate University)
- Hayashi, Reiko (Ministry of Health and Prevention, Republic of Senegal)
- Mori, Koichiro (Institute of Industrial Science, the University of Tokyo)
- Torigoe, Keiko (School of Cultural & Creative Studies, Aoyama Gakuin University)

- Nao, Nobuhide ( Graduate School of Engineering, the University of Tokyo )
- Kitagaki Ryoma ( Graduate School of Engineering, the University of Tokyo )
- Takeuchi, Wataru ( Institute of Industrial Science, the University of Tokyo )
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- Okabe, Akiko ( Graduate School of Engineering, Chiba University )
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- Tanigawa, Ryuichi ( Institute of Industrial Science, the University of Tokyo )
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- ANDERSEN, Hans Thor ( Department of Geography & Geology, the University of Copenhagen )
- SHIMADA, Ryuto ( Seinan Gakuin University, Associate Professor )
- MEUTIA, A. Ami. ( Research Institute for Humanity and Nature )
- Hiroko, Matsuda ( Research Institute for Humanity and Nature )

### ■ Future Themes

During the PR stage last year, we established a research organization, broadened our views, and created a network with researchers in Jakarta. We will finally enter FR1 stage this year, starting full-scale studies. The following is our research plan for the next year and years (FP1, 2) before the interim evaluation.

- 1) We will increase our knowledge regarding various megacities on the Earth, and create a large-scale sketch illustrating what these cities are.
- 2) We will establish a city evaluation index (*3E+ICH*) .
- 3) We will rapidly collect and organize macro-information on Jakarta.
- 4) We will set up hypotheses and verify them regarding the three aspects of cities' relationship with the Earth's environment (exhaustion of resources, deterioration of natural environment, and degradation of amenities).
- 5) We will establish a framework for the final research outcome.
- 6) We will create an international network to deal with megacity issues, and hold international symposia.



**Stage:** FS

**Project Name:** An Environmental History of Nomads and Farmers in Central Asia

**Abbreviated Title:** C.A. Project

**Project Leader:** UNO Takao

**Research Axis:** Ecohistory Program

**URL:** <http://web.mac.com/tuno>

**Key Words:** environment, history, nomad, farmer, Central Asia, agriculture, irrigation

### ■ Research Subject and Objectives

Our research objective is investigating interactions between human activities and environment in Central Asia since beginning of nomadism and agriculture until modern times. Our final objective is establishing guideline for harmonic progress in this reason.

### ■ Progress and Results in 2009

We practiced following researches around Dabusya tepa in Zeravshan valley, Uzbekistan.

1. Ethno-archaeological survey of Nomadism or mobile livestock, in flood plain of Zeravshan valley.
2. Modern-environment survey of collecting samples of water in various point of Zeravshan valley and isotope analysis of them.
3. Excavation at the moat of citadel and pollen/diatom analysis of soil samples.
4. Excavation at the citadel for collecting data of farmers and nomads.
5. Topographical analysis based on high definition digital elevation model

Results

1. Mobile livestock have been executed extensively in flood plain of Zeravshan valley, but they are threatened by irrigation agriculture recently.
2. Not only drinking water from streams and springs but also irrigation water are contaminated by uranium and antimony.
3. We could find good stratums of fine sand and course sand in the moat. We are now analyzing the pollen and diatom from soil samples.
4. We could collect a lot of animal bones for reconstructing menu of royal families of agricultural dynasty and pastoral dynasty.
5. We created high definition digital elevation model of this area and analyzing distribution of Silk Road city sites on it.

### ○ Co-Researchers

- ◎ UNO Takao ( International Research Center for Japanese Studies, Professor, Implementation and summary of research works )
- YAMAGUCHI Hiroshi ( International Research Center for Japanese Studies, Lecturer, Studies of Informatics archaeology )
- SATO Yo-ichiro ( RIHN, Professor, Studies of DNA archaeology )
- KUBOTA Junpei ( RIHN, Associate Professor, Studies of Hydrogy )
- NAKANO Takanori ( RIHN, Professor, Studies of Isotope analysis )
- SAKAI Hideo ( Faculty of Science Toyama University, Professor, Studies of Geophysics )

### ■ Future Themes

This project was closed.

### Books

#### 【 Authored/Co-authored 】

- Uno, T Mar, 2010 Reading Historical Space Structures of Ancient Urban and Rural Settlements in Eurasia. Bensei Press, Tokyo, 201pp. (in Japanese)

#### 【 Chapters/Sections 】

- Komil, R., Uno, T Dec,2009 . Archaeological Research in Uzbekistan, 6. Institute of Archaeology of Uzbekistan, Samarkand, pp.258. (Other)

## **Research Presentations**

### **【Oral Presentation】**

- Hirofumi TERAMURA and Takao UNO 3D modeling of seals and seal impressions excavated at Kanmer.. BHUJ ROUND TABLE; International Conference on Gujarat Harappans & Chalcolithic Cultures, Jan 28,2010-Jan 31,2010, Bhuj, Gujarat, India..
- Hirofumi TERAMURA and Takao UNO GIS applications in the Indus Project, RIHN -Case studies in progress at Kanmer and Farmana, India. 19TH CONGRESS OF THE INDO-PACIFIC PREHISTORY ASSOCIATION, Nov 29,2009-Dec 05,2009, Vietnam, Hanoi.

**Stage: FS****Project Name: Atmospheric Methane and Agriculture in Monsoon Asia****Project Leader: HAYASHIDA Sachiko****■ Research Subject and Objectives**

This project examines atmospheric methane (CH<sub>4</sub>) and agriculture in monsoon Asia. In terms of radiative forcing, CH<sub>4</sub> is the second most significant greenhouse gas (after carbon dioxide [CO<sub>2</sub>]). Agriculture, especially paddy rice cultivation and the keeping of ruminant animals, produces large amounts of CH<sub>4</sub>. Monsoon Asia, where approximately 90% of the world's rice fields are located, is therefore a major source of CH<sub>4</sub> emissions. Research in this project quantifies CH<sub>4</sub> emissions and attempts to describe a culturally appropriate low-methane food system.

**■ Progress and Results in 2009**

- 1) We reorganized the research structure, rearranged sub-themes, and added ten new project members.
- 2) Some of the project members visited Vietnam, Thailand, China, and Cambodia to investigate the actual methane flux network. Regarding other surveys, about 20 institutions have promised to collaborate in the project.
- 3) We compared the rice field distribution observed using MODIS (Takeuchi and Yasuoka, 2009) with a bottom-up methane emission inventory (Yan et al., 2009), and with the CH<sub>4</sub> distribution observed with SCIAMACHY (Hayashida, unpublished data). There is potential to reduce the discrepancy between the rice field map and the bottom-up emission map.
- 5) As a case study, we have collected life cycle inventory data for rice, and calculated the carbon footprint (CFP) of rice production in the northern Lake Biwa basin as a benchmark. This analysis attributed about two thirds of the total amount of greenhouse gasses (CO<sub>2</sub>-equivalents) that were emitted through the cultivation process to methane emissions from rice fields. In November, the CFP was formally approved, after examinations. The rice is now on the market, and attention is now focused on the reaction of consumers.

**○ Co-Researchers**

- ◎ Hayashida Sachiko ( Faculty of Science, Nara Women' s University )
- KUJI Makoto ( Faculty of Science, Nara Women' s University )
- AOKI Shuji ( Graduate School of Science, Tohoku University, Professor )
- HAYASAKA Tadahiro ( Graduate School of Science, Tohoku University, Professor )
- IMASU Ryoichi ( Center for Climate System Research, The University of Tokyo )
- TAKEUCHI Wataru ( Institute of Industrial Science, The University of Tokyo )
- YAGI Kazuyuki ( National Institute for Agro-Environmental Sciences )
- INUBUSHI Kazuyuki ( Graduate School of Horticulture, Chiba University, Professor )
- ENISHI Osamu ( National Institute of Livestock and Grassland Science )
- TAKENAKA Akio ( Japan International Research Center for Agricultural Sciences )
- MATSUMOTO Jun ( Faculty of Urban Environmental Sciences, Tokyo Metropolitan, Professor )
- MATSUEDA Hidekazu ( Geochemical Research Department, Meteorological Research Institute )
- AMANO Koji ( Department of Environmental Systems Engineering, Ritsumeikan University, Professor )
- SHIMADA Koji ( Department of Economics, Ritsumeikan University, Professor )

**■ Future Themes**

This study will improve understanding of the direct environmental impact of food production and consumption in Monsoon Asia and of the global significance of rice and livestock production to global GHG emissions. A final objective is to suggest how methane emissions associated with agriculture can be reduced, and so to contribute to the design of low-GHG societies

**Stage: FS****Project Name: Development, Migration, Environmental Change and Human Health in Malaysia****Project Leader: SUDA Kazuhiro****■ Research Subject and Objectives**

Human Development Report 2009 (UNDP, 2009) indicated that human mobility has been spurred with globalisation. The high human mobility has accelerated tremendous expansion of development frontiers and has caused environmental deterioration in intact ecosystems across countries.

According to Rockström et al. (2009), of nine categories of global environmental issues that were defined according to biophysical processes, three issues, i.e., climate change, rate of biodiversity loss and interference with the nitrogen cycle, have already transgressed a threshold of Earth's capacity for self-regulation, beyond which there may be abrupt in non-linear changes and recover will be impossible. There is no doubt that the three global environment issues (mentioned above) have been associated with continuous expansion and intensification of human activities of not only local populations but also of migrant populations in development frontiers, particularly, in tropical forests. Environmental impacts of the latter populations have increased drastically. Myers (2002) emphasizes that as many as 200 million people may become environment refugees due to catastrophic shift of planetary system, which may pose further pressure on the frontiers. UNDP launched several actions for the mitigation of the problem.

There is the vicious cycle in development frontiers: migration is the fundamental cause of mal-adaptation, which leads to the deterioration of the environment; further migrations occur from that area. If we realized the increasing trend in number of migrants, it is crucial to break out the vicious cycle for avoiding catastrophic global environment issues, for reducing poverty, and for achieving human well-beings.

A research project that tackles the issues for human mobility and global environmental problems is indispensable. Goal of our research project is to clarify the dynamic equilibrium/disequilibrium of human ecosystems when they were perturbed by human mobility. To achieve this ultimate goal, we have four specific research objectives: (1) to investigate reality of human mobility in development frontiers by compiling case studies for mobility-environment issues; (2) to categorise human mobility cases by the causes and environmental consequences; (3) to clarify conditions (i.e., ecological, socio-cultural, political) with which migrant populations can harmonized with natural ecosystems; and (4) to provide the possible mitigation processes for human adaptations to each environment based on evaluation for substantial of human environment in the developmental frontiers.

**■ Progress and Results in 2009**

We will employ the research methods that have been developed in the following disciplines: ecological anthropology, cultural anthropology, epidemiology, human ecology, eco-toxicology and landscape ecology. The methods have strength when they were applied to collect quantitative and basic data about the impact on the local environments caused by domestic and international human migrations in Southeast Asia, mainly in Malaysia and Indonesia. Indonesia has adopted the "trans-migrations policy". The policy initiated development of rain-forested areas by active trans-migrants from areas (islands) that experienced natural disasters, politics instability, and poverties. In contrast, Malaysia is a nation that has accepted number of migrants from foreign countries for the colonial and national development since the 19<sup>th</sup> century. We organized the research group as: (1) the group for classification of human mobility; (2) the group for case studies of human mobility; (3) the group for evaluating impact of human mobility on environment; (4) the group for generalization and advancement of mobility-environment studies. The aim of the group (1) is to classify the human mobility based on its causes and to investigate the possible relationships between human mobility and global environmental problems, while the group (2) will provide case studies for migration networks, variety of resource uses and environment recognitions among the

migrants. The group (3) will grasp the possible conditions for human adaptations to each environment based on evaluation for substantial of human environment in the developmental frontiers. Based on the work and outcomes analyzed by these three research groups, the group (4) will try to generalize all the results for further evaluation and feedback for each research group, and to advance dynamic equilibrium/disequilibrium between human mobility and human ecosystem in the environmental perturbation era.

### ○Co-Researchers

- ◎ SUDA Kazuhiro ( Hokkai-Gakuen University, Professor, General manager of the project )
- KUCHIKURA Yukio ( Gifu University, Professor, Analysis of resource use and development )
- NOBUTA Toshihiro ( National Museum of Ethnology, Associate Professor, Analysis of development )
- ICHIKAWA Tetsu ( Rikkyo University, Research Assistant, Analysis of migration )
- WATANABE Chiho ( University of Tokyo, Professor, Analyses of nutritional /chemical burden on human-environment system and its associated risk )
- UMEZAKI Masahiro ( University of Tokyo, Associate Professor, Assessment of nutritional impact of migration )
- INAOKA Tsukasa ( Saga University, Professor, Assessment of migration-induced health transition )
- OKUBO Satoru ( University of Tokyo, Assistant Professor, Landscape ecological assessment )
- TAWA Masataka ( Kwansei Gakuin University, Professor, Geographical analysis of Cambodian fishers in West Malaysia )
- NISHITANI Masaru ( National Museum of History, Associate Professor, Historical analysis of migrants in Indonesia )
- IIDA Taku ( National Museum of Ethnology, Associate Professor, Anthropological analysis of Malay fishers in West Malaysia )
- ODANI Shingo ( Chiba University, Associate Professor, Anthropological analysis of Orang Asli in West Malaysia )
- RAMLE bin Abdullah ( Malaysia Darul Iman University, Senior Lecturer, Anthropological analysis of Orang Asli in West Malaysia )

### ■Future Themes

We encountered several problems about (1) logistic reasons for selection of fieldwork location; (2) size of our research grope; (3) the exact methods for evaluating the possible affect of human mobility on environment. In terms of possible solutions for these problems, we changed our research design and project goal dramatically and suggest as follows; (1) we found Indonesia and Malaysia are one of the most potential research fields for this project as deforesting of tropical rain forest and various types of migrants and exile population are increasing; (2) we newly made four research groups as discussed above and also added two more scholars who majoring migrant study and development anthropology; and (3) we divide any disturbances of human ecosystem caused by human mobility into (A) direct influence and (B) in-direct influence, and are planning to conduct landscape-ecology or epidemiological investigations to evaluate the micro-level of nutrition intake, eco-toxicology and soil contamination in relation to the macro-level of global environment problems such as deforesting of rain forest.

### Books

#### 【Chapters/Sections】

- Nobuta, T. 2009 Urbanization and indigenouse people: Development among the Orang Asli, Malaysia. Goda, Toh (ed.) *Urbanization and Formation of Ethnicity in Southeast Asia*. New Day Publishers, Quezon City, Philippines, pp.100-115.
- Ramle bin Abdullah, K. SUDA 2009 Penerimaan Pembangunan Dalam Kalangan Suku Kaum bateq di Kuala koh, Kelantan. Abdul Razaq Ahmad and Zalizan Mohd Jelas (ed.) *Masyarakat Orang Asli: Perspektif Pendidikan dan Sosiobudaya*. UKM Press, Bangi, Malaysia. (Other)

### Editing

#### 【Editing / Co-editing】

- Nobuta, T., Masaki, K. (ed.) 2009 Anthropology of Development in South and Southeast Asia. Akashi

Shoten, Tokyo, (in Japanese)

## Papers

### 【Original Articles】

- Suda, K. 2009 An ecological anthropological study on regional development and its impacts on the Orang Asli communities in Terengganu, Malaysia. *Bulletin of Faculty of Humanities, Hokkai-Gakuen University* 42 :161-184. (in Japanese)
- Fukuyama, S., Watanabe, C., Umezaki, M., Ohtsuka, R. 2009 Twenty years' demographic change in sedentes and migrants of an international migrant-sending community in Tonga. *Journal of Biosocial Science* 41 :77-87.

## Research Presentations

### 【Oral Presentation】

- Ichikawa, T. Natural resources and international migration: Malaysian Chinese community in Papua New Guinea. International Conference "Society for East Asian Anthropology & Taiwan Society for Anthropology and Ethnology 2009 Conference", Jul 05, 2009, Academia Sinica, Taipei, Taiwan.

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**Stage: FS**

**Project Name: Genetic Pollution, Farming Ecosystems and New Energy Crops in Tropical Asia**

**Project Leader: SATO, Tadashi**

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### ■ Research Subject and Objectives

The objective of this project is to propose a new sustainable farming system, based on investigating the wisdom inherited in traditional farming systems, which can secure a reliable yield irrespective of a low environmental load. We shall investigate how biodiversity and sociocultural circumstances have enabled sustainable agriculture in traditional farming. In addition, we would like to propose a “Sustainability of food production and lifestyle” as a sociocultural basis supporting sustainable traditional farming systems.

Modern farming system in tropical Asia after the “Green Revolution”, in exchange for enhanced productivity obtained by heavy use of chemical fertilizers and agrichemicals, has caused serious global environmental problems such as pollution in lakes and rivers. Introduction of new cultivars for industrial materials such as cassava, oil palm, and gum tree has created new jobs and new foundations for rural economies. However, their introduction has promoted large-scale monocultures, which have caused forest destruction and which have greatly decreased biodiversity through reclamation. Moreover, there is concern that the expansion of these cultivated areas deprives people and domestic animals of food crops. Consequently, introduction of modern cultivars and new crops has promoted global environmental problems in rural villages of tropical Asia.

Global environmental problems initiated by modernization of agriculture cannot be resolved merely by the reduced use of chemical fertilizers and agrichemicals. An important difficulty is how people shall farm and eat properly in their communities. Fortunately, regions where people practice traditional farming remain in tropical Asia. They might provide clues to resolution of global environmental issues. Therefore, this project to propose a sustainable modern farming system, with consultation of the wisdom of traditional farming systems, must be an urgent one for RIHN.

The research regions are mountain-ringed areas where traditional farming is underway and plain areas where modern farming has been introduced in Laos and Indonesia. We plan to investigate the biodiversity and genetic diversity of crops and the sociocultural systems related to food production and lifestyle in these two regions. Aspects of farming systems such as irrigation, weeding, fertilization, and yield criteria will be researched through a literature survey and interviews of farm workers. Biodiversity and genetic diversity of crops, weeds, and insects will be investigated through field observations. Furthermore, molecular analyses can be used to characterize microbial community structure, diversity, and activity in farms. Regarding formalities and traditions related to food production and lifestyle, sociocultural systems will be investigated through literature surveys and interviews of farm workers. Results in each region, collected through the investigations described above, will reveal differences between traditional farming regions and modern farming regions. We will verify organic links among farming systems, diversity, and the sociocultural base.

The project team consists of professional researchers of the following fields: agronomy, genetic diversity and biodiversity, pathology, microbial ecology, religions and cultures, and ethnic communities.

### ■ Progress and Results in 2009

The study regions of traditional farming are rain-fed paddy fields in mountain areas located in northern territories of Laos and in southern Sulawesi, Indonesia. A preliminary study revealed that the average rice yield in mountainous areas of the northern territory of Laos is about one-half of that in Japan. The variety of rice cultivars in those traditional farming regions was found to be much wider than that in modern farming regions. Farmers in traditional farming regions apparently rotate cultivars of rice with 2-3 year frequency. They share the practice of exchanging cultivars of rice among families, settlements, and villages. Although weeds are removed using chemical herbicides in modern farming, farmers in the

traditional farming used asteranceae andleguminous plants as fertilizer by furrowing. These regions conserve richbiodiversity, genetic diversity, traditional practices, and common practices offarming.

Studyregions of modern farming are irrigated paddy fields in the middle plains of Laos and in southern Sulawesi, Indonesia.A preliminary investigation of irrigated paddy fields in Vientiane revealed that modern cultivars ofrice are affected by rice blast. Furthermore, we confirmed that chemicalfertilizers and agricultural chemicals were used at gum tree plantations andcornfields in northern Laos,and at oil perm and cacao plantations in southern Sulawesi of Indonesia.

Therefore,we reconfirmed the wisdom of traditional farming systems, which securedreliable harvests irrespective of their low environmental loads. Thisreconfirmation suggests that organic links between farming systems,biodiversity and genetic diversity in fields, and sociocultural systems areinherited in communities conserving traditional agriculture.

Theproject team comprises professional researchers from fields of natural andsocial sciences. We selected Laosand southern Sulawesi, Indonesia as study regions of bothtraditional and modern farming. A preliminary investigation obtained theinteresting results described above. Based on these achievements, we shallfocus on our objectives. Agreements on cooperative research have been concludedbetween RIHN, National Agriculture and Forestry Research Institute, Laos,and Hasanuden University of Indonesia. These agreements enable us toinvestigate plants that are controlled by international law. We haveestablished a framework for cooperative research with these two institutionsthrough successful workshops, conferences, and meetings. Arrangements ofcooperative research programs on cultivation methods to control diseases andpests using genetic diversity are being made with researchers at Yunnan Agricultural University, China. Additionally, we haveestablished methods to evaluate the diversity of microorganisms living togetherin rhizosphere and plant bodies applying molecular biology. Therefore, we areconvinced that all the arrangements for this project have been prepared topromote the full research project in RIHN.

### ○Co-Researchers

- ◎ SATO Tadashi ( Graduate School of Life Science, Tohoku University, Associate Professor, Generalization of project )
- SATO Yo-Ichiro ( RIHN, Professor, Biological study )
- FUKUTA Yoshimichi ( Japan International Research Center for Agricultural Sciences, Project Leader, Biological study )
- KIMURA Toshiaki ( Graduate School of Arts and Letters, Tohoku University, Associate Professor, Sociocultural study )
- MATOH Toru ( Graduate School of Agriculture, Kyoto University, Professor, Agricultural study )
- KAWANO Kazuaki ( Kagoshima Prefectural Museum of Culture Reimeikan, Chief Curator, Sociocultural study )
- ICHIKAWA Masahiro ( aculty of Agriculture, Kagoshima University, Associate Professor, Agricultural study )
- NAKAMURA Ikuo ( Graduate School of Horticulture, Chiba University, Associate Professor, Biological study )
- YUMOTO Takakazu ( RIHN, Professor, Biological study )
- SJAHRI Rinaldi ( Faculty of Agriculture Hasanuddin University, Indonesia, Associate Professor, Research cooperation )
- BOUNPHANOUSAY Chay ( Rice and Cash Crop Research Center, LaoPDR, Deputy Director, Research cooperation )

### ■Future Themes

Inour members meeting held July 2009, we discussed topics expected to produceclear distinction among the roles of members: our background, progress of ourresearch, framework and mode of this research. Then, in our members meetingheld October 2009, we confirmed on the framework, methods, objective andachievements of this research.

Whatwe have learned through the lectures, workshops and meetings at NationalAgriculture and Forestry Research Institute, Laos, Hasanuden University ofIndonesia and Yunnan Agricultural University, China has convinced us thatpeople strongly wish to halt or reduce use of chemical fertilizers andagrochemicals to



at least partially alleviate environmental issues. At an international symposium on wild rice, we reported on environmental microorganisms gaining the interest of participants. This demonstrates the importance, urgency, and high rating of this project.

We have established a new group structure analysis of molecular biology for microorganism parasitism in plants. The existence of genetic diversity in inoculation of environmental microorganism has been estimated from our research. Regarding traditional farming in Asia, we published a monograph "Sustainability of Asian Traditional Farming systems." Furthermore, we discovered a marker to identify cultivated rice and wild rice by analysis of base sequence of chloroplast DNA of rice genus. Additionally, we developed a simple method of identifying genome of a rice genus through analyses of variable regions in the *PolA* gene.

The targets of a feasibility study, reinforcement of the research framework, selection of local regions to be investigated, well-defined collaboration system, and establishing new methods of research have all been attained. We discussed and determined our planned final achievements at a meeting held in October 2009. We contemplated inviting specialists in nutrition, taste sensations, and food culture as members of this project. However, we have not finished those arrangements as of the time of this submission. Therefore, this matter will be settled in a supporting research framework during preparations for the feasibility study.

Although we have received funding for analysis of biodiversity and for surveys of genetic diversity, we have not received funding for research such as that described above concept.

## Books

### 【Chapters/Sections】

- Yoshimichi Fukuta, Donghe Xu, Mary Jeanie Yanoria, Aris Hairmansis, Nagao Hayashi, Nobuya Kobayashi 2009 Genetic characterization of universal differential variety sets developed under the IRRI-Japan Collaborative research Project.. *Advance in genetics and Control of Rice Blast Disease*. Springer, pp.325-335.
- Daisuke Fujita, Leodegario A. Ebron, Nobuya Kobayashi, Yoshimichi Fukuta 2009 DNA markers analysis of blast resistance gene *Pib* and *Pia* in IRRI-Bred Rice varieties comparing with gene estimation by a differential system.. *Advance in genetics and Control of Rice Blast Disease*. Springer, pp.315-324.

## Papers

### 【Original Articles】

- Koide Y., Kobayashi N., Xu D., Fukuta Y. 2009 Resistance genes and selection DNA markers for blast disease in rice (*Oryza sativa* L.). . *JARQ* 43 :255-280.
- Takahashi, H., Sato T., Sato Y-I., Nakamura I. 2009 Genome-type-specific variation of the 19th intron sequence within the RNA polymerase I largest subunit gene in the genus *Oryza*.. *Plant Syst. Evol.* 282 :21-29.
- Takehisa H., Yasuda M., Fukuta Y., Kobayashi N., Hayashi N., Nakashita H., Abe T., Sato T. 2009 Genetic analysis for resistance gene in an Indica-type rice (*Oryza sativa* L.), Kasalath, using DNA markers.. *Breeding Science* 59 :253-260.
- Kawasaki, A., K. Imai, J. Ushiki, T. Ishii, and R. Ishikawa 2009 Molecular constitution of weedy rice (*Oryza sativa* L.) found in Okayama prefecture, Japan.. *Breeding Science* 59 :229-236.
- Imai, K., M. MURAI, Y. Hao, Y. CHIBA, A. CHIBA and R. ISHIKAWA 2009 Mapping of rice *Ur1* (Undulated rachis-1) gene with effect on increasing spikelet number per panicle and sink size, and development of selection markers for the breeding by the use of *Ur1* . *Hereditas* 146 :1-9.
- Akasaka, M., J. Ushiki, H. Iwata, R. Ishikawa and T. Ishii 2009 Genetic relationships and diversity of weedy rice (*Oryza sativa* L.) and cultivated rice varieties in Okayama Prefecture, Japan.. *Breeding Science* 59 :401-409.
- Tsuchiya, T., N. Kameya, I. Nakamura 2009 Straight Walk: A modified method of ligation-mediated genome walking for plant species with large genomes.. *Anal. Biochem.* 288 :158-160.

- Thirukkumaran, G., R.S. Khan, D.P. Chin, I. Nakamura, M. Mii. 2009 Isopentenyl transferase gene expression offers the positive selection of marker-free transgenic plant of *Kalanchoe blossfeldiana*. *Plant Cell. Tiss. Organ Cult.* 97 :237-242.
- Yamauchi, T., Y. Jozuka-Hisamori, S. Fukuda-Tanaka, R. Terada, I. Nakamura and S. Iida. 2009 Homologous recombination-mediated knock-in targeting of the MET1a gene for a maintenance DNA methyltransferase reproducibly reveals dosage-dependent spatiotemporal gene expression in rice. *Plant J.* 60 :386-396.
- Nakamura, I., B. Rai, H. Takahashi, K. Kato, Y-I. Sato 2009 Aegilops section Sitopsis species contains the introgressive PolA1 gene with a closer relationship to that of *Hordeum* than *Triticum*-*Aegilops* species. *Breed. Sci.* 59 :602-610.
- Takahashi, H., B. Rai, K. Kato and I. Nakamura 2009 Divergent evolution of wild and cultivated subspecies of *Triticum timopheevii* as revealed by the study of PolA1 gene. *Genet. Res. Crop Evol.* 57 :101-109.
- Sachiko Namai Kazunobu Toriyama, Yoshimichi Fukuta 2009 Genetic variation in dry matter production and physiological nitrogen use efficiency in rice (*Oryza sativa* L.) varieties. *Breeding Science* 59 :269-276.

#### **【Review Articles】**

- Takehisa H. Hayashi Y. Abe T. Sato T. 2009 Breeding of salinity tolerant rice by using heavy-ion beam mutation technology. *Radiation & Industries* 121 :22-26. (in Japanese)
- Daisuke Fujita, Leodegario A. Ebron, Nobuya Kobayashi, Yoshimichi Fukuta. 2009 DNA markers analysis of blast resistance gene Pib and Pia in IRRI-Bred Rice varieties comparing with gene estimation by a differential system. *Advance in genetics and Control of Rice Blast Disease*, Springer, pp.315-324.
- Yoshimichi Fukuta, Donghe Xu, Mary Jeanie Yanoria, Aris Hairmansis, Nagao Hayashi, Nobuya Kobayashi. 2009 Genetic characterization of universal differential variety sets developed under the IRRI-Japan Collaborative research Project. *Advance in genetics and Control of Rice Blast Disease*. Springer, pp.325-3355.

### **Research Presentations**

#### **【Oral Presentation】**

- Ishikawa R. Honda T. Hao Y. Tanaka K. Ichitani K. Nakamura I. Sato T. Sato Y-I. Genetic differentiation between Oceania and Asia rufipodon in *Oryza* genus. 117th Meeting of Japanese Society of Breeding, Mar 26, 2010-Mar 27, 2010, Kyoto. (in Japanese)
- Yoshimichi Fukuta, Nobuya Kobayashi, Tkahito Noda, Nagao Hayashi, Casiana M. Vera Cruz. Blast Research Network for Stable Rice Production. 6th International Rice Genetic Symposium, Nov 15, 2009-Nov 19, 2009, Manila.
- Honda T. Hao Y. Nakamura I. Sato T. Sato Y-I. Ishikawa R. Comparison of genetic diversity with core collection though Asia and Cambodia nationwide collection by using chloroplast genome. 116th Meeting of Japanese Society of Breeding, Sep 25, 2009-Sep 26, 2009, Sapporo. (in Japanese)
- Ishikawa R. Impression of an origin of indica varieties with Rc haplotypes. 116th Meeting of Japanese Society of Breeding, Sep 25, 2009-Sep 26, 2009, Sapporo. (in Japanese)
- Hao Y. Ishii T. Ishikawa R. Comparison of the cytoplasmic variety in AA genome species wild rice. 116th Meeting of Japanese Society of Breeding, Sep 25, 2009-Sep 26, 2009, Sapporo. (in Japanese)

#### **【Poster Presentation】**

- So Makabe, Hiroko Takahashi, Masahiro Akimoto, Hathairat Uairong, Ryuji Ishikawa, Tadashi Sato, Yo-ichiro Sato, and Ikuo Nakamura BKK strain: natural triploid wild rice found in Bangkok. International Symposium on Wild Rice 2009, Nov 22, 2009-Nov 24, 2009, Bangkok.
- Hiroko Takahashi, Yo-ichiro Sato, and Ikuo Nakamura Evolutionary analysis of two plastid DNA sequences in *Oryza* AA genome species. International Symposium on Wild Rice 2009, Nov 22, 2009-Nov 24, 2009, Bangkok.

Bangkok.

- Rinaldi Sjahril, Muh. Riadi, Muh. Danial Rahim, Hiroko Takahashi, Tadashi Sato, and Ikuo Nakamura *Oryza officinalis* accessions found in South Sulawesi of Indonesia. International Symposium on Wild Rice 2009, Nov 22, 2009–Nov 24, 2009, Bangkok.
- Hanzawa E., Nagai S., Sasaki K., Miyao A., Hirochika H., Obara M., Higashitani A., Maekawa M., Sato T. A soil surface rooting mutant is deficient in gravitropism of primary roots in rice.. 6th International Rice Genetics Symposium, Nov 15, 2009–Nov 19, 2009, Manilla.
- Kuriyama S., Sato T. Contribution of Na<sup>+</sup> Excretion via hydathode on Salinity Tolerance in Rice. 6th International Rice Genetics Symposium, Nov 15, 2009–Nov 19, 2009, Manilla.
- Lee H-S, Sasaki K, Higashitani A, Sato T. Mapping of quantitative trait loci controlling mesocotyl elongation in Rice (*Oryza sativa* L.). 6th International Rice Genetics Symposium, Nov 15, 2009–Nov 19, 2009, m.
- Hayashi Y. Takehisa H. Kazama Y. Oobe S. Tokairin H. Sato T. Abe T. Genetic Analysis Rice mutant with heavy-Ion beam technology. 116th Meeting of Japanese Society of Breeding, Sep 25, 2009–Sep 26, 2009, Sapporo. (in Japanese)
- Lee H-S, Sasaki K, Higashitani A, Sato T. Mapping of quantitative trait loci controlling mesocotyl elongation in Rice (*Oryza sativa* L.). 116th Meeting of Japanese Society of Breeding, Sep 25, 2009–Sep 26, 2009, Kyoto.

**【Invited Lecture / Honorary Lecture / Panelist】**

- Sato, T. Genetic pollution of farming ecosystem caused by the rapid expansion of cultivation for new energy crops in the Tropical Asia. NAFRI Workshop, Nov 26, 2009, Vientiane.
- Ikuo Nakamura Practical classification of organisms based on molecular data. NAFRI Workshop, Nov 26, 2009, Vientiane.
- Kimura Toshiaki Religion, social and agriculture change in Tropical Asia. NAFRI Workshop, Nov 26, 2009, Vientiane.
- Ryuji Ishikawa Evaluation and Utilization of Core collection and “de novo” collection. International Symposium on Wild Rice 2009, Nov 22, 2009–Nov 24, 2009, Bangkok.
- Ikuo Nakamura Nuclear copies of plastid DNA in japonica genome records dynamic speciation of Asian AA genome species. International Symposium on Wild Rice 2009, Nov 22, 2009–Nov 24, 2009, Bangkok.
- Sato T. The long journey on humans and wild rice. International Symposium on Wild Rice 2009, Nov 22, 2009–Nov 24, 2009, Bangkok.
- Sato T. Mapping and characterization of quantitative trait loci related growth of rice in saline paddy field. Lecture of Yunnan Agriculture University, Sep 18, 2009, Konmei China.

**Stage: FS****Project Name: Agricultural and Hydrological Cycles in the Changjiang Basin****Project Leader: TANAKA Hiroki**

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**■ Research Subject and Objectives**

China is one of most important nations in the current global economy and the most important trading partner of Japan. Changes in human livelihood and economy in China affect Japan directly. Moreover, hydrological changes in China affect Japan's environment as well as the global environment through oceanic and atmospheric effects. We must work together to tackle difficult current and future environmental problems to help ensure peaceful co-existence and mutual prosperity.

This study project will examine water problems such as water shortage, drought, water pollution, flood and sediment disaster in China, with particular focus on the spatio-temporal variability of such problems in the humid Changjiang basin. This project involves multidisciplinary research and includes both macro- and micro-scale studies. Objectives of this project are (1) to evaluate the spatio-temporal distribution of potential eco-hydrological risk, (2) to understand the adaptability of local and regional societies to water-related risk, (3) to provide feasible action models for solving water problems in China and (4) to provide fundamental information on how changes in China may have worldwide influence through economic, oceanic and atmospheric circulations

**■ Progress and Results in 2009**

Project members have discussed the project structure and concrete topics in five project meetings held during this fiscal year (FY 2009). Furthermore, a China-Japan joint workshop was held to exchange information and ideas between science communities in Japan and China. Finally, a concrete project structure has been successfully constructed, as described in section 2.

The joint China-Japan workshop was held from 7 to 9 September 2009 in Jiangxi Province, China, and was sponsored by the Nanjing Institute of Geography and Limnology, Chinese Academy of Sciences; the Hydrospheric Atmospheric Research Center, Nagoya University; and the RIHN. Forty-six participants attended from 12 institutions and universities in China and Japan. Participants confirmed the importance and necessity of the multidisciplinary research related to hydrological cycles and land use in the Changjiang basin and the frameworks of data sharing, in situ observation networks and integral or comparative studies using various numerical models. Finally, the workshop concluded that such an international co-operative framework of multidisciplinary environmental study and consecutive international workshops has been strongly desired.

During the workshop and following preliminary field surveys, positive discussions were held regarding the in situ observations with several responsible persons at field research stations, resulting in concrete personal agreements. Preliminary sociological surveys have also been conducted in several villages in Jiangxi Province and Sichuan Province to clarify the problems found at the local scale. An initial finding is that the traditional style of rice double cropping in South China has been undergoing dramatic change. In all the villages surveyed in Jiangxi Province, approximately 70% to 80% of the area once devoted to double-cropping rice cultivation has been shifted to single cropping of rice. This significant change in agricultural phenology will have effects on the seasonality of the hydrological state and the potential risk of water-related problems.

For the macro-scale study, agricultural water-use efficiency has been analysed. A decreasing tendency of agricultural water-use efficiency has been evident in the Changjiang basin, implying the dissolution of water management in rural areas. The gap between water demand and supply in China was also analysed at the macro-scale, and the possibility of water shortage was projected for 2050 in and around large cities in the Changjiang basin. These preliminary results suggest the clear importance of this project and highlight the need for further research not only at the macro-scale but also at the local scale to understand the actual situation.

## ○Co-Researchers

- TANAKA Hiroki ( , Hydrospheric Atmospheric Research Center, Nagoya University, Associate professor, Coordination and summarizing; Hill slope hydrology; Land-air interaction )
- TATENO Ryunosuke ( Faculty of Agriculture, Kagoshima University, Associate professor, Evaluation of ecological status and function of forest; Evaluation of material flow in forest and soil )
- LIU Yuanbo ( Nangjing Institute of Geography and Limnology, Chinese Academy of Sciences, Professor, Evaluation of evapotranspiration from satellite remote sensing )
- TANAKA Kenji ( Disaster Prevention Research Institute, Kyoto University, Associate professor, Development of land use map; Land surface modelling )
- BAO Weikai ( , Chengdu Institute of Biology, Chinese Academy of Sciences, Professor, Evaluation of ecological status and function of forest; Evaluation of long-term changes in vegetation )
- HIYAMA Tetsuya ( Hydrospheric Atmospheric Research Center, Nagoya University, Associate professor, Groundwater dynamics; Evaluation of vulnerability on local water cycle )
- KATSUYAMA Masanori ( , Graduate School of Agriculture, Kyoto University, Research fellow, Evaluation of the hydrological dynamics over forested hill slopes )
- NISHIKAWA Masanori ( Graduate School of Environmental Studies, Nagoya University, Doctor course student; Ph.D. candidate, Role of land surface on the atmospheric condition and precipitation; Numerical simulation on meteorology )
- MAEDA Kenji ( Graduate School of Bioagricultural Sciences, Nagoya University, Research fellow; Ph.D. candidate, Evaluation of hydrological properties; Numerical simulation of water cycle )
- ISHIKAWA Daitaro ( The United Graduate School of Agricultural Sciences, Kagoshima University, JSPS research fellow, Ph D. candidate, Evaluation of spectral reflectance characteristics of vegetation; evaluation of vegetation change )
- TANAKA Shigeyoshi ( Graduate School of Environmental Studies, Nagoya University, Professor, , Sociology and commonality in multi-scale regional society )
- ZHU Anxin ( , School of Scioal and Behavioral Sciences, Nanjing University, Lecturer, Sociology and commonality in local community, Sociological general survey )
- UDA Shuhei ( Graduate School of Medicine, the University of Tokyo, JSPS research fellow PD, Anthropological study for domestic subsistence; Social and Natural environment for fishermen )
- LIU Chen ( Graduate School of Environmental Studies, Nagoya University, Associate professor, Nutrient flow dynamics and evaluation; Human behavioural impact assessment )
- YUTAKA Tomoyuki ( Faculty of Agriculture, Kagoyashima University, Associate professor, Status of the agricultural marketing and the networks of transportation for the product )
- IMURA Hidefumi ( Graduate School of Environmental Studies, Nagoya University, Professor, Policy analysis on the water management system )
- ONISHI Akio ( Graduate School of Environmental Studies, Nagoya University, Research fellow, Water demand and supply structure analysis; Water use efficiency analysis )
- MORISUGI Masafumi ( Faculty of Urban Science, Meijo University, Associate professor, Economical analysis on the water management system )
- CAO Xin ( State Key Laboratory of Earth Surface Processes and Resource Ecology, Beijing Normal University, Lecture, Land use / cover analysis )
- LUO Pingping ( Graduate School of Engineering, Kyoto University, Doctor course student; Ph.D. candidate, Summarizing the historical information in civil engineering )
- YAN Shangping ( Faculty of Economics, Momoyama Gakuin University, Professor, Agricultural economics; Analysis of the situation of agriculture and rural regions )
- ISHIZAKA Joji ( Hydrospheric Atmospheric Research Center, Nagoya

- University, Professor, Evaluation of oceanic influences on East China Sea and Japan Sea; Dynamics of Changjiang Diluted Water )
- UCHIDA Taro ( Public Works Research Institute, Senior researcher, Evaluation of sediment yield in hilly area )
- FURUICHI Takahisa ( , Center of Education for Leaders in Environmental Sectors, Tokyo University of Agriculture and Technology, Associate, professor, Evaluation of the sediment transportation through the river; Sediment yield; Effective use of the sediment resources in socio-economical system )
- MORIMOTO Akihiko ( Hydrospheric Atmospheric Research Center, Nagoya University, Associate professor, Evaluation of the change in physical dynamics on East China Sea and Japan Sea )
- YAMADA Hiroyuki ( Research Institute for Global Change, Japan Agency for Marine-Earth and Technology, Researcher, Evaluation of extreme meteorological events; Role of land surface on precipitation event )
- FUJINAMI Hatsuki ( Hydrospheric Atmospheric Research Center, Nagoya University, Assistant professor, Evaluation of long-term changes in precipitation and atmospheric circulation variability over East Asia )
- ENDO Nobuhiko ( , Research Institute for Global Change, Japan Agency for Marine-Earth and Technology, Senior technical researcher, Evaluation of climatological change over China )
- FURUZAWA Fumie ( Hydrospheric Atmospheric Research Center, Nagoya University, Research fellow, Evaluation of the recent change in precipitation statistics; Radiative properties of land surface )
- NAKAMURA Kenji ( Hydrospheric Atmospheric Research Center, Nagoya University, Professor, Evaluation of the recent change in precipitation statistics )
- SHINODA Taro ( Hydrospheric Atmospheric Research Center, Nagoya University, Assistant professor, Evaluation of extreme meteorological events; Role of land surface on precipitation event )
- UYEDA Hiroshi ( Hydrospheric Atmospheric Research Center, Nagoya University, Professor, Evaluation of the precipitation )
- YASUNARI Tetsuzo ( Hydrospheric Atmospheric Research Center, Nagoya University, Professor, Change in the monsoon climate related human-induced changes )

## ■ Future Themes

As the study region is in China, collaboration with Chinese researchers and institutions is essential. In the FS period, one of our most important tasks was to establish close relationships with Chinese scientists. As one example of our efforts toward this goal, we held the China-Japan joint workshop to exchange information, knowledge and ideas related to conducting the international and multidisciplinary research. During the FS period, we have established personal communications and personal agreements to carry out partial aspects of the project. Consecutive future workshops will help establish and strengthen international collaboration.

In addition to personal communications and scientific meetings, inter-institutional agreements are also essential for carrying out the actual research activities in China. In the PR period in FY 2010, it will be most important to establish agreements with several institutions related to this project, with a view toward the 5-year full-research period

## Books

### 【Chapters/Sections】

- Morimoto A 2009 Horizontal and vertical nutrients transport in the eastern channel of the Tsushima Strait. From "Monitoring and prediction of marine and atmospheric environmental change in the East Asia". T. Yanagi (ed.) TERAPUB. in press

## Papers

### 【Original Articles】

- Liu C, Wang Q, Lei A, Yang, Y, Ouyang Z, Lin Y, Li Y, Wang K 2009 Identification of anthropogenic parameters for a regional nitrogen balance model via field investigation of six ecosystems in China. . *Biogeochemistry*, 94 :175-190.
- Liu Y, Noumi Y, Yamaguchi Y 2009 Discrepancy between ASTER- and MODIS- derived land surface temperatures. *Terrain effects. Sensors* 9 :1054-1066.
- Morimoto A, Takikawa T, Onitsuka G, Watanabe A, Moku M, Yanagi T 2009 Seasonal variation of horizontal material transport through the eastern channel of the Tsushima Straits.. *Journal Oceanography* 65 :61-71.
- Nishikawa M, Hiyama T, Tsuboki K, Fukushima Y 2009 Numerical simulations of local circulation and cumulus generation over the Loess Plateau, China. *Journal of Applied Meteorology and Climatology* 48 :849-862.
- Shinoda T, Higuchi A, Tsuboki K, Hiyama T, Tanaka H, Endo S, Minda H, Uyeda H, Nakamura K 2009 Structure of convective circulation in the atmospheric boundary layer over the northwestern Pacific Ocean under a subtropical high.. *Journal of the Meteorological Society of Japan* 87(6) :979-996.
- Liu C, Wang Q, Lei A, Yang, Y, Ouyang Z, Lin Y, Li Y, Wang K 2009 Identification of various paramters of Nitrogen balance in 6 typical ecosystems of China by field investigation.. *Journal of the Japanese Agricultural System Society* 25(1) :35-44. (in Japanese)
- Onishi A, Sato Y, Morisugi M, Watanabe T, Fukushima Y 2009 Evaluation of regional difference of agricultural water use efficiency in China.. *Journal of Japan Society of Hydrology and Water Resources* 22(5) :356-371. (in Japanese)
- Shinoda T, Yamada H, Endo S, Tanaka H, Uyeda H 2009 Review of a research progress on the boundary layer and precipitation system on the eastern part of mainland China - 10 years since the GAME/HUBEX IOP -. *Tenki* 56(12) :971-981. (in Japanese)
- Zhu A 2009 The forgotten phase of community concept in China,. *Journal of Social Theory, Peking University Press* . (in Chinese) in press.

## Research Presentations

### 【Oral Presentation】

- Goto A, Morimoto A, Senju T, Onizuka G, Takikawa T, Watanabe A, Moku M Nutrient transport advected by the Tsushima Warm Current and its interannual variability.. Fall Meeting of the Oceanographic Society of Japan, , September 2009, Kyoto, Japan. (in Japanese)
- Tanaka H Role of the land surface on the water cycle. . China-Japan Joint Workshop on “Human-Nature Interactions in the Changjiang River Basin of China Experiencing Abrupt Change,” , September 2009, the Poyang Lake Laboratory for Wetland Ecosystem Research, NIGLAS, CAS, Xinzi, China.
- Tanaka K Description of landuse and vegetation status in hydrometeorological simulation. . China-Japan Joint Workshop on “Human-Nature Interactions in the Changjiang River Basin of China Experiencing Abrupt Change,” , September 2009, the Poyang Lake Laboratory for Wetland Ecosystem Research, NIGLAS, CAS, Xinzi, China.
- Zhu A The forgotten phase of community concept in China. Workshop of Chinese Organization Sociology, July 2009, Wuhan, China. (in Chinese)
- Morimoto A, Watanabe A, Takikawa T, Onitsuka G, Moku M, Yanagi T Interannual variation in material transports through the eastern channel of the Tsushima/Korea Sraits.. The 15th Pacific-Asian Marginal Seas Meeting, April 2009, Busan, Korea.

### 【Poster Presentation】

- Furuzawa FA, Tanaka H, Nakamura K Change of Precipitation over the Changjiang River Area Undergoing Sudden Change Revealed by TRMM Precipitation Radar, PR. . Annual meeting of Meteorological Society of Japan, November 2009, Fukuoka, Japan. (in Japanese)

- Onishi A, Iwamoto A, Shi F, Higashi O, Morisugi M, Watanabe T, Imura H Study on changes of future water demand by different socio-economic scenarios in China, pp.93-94. proceedings of 20th annual meeting of the Japanese Association for Arid Land Studies, 93-94, May 2009, Ibaragi, Japan. (in Japanese)



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**Stage:** FS

**Project Name:** Managing Environmental Risks for Sustainable Food and Health in Watershed Planning in Southeast Asia

**Project Leader:** KADA Ryohei

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### ■ Research Subject and Objectives

Deterioration in ecosystem services (due to deforestation, increased human settlements, agricultural activities, and industrial development) has recently caused significant ecological risks such as floods, soil erosion and water pollution in Southeast Asia. Ecological risks then critically impact agricultural and marine foods on which public health heavily depends. Food risks, which result from both inadequate supply of food as well as poor and contaminated quality of food, are contributing significantly to the public health risks. Our research site to be examined is Lake Laguna region in the Philippines. The water quality in Lake Laguna has significantly deteriorated due to pollution from soil erosion, mine drainage, effluents from chemical industries, and household discharges. Drastic change in the population pressure over the past ten years has remarkably contributed to the pollution activities.

The general objective of this FS research is to critically study how ecological risks impact the sustainable linkage between agricultural & marine foods and public health, from social and natural science perspectives, in the watershed area of Southeast Asia. In particular, we would try to examine:

- (1) to explore the current state of heavy metal concentration in the aquatic resources of Lake Laguna, and its impacts on public health; and to determine the level of chemical contaminants in the lake to precisely track the route of pollution;
- (2) to analyze long-standing presence of chemical materials in agricultural field, and its impacts on food supply; and to study land-use change, its impact on ecological changes in material cycles such as groundwater level and water quality; and
- (3) to combine social sciences with physical sciences including medical science to devise ecological risk management for sustainable food and health linkage.

### ■ Progress and Results in 2009

In cooperation with the faculty members from the University of the Philippines, we extensively carried out field surveys in the following three sites: Victoria Village (rural area), Los Banos Town (semi-urban area), and Sta Rosa City (urban area). In this regard, we will hire graduate students for assistance with the field surveys and experiments.

The following 4 research teams have been formed to carry out the research:

**Research Team 1: The Environmental Risk Analysis Team.** This team is concerned about the exact sources of particular pollutions, factors responsible for the pollutions, the routes of pollution and the way in which this is connected to the food chain.

**Research Team 2: Health Risk Evaluation Team.** The team will collect data from three sites on nutrition, history of diseases, and life expectancy crossed with socio-economic data. It will do purposive sampling by selecting a second generation farmers and/or fishers.

**Research Team 3: Ecosystem Degradation Evaluation Team.** The team is concerned about the land use changes in agriculture that bring a major source of pollutants to downstream. The team will use stable isotope technique to investigate organic matter movement.

**Research Team 4: Socio-Economic Evaluation Team.** This team will explore the way of how to improve the water quality by both Market-Based Instruments (e.g., economic regulation) and Non-Market Based Instruments (e.g., government regulation, community based management or collective action, education, and awareness).

We have established strong research collaboration between Philippine researchers and Japanese researchers as well as among Philippine researchers. Health risk related researchers at the University of the Philippines-Manila (UPM) and agriculture-resource oriented researchers at UP-Los Banos (UPLB) have reached agreement to collaborate among themselves for the first time in history. Fusion of

agricultural and medical sciences is evolving.

We also intensively discussed the issues with the faculty members from UP. Furthermore, we have developed the above-mentioned research teams that made a preliminary but well planned visits to the surrounding area of Lake Laguna in September and again in November 2009. They have shown enormous enthusiasm and appreciation towards the project by sending us updated data and study materials.

### ○Co-Researchers

- ◎ KADA Ryohei ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Environmental Economics )
- YUMOTO Takakazu ( Research Institute for Humanity and Nature, Professor, Forest Ecology )
- NAKANO Takanori ( Research Institute for Humanity and Nature, Professor, Isotopic Environmental Science )
- MATSUDA Hiroyuki ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Environmental Ecology )
- MASUNAGA Shigeki ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Environmental Chemistry )
- KANEKO Nobuhiro ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Soil Ecology )
- NAKAI Satoshi ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Environmental Risk Epidemiology )
- HAYASHI Naoki ( Graduate School of Environment and Information Sciences, Yokohama National University, COE Fellow, Rural Planning for Resource Management )
- MIZUSHIMA Shunsaku ( Graduate School of Medical Sciences, Yokohama City University, Professor, Preventive Epidemiology )
- NAGAI Takashi ( National Institute of Agro-Environmental Sciences, Researcher, Organic Chemistry Risk Analysis )
- TANAKA Katsuya ( Research Center for Sustainability and Environment, Shiga University, Associate Professor, Resource Economics )
- TAN, J. Galvez ( Medical School, University of the Philippines at Manila, Professor, Public Health )
- MOLINA, V. B. ( Medical School, University of the Philippines at Manila, Associate Professor, Public Health )
- RANOLA, R. F. ( College of Agriculture, University of the Philippines at Los Banos, Professor, Resource Economics )
- ZAFARALLA, M. T. ( College of Agriculture, University of the Philippines at Los Banos, Professor, Biology )
- MACANDOG, D. ( College of Agriculture, University of the Philippines at Los Banos, Professor, Plant Ecology )
- BALANGNE, T. O. ( College of Agriculture, University of the Philippines at Los Banos, Professor, Forest Resource Management )
- BORJA, A. C. SANTOS ( Research Department, Lake Laguna Development Authority, Director, Biological Limnology )
- CONCEPCION, R. N. ( College of Agriculture, University of the Philippines at Los Banos, Visiting Professor, Environmental & Resource Economics )

### ■Future Themes

In collecting data on both ecological degradation and socio-economic changes will require several years of field work, as those data changes in nature over a period of time.

After the PR studies are conducted in the Philippines, the same framework/subject will be possibly extended to Penang in Malaysia which represents the highly rapid economic development/growth in Asia and Japan, as the case for already developed and matured society. Intention of this is to make a comparison of three typical different countries of different economic development stages.

We will take the community-based monitoring system, in which local people are involved in resource observation, monitoring of the ecosystem changes. We consider that it takes time for local people to be trained and participate in all the processes.

## Papers

### 【Original Articles】

- Matsuda H, Makino M, Sakurai Y 2009 Development of adaptive marine ecosystem management and co-management plan in Shiretoko World Natural Heritage Site. *Biol Cons* 142 :1937-1942.
- Fujii, Y. and N. Kaneko 2009 The effect of earthworms on copper fractionation of freshly and long-term polluted soils. *Ecotoxicology and Environmental Safety* 72 :1754-1759.
- Ying Zhang, Satoshi Nakai, Shigeki Masunaga 2009 An exposure assessment of methyl mercury via fish consumption for the Japanese population. *Analysis* 29(9) :1281-1289.

### 【Review Articles】

- Kada, Ryohei Apr, 2009 Basic issues of food safety and needed risk management. *Safety Engineering* 48(1) :2-8. (in Japanese)

## Research Presentations

### 【Oral Presentation】

- Kada, Ryohei & Ashutosh Sarker Payment for Ecosystem Services and Sustainable Agricultural Development. Paper Presented at the 15th International Conference of Sustainable Development, Jul 05, 2009-Jul 08, 2009, Univ. of Utrecht, Nederland.

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**Stage: FS**

**Project Name: Ecosystem and Social Sustainability in Coastal Southeast Asia**

**Project Leader: ISHIKAWA Satoshi**

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### ■ Research Subject and Objectives

Consolidated database regarding the livelihood of the local people and resource utilization is established through interdisciplinary filed surveys conducted on the coastal area of Southeast Asia. Using this database, ideas, opinions and information are exchanged among local people, researchers and politicians etc. Through these dialogs, the actual situations and importance of resources are well understood. Then rational and concrete countermeasures for sustainability both of the social and ecosystem will be established.

### ■ Progress and Results in 2009

We already started multi-disciplinary field survey at pilot areas in cooperation with Japanese, Thailand and Philippines peoples. Information of management policy changes in Batang Bay for these two years, land use changes and coastal aquaculture development around Mangrove area in Surat Thani was collected. Consciousness survey of 184 local people regarding conservation by interview has conducted in Ishigaki Is.

The specimens for taxonomy and genetic analyses are 281 individuals of 78 species from Rayong and Tran in Thailand, 119 individuals of 51 species from Panay Island. And we conducted mtDNA analysis using COI region sequence data on the several specimens. We identify a unique population of *Sillago sihama* in Rayong area by mtDNA analysis.

Major existing data and information collected during the field surveys are;

- 1) Livelihood information of ca. 500 households around Batang Bay in Panay Island collected by Univ. Philippines in 2001,
- 2) Information and data of fisheries resources utilization in the coastal area in the Philippines from 1998 to 2008 and estimation of negative impacts of human activities on the coastal resources by Kagoshima Univ. and Univ. Philippines,
- 3) Negative impacts and human responses against Oil Spill accident at Guimaras Is. collected by Kagoshima Univ. and Univ. Philippines,
- 4) The land utilization situation of the coastal area of Batang Bay for these 5 years collected by UT and Aklan State Univ.,
- 5) Biological and social impact derived from installation of set-net in Rayong coastal area for these 6 years estimated by TUMSAT and TD/SEAFDEC,
- 6) Fish and benthic animal lists in Mangrove area in southern part of Thailand made by UT and Rajamangala Univ. Technology,
- 7) All fishing gears used in Southeast Asia had been recorded by SEAFDEC.

### ○ Co-Researchers

- ◎ ISHIKAWA Satoshi ( Tokai University, Associate Professor, General Mangement )
- KUROKURA Hisashi ( Graduate School of Agricultural and life Sciences, The University of

- Tokyo, Professor, Biological Research )
- OKAMOTO Junichiro ( Graduate School of Fisheries Sciences, Hokkaido University, Professor, Rural Development )
  - SANO Mitsuhiro ( Graduate School of Agricultural and life Sciences, The University of Tokyo, Professor, Fish Biology )
  - NISHIDA Mutsumi ( NISHIDA Mutsumi, Professor, Molecular Analysis )
  - ARIMOTO Takafumi ( Faculty of Marine Science, Tokyo University of Marine Science and Technology, Professor, Fishing Technology )
  - BABA Osamu ( Faculty of Marine Science, Tokyo University of Marine Science and Technology, Professor, Economics )
  - YOSHIKAWA Takashi ( School of marine science and technology, Tokai University, Assistant Professor, Ecological Research )
  - YAMADA Yoshihiko ( School of marine science and technology, Tokai University, Professor, Marine Policy )
  - TAWA Masataka ( Department of Geography, Kwansai Gakuin University, Field Studies )
  - KAWADA Makito ( School of Contemporary Sociology, Chukyo University, Professor, Folklore )
  - KONO Yasuyuki ( Center for Southeast Asian Studies, Kyoto University, Professor, Resource management )
  - TAKAHASHI Hiroshi ( National Fisheries University, Assistant Professor, Population Genetic Research )
  - MATSUOKA Tatsuro ( Department of Fishery, Kagoshima University, Professor, Human Impact Analysis )
  - MOTOMURA Hiroyuki ( The Kagoshima University Museum, Associate Professor, Fish Taxonomy )
  - HORI Mina ( Graduate School of Agricultural and life Sciences, The University of Tokyo, Post Doctoral Fellow, Livelihood Research )
  - KON Koetsu ( Graduate School of Agricultural and life Sciences, The University of Tokyo, Post Doctoral Fellow, Benthos Survey )
  - NANJO Kusuto ( Graduate School of Agricultural and life Sciences, The University of Tokyo, Graduate Student, Coral Reef Ecology )
  - Jon Altamirano ( Graduate School of Agricultural and life Sciences, The University of Tokyo, Graduate Student, Mangrove Ecology )
  - NAKANE Yukinori ( Graduate School of Agricultural and life Sciences, The University of Tokyo, Post Doctoral Fellow, Fish Ecology )
  - KOBAYASHI Takanori ( Waseda University, Lecturer, Social Survey )

### ■ Future Themes

As a lot of social and biological data and information collected by SEAFDEC, the University of Philippines, Kagoshima Univ., TUMSAT, UT, and Waseda Univ. were found so far. It will take much time than that we had expected, to compile all existing data and information. As the framework of RIHN projects differing from that of other projects in which foreign members had been participated, e.g. JSPS projects, we spent much time and paid many efforts to establish the project team.

However, a lot of existing data can drive to create database. Due to the mutual deep discussions, core members could understand the ideas and objectives of present study clearly. The problems mentioned above will be coped with in early date in the project duration.

### Papers

#### 【Original Articles】

- Koetsu Kona, Hisashi Kurokura and Prasert Tongnunui Feb, 2010 Effect of the physical structure of mangrove vegetation on a benthic fauna community. *Journal of Experimental Marine Biology and Ecology* 383(2) :171-180. (reviewed).
- Yokoo, T., Sakamoto, T., Kanou, K., Moteki, M., Kohno, H., Tongnunui, P. and Kurokura H. Jan, 2010 Morphological characters and occurrence patterns of juveniles of two estuarine gobies *Acentrogobius karanjensis* and *Acentrogobius malayanus*, verified by molecular identification. *Journal of Fish Biology* 75(10) :2805-2819. (reviewed).

- Ishikawa Satoshi, Takafumi Arimoto Dec, 2009 Challenging Project for sustainable use of coastal fisheries resources in Southeast Asia- New concept "Area Capability" . *JSPS - NRCT Seminar 2009, Rayong, Thailand* :52-53.
- The Bulletin of The Kyushu Anthropological Association Nov, 2009 Accumulation of Lipofuscin and Preliminary estimation of age-structure in wild mud crab (*Squilla parmosa*) population in tropical mangrove swamp. *Thailand. Journal of Fisheries and Aquatic Science* 4(4) :191-202. (reviewed).
- KAWADA Makito Jul, 2009 Has all the mystery been solved?: On magical power and fear. *The Bulletin of The Kyushu Anthropological Association* 36 :66-76. (in Japanese) (reviewed).
- Mayu Aizawa, Nguyen Duy Can, Nguyen Van Hao, Hisashi Kurokura, and Kazuhiko Kobayashi Jun, 2009 Changes in rice farmers' agronomic practices in response to changes in Hydrological condition for salinity prevention in the Mekong Delta Viet Nam. *Tropical Agriculture and Development* 53(2) :33-42. (reviewed).
- Kon Koetsu, Kawakubo Naoya, Aoki Jyun-Ichi, Tongnunui Prasert, Hayashizaki Ken-Ichi, Kurokura Hisashi May, 2009 Effect of shrimp farming organic waste on food availability for deposit feeder crabs in a mangrove estuary, based on stable isotope analysis. *Fisheries Science* 75(3) :715-722. (reviewed).
- Ishikawa Satoshi 2009 Utilization and management of fisheries resources in the coastal area of Thailand. International Cooperation Center for Agricultural Education of Nagoya University (ed.) . International Cooperation in Agriculture, 11. pp.125-135. (in Japanese)

## Research Presentations

### 【Oral Presentation】

- Koji Fujimoto, Masahiro Horinouchi, Prasert Tongnunui, Yukinori Nakane, Kusuto Nanjo, Ko Ikejima, Mitsuhiko Sano and Hisashi Kurokura Fishes captured by traps in a mangrove area in Thailand. Annual Meeting of the Japanese Society of Fisheries Science, Mar 26, 2010-Mar 30, 2010, . (in Japanese)
- Satoshi Ishikawa, Hiroyuki Matsuura, Takashi Yoshikawa, Takaharu Fukaya, Takanori Nakane, Masayoshi Miura, Kaneo Isikawa, Dai Hayashi, Toshiyuki Tanekura, Ikuyuki Matsunaga, Yoshimasa Hayase Database construction on biological resource in a coastal area of Mikawa Bay (1) Outline of the database. Annual meeting of the Japanese Society of Fisheries Science, Mar 26, 2010-Mar 30, 2010, Kanagawa, Japan. (in Japanese)
- Takashi Yoshikawa, Keita Asai, Takahiro Arai, Ryosuke Hashizume, Michitaka Hattori, Dai Hayashi, Toshiyuki Tanekura, Ikuyuki Matsunaga, Yoshimasa Hayase Database construction on biological resource in a coastal area of Mikawa Bay (2) Results in rocky shores and tidal flats. Annual meeting of the Japanese Society of Fisheries Science, Mar 26, 2010-Mar 30, 2010, Kanagawa, Japan. (in Japanese)
- Sigeto Kawabata, Mina Hori, Nakane Yukinori, Ratana Munprasit, Satoshi Ishikawa Beach Seine Net Fishery at Suwanson Beach in Rayon Province, Thailand. Annual meeting of the Japanese Society of Fisheries Science, Mar 26, 2010-Mar 30, 2010, Kanagawa, Japan. (in Japanese)

## Incubation Study

### Impact of Recent Human Activities on the Insect Fauna in Asia

ARAYA Kunio (Graduate School of Social and Cultural Studies, Kyushu University)

Insects are among the most diverse group of animals on the Earth. They play important roles in ecosystem and are beneficial to the ecosystem services. Recently, however, changes of local insect fauna with decreases in biodiversity caused by various human activities have been increasingly observed. Under this condition, we aim to assess the ecological risk brought with rapid changes of insect fauna affected by recent human activities in Asia.

Though the preliminary field studies in the Ryukyu Islands, Japan, we clarified serious impacts of several invasive beetles upon native endemic taxa. Overseas field researches have been conducted in Taiwan and Sabah (Malaysia), and as the result, it was suggested that recent overexploitation of pet insects in Asian tropics for trading with insect collectors in developmental countries including Japan was likely to cause extinction of many native taxa.

### Environment and Public Sphere in the Changing Slavic Eurasia: Comparative Studies on Regional Water Systems

IEDA Osamu (Slavic Research Center, Hokkaido University)

The research aims to examine the changing natural and cultural environments in the post-communist countries, the Slavic Eurasian regions, from a viewpoint of trans-border public sphere. In order to realize this aim, we need to establish interdisciplinary cooperation, especially between environmental studies and area studies, because not only the environment but also the political and economic systems are also changing drastically in the regions. Besides, the borders also changed due to the independence of the new nations, and regional integration, such as EU, is also going on in the regions. Among many trans-border environmental issues, we take cases around the international river basins, such as the Danube River in the west of the area and the Amur-Okhotsk in the east. Preliminary field surveys have been done in Hungary, and the research concept was presented at the Oxford Roundtable in March 2010.

### Effects of local governance and landuse changes on the degradation and resilience of ecosystem services in tropics

OKUDA Toshinori (Graduate School of Integrated Arts and Sciences, Hiroshima University)

In order to clarify the relationship between the local governance and ecosystem services in the Southeast Asian Tropics, we carried out the preliminary survey and gathered information related to the local governance, administrative response to the degradation of forest ecosystem in the Peninsular Malaysia, West Malaysia (state of Sabah) and Indonesia (Borneo, Java Island). Prior to these surveys in the FY 09, we originally planned to initiate the study how local governance systems facilitate good and sustainable use of forest ecosystem services. However, due to the complexity in governance mechanism in the sense of highly diverse geographical and hierarchical structure, it was found that we should rather start with effects of several international incentive mechanisms, such as carbon and biodiversity offset mechanisms for reducing emissions of green house gasses from deforestation and forest degradation and for protecting the pristine forests upon slowing and securing degradation ecosystem services. By incorporation the factor of incentive, we will be able to give an insight for understanding how the local governance level, preservation policy and local participation play a role for maintaining and upgrading ecosystem services.

### Approaches to Cope with Desertification in semi-arid sub-Saharan Africa

TANAKA Ueru (Graduate School of Global Environmental Studies, Kyoto University)

Semi-arid Sub-Saharan Africa is known as a front of desertification. Prevention of desertification is one of the global concerns toward livelihood security and welfare of local people. Set in some villages of the West African Sahel of Niger, where numerous nomadic and cultivating peoples stay, the IS study aims to characterize socio-ecological condition and local husbandry systems, to develop practical technique for desertification prevention and to collect information helpful to establish rural development approaches. Through field studies, we identified the “year of crisis” in the past 20 years and coping activities of local people, significance of small-scale livelihood activities and differences in susceptibility to the crisis among ethnic groups. We examined the effectiveness of “petit-fallow system” as a practical technique to prevent wind erosion and to increase crop yield. Using this technique as a marker, we conducted participatory village survey and confirmed the existence of information/technique dissemination channel among local people, which may be useful to establish feasible approach of rural development assistance.

### Global greenization: its contemplation and practice

FUKUI Kiichi (Graduate School of Engineering, Osaka University)

This study was initially proposed as a study aiming to contribute to a solution of global problems of environment, energy, and greenhouse gas, as well as to create a new concept of values and a new civilization, by effectively greening tropical semiarid areas on a large scale by a new energy plant. Starting with this proposal, we repeated discussions in three seminars and a symposium with invited researchers of various fields, and also among members. Through the discussions, we achieved in this IS (1) a shared awareness of the fact that greening is not unconditionally good, (2) a finding that the life of local residents and the environmental condition of each area are keys to consider greening, and (3) a realization of the need of a new concept which shows the relationship among human, the earth, and green. We think that it is important to create a new index which can be used to propose “the desirable greens” which is suitable for each area, based on the concept. From this reason, we decided to change the aim of this study into the creation of a new index.



## The Center for Coordination, Promotion and Communication (CCPC)

The Center for Coordination, Promotion and Communication (CCPC) supports RIHN's research projects, integrates and disseminates their results, and determines strategies for creating new research. To perform these important functions, it has three divisions namely the (1) Division of Coordination, (2) Division of Promotion, and (3) Division of Communication.

### (1) Division of Coordination

This division researches and defines RIHN's theoretical and practical approach to global environmental studies, establishes academic guidelines for the evaluation of research projects, and promotes research coordination with academic institutions and universities in Japan and overseas. Furthermore, it is responsible for supporting the professional development of doctoral and post-doctoral students and junior scholars. The Division of Coordination is in charge of RIHN's annual meeting on the progress of on-going research projects, as well as several other important meetings.

### (2) Division of Promotion

This division acts to support RIHN research. It collects and analyses RIHN's research outcomes, and relates these to the wider body of global environmental studies scholarship. At RIHN, it also manages the institute databases and archives, oversees selection of library books, journals and maps, maintains and manages laboratory and field instruments, conducts analysis of water and biological samples, and supports RIHN's researcher's national and international fieldwork. In line with these routine works, the Division of Promotion emphasizes the integration of accumulated research materials and data for dissemination to academic societies and the general public.

### (3) Division of Communication

This division engages in various extensive activities for the dissemination of RIHN's research outcomes and their implications to academic societies and the general public. The division plans and implements RIHN's seminar series, public seminars and numerous workshops and symposia, and publishes their results. It also publishes RIHN's *Humanity and Nature Newsletter* as well as several books such as "Chikyuken Soshu" (RIHN's global environmental studies series), "Chikyuken Library" (RIHN's monograph series) in Japanese. The division has also introduced RIHN's research outcomes through regularly published articles in a public newspaper for one year. This division is also involved in environmental education, holding special lectures and tours for primary, junior and senior high school students. The division is now preparing a retrospective publication for RIHN's tenth anniversary in 2012.

Each division has a full-time head and a number of task forces in which practical works is conducted in close cooperation with the staff of the Research and Administrative Departments. For the effective progress of the CCPC's work, the three division heads and CCPC director hold routine meetings. CCPC staff and institute-wide meetings are also held a few times a year.

## Outreach Programs and Events

### 1. International Symposium

#### RIHN 4th International Symposium

In order to diffuse the findings of the one FR project concluding in March 2010, the RIHN 4th International Symposium 'The Dilemma of Boundaries: Toward a New Concept of Catchment' was held on the 20, 21 and 22 of October 2009 at Lecture Hall, RIHN. The details of the symposium are as follows.

<Tuesday Oct 20>

#### Opening Session

Chair: SHIRAIWA Takayuki (RIHN)

- Opening Remarks: TACHIMOTO Narifumi (Director-General, RIHN)
- Objectives of the Symposium: TANIGUCHI Makoto (RIHN)
- Keynote Address: Codification of International Law for Transboundary Aquifers by the United Nations  
YAMADA Chusei (Special Assistant to the Minister for Foreign Affairs of Japan / Former Member of UN International Law Commission)

#### Session 1 : Ignored Linkage between Surface and Sub-surface Environments

Chair: ONISHI Takeo (RIHN)

- Linkages beyond boundaries between surface/subsurface and land /ocean for better management of environment in Asia  
TANIGUCHI Makoto (RIHN)
- The NA (nitrate-arsenic) boundary as an important concept in aquatic environmental studies  
HOSONO Takahiro (Kumamoto University)
- A Model to Assess Groundwater Inflows to Lakes via a Rn-222 Mass Balance aquatic environments  
BURNETT, William and DIMOVA, Natasha (Florida State University, USA)

#### Session 2 : Transboundary Linkage of Land and Ocean

Chair: TANIGUCHI Makoto (RIHN)

- "Giant" Fish-Breeding Forest: A new environmental system linking continental watershed with open water  
SHIRAIWA Takayuki (RIHN)
- Numerical Simulation of Dissolved Iron Production and Transport in the Amur river and the Sea of Okhotsk  
ONISHI Takeo (RIHN) and MITSUDERA Fumio (Hokkaido University)
- Basic Concept of a Newly Established Integrated Study on the Linkage of Forest-Sato-Sea Collaborating with a Social Movement Flagged "The Sea is Longing for the Forest" and Its Actual Case Research Conducted in Ariake Bay-Chikugo River System, Japan  
TANAKA Masaru (Kyoto University)
- Transportation of Marine-derived Nutrients (MDN) onto Land by Anadromous Fish: A Case Study of Pacific salmon in Russian Far East  
MUROTA Takeshi (Doshisha University)
- Discussion

<Wednesday Oct 21>

#### Session 3 : Impacts of Human-made Boundaries

Chair: SHIRAIWA Takayuki (RIHN)

- National boundaries and the fragmentation of governance systems: Amur-Okhotsk ecosystem from the legal, political perspective

HANAMATSU Yasunori (RIHN)

- The History of “Uotsukirin” (Fish-Breeding Forest) in Japan  
WAKANA Hiroshi (Muroran University of Technology)
- Integrating Groundwater Boundary Matters into Catchment Management  
JARVIS, William Todd (Oregon State University)
- A Boundary between Surface and Ground Water in Japanese Legal System – Its Consequence and Remedy –  
ENDO Takahiro (RIHN)

#### Session 4 : Challenge for New Management beyond the Boundaries

Chair: ENDO Takahiro (RIHN)

- HELCOM Baltic Sea Action Plan – Ecosystem based approach to manage a semi-enclosed European sea area with nine riparian countries  
LEPPÄNEN, Juha – Markku (Finish Environmental Institute)
- Combining Activities of Sato-umi and Sato-yama in Japan: Towards a New Type of Integrated Coastal and Watershed Management  
MATSUDA Osamu (Hiroshima University)
- Aquifers know no boundaries... but farmers do ! So, who should care?!  
PURI, Shammy (Secretary General of IAH, Consultant to UNESCO)
- The trans-boundary management of groundwater resources in the Kumamoto area, Japan – Sustainable management of groundwater resources for over 700,000 residents –  
SHIMADA Jun (Kumamoto University)
- Discussion

<Thursday Oct 22>

#### Session 5 : Discussion and Conclusion

Chair: TANIGUCHI Makoto (RIHN)

- Summary of session 1 Rappoteur: NAKANO Takanori (RIHN)
- Summary of session 2 Rappoteur: NAKATSUKA Takeshi (Nagoya University)
- Summary of session 3 Rappoteur: KUBOTA Jumpei (RIHN)
- Summary of session 4 Rappoteur: IEDA Osamu (Hokkaido University)
- Agenda Setting : ONISHI Takeo (RIHN)
- Roundtable discussion
- Symposium closing: WATANABE Tsugihiko (RIHN)
- Business meeting

## 2. RIHN Forum

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“What are global environmental problems?” “What are integrated global environmental studies?” “What will be the outcomes of such studies?” “What is the future of global environmental problems?” “Will it be possible to solve such problems?”

The RIHN Forum is intended to help us to address such fundamental questions and to animate discussion of up-to-date environmental topics. The eighth forum was held in fiscal 2009 as below.

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### The 8<sup>th</sup> RIHN Forum

Date: 5 July, 2009

Theme: Linking Human Well-being and the Environment

Venue: Kyoto International Conference Center

### 3. Public Seminar

In order to present RIHN research activity in a manner that accessible to the general public, since November 2004, RIHN has offered public lectures. Six seminars were held in 2009 at the RIHN lecture hall and the Heartpia Kyoto.

RIHN staff offer accessible explanations of global environmental problems, and the Public Seminars have stimulated engrossing discussions of contemporary environmental concerns.

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The 32 <sup>nd</sup> Public Seminar	17 April, 2009 How Will You Live after Finishing Oil Resources? SHIMADA Yoshihito (Professor, Graduate School of Letters, Nagoya University), NAWATA Hiroshi (RIHN)
The 33 <sup>rd</sup> Public Seminar	16 June, 2009 World Water – The Role and Responsibility of Japan in the 21st Century TAKEMURA Kotaro (Secretary General, Japan Water Forum & Water Security Council of Japan / President, Foundation for Riverfront Improvement and Restoration) WATANABE Tsugihiko (RIHN)
The 34 <sup>th</sup> Public Seminar	11 September, 2009 A Philosophy of Co-existence: Neo Confucian Environmental Thought KINOSHITA Tetsuya (RIHN) KURATA Takashi (RIHN)
The 35 <sup>th</sup> Public Seminar	16 October, 2009 China's Environmental Problems: Possibilities and Role of International Nongovernmental Cooperation TAKAMI Kunio (Secretary General, Green Earth Network) KUBOTA Jumpei (RIHN)
The 36 <sup>th</sup> Public Seminar	18 December, 2009 Economic Development and Environmental Issue in India SWARUP, Vikas (The Consul General, India in Osaka-Kobe, Japan) OSADA Toshiki (RIHN)
The 37 <sup>th</sup> Public Seminar	16 February, 2010 Global Warming and Water MANABE Syukuro (Senior Meteorologist, Program in Atmospheric & Oceanic Sciences, Princeton University) ABE Ken-ichi (RIHN)

### 4. RIHN Area Seminar

The RIHN Area Seminars offer an opportunity for RIHN research staff to gather with regional intellectuals and local citizens to consider problems related to the environment and culture of each area of Japan. The first seminar was held in 2005. In fiscal year 2009, two seminars were held as follows.

#### The 6th RIHN Area Seminar

“Mountain, People and Nature: Live Richly in Harsh Nature”

Date: 28 November, 2009

Venue: Matsumoto Performing Arts Centre (Matsumoto City, Nagano)

**The 7th RIHN Area Seminar**

“Sato”; Lessons from Japan’s Rural Experience for the World”

Date: 6 February, 2010

Venue: Ishikawa Ongakudo (Kanazawa City, Ishikawa)

**5. RIHN Annual Open Meeting**

Each December, RIHN research and office staff and outside research collaborators gather to review the year’s progress. All project leaders present their research findings and accomplishments and receive questions from the floor. Attracting 455 attendees in its three-day duration, the annual meeting generates dialogue between RIHN researchers and improves general awareness of RIHN’s progress and evolution within the larger fields of environmental research.

Date: 9-11 December, 2009

Venue: Co-op inn Kyoto

**6. RIHN Seminars**

RIHN Seminars are invited talks by esteemed Japanese or foreign researchers. The seminars provide opportunities for RIHN scientists to learn of the latest topics and research directions in a variety of fields; they also often are a first step toward future research collaborations between RIHN researchers and those of other institutions. Seminars are held several times a year.

The 36th	15 May, 2009 Climate Change and Historic Site in the Field: The Birth of Mogao Caves and Its Preservation FUKUDA Masami (University of Alaska Fairbanks, U.S.A)
The 37th	16 June, 2009 The Role of Water Reuse in Water Resources Management ASANO Takashi (University of California, Davis, U.S.A)
The 38th	30 June, 2009 Comparing Climate Change Policy Networks (Compon): An International Comparative Research Project BROADBENT, Jeffrey Praed (University of Minnesota, U.S.A)
The 39th	8 July, 2009 Taklamakan Desert, Mysterious Land – Why Is It Interesting for TV ? GOTO Tamon (Former Lead Editing Manager, Books Editorial Department, Japan Broadcast Publishing Co., Ltd)
The 40th	30 September, 2009 Natural Science and Social Practice: How Understanding Science Affects Sustainable Practice for Migrant Workers in China and Fishermen in the Baltic Sea CHABAY, Ilan (Chalmers University of Technology, Sweden)
The 41st	12 November, 2009 Post-revolutionary Djakarta: Accessible City ANDERSON, Benedict (Cornell University, U.S.A)
The 42nd	12 February, 2010 NGOs, Public Participation and Dam Construction in China WANG Yongchen (Green action in China)

## 7. Lunchtime Meetings (Danwakai)

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Lunchtime meetings allow all RIHN research staff, including visiting professors, part-time researchers, foreign researchers and so on, to freely present their individual research to their colleagues in an informal and supportive forum. As these meetings promote creative thinking and constructive debates, they are held on a biweekly basis.

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### May 2008-March 2009

- |        |   |
|--------|---|
| No.143 | 13 May, 2009<br>Progress report of RIHN Annual Open Meeting WG<br>ONISHI Takeo (Senior Project Researcher)  |
| No.144 | 20 May, 2009<br>Detection and quantification of koi herpesvirus in the freshwater environments<br>MINAMOTO Toshifumi (Senior Project Researcher)  |
| No.145 | 2 June, 2009<br>A study of coastal areas connecting oceans and lands: how do objects move in the coastal areas<br>NAKADA Satoshi (Project Researcher)                                     |
| No.146 | 16 June, 2009<br>Changes in Agricultural Land Productivity and Ecological Footprint in China<br>TOYOTA Tomoyo (Project Researcher)  |
| No.147 | 30 June, 2009<br>Between fragmentation and integration in International Law<br>HANAMATSU Yasunori (Project Researcher)  |
| No.148 | 7 July, 2009<br>A Viewpoint of Cultural Anthropology: Study on the Visible and Invisible World<br>NAKAMURA Ryo (Project Researcher)   |
| No.149 | 15 September, 2009<br>Staring at the change of architectural culture: a case study of the platform house built in colonial era in Medan, Indonesia.<br>HAYASHI Kengo (Project Researcher) |
| No.150 | 29 September, 2009<br>Cereals agriculture in the African inner semi-dryland – Case study on Lake Chad region –<br>ISHIYAMA Shun (Project Researcher)                                      |
| No.151 | 8 March, 2010<br>Introduction and Application of 3D Geologic Modeling<br>YONEZAWA Go (Assistant Professor)  |
| No.152 | 30 March, 2010<br>Chemical ecology in defensive strategy of anuran tadpoles<br>TAKAHARA Teruhiko (Project Researcher)   |

## 8. Publications

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### 8-1. RIHN Series

These are books introducing RIHN's research results to the general public. The following titles were published in fiscal year 2009:

Mono no Ekkyo to Chikyu Kankyo Mondai (Transboundary Movements and Global Environmental Problems)  
Edited by KUBOTA Jumpei, Showado, October 2009 (in Japanese).

Antei Dositai to iu Megane (Stable Isotope Analysis: A Lens for Examining Human-environmental Interactions).

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Edited by WADA Eitaro, KOHMATSU Yukihiro. Showado, March 2010 (in Japanese).

### **8-2. RIHN News: Humanity & Nature Newsletter**

This periodical communicates RIHN identity and latest news to specific research communities. The newsletter is published in an A4 format with all-color, easy-to read content. Issues 19-24 were published in fiscal year 2009.

### **9. Press Conference**

RIHN periodically holds official press conferences in order to release information on its academic activities, research projects, symposia, publications and latest environmental findings. As a public institution with a public mandate, such activities provide an important link between RIHN and the citizenry. Five press conferences were held in fiscal 2009.

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## Coordination Research

### The Integrated Study of People and Water in Humid Asia

**Representative: Tomoya AKIMICHI**

**(Research Institute for Humanity and Nature)**

In 2007, a five-year research project, entitled as “The Integrated Study of People and Water in Humid Asia”, was launched as one of the coordination research on “The Cultural Exchange between Japan and Eurasia”, organized and granted by the National Institutes for the Humanities (head office in Tokyo), and it completed in 2010.

The coordination research on “People and Water” aimed to clarify human’s multiple interrelations with water in humid Asia, from various academic approaches such as history, culture, folk-lore, ecology and the environment. More concretely, we have focused upon several themes on human and water associations with reference to animal, plants, religion, landscape, global environment, subsistence, society, and human body, that provide key concepts for the overall analysis. Each theme has also served as specific topics in the periodical journals published at the semi annual basis.

The study areas covered by this research project are humid Asia, and these include various regions in Japan such as Mt. Chokai watershed (Yamagata Prefecture), Otsuchi town (Iwate Prefecture), Saijo city (Ehime Prefecture), Kyoto Basin (Kyoto Prefecture), Lake Biwa (Shiga Prefecture) and Sumida river (Tokyo) and elsewhere. Furthermore, Asian humid and semi arid regions were chosen for the archaeological and anthropological research, focusing upon the Mekong (China, Laos, Cambodia), Ganga and Indus rivers. Also, Japanese historical documents, drawings, iconography, and literatures were extensively used for the analysis to elicit Japanese unique perception and attitudes toward water.

It is also our outstanding approach to combine hydrological and bio-chemical analysis of water with cultural, legal and economic findings invested on water to shed lights on the integrated figures of human and water interactions in local and regional contexts. Stable isotope and DNA techniques were employed as two major proxies.

From intensive and extensive inquiries into human’s interactions with water, several important results have been clarified; (1) a diverse nature of water quality and quantity in rivers and lakes as well as underground aquifers was clarified by region and the watershed which bear close cultural and economic implications, (2) access rights to water resources were examined, and a new concept on the water rights was proposed. Especially, underground water should be regarded as public commons, rather than private property, (3) governance over the sharing of water resources is a key to solve water issues not only at local but also global levels. Yet, water should not be manipulated as a commodity salable and transported to other regions, (4) associated cultural belief in sacred water is one of the prime importance in terms of human’s symbolic association with water, (5) cultural diversity invested on water becomes a key to understand human and water interactions in favor of human rights and equity to access to water resources.

Other than these findings, we have achieved several out-reach activities including public symposia, lectures, special exhibition, and publications. These activities and outcomes are described below.

#### 1. Workshop and symposia

**(As session organizer)**

The 4<sup>th</sup> World Water Forum, Mexico City, Mexico, March, 2006.

The 5<sup>th</sup> World Water Forum in Istanbul, Turkey, March, 2009.

“Water, cultural diversity and global environmental change: Emerging trends, Sustainable futures?” (RIHN/UNESCO-IHP/UNU-IAS International symposium), RIHN, Kyoto, October, 2009.

**(As host or co-host)**

“World heritage, people and water”, RIHN, Kyoto, November 9, 2006.

“Water and Culture”, Hitotsubashi Memorial Hall, Tokyo, February 24, 2007.

“Spring water and livelihood”, RIHN, Kyoto, March 19, 2008.

“Thinking water as a linkage: Tasty water of Saijo for the future,” Saijo City Synthesis Culture Hall, Ehime, September,



15, 2008.

“Area and the livelihoods seen in Mt. Chokaizan area”, Chokai shizen bunka kaikan, Yamagata, November 15, 2008.

“Water and Civilization”, Hitotsubashi Memorial Hall, Tokyo, February 11, 2009.

“Underground Water for the Future”, Otsuchi central public hall, Iwate, November 7, 2010.

## 2. Publications

### Research journals

“**Water and People**” No.0 ~ No.8 (Tokyo: National Institutes for the Humanities)

Akimichi, T. *et al.*, eds. *Water and People* no.0 (March 2006).

Nakamura, Y. *et al.*, eds. Water and human body – Water as representation of human body. *Water and People* no.1 (October 2006).

Endo, T. *et al.*, eds. Water and society – Water management. *Water and People* no.2 (March 2007).

Yasumuro, S. *et al.*, eds. Water and subsistence –The versatile subsistence use of the paddy field, *Water and People* no.3 (October 2007).

Nakano, T. *et al.*, eds. Water and global environment –Quantity and quality of water, *Water and People* no.4 (March 2008).

Shirahata, Y., *et al.*, eds. Water and landscape –Favored landscape with water. *Water and People* no.5 (October 2008).

Ikeya K. *et al.*, eds. Water and animal –Unique relationships between animals and people *Water and People* no.6 (March 2009).

Sato, Y., *et al.*, eds. Water and plants –How much water rice requires? From Paddy to stomach. *Water and People* no.7 (October 2009).

Komatsu, K. *et al.*, eds. Water and belief –Symbolism with water. *Water and People* no.8 (March 2010).

### Exhibition catalogue

Taguchi, R., Kubo, M. and Akimichi, T. eds. 2010 *Water and Vessels: From Cupped Hands to the Planet*. An exhibition catalogue. Tokyo: National Institutes for the Humanities.

### Books

Akimichi, T. ed. 2008. *Water and World Heritage*. Tokyo: Shogakkan.

Akimichi, T., Komatsu, K. and Nakamura, Y. eds. 2010. *Water and People I. Water and Environment*. Tokyo: Bensei Publishing.

Akimichi, T., Komatsu, K. and Nakamura, Y. eds. 2010. *Water and People II. Water and Life*. Tokyo: Bensei Publishing.

Akimichi, T., Komatsu, K. and Nakamura, Y. eds. 2010. *Water and People III. Water and Culture*. Tokyo: Bensei Publishing.

Akimichi, T. ed. 2010. *Water and Civilization*. Kyoto: Shouwado.

Akimichi, T. ed. 2010. *Water and Life at Mt.Chokai - A Report from the Area*. Tsuruoka: Tohoku Planning Publisher.

Akimichi, T. ed. 2010. *Nature, Water and People in Otsuchi - A Message for the Future*. Tsuruoka: Tohoku Planning Publisher.

## 3. Exhibition

*Water and Vessels: From Cupped Hands to the Planet*. National Museum of Ethnology, Osaka, Japan, March 25 – June 22, 2010.

## Individual Achievements

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	BOERZHIJIN, Wuyunbilige	Visiting Research Fellow	
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	OSADA Toshiki	Professor	
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S	SAITO Kiyooki	Professor	
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	SAKAI Toru	Senior Project Researcher	
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※Job titles listed above are as of March 31st, 2010.

(For those who retired in the middle of fiscal 2009, the job titles of that time are listed.)

## AKIMICHI, Tomoya

Deputy Director-General, Professor

**Born in 1946.****[Academic Career]**

Department of Anthropology, Faculty of Science, The University of Tokyo, D. Course (1977)

Department of Anthropology, Faculty of Science, The University of Tokyo, M. Course (1974)

Department of Zoology, Faculty of Science, Kyoto University (1968)

**[Professional Career]**

Professor, Research Institute for Humanity and Nature (2002)

Head of Department, Department of Cultural Research, National Museum of Ethnology (1999)

Adjunct Professor, School of Advanced Sciences, The Graduate University of Advanced Studies (1998)

Professor, Department of Cultural Research, National Museum of Ethnology (1995)

Professor, 1st Research Department, National Museum of Ethnology (1992)

Adjunct Associate Professor, Faculty of Cultural Research, The Graduate University of Advanced Studies (1988)

Associate Professor, 1st Research Department, National Museum of Ethnology (1987)

Assistant Professor, 2nd Research Department, National Museum of Ethnology (1977)

**[Higher Degrees]**

D.Sc. (The University of Tokyo, 1986), M.Sc. (The University of Tokyo, 1974)

**[Fields of Specialization]**

Ecological Anthropology, Ethno-Biology

**[Academic Society Memberships]**

The Society of the Bio-Sophia Studies, The Society of Human and Animal Relations, The Society of the Environmental Sociology, The Society of Ecological Anthropology, The Japanese Society of Coral Reef Studies, The Society of Tropical Ecology

**[Awards]**

Daido-Seimei Chiiki-Kenkyu Shorei-Sho in 1998 (Award for Promotion of Area Studies by Daido Life Insurance Company in 1998)

**—Achievements—****[Editing]***[Editing / Co-editing]*

- SEEDer Editorial Board(Chief Editor: Akimichi Tomoya) (ed.) Mar,2010 *SEEDer: Future of the Earth: Consideration from Informatics in Area and Environment (chiiki kankyo joho kara kangaeru chikyuu no mirai)*. Vol.2. Shouwadou, Sakyo-ku, Kyoto, 84pp. Special Issue: Futurability of the Earth and Biodiversity.
- Akimichi Tomoya, Kazuhiko Komatsu, and Yasuo Nakamura (ed.) Mar,2010 *Water and Environment (Mizu to kankyo)*. Water and People, Vol. I. Bensei-Shuppan, Chiyoda-ku, Tokyo, 332pp.
- Akimichi Tomoya, Kazuhiko Komatsu, and Yasuo Nakamura (ed.) Mar,2010 *Water and Culture (Mizu to bunka)*. Water and People, Vol. III. Bensei-Shuppan, Chiyoda-ku, Tokyo, 329pp.
- Akimichi Tomoya, Kazuhiko Komatsu, and Yasuo Nakamura (ed.) Mar,2010 *Water and Life (Mizu to seikatsu)*. Water and People, Vol. II. Bensei-Shuppan, Chiyoda-ku, Tokyo, 333pp.

- Akimichi, Tomoya (ed.) Mar,2010 *Water and Civilization- A New Perspective on Control and Co-existence(Mizu to bunmei- Seigyō to Kyozon no aratana shiten)*. Showadou, Sakyo-ku, Kyoto, 288pp.
- Akimichi, Tomoya (ed.) Mar,2010 *Water of Mt. Chokai and Life- A Report from the Area(Chokai-zan no mizu to kurashi-Chiiki kara no repoto)*. Tohoku Shuppan Kikaku, Hieda, Tsuruoka, 484pp.

## [Papers]

### [Original Articles]

- Akimichi Tomoya Mar,2010 "The Cultural Significance of Rituals with Reference to the Domestication of Junglefowl: Cases of Ethnic Minorities in Northern Thailand, Laos and Xishuangbanna". Honorary editors: H.R.H. Prince Maha Chakri Sirindhorn, H.I.H. Prince Akishinonomiya Fumihito (ed.) *Chickens and Humans in Thailand: Their Multiple Relationships and Domestication*. The Siam Society, Bangkok, Thailand, pp.153-168.
- Akimichi, Tomoya Mar,2010 "The Earth as a Water Vessel"(Mizu no utsuwa-chikyu). *Water and People(8)*. pp.24-25. (Special Issue: Water and Belief: Powers of Water and Symbolism).
- Akimichi Tomoya Mar,2010 "A New Perspective on the Human Civilization from Water Problem"(Mizu kara jinrui no bunmei wo yomitoku). Akimichi, Tomoya (ed.) *Water and Civilization- A New Perspective on Control and Co-existence(Mizu to bunmei: seigyō to kyozon no aratana shiten)*. Showadou, Sakyo-ku, Kyoto, pp.1-18.
- Akimichi, Tomoya Mar,2010 "The Story of Water and People: Linkage between Nature and Culture for the Future"(Chokai no mizu monogatari- Shizen to bunka no tsunagari wo mirai e). Akimichi Tomoya (ed.) *Water of Mt. Chokai and Life- A Report from the Area(Chokai-zan no mizu to kurashi- Chiiki kara no repoto)*. Tohoku Shuppan Kikaku, Hieda, Tsuruoka, pp.26-47.
- Akimichi Tomoya Feb,2010 "Ownership of Marine Biological Resources"(Kaiyo shigen wa darenomonoka). *Ocean and Marine Life (Kaiyo to Seibutsu)* 32(1) :3-9. (Special Issue: Jewelry Corals and Washington Treaty).
- Akimichi Tomoya Feb,2010 "Water as Super-Media"(Choubaitai toshiteno mizu). Akimichi Tomoya, Kazuhiko Komatsu, and Yasuo Nakamura (ed.) *Water and Environment(Mizu to kankyo)*. Water and People, Vol. I. Bensei-Shuppan, Chiyoda-ku, Tokyo, pp.v-xx.
- Akimichi Tomoya Feb,2010 "Coral trading and Tibetan culture". Iwasaki Nozomu (ed.) *A Biohistory of Precious Corals: Scientific, Cultural and Historical Perspectives*. Tokai University Press, Hadano-shi, Kanagawa, pp.149-162.
- Akimichi Tomoya Feb,2010 "Living with Flood"(Kozui to ikiru). Akimichi Tomoya, Kazuhiko Komatsu, and Yasuo Nakamura (ed.) *Water and Culture*. Water and People, Vol. III. Bensei-Shuppan, Chiyoda-ku, Tokyo, pp.229-254.
- Akimichi Tomoya Dec,2009 "Only a small, but precious Shijimi shell (,Corbicula)"(Takaga shijimi, saredo shijimi). *BIOSTORY (12)*. pp.95-99. (Special Issue: Cloth: A Present from Living organisms).
- Akimichi Tomoya Jul,2009 "Living Organisms Predicting Flood"(Kozui wo yochi suru ikimono). *BIOSTORY(11)*. pp.54-57. (Special Issue: Organisms in the Archaeology).

## [Research Presentations]

### [Oral Presentation]

- Akimichi Tomoya 'Panelist' on "Linking Local and global Commons: Shared Weath and Responsibility" . International Symposium "The Earth Hall of Fame KYOTO", Feb 14,2010, Kyoto International Hall, Kyoto City.
- Akimichi Tomoya 'Summary for the General Discussion'. International Symposium "The Earth Forum KYOTO", Feb 13,2010, .
- Akimichi Tomoya 'General Introduction and panelist' . 7th RIHN Area Seminar "Considering the Weath: The Fturability of SATOYAMA", Feb 06,2010, Ishikawa Ongakudo, kanazawa, Ishikawa.

- Akimichi Tomoya "The Wealth of the Sea reviewing from Area and the Earth: for Integrating Marine Resource Use". Symposium , Nov 28, 2009, Tower 111, Toyama City.
- Akimichi Tomoya 'commentator'. The 3rd Study Meeting on "Maritime Issues in Asia", GRIPS Global COE, Jul 24, 2009, Toyo University, Tokyo..

*[Invited Lecture / Honororary Lecture / Panelist]*

- Akimichi Tomoya "Rethinking WhaleTombs and Sanction" (Keynote Lecture). The 1st International Symposium Human History from the Views of Maritime People and Maritime World. Institute for International Culture and Ordinary People, Mar 27, 2010, Kanagawa University, Yokohama City. (in Japanese)
- Akimichi Tomoya "Watershed from the Views of Agriculture and Fishery: Wealth of Ground Water and Diversity". 18th Study Meeting of Rivers and Nature (Shizen kyosei kasen kenkyukai), Mar 09, 2010, Midland Hall, Nagoya City.
- Akimichi Tomoya "Whale and Japanese". 262th Omron Culture Forum, Feb 20, 2010, Science Hall, Kyoto Research Park, Kyoto City. (in Japanese)
- Akimichi Tomoya "An Insights into the Japanese View of Nature: An Appeal from Kyoto", Presentation and Panelist. The Earth Forum KYOTO international Symposium "Linking Local and Global Commons: Shared Wealth and Responsibility", Feb 14, 2010, Kyoto International Hall, Kyoto City.
- Akimichi Tomoya Coordinator on Summary Session . The Earth Forum KYOTO, Feb 13, 2010, Internatrional Conference Hall, Kyoto City.
- Akimichi Tomoya General Introduction and panelist. Considering the Weath: The Futurability of SATOYAMA. 7th Coordinating Seminar of RIHN, Feb 06, 2010, Japanese traditional Music Hall of Ishikawa Prefectural Music hall, Kanazawa City.
- Akimichi Tomoya "Global Environmental Study and the Commons: On the Distribution of Common-Pooled Resources in Freshwater Zone". (Komonz kenkyu no shintenkai- seika to tenbo), Dec 12, 2009, Campus Plaza, Kyoto.
- Akimichi Tomoya "Rice, Water Bodies and Fish:A Diversity of Agro-fisheries in Lowland Indo-China". International Symposium on 'Wild Rice 2009', Nov 23, 2009–Nov 24, 2009, Sofitel Centra Grand Bangkok Hotel, Bangkok, Thailand.
- Akimichi Tomoya 'Chairperson in the Discussion'. RIHN' s Tokyo Seminar "People, Water and the Earth: the Proposalforthe Future", Oct 09, 2009, Kazan Kaikan, Tokyo. (in Japanese)
- Akimichi Tomoya 'Chairperson in the session 3 :Future ecologies: Water, environmental change and cultural adaptation'. International Symposium "Water, Cultural Diversity and global environmental Change: Emerging Trends, Sustainable Future?", Oct 01, 2009–Oct 03, 2009, RIHN, Kyoto City. Organized by UNESCO-IHP, RIHN and UNU-IAS Traditional Knowledge Initiative.
- Akimichi Tomoya "Mangrove in Southern Thailand 1970–2006 (Thai nanbu no mangrove wo megutte 1970–2006)". 'Mangrove' The second meeting on Resource Programme, Jul 23, 2009, lecure Hall, Research Institute for Humanity and Nature. (in Japanese)
- Akimichi Tomoya "Ownerships of Marine Biological Resources". The symposium 'Jewelry Coral and the Washington Convention', Jul 18, 2009, Kochi University, Kochi City.
- Akimichi Tomoya 'Coordinator'. "The 18th KOSMOS Forum: Is the Ocean World Unlimited for Human Being? A New Environmental View in the 21st Century", Jul 04, 2009, Velusale Kudan, Tokyo.
- Akimichi Tomoya "Governance of Marine Resource Use in Global Era" (Keynote Lecture). International Symposium 'Maritime Culture and Globalization', May 29, 2009–May 31, 2009, The Ocean Resort, Yeosu, Korea.
- Akimichi Tomoya "Water and Life in Kyoto" presentation and panelist. 'RIHN and ICJS Joint Symposium' Culture and Environment in Kyoto: Water and Life, May 09, 2009, ICJS Hall, Kyoto City. (in Japanese)

- Akimichi Tomoya “Shifting common property regimes in seasonal and eco-historical” and Coordination. IHDP Open Meeting 2009: The 7th International Science Conference of the Human Dimension of Global Environment Change, Apr 27, 2009–May 02, 2009, Bonn, Germany.

## Aysun UYAR

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Assistant Professor

### Born in 1980.

#### [Academic Career]

Department of International Relations, Faculty of Economics and Administrative Sciences, Middle East Technical University, Ankara, Turkey (2001)

Institute of Social Sciences, Middle East Technical University, Ankara, Turkey (2004)

Graduate School of East Asian Studies, Yamaguchi University, Yamaguchi, Japan (2008)

#### [Professional Career]

Research assistant, Department of International Relations, Faculty of Economics and Administrative Sciences, Hacettepe University, Ankara, Turkey (2001–2005)

Project assistant, Graduate School of East Asian Studies, Yamaguchi University, Japan (2005–2008)

Post-doc research fellow, Afrasian Centre for Peace and Development Studies, Ryukoku University, Kyoto, Japan (2008–2009)

Part-time lecturer, Faculty of Intercultural Communication, Ryukoku University (2008–)

#### [Higher Degrees]

Ph.D. (Yamaguchi University, 2008)

M.Sc. (Middle East Technical University, 2004)

#### [Fields of Specialization]

International Relations

International Political Economy

#### [Academic Society Memberships]

International Studies Association (ISA)

The Japan Association of International Relations (JAIR)

Japan Association for Asian Studies (JAAS)

Japan-Turkey Friendship Association

#### [Awards]

The First Prize (Paper Contest), Institute for International Monetary Affairs (2005)

Yamaguchi University President Award (2008)

### —Achievements—

#### [Editing]

*[Editing / Co-editing]*

- Tsuyoshi Kato and Aysun Uyar (ed.) Sep, 2009 The Question of Poverty and Development in Conflict and Conflict Resolution. Afrasia Symposium Series, 4. Afrasian Centre for Peace and Development Studies, Ryukoku University, Kyoto, 278pp.

#### [Papers]



*[Original Articles]*

- Aysun Uyar Dec, 2009 Political Configuration of Thailand' s Free Trade Agreements within the Framework of Southeast Asian Regional Economic Cooperation (Working Paper). *Afrasia Working Paper Series* (43).

**[Research Presentations]***[Oral Presentation]*

- Aysun Uyar Governance of Regional Labour Migration in Southeast Asia: ASEAN Free Trade Area. ICAS6 (International Institute for Asian Studies and Chungnam National University), Aug 06, 2009–Aug 09, 2009, Daejeon, South Korea.
- Aysun Uyar Environmental Apprehension of Turkey' s Accession to the EU: 'Water and Agriculture' Aspect. HEAR-MET Workshop (Institute for Humanity and Nature), Jul 16, 2009, Kyoto.
- Aysun Uyar Culture and Conflict. The Second Research Meeting of Afrasia Group 3 (Afrasian Centre for Peace and Development Studies, Ryukoku University), Jun 27, 2009, Kyoto.

*[Invited Lecture / Honorary Lecture / Panelist]*

- (Chair) The 36th RIHN Public Seminar, "Economic Development and Environment Issue in India". Institute for Humanity and Nature, Dec 18, 2009, Kyoto, Japan.
- (General Secretary) The Fourth Afrasian International Symposium, "The Question of Poverty and Development in Conflict and Conflict Resolution". Afrasian Centre for Peace and Development Studies, Ryukoku University, Nov 15, 2009–Nov 16, 2009, Kyoto.
- (Media appearance) News-Haberler. BBC Turkish Radio, Sep 16, 2009, . (in Turkish)
- (Lecturer) Contemporary Islam and Issues (Teachers` Certificate Seminars). Faculty of Intercultural Communication, Ryukoku University, Jul 30, 2009, Seta. (in Japanese)
- (Committee member) Asahi-University Partners Symposium, "Who Cares? Foreign Health Care Workers in Japan". Ryukoku University–Asahi Sinbun Osaka Head Office, Jun 20, 2009, Kyoto. (in Japanese)

**CAI, Guoxi**

Project researcher

**Born in 1970.****[Academic Career]**

Graduate School of Biomedical Sciences, Nagasaki University, PH.D. course(2007)  
Fujian Medical University, Bachelor of Medical Sciences(1993)

**[Professional Career]**

Project researcher, Research Institute for Humanity and Nature(2008)  
Research fellow, Nagasaki University Institute of Tropical Medicine(2007)  
Doctor-in-charge, Center for Disease Control and Prevention, Ningde city, China(2002)  
Medical doctor, Center for Disease Control and Prevention, Ningde city, China(2000)

**[Higher Degrees]**

PH. D. (Nagasaki University, 2007)

**[Fields of Specialization]**

Public health  
International health

**[Academic Society Memberships]**

Japanese Society of Tropical Medicine  
Chinese Academy of Science and Engineering in Japan

### —Achievements—

#### [Books]

*[Authored/Co-authored]*

- Guoxi CAI, Hua CHEN, Zhuo ZHANG, et al. Oct, 2009 A new influenza pandemic is coming . Tianjin Science and Technology Press, Tianjin city, China, 135pp. (in Chinese) ISBN 978-7-5308-5114-9 .

#### [Papers]

*[Original Articles]*

- Guoxi CAI, Jun KANG, Ling SHEN, Xiangdong MIN, Zhunyou WU, Keming ROU , Taro YAMAMOTO, Zhuo ZHANG, and Kazuhiko MOJI. 2009 Assessment of a questionnaire used for an AIDS-related KABP survey among physicians in China. . *Information, An International Interdisciplinary Journal* Vol.12, ( No.3). (reviewed).in press.

#### [Research Presentations]

*[Oral Presentation]*

- CAI G, MOJI K, WU Z, ROU K, ZHANG K An Epidemiological Study on AIDS among Cross-Border Floating Population. International Convention of Asian Scholars (ICAS6), Aug 05, 2009–Aug 07, 2009, Daejeon, Korea .

*[Poster Presentation]*

- Zhang Z, Moji K, Wu XN, Zhang KL, Cai GX, Ali M, Kuroiwa C Does a Blood-born Pathogen prevention program affect the incidence of exposure to blood?. The Unite For Sight Six Annual Global Health Conference. New Haven, Connecticut, USA, April 2009, New Haven, Connecticut, USA.

### Chengzhi(Kicengge)

Senior Project Researcher

**Born in 1968.**

#### [Academic Career]

Department of Oriental History, Graduat school of Letters, Kyoto University, D. Course (2003)  
Department of Oriental History, Graduat school of Letters, Kyoto University, M. Course (2000)  
Department of Chinese language literature, Ili Normal University, China(1990)

#### [Professional Career]

Docent, Kyoto University, (1997~1998)  
Docent, Kyoto Women's University, (2000~2004)  
Foreigner co investigator, Kyoto University(2004~2004)  
JSPS Research Fellow, Research Institute for Humanity and Nature(2005)

#### [Higher Degrees]

Litt. D. (Kyoto University, 2004)  
Litt. M. (Kyoto University, 2000)

#### [Fields of Specialization]

Oriental History, History of Qing Empire, Manchu Philology

**[Academic Society Memberships]**

Tōyōshi Kenkyūkai(The Society of Oriental), Shigaku Kenkyūkai(The Society of Historical Research),  
Manzokushi kenkyūkai(The Japanese Association for Manchu and Qing studies)

**—Achievements—****[Papers]***[Original Articles]*

- Chengzhi (Kicengge) 2009 The Manchu Language “Of the Ula region Map” . *National Palace Museum Research Quarterly* Volume26 (Number4) :1-74. (in Chinese) (reviewed).

**EVANS, Tom**


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Visiting Research Fellow

**[Academic Career]**

University of North Carolina at Chapel Hill (1998)  
Pre-Doctoral Trainee, Carolina Population Center(1998)  
Virginia Polytechnic Institute (1989)

**[Professional Career]**

Co-Director, Center for the Study of Institutions, Population, and Environmental Change (CIPEC), Indiana University (2006-)  
Associate Professor, Department of Geography, Indiana University(2005)  
Associate Director, Center for the Study of Institutions, Population, and Environmental Change (CIPEC), Indiana University (2002)  
Assistant Professor, Department of Geography, Indiana University (1999)  
Post-Doctoral Fellow in GIS, Center for the Study of Institutions, Population, and Environmental Change (CIPEC), Indiana University(1998)

**[Higher Degrees]**

B.A. (Virginia Polytechnic Institute, 1989)  
Ph.D. (University of North Carolina, 1998)

**[Fields of Specialization]**

Geography

**—Achievements—****[Papers]***[Original Articles]*

- Andersson KA, Evans TP, and Richards KR. 2009 National forest carbon inventories: Policy needs and assessment capacity. *Climatic Change* 93 :69-101.

**HAMADA, Atsushi**


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Project Researcher

**Born in 1976.****[Academic Career]**

Department of Geophysics, Faculty of Science, Kyoto University, M.Course (2008)

**[Higher Degrees]**

M.Sc (Kyoto University, 2001)

**[Fields of Specialization]**

Tropical Meteorology

Satellite Meteorology

**[Academic Society Memberships]**

Meteorological Society of Japan

The Remote Sensing Society of Japan

American Meteorological Society

American Geophysical Union

**—Achievements—****[Papers]***[Original Articles]*

- Inoue, T., D. Vila, K. Rajendran, A. Hamada, X. Wu, and L. Machado 2009 Life cycle of deep convective system over the eastern tropical Pacific observed by TRMM and GOES-W. *J. Meteor. Soc. Japan* 87A :381-391. DOI:10.2151/jmsj.87A.381. (reviewed).
- Fujiwara, M., S. Iwasaki, A. Shimizu, Y. Inai, M. Shiotani, F. Hasebe, I. Matsui, N. Sugimoto, H. Okamoto, N. Nishi, A. Hamada, T. Sakazaki, and K. Yoneyama 2009 Cirrus observations in the tropical tropopause layer over the western Pacific.. *J. Geophys. Res.*, 114(D09304). DOI:10.1029/2008JD011040. (reviewed).
- Yatagai, A., O. Arakawa, K. Kamiguchi, H. Kawamoto, M. I. Nodzu, and A. Hamada 2009 A 44-year daily gridded precipitation dataset for Asia based on a dense network of rain gauges. *SOLA* 5 :137-140. DOI:10.2151/sola.2009-035. (reviewed).

**[Research Presentations]***[Oral Presentation]*

- Hamada, A. Cloud-top height estimation by geostationary satellite split-window measurements using CloudSat measurements. Fourth Japan-China-Korea Joint Conference on Meteorology, Nov 08,2009–Nov 10, 2009, Tsukuba.
- Inoue, T., A. Hamada, Y. Hagihara, and S. Fukuda High-level cloud classified by the split window and CALIOP observations. EarthCARE Workshop 2009, June 2009, Kyoto.

*[Poster Presentation]*

- Hamada, A., and N. Nishi Cloud-top height estimation by geostationary satellite split-window measurements using CloudSat measurements. 2009 AGU Fall Meeting, December 2009, San Francisco.
- Yatagai, A., N. Yasutomi, A. Hamada, K. Kamiguchi, and O. Arakawa A 47-year daily gridded precipitation dataset for Asia based on a dense network of rain gauges -APHRODITE project-. 2009 AGU Fall Meeting, December 2009, San Francisco.
- Hamada, A., and N. Nishi Cloud-top height estimation by geostationary satellite split-window measurements using CloudSat measurements. 2009 AGU Fall Meeting, December 2009, San Francisco.
- Yatagai, A., N. Yasutomi, A. Hamada, K. Kamiguchi, and O. Arakawa A 47-year daily gridded precipitation dataset for Asia based on a dense network of rain gauges -APHRODITE project-. 2009 AGU

Fall Meeting, December 2009, San Francisco.

## HANAMATSU, Yasunori

Project Researcher

### Born in 1977.

#### [Academic Career]

Faculty of Law, Hokkaido University (2000)

Department of Public Law, School of Law, Hokkaido University, M. Course (2004)

Department of Public Law, School of Law, Hokkaido University, D. Course (2008)

#### [Professional Career]

Project Researcher, RIHN (2008)

#### [Higher Degrees]

Master (Law) (Hokkaido University) 2004

#### [Fields of Specialization]

Public International Law

#### [Academic Society Memberships]

Japanese Society of International Law

The International Human Rights Law Association

### —Achievements—

#### [Papers]

##### [Original Articles]

- HANAMATSU, Y., HORIGUCHI, T., ENDO, T. Mar, 2010 The legal, political situations and a future conservation strategy of the giant fish-breeding forest. *Report on Amur-Okhotsk Project 6* :87-104.

#### [Research Presentations]

##### [Oral Presentation]

- HANAMATSU, Y. The Amur-Okhotsk Ecosystem and China: Domestic Policy and International Cooperation on the Management of Wetland and Forest in China. International Workshop on "Environmental Governance in China", Mar 18, 2010-Mar 19, 2010, RIHN, Kyoto, Japan.
- HANAMATSU, Y. Conservation of the "Giant" Fish-Breeding Forest. International Symposium on the Amur-Okhotsk Project, Jan 19, 2010-Jan 20, 2010, RIHN, Kyoto, Japan.
- SHIRAIWA, T., HANAMATSU, Y. The "Giant" Fish-Breeding Forest and its Conservation. International Symposium on "Environmental Conservation of the Sea of Okhotsk: Cooperation between Japan, China and Russia", Nov 07, 2009-Nov 08, 2009, Hokkaido University, Sapporo, Japan.
- HANAMATSU, Y. National Boundaries and the Fragmentation of Governance Systems: Amur-Okhotsk Ecosystem from the Legal and Political Perspective. 4th RIHN International Symposium, "The Dilemma of Boundaries", Oct 20, 2009-Oct 22, 2009, RIHN, Kyoto, Japan.

## HASEGAWA, Shigeaki

Senior Project Researcher

**—Achievements—****[Papers]***[Original Articles]*

- Tobita, H., Hasegawa, S.F., Tian, X., Nanami, S. and Takeda, H. 2009 Spatial distribution and biomass of root nodules in a naturally regenerated stand of *Alnus hirsuta* Turcz. var. *sibirica*. *Symbiosis* . (reviewed). in press.

**HONJO, Mie**

Project Researcher

**[Academic Career]**

Department of Zoology, Division of Biological Science, Graduate School of Science, Kyoto University, D. Course (2006)

Department of Zoology, Division of Biological Science, Graduate School of Science, Kyoto University, M. Course (2001)

Department Ecosystem Studies, School of Environmental Science, The University of Shiga Prefecture (1999)

**[Professional Career]**

Research Fellow, Research Institute for Humanity and Nature (2006)

**[Higher Degrees]**

D.Sc. (Kyoto University, 2006)

M.Sc. (Kyoto University, 2001)

**[Fields of Specialization]**

Aquatic Microbial Ecology

Viral Ecology

Limnology

**[Academic Society Memberships]**

American Society for Microbiology

Ecological Society of Japan

The Japanese Society of Limnology

**—Achievements—****[Papers]***[Original Articles]*

- Honjo, M. N., Minamoto, T., Matsui, K., Uchii, K., Yamanaka, H., Suzuki, A. A., Kohmatsu, Y., Iida, T., Kawabata, Z. Jan, 2010 Quantification of cyprinid herpesvirus-3 (CyHV-3) in environmental water using an external standard virus.. *Applied and Environmental Microbiology* 76 :161-168. DOI:10.1128/AEM.02011-09. (reviewed).
- Minamoto, T., Honjo, M. N., Kawabata, Z. Nov, 2009 Seasonal Distribution of Cyprinid Herpesvirus 3 in Lake Biwa, Japan.. *Applied and Environmental Microbiology* 75 :6900-6904. DOI:10.1128/AEM.01411-09. (reviewed).

**[Research Presentations]***[Oral Presentation]*

- Honjo, M. N., Minamoto, T., Kawabata, Z. Detection and quantification of cyprinid herpesvirus-3 (CyHV-3) from sediments in lake and pond. The 57th Annual Meeting of The Japanese Society of Ecology, Mar 15, 2010–Mar 20, 2010, Meguro-ku, Tokyo. (in Japanese)
- Minamoto, T., Honjo, M. N., Uchii. K., Yamanaka, H., Suzuki, A. A., Kohmatsu, Y., Yonekura, R., Omori, K., Itayama T., Tanaka N., Asano, K., Sirae, Y., Okuda, N., Kawabata, Z. Interactions between koi herpesvirus and humans. (in Symposium S12: Linkage among environmental alteration, infectious diseases and humans) . The 57th Annual Meeting of the Ecological Society of Japan, Mar 15, 2010–Mar 20, 2010, Meguro, Tokyo. (in Japanese)
- Tanaka, N., Itayama, T. Minamoto, T., Honjo, M., Kawabata, Z. Development of a concentration system of virus at low concentration in environmental water. 44th Annual Conference of Japan Society on Water Environment, Mar 15, 2010–Mar 17, 2010, Fukuoka. (in Japanese)
- Minamoto, T., Honjo, M. N., Kawabata, Z. Dynamics of the cyprinid herpesvirus 3 in Lake Biwa. The 74th Annual Meeting of the Japanese Society of Limnology, Sep 15, 2009–Sep 17, 2009, Oita City, Japan. (in Japanese)
- Yamanaka, H., Sogabe, A., Omori, K., Minamoto, T., Uchii, K., Honjo, M. N., Suzuki, A., Kohmatsu, Y., Kawabata, Z. Active thermoregulation and its seasonal change of common carp. The 74th Annual Meeting of the Japanese Society of Limnology, Sep 15, 2009–Sep 17, 2009, Oita City, Japan. (in Japanese)
- Honjo, M. N., Minamoto, T., Kawabata, Z. Detection of cyprinid herpesvirus 3 DNA in lake sediments. Workshop on CyHV-3 disease in an environment–human linkage, Apr 08, 2009, Kyoto, Japan.
- Minamoto, T., Honjo, M. N., Kawabata, Z. Seasonal distribution of cyprinid herpesvirus 3 in Lake Biwa. Workshop on CyHV-3 disease in an environment–human linkage, Apr 08, 2009, Kyoto, Japan.

**HOSOYA, Aoi**

Project Researcher

Born in 1967.

**—Achievements—****[Editing]***[Editing / Co-editing]*

- Yo-Ichiro Sato, Leo Aoi Hosoya, Dorian Q Fuller (ed.) Mar, 2010 The Archaeobotany of Early Rice Agriculture in Asia. Archaeological & Anthropological Sciences , Vol. 2 (1). Springer, Berlin / Heidelberg, Germany,
- Yo-Ichiro Sato, Leo Aoi Hosoya, Dorian Q Fuller (ed.) Mar, 2010 The Archaeobotany of Early Rice Agriculture in Asia. Archaeological and Anthropological Sciences, Vol. 2 (1). Springer, Berlin / Heidelberg, Germany,

**[Papers]***[Original Articles]*

- Leo Aoi Hosoya Mar, 2010 Surviving Tradition and Disappearing Tradition: 'Old days' landscape with raised-floor granaries in Bali and Amami Oshima. Proceedings of the 14th International Conference of Historical Geographers. Kyoto University Press, Kyoto, Japan, p.00–00.

**[Research Presentations]**

*[Oral Presentation]*

- Leo Aoi Hosoya The ‘Routine-scape’ of Broad Spectrum Farming Society: Ethnoarchaeological approach to East Asian early rice farmers’ perception of dynamic landscape and its transformation. 1st International Landscape Archaeology Conference LAC2010, Jan 26, 2010–Jan 28, 2010, Amsterdam, Netherlands.
- Leo Aoi Hosoya What did Agriculture Bring to the Life?: The ‘routine-scape’ and social structurarisation in the formation of agricultural society. Centre of Excellence in Cultural Theory II Conference, Oct 28, 2009–Oct 30, 2009, Tartu, Estonia.
- Leo Aoi Hosoya Staple or Famine Food?: Ethnographic and archaeological approaches to nut processing in East Asian prehistory. Vth International Congress of Ethnobotany, Sep 21, 2009–Sep 24, 2009, San Carlos de Bariloche, Patagonia, Argentina.
- Leo Aoi Hosoya Surviving Tradition and Disappearing Tradition - ‘Old days’ landscape with raised-floor granaries in Bali and Amami Oshima. 14th International Conference of Historical Geographers 2009 KYOTO, Aug 23, 2009–Aug 27, 2009, Kyoto, Japan.
- Leo Aoi Hosoya Surrounded by Water, but Short of it: Ethnohistory of agriculture in Okinawa Islands. International Human Dimensions Programme on Global Environmental Change: Open Meeting 2009, Apr 26, 2009–Apr 30, 2009, Bonn, Germany.
- Leo Aoi Hosoya Wild Food for Farmers: Archaeobotanical and ethnoarchaeological reconstruction of wild resource exploitation by Chinese early farmers. Society for American Archaeology 74th Annual Meeting, Apr 22, 2009–Apr 26, 2009, Atlanta, USA.

*[Invited Lecture / Honorary Lecture / Panelist]*

- Leo Aoi Hosoya Broad Spectrum Farming Society: Reconstruction of uses of wild food plants by East Asian early farmers from an ethnoarchaeological viewpoint. Cambridge University George Pitt-Rivers Laboratory Lunch Time Talk, Sep 18, 2009, Cambridge, UK.

**ICHIJO, Tomoaki**

Project Researcher

**Born in 1980.****[Academic Career]**

Environmental Pharmaceutical Sciences, Graduate School of Pharmaceutical Sciences, Osaka University, Doctoral Course (2008)

Environmental Pharmaceutical Sciences, Graduate School of Pharmaceutical Sciences, Osaka University, M. Course (2005)

Department of Comprehensive Pharmacy, School of Pharmaceutical Sciences, Osaka University (2003)

**[Professional Career]**

Research Assistant, Osaka University (2005, 2007)

Research Fellow, Research Institute for Humanity and Nature (2008)

**[Higher Degrees]**

Ph. D. (Osaka University, 2008)

M. Sc. (pharmacy) (Osaka University, 2005)

**[Fields of Specialization]**

Environmental Microbiology

**[Academic Society Memberships]**



The Pharmaceutical Society of Japan  
 Japanese Society of Microbial Ecology  
 Japanese Society for Bacteriology  
 American Society for Microbiology  
 International Society for Microbial Ecology

### [Awards]

Best poster of 30th Annual Congress European Society of Mycobacteriology (2009)

## —Achievements—

### [Research Presentations]

#### [Oral Presentation]

- T. Ichiyo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid Detection of Respiratory Active Mycobacteria by Auramine O-CTC double staining. 30th Annual Congress European Society of Mycobacteriology, Jul 05, 2009–Jul 08, 2009, Porto, Portugal.

#### [Poster Presentation]

- T. Ichiyo, A. Hiramatsu, T. Kenzaka, T. Baba, N. Yamaguchi, M. Nasu Diversity of *Legionella pneumophila* in aquatic environments. The 130th Annual Meeting of the Pharmaceutical Society of Japan, Mar 28, 2010–Mar 30, 2010, Okayama. (in Japanese)
- T. Ichiyo, Y. Izumi, N. Yamaguchi, M. Nasu Auramine O-CTC double staining as a method for rapid detection of respiring *Mycobacteria*. The 130th Annual Meeting of the Pharmaceutical Society of Japan, Mar 28, 2010–Mar 30, 2010, Okayama. (in Japanese)
- T. Ichiyo, N. Yamaguchi, M. Nasu Rapid detection of respiratory active nontuberculous mycobacteria by Auramin e O-CTC double staining. The 83rd Annual Meeting of Japanese Society for Bacteriology, Mar 27, 2010–Mar 29, 2010, Yokohama, Kanagawa. (in Japanese)
- T. Ichiyo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid detection of respiratory active Mycobacteria by Auramine O - CTC double staining. 25th JSME Annual Meeting, Nov 21, 2009–Nov 23, 2009, Higashi-Hiroshima, Hiroshima. (in Japanese)
- T. Ichiyo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid detection of respiratory active non-tuberculous mycobacteria by Auramine O-CTC double staining. Forum 2009: Pharmaceutical Health Science and Environmental Toxicology, Nov 05, 2009–Nov 06, 2009, Ginowan, Okinawa. (in Japanese)
- T. Ichiyo, Y. Izumi, N. Yamaguchi, M. Nasu Rapid Detection of Respiratory Active Mycobacteria by Auramine O-CTC double staining. 30th Annual Congress European Society of Mycobacteriology, Jul 05, 2009–Jul 08, 2009, Porto, Portugal.
- T. Ichiyo, T. Kenzaka, N. Inoue, A. Hiramatsu, T. Baba, N. Yamaguchi, M. Nasu Difference of *Legionella pneumophila* Isolates between from natural and from Anthropogenic Environments.. 109th American Society for Microbiology General Meeting, May 17, 2009–May 22, 2009, Philadelphia, PA, USA.

## ISHIKAWA, Satoshi

Visiting Associate Professor

**Born in 1967.**

### [Academic Career]

Bachelor, National Fisheries University (1993)

Master's, Graduate School of Biosphere Science, Hiroshima University (1995)

Dr, Graduate School of Agricultural and Life Sciences, The University of Tokyo (1998)

### **[Professional Career]**

Research Associate, The University of Tokyo (1998.4-2000.12)

Researcher, Fisheries and Aquaculture International Co. Ltd. (2001.1-2003.10)

Researcher, Japan Science Agency (2003.11-2006.3)

Associate Professor, Tokai University (2006.4-)

### **[Higher Degrees]**

Agricultural Doctor

### **[Fields of Specialization]**

Fisheries Science, Conservation Ecology, Rural Studies

### **[Academic Society Memberships]**

The Japanese Society of Fisheries Science

The Ichthyological Society of Japan

The Japanese Society of Fisheries Oceanography

The Japanese Society of Tropical Ecology

The Society of Biosophia Studies

The World Aquaculture Society

The Japan Regional Fisheries Society

The society for the study of Laos Aquaculture

### **[Awards]**

1. The Best Article Award 2004 of The Ichthyological Society of Japan.
2. The Best Article Award 2007 of The Japanese Society of Fisheries Science.

## **—Achievements—**

### **[Books]**

#### *[Chapters/Sections]*

- Satoshi Ishikawa Sep, 2009 Tonle Sap Lake. Kazunobu Ikeya Ed (ed.) Water and Animal. Water and People, 6. Showado, Kyoto, pp.24-25. (in Japanese) ISBN978-4-8122-0919-6
- Satoshi Ishikawa Jun, 2009 Population structure and Speciation of genus *Anguilla*. Mutsumi Nishida Ed (ed.) Dynamics of Oceanic Lifes. Tokai University Press, Kanagawa, pp.322-340. (in Japanese) ISBN978-4-486-01685-4

### **[Papers]**

#### *[Original Articles]*

- Ishikawa Satoshi Dec, 2009 Capability of Net-work construction aiming unify fisheries researches and rural developments. International Cooperation in Agriculture. pp.99-110. (in Japanese)
- Ishikawa Satoshi Dec, 2009 Challenging Project for sustainable use of coastal fisheries resources in Southeast Asia- New concept "Area Capability". JSPS - NRCT Seminar 2009. Rayong, Thailand, pp.52-53.
- Ishikawa Satoshi May, 2009 Capability of Net-work construction aiming unify fisheries researches and rural developments. *International Cooperation in Agriculture* 10 :99-110. (in Japanese)
- Ishikawa Satoshi 2009 Utilization and management of fisheries resources in the coastal area of Thailand. International Cooperation in Agriculture. pp.125-135. (in Japanese)

### **[Research Presentations]**

#### *[Oral Presentation]*

- Shigeto Kawabata, Mina Hori, Yukinori Nakane, Ranata Munprasit, Satoshi Ishikawa Current status of beach seine net at Swanson Beach in Rayong, Thailand,. Annual meeting of the Japanese Society of Fisheries Science, Mar 26,2010–Mar 30,2010, Fujisawa, Kanagawa. (in Japanese)

*[Poster Presentation]*

- Satoshi Ishikawa, Hiroyuki Matsuura, Takashi Yoshikawa, Takaharu Fukaya, Seigi Miura, Kaneo Ishikawa, Dai Hayashi, Hiroyuki Tanekura, Ikuyuki Matsunaga, Yoshimasa Hayase Construction of integrated database of coastal environment in Hazu in Mikawa Bay. Annual meeting of the Japanese Society of Fisheries Science, Mar 26,2010–Mar 30,2010, Fujisawa, Kanagawa. (in Japanese)
- Eisen Takeyoshi, Shusuke Yokoyama, Kuniko Hanamori, Shigeo Yamamoto, Satoshi Ishikawa Genetic diversity of asari clam in Mikawa and Hamana Bays inferred from molecular analyses. Annual meeting of researchers around Hamana Lake, Dec 05,2009, Shizuoka. (in Japanese)
- Koji Miyoshi, Kuniko Hanamori, Chiaki Yahata, Satoshi Ishikawa Genetic diversity of *Sergia lucense* inferred from microsatellite analysis. Annual meeting of researchers around Hamana Lake, Dec 05,2009, Shizuoka. (in Japanese)
- Shigeto Kawabata, Satoshi Ishikawa Relationship between fishermen and ecotourism of dolphin watching in Amakusa-Itsuwa area. Annual meeting of researchers around Hamana Lake, Dec 05,2009, Shizuoka. (in Japanese)
- Kuniko Hanamori, Yoshihiro Okada, Satoshi Ishikawa, Kanemitsu Michiko, Yoichiro Sato Genetic Analysis of rice seed uncovered from Takenoi Ruin Site II. Annual meeting of Japan Society for Science Studies on Cultural Properties, Jul 11,2009–Jul 12,2009, Nagoya. (in Japanese)

*[Invited Lecture / Honorary Lecture / Panelist]*

- Satoshi Ishikawa Cooperation technology among fishing, local society and physical distribution. Lecture meeting of fishery, Annual meeting of the Japanese society of fishery science, Feb 26,2010, Kanagawa. (in Japanese)
- Satoshi Ishikawa Challenging Project on Sustainable use of coastal fisheries resources in Southeast Asia. JSPS-NRCT Joint Seminar 2009., Dec 14,2009, Rayong Thailand.
- Satoshi Ishikawa Fisheries resource management in Thailand coastal area. Tenth Open forum of International cooperation center for agricultural education, Nov 30,2009, Nagoya University. (in Japanese)
- Satoshi Ishikawa Tourism and Environmental conservation. Yaeyama Town Meeting, Nov 13,2009, Ishigaki. (in Japanese)
- Satoshi Ishikawa Fish and People in Mekong river basin. Seminar of Shizuoka International study group, Aug 29,2009, Shizuoka. (in Japanese)

## ISHIMARU, Eriko

Project Researcher

**[Academic Career]**

Graduate School of Human and Environmental studies, Kyoto University, D Course (2007)

Graduate School of Letters, Hiroshima University, M Course (2001)

Faculty of Letters, Hiroshima University (1999)

Faculty of Agriculture, Ehime University (1990)

**[Professional Career]**

THE NIKKA WHISKY DISTILLING CO., LTD (1991)

project researcher, Research Institute for Humanity and Nature (2008)

### [Higher Degrees]

M.Lit., Hiroshima University (2001)

### [Fields of Specialization]

Zoo-archaeology

Isotope Zoo-archaeology

Environmental archaeology

### [Academic Society Memberships]

Japanese Society for Scientific Studies on Cultural Property

Society of Archaeological Studies

Japanese Zoo-archaeological Society

International Council for Archaeo-Zoology

### [Awards]

The second Japanese Society for Scientific Studies on Cultural Property Encouragement thesis prize (2009)

Honourable Mention International Council for Archaeozoology 2006 Poster Competition student category (2006)

Mishima Kaiun Memorial Foundation Science encouragement prize (2005)

## —Achievements—

### [Papers]

#### [Original Articles]

- Eriko ISHIMARU Mar, 2010 The use of animal resources in Yano site. Izumo city broad of education (ed.) Yano site . Izumo, Shimane , pp.149-157. (in Japanese)
- Eriko ISHIMARU Mar, 2010 Animal remains excavated from Amataki site and use of animal resources in Inland. Iwate Cultural Promotion Agency (ed.) Excavation report of Amataki site. Buried cultural properties investigation report of Iwate Cultural Promotion Agency , 562. pp.191-198. (in Japanese)
- Minoru YONEDA, Takashi GAKUHARI, Eriko ISHIMARU, Naoto TOMIOKA Mar, 2010 Approach of Human life of Hakata in the mediaval period from isotope anlysis of bone. *City history Research FUKUOKA* (5) :33-49. (in Japanese)

#### [Review Articles]

- Eriko ISHIMARU Jul, 2009 Bone use of ancient people - learning from excavated bone -. Osaka MUuseum of Natural History (ed.) Learn by HONE, Enjoy by HONE. 39th Exhibition Guide books "Hone Hone Expedition". Higashisumiyoshi-ku, Osaka, pp.119-123. (in Japanese)
- Eriko ISHIMARU Jul, 2009 Hardship story of Zoo-Archaeology - sampling of modern animal and making of specimen-. Osaka Museum of Natural History (ed.) Learn by HONE, Enjoy by HONE. 39th Exhibition Guide books "Hone Hone Expedition". Higashisumiyoshi-ku, Osaka, pp.124. (in Japanese)

### [Research Presentations]

#### [Oral Presentation]

- Ichiro TAYASU, Eriko ISHIMARU, Katakazu YUMOTO Feeding ecology of contemporary Japanese revealed by stable isotope analysis. 63th Conference of the Anthropological Society of Nippon, Symposium of subcommittee meeting Osteoarcheology, Oct 03, 2009-Oct 04, 2009, Tokyo. (in Japanese)
- Eriko ISHIMARU, Ichiro TAYASU, Tetsuya UMINO, Minoru YONEDA, Takakazu YUMOTO Ancient transport in the Japanese Archipelago revealed trough carbon and nitrogen stable isotope ratios of excavatedm marine fishes. International Council for Archaeozoology Fish Remains Working Group 15th Meeting, Sep

03, 2009–Sep 09, 2009, Poznan and Torun, Poland.

- Eriko ISHIMARU, Emi KOKADO, Soichiro KUSAKA, Takanori NAKANO, Takakazu YUMOTO Restoration of hunting area in Jomon and Yayoi period –strontium isotope analysis of animal remains and plants. 26th Conference of JAPAN SOCIETY FOR SCIENTIFIC STUDIES ON CULTURAL PROPERTIES, Jul 11, 2009–Jul 12, 2009, Nagoya, Aichi. (in Japanese)
- Eriko ISHIMARU, Emi KOKADO, Soichiro KUSAKA, Kiyohide FURUSE, Takanori NAKANO, Takakazu YUMOTO Hunting area of Jomon period –isotope analysis of animal remains excavated from TAISHAKU-kyo sites in Hiroshima-. 75th annual meeting and convention of Japanese Archaeological Association, May 30, 2009–May 31, 2009, Tokyo. (in Japanese)

*[Poster Presentation]*

- Eriko ISHIMARU, Kicheol SHIN, Hirofumi TERAMURA, Takanori NAKANO and Clarification of hunting and gathering region by strontium isotope. The 13th Annual Meeting of Japanese Zoo-Archaeological Society, Dec 19, 2009–Dec 20, 2009, Ibaragi. (in Japanese)
- Eriko ISHIMARU, Kicheol SHIN, Hirofumi TERAMURA, Takanori NAKANO and Can the hunting area of Jomon period be clarified? : Approach by. The 10th Annual Meeting of Kansai Jomon Cultural Society, Dec 12, 2009–Dec 13, 2009, Azuchi, Shiga. (in Japanese)
- Eriko ISHIMARU, Kicheol SHIN, Hirofumi TERAMURA, Ryo TUJINO, Takanori Hunting areas of Jomon and Yayoi period revealed through the strontium. 2009 Annual Meeting of the Mammalogical Society of Japan, Nov 21, 2009–Nov 24, 2009, Taipei, Taiwan. (in Japanese)
- Eriko ISHIMARU What kind of fish are these? Bones from the Bancho site and Yokkaichi site of the Edo period(17th–19th) in Japan. International Council for Archaeozoology Fish Remains Working Group 15th Meeting, Sep 03, 2009–Sep 09, 2009, Poznan and Torun, Poland.

*[Invited Lecture / Honorary Lecture / Panelist]*

- Eriko ISHIMARU A new approach of distribution of marine products and exchange study : Stable isotope analysis of fish remains. The 8th Annual Meeting of the Neolithic age Society of Japan and Korea, Jul 18, 2009–Jul 19, 2009, Moppo, Korea. (in Japanese)

## ISHIMOTO Yudai

Project Researcher

### **Born in 1979.**

#### **[Academic Career]**

Department of Agriculture, Tottori University(2001)

Graduate School of Asian and African Area Studies, Kyoto University (2008)

#### **[Professional Career]**

Teaching assistant at Kyoto University (2003)

#### **[Higher Degrees]**

Master degree of area study(Kyoto University, 2008)

#### **[Fields of Specialization]**

Ecological anthropology

#### **[Academic Society Memberships]**

Japan Association for African Studies

The Japanese Association for Arid Land Studies

The Society for Ecological Anthropology

—Achievements—

**[Research Presentations]**

*[Poster Presentation]*

- Yudai Ishimoto Introduction and Infiltration of Labor migration in Sahelian Area: Case study of a village in northern part of Burkina Faso. International Science Conference on the Human Dimensions of Global Environmental Change, Apr 26, 2009–Apr 30, 2009, Bonn, Germany.

ISHIYAMA, Shun

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Project Researcher

**Born in 1965.**

**[Academic Career]**

Graduate School of Letters(Comparative Studies of Humanities and Social Sciences), Nagoya University, D. Course (2006)

Graduate School of Humanities and Social Sciences, Shizuoka University, M.A. Course(2000)

Tokyo University of Agriculture (1989)

**[Professional Career]**

Staff, NGO Action for Greening Sahel(1993)

Staff, NPO Mori no Enerugi Foramu (2004)

Lecturer(Part-time), Fukui Prefectural University (2006)

Staff, NPO Echizen(2007)

Project researcher, Research Institute for Humanity and Nature (2008–)

**[Higher Degrees]**

M.A. (Shizuoka University, 2000)

B.A. (Tokyo University of Agriculture, 1989)

**[Fields of Specialization]**

Cultural Anthropology

Development Anthropology

**[Academic Society Memberships]**

Japan Association for African Studies

Japanese Society of Cultural Anthropology

The Japanese Association for Arid Land Studies

Japan Association for Nilo-Ethiopian Studies

—Achievements—

**[Books]**

*[Chapters/Sections]*

- ISHIYAMA, Shun Nov, 2009 Afforestation project as activities against desertification. SHIYRAISHI, Soichiro (ed.) Kyoto Working Papers on Area Studies, Center for Southeast Asian Studies, Kyoto University. JSPS Working Papers on Area Studies, 84. Center for southeast asian studies Kyoto

University, pp.35-49. (in Japanese)

- ISHIYAMA, Shun Jul,2009 Deforestation. The japanese association for arid land studies (ed.) Encyclopedia of desert. Maruzen, p.19-19. (in Japanese)
- ISHIYAMA, Shun Jul,2009 People of the desert. The japanese association for arid land studies (ed.) Encyclopedia of desert. Maruzen, Chuo-ku Tokyo, p.83-83. (in Japanese)
- ISHIYAMA, Shun Jul,2009 Diffusion of ameliorated cooking stove:Africa. The japanese society for arid land studies (ed.) Encyclopedia of desert. Maruzen, Chuo-ku Tokyo, p.94-94.
- ISHIYAMA, Shun Jul,2009 Africa and the desertification. The japanese society for arid land studies (ed.) Encyclopedia of desert. , p.119-119. (in Japanese)

### [Research Presentations]

#### [Oral Presentation]

- ISHIYAMA, Shun *Human mobility in the Sub-Sahara arid land:Southward Migration of Kanemubu and drought in Lake Chad region.* The 16th International Congress of IUAES, Jul 27,2009-Jul 31,2009, Yunnan University, Kunming, China.
- ISHIYAMA, Shun *Human mobility in the Sub-Sahara arid land: Southward Migration of Kanemubu and drought in Lake Chad region.* 16th International Congress of Anthropological and Ethnological Sciences, Jul 27,2009-Jul 30,2009, Kunming China.
- ISHIYAMA, Shun *Reevaluation on human mobility of the Sub-Sahara arid land: Southward Migration of Kanemubu and drought in Lake Chad region.* Afro-Eurasia Civilizations: The 1st International Workshop, Jul 18,2009-Jul 20,2009, Nagoya University, Aichi, Japan.

## KADA, Ryohei

Visiting Professors

### Born in 1949.

#### [Academic Career]

Graduated from Graduate School of Agriculture, Kyoto University

Graduate School of Agricultural and Life Sciences, University of Wisconsin-Madison

#### [Professional Career]

Professor of Kyoto University

Policy Research Coordinator, Policy Research Institute of the Ministry of Agriculture, Forestry and Fisheries

President, AMITA Research Institute for Sustainable Economies

#### [Higher Degrees]

Ph.D. (Univ. of Wisconsin-Madison)

#### [Fields of Specialization]

Agricultural Policy

Environmental Economics

Food Risk Management

#### [Academic Society Memberships]

Ecological Society of Japan

Society of Environmental Science, Japan

Japan Society on Water Environment

Japanese Association of Agricultural Economics  
 The Association of Rural Planning  
 The Food System Research Association of Japan  
 International Sustainable Development Research Society  
 International Association for Agricultural Economists  
 Asian Association for Agricultural Economists

### **[Awards]**

Best Publication Award from Japanese Association of Agricultural Economics by “Part-time Family Farming” (in English) (1980)

Policy Research Memorial Award from NIRA (National Institute for Research Advancement) by the publication of “Environmental Conservation and Sustainable Agriculture” (in Japanese) (1991)

### **—Achievements—**

#### **[Papers]**

##### *[Review Articles]*

- KADA Ryohei Apr, 2009 Basic issues of food safety and needed risk management. *Safety Engineering* 48(1) :2-8. (in Japanese)

#### **[Research Presentations]**

##### *[Oral Presentation]*

- KADA Ryohei, Ashutosh Sarker Payment for Ecosystem Services and Sustainable Agricultural Development. Paper Presented at the 15th International Conference of Sustainable Development, Jul 05, 2009–Jul 08, 2009, Univ. of Utrecht, Nederland.

KATO, Yuzo

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Assistant Professor

**Born in 1971.**

#### **[Academic Career]**

Graduate School of Law, Kyoto University, Doctor's program (2000)

Graduate School of Law, Kyoto University, Master's program (1996)

Faculty of Law, Kyoto University (1994)

#### **[Professional Career]**

Assistant Professor, Research Institute for Humanity and Nature (2001)

Junior Research Fellow, Institute for Research in Humanities, Kyoto University (2001)

Research Associate, Graduate School of Law, Kyoto University (2000)

JSPS Research Fellow (DC2) (1997)

#### **[Higher Degrees]**

LL. M. (Kyoto University, 1996)

#### **[Fields of Specialization]**

Legal History

#### **[Academic Society Memberships]**

Japan Legal History Association



**—Achievements—****[Books]***[Chapters/Sections]*

- KATO Yuzo Feb, 2010 The South Side of Gobi Desert after the Mongol Empire. SHIRAISHI Noriyuki (ed.) The Commandment of Činggis Qan. Douseihsa, Chiyoda-ku, Tokyo, pp.126-140. (in Japanese)
- KATO, Yuzo Dec, 2009 The Lawsuit Handbooks in "R. O. C". SUZUKI, Hidemitsu • TAKATANI, Chika • HAYASHI, Makiko • YASHIKI, Jiro (ed.) CIRCVLATIO IVRIS. JIGAKUSHA, Hinode-machi, Tokyo, pp.849-872. (in Japanese) (reviewed)

**[Papers]***[Original Articles]*

- KATO, Yuzo Dec, 2009 On the Sequestration of the Taiwan Judiciary by R.O.C.. *The Memoirs of the Institute of Oriental Culture* 156 :311-357. (in Japanese) (reviewed).

**KAWABATA, Zen'ichiro**

Professor

**Born in 1946.****[Academic Career]**

Department of Biology, Graduate School of Science, Tohoku University, unfinished D Course (1975)

Department of Biology, Graduate School of Science, Tohoku University, M. Course (1973)

Department of Biology, Faculty of Science, Tohoku University (1971)

**[Professional Career]**

Professor, Research Institute for Humanity and Nature(2005)

Professor(Concurrent), Center for Marine Environmental Studies, Ehime University(1999)

Professor, Center for Ecological Research, Kyoto University (1998)

Professor, Department of Environmental Conservation, Ehime University(1996)

Associate Professor, Department of Environmental Conservation, Ehime University(1983)

Lecturer, Department of Environmental Conservation, Ehime University(1981)

Assistant Professor, Faculty of Science, Biological Institute, Tohoku University (1977)

Technician, Faculty of Science, Biological Institute, Tohoku University (1975)

**[Higher Degrees]**

Dr. Sci. (Tohoku University, 1977)

Ms. Sci. (Tohoku University, 1973)

**[Fields of Specialization]**

Microbial Ecology, Aquatic Ecosystem Ecology

**[Academic Society Memberships]**

The Ecological Society of Japan

The Japanese Society of Microbial Ecology

The Japanese Society of Limnology

Japanese Society of Water Treatment Biology

Japanese Society for Environmental Biotechnology

The Japanese Society of Fisheries Sciences  
 Japan Society on Water Environment  
 Society of Environmental Science, Japan  
 International Association for Theoretical and Applied Limnology.  
 The Nature Conservation Society of Japan

### [Awards]

Ehime Publication and Culture Prize, 2000(with coauthors) (2000)

## —Achievements—

### [Papers]

#### [Original Articles]

- Minamoto, T., Honjo M. N., Uchii, K., Yamanaka, H., Suzuki, A., Kohmatsu, Y., Iida, T. and Kawabata, Z 2009 Detection of cyprinid herpesvirus 3 DNA in river water during and after an outbreak. . *Veterinary Microbiology* 135 :261-266.
- Uchii, K., Matsui. K., Iida, T. and Kawabata, Z 2009 Distribution of the introduced cyprinid herpesvirus 3 in a wild population of common carp (*Cyprinus carpio*). *Journal of Fish Diseases* 32 :857-864.
- Minamoto, T., Honjo, M. N. and Kawabata, Z 2009 Seasonal distribution of cyprinid herpesvirus 3 in Lake Biwa, Japan. *Applied Environmental Microbiology* 75 :6900-6904.
- Xuechu Chen, Xiaodong Wang, Hainan Kong, Deyi Wu, Shengbin He, Zen'ichro Kawabata 2009 Seasonal variation of mixing depths and its influence on phytoplankton dynamics in the Zeya reservoir, China. *Limnology* 10 :159-165.

### [Research Presentations]

#### [Oral Presentation]

- Minamoto, T., Honjo, M. N., Kawabata, Z Seasonal distribution of cyprinid herpesvirus 3 in Lake Biwa. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08,2009, Kyoto, Japan.
- Uchii, K and Kawabata, Z Establishment of cyprinid herpesvirus 3 in a wild population of common carp in Lake Biwa. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08,2009, Kyoto, Japan.
- Honjo, M. N., Kawabata, Z. Detection of cyprinid herpesvirus 3 DNA in lake sediments. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08,2009, Kyoto, Japan.
- Itayama, T., and Kawabata, Z Development of microdevices for enviromental microbiology and virology. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08,2009, Kyoto, Japan.

#### [Poster Presentation]

- Kawabata, Z Destruction of littoral zone, koi herpesvirus, and human linkages: A case study of Lake Biwa, Japan. DIVERSITAS Open Science Conference(DIVERSITAS OS2), Oct 14,2009-Oct 16,2009, Cape Town, South Africa.

#### [Invited Lecture / Honorary Lecture / Panelist]

- Kawabata, Z Environmental change, pathogen, and human linkage :A case study of Lake Biwa, Japan. (invited). Special Symposium, Aquatic Ecosystem Restoration, World City Water Forum 2009(WCWF2009), Aug 21,2009, Inchon, Korea.
- Kawabara, Z Concept of environmental disease. Dali University, Jun 25,2009, Dali, Yunnan, China.

Project Researcher

**Born in 1981.****[Higher Degrees]**

D. Sc (The University of Kyoto, 2008)

**[Fields of Specialization]**

population genetics

plant phylogeny

serpentine plant

**—Achievements—****[Papers]***[Original Articles]*

- Kawase D, Yumoto T, Ken S 2009 Phylogeography of a rare serpentine plant *Arenaria katoana* Makino (Caryophyllaceae). *Acta Phytotaxonomica et Geobotanica* 60(1) :19-25. (reviewed).
- Kawase D, Ueno S, Tsumura Y, Tomaru T, Seo A, Yumoto T 2009 Development and characterization of EST-SSR markers for *Sciadopitys verticillata* (Sciadopityaceae). *Conservation Genetics* . DOI:10.1007/s10592-009-9877-1. (reviewed).

**KIM, Heonsook**

Project Researcher

**Born in 1980.****—Achievements—****[Research Presentations]***[Oral Presentation]*

- Kim, H.-S., S. Maksyutov, P. Patra, K. Sudo, and G. Inoue Estimates of regional CH<sub>4</sub> fluxes using NIES transport model. 2009 Autumn Meeting of the MSJ, Nov 25, 2009–Nov 27, 2009, Hukuoka.

**KISHIMOTO, Keiko**

Project Researcher

**[Academic Career]**

Received Bachelor of Agriculture from Faculty of Agriculture, Tokyo University of Agriculture, in March 2001

Received Master of Agriculture from Graduate School of Nagoya University in March 2003

Received Doctorate of Human and Environmental Studies from Graduate School of Kyoto University in May 2008

**[Professional Career]**

Research Institute for Humanity and Nature

**[Higher Degrees]**

Dr

**[Fields of Specialization]**

Insect Ecology, Community Ecology, Tropical Ecology

**—Achievements—****[Papers]***[Original Articles]*

- Kishimoto-Yamada, K., T. Itioka, S. Sakai, K. Momose, T. Nagamitsu, H. Kaling, P. Meleng, L. Chong, A.A. Hamid Karim, S. Yamane, M. Kato, C.A.M. Reid, T. Nakashizuka and T. Inoue 2009 Population fluctuations of light-attracted chrysomelid beetles in relation to supra-annual environmental changes in a Bornean rainforest. *Bulletin of Entomological Research* 99 :217-227. (reviewed).

**[Research Presentations]***[Poster Presentation]*

- Keiko Kishimoto-Yamada Plant phenology and insect population dynamics in Lambir Hills National Park, Sarawak. First ASIAHORCs Joint Symposium "Asian Biodiversity: Characteristics, Conservation and Sustainable Use, Jul 18, 2009-Jul 20, 2009, Nagoya Univ. Japan.

**KOSAKA, Yasuyuki**

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Project Researcher

**—Achievements—****[Papers]***[Original Articles]*

- Tsering, R., Bora, L., Ando, K., Kosaka, Y. Dec, 2009 The Brokpa and their social development: The work of M/S Dunkarpa Welfare Association at Dirang Circle of West Kameng District, Arunachal Pradesh, India. Proceedings of the First High-Altitude Project International Conference "Global environmental issue in the human body: Disease and aging manifested by the imbalance between high-altitude adaptation and recent life-style change". Research Institute for Humanity and Nature, Kita-ku, Kyoto, pp. 96-104.

**KUBOTA, Jumpei**

---

Associate Professor

**Born in 1957.****[Academic Career]**

Department of Forestry, Faculty of Agriculture, Kyoto University, D. Course (1987)

Department of Forestry, Faculty of Agriculture, Kyoto University, M. Course (1983)

Department of Forestry, Faculty of Agriculture, Kyoto University (1981)

**[Professional Career]**

Associate Professor, Research Institute for Humanity and Nature (2002)

Associate Professor, Faculty of Agriculture, Tokyo University of Agriculture and Technology (1997)

Assistant Professor, Faculty of Agriculture, Tokyo University of Agriculture and Technology (1989)

Assistant Professor, University Forest, Kyoto University (1987)

### **[Higher Degrees]**

D. Agr. (Kyoto University, 1987)

M. Agr. (Kyoto University, 1983)

### **[Fields of Specialization]**

Hydrology

Forest Hydrology

Erosion Control Engineering

### **[Academic Society Memberships]**

The Japanese Forestry Society

The Japan Society of Hydrology and Water Resources

The Japan Society of Erosion Control Engineering

### **[Awards]**

Water Environment Federation Excellence Award, McKee Groundwater Protection, Restoration, Sustainable Use Medal (2009)

## **—Achievements—**

### **[Books]**

#### *[Chapters/Sections]*

- Jumpei Kubota and Tomoko Nakamura Mar, 2010 Water issues and water saving policies in China. Tomoya Akimichi, Kazuhiko Komatsu and Yasuo Nakamura (ed.) Water and People - 1. Water and the Environment. Showa-do, Sakyo-ku, Kyoto, pp.275-304. (in Japanese)
- Jumpei Kubota Feb, 2010 Water and People in the Silkroads. Tomoya Akimichi (ed.) Water and Civilization. Showa-do, Sakyo-ku, Kyoto, pp.174-204. (in Japanese)
- Jumpei Kubota Jul, 2009 Historical changes of climate and water resources in central Eurasia. Yo-Ichiro Sato and Takashi Kurata (ed.) Agriculture and climate in desert and pasture. History of agriculture in Eurasia, 3. Rinsen Book co., Kyoto, Sakyo-ku, pp.93-140. (in Japanese)

### **[Editing]**

#### *[Editing / Co-editing]*

- Jumpei Kubota (ed.) Mar, 2010 History of Central Eurasia from the 13th to 15th Century. Research Institute for Humanity and Nature, KIIta-ku, Kyoto, 430pp. (in Japanese)
- Jumpei Kubota (ed.) 2009 Global Environmental Issues by Transboundary Movement. Showado, Sakyo-ku, Kyoto, 224pp. (in Japanese)

### **[Research Presentations]**

#### *[Oral Presentation]*

- Jumpei Kubota Effects of human activities on the hydrological processes in arid regions of Central Eurasia -a multi-disciplinary approach. International Workshop on Changes in Surface and Ground Water in the Tarim River Basin, October 2009, Xi' an, China.
- Jumpei Kubota Effects of human activities on the hydrological processes in arid regions of Central Eurasia -a multi-disciplinary research project. International Workshop on the Northern Eurasia High Mountain Ecosystems, September 2009, Bishkek, Kyrgyzstan.

- Jumpei Kubota Environmental Issues on Water caused by Agricultural Development in arid regions –A case study in the Heihe River Basin, Western China. The 16th World Congress of the International Union of Anthropological and Ethnological Science, July 2009, Kunming, China.
- Jumpei Kubota Impacts of Human Activities on the Ecosystem in the Heihe River Basin, Western China: An Historical Perspective on the Future. The 16th World Congress of the International Union of Anthropological and Ethnological Science, July 2009, Kunming, China.
- Jumpei Kubota Historical interactions between human activities and environmental changes in arid regions of Central Eurasia. IHDP 7th Open Meeting, April 2009, Bonn, Germany.
- Jumpei Kubota Impacts of Agricultural Development on the Environment in the Heihe River Basin, Western China. IHDP 7th Open Meeting, April 2009, Bonn, Germany.

*[Invited Lecture / Honororary Lecture / Panelist]*

- Jumpei Kubota Historical interaction between human and the environment in arid regions of Central Eurasia. 1st International Conference “Aral: Past, Present and Future – Two Centuries of the Aral Sea Investigations, October 2009, St. Petersburg, Russia.

## LEKPRICHAKUL, Thamana

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Senior Project Researcher

### **Born in 1959.**

#### **[Academic Career]**

Department of Economics, University of Hawaii, USA (2001)

Faculty of Economics, Thammasat University, Thailand (1987)

#### **[Professional Career]**

Senior Researcher, Research Institute for Humanity and Nature (2006–Present)

Post-doctoral fellow, Social Science Research Institute, University of Hawaii (2006)

Research Assistant, Energy Technology Department, Asian Institute of Technology, Thailand (1998)

#### **[Higher Degrees]**

Ph. D. (University of Hawaii, 2001)

B.A., Honors (Thammasat University, Thailand, 1987)

#### **[Fields of Specialization]**

Health–Demographic Economics

Labor Economics

Development Economics

#### **[Academic Society Memberships]**

Member of American Economic Association

Member of Thai Economic Association

#### **[Awards]**

BA in Economics with honored (equivalent to summa cum laude in the USA) and a recipient of the King Bhumipol’ s Outstanding Student Award

King Bhumipol’ s first place award for an essay on “The King Bhumipol and His Contributions to Social Development” in 1986

Second place award from the United Nations for an essay on “Zimbabwe” in 1987

First place award from the department of economics, Thammasat University, for an essay on

“International Trade and Protectionism” in 1987

## —Achievements—

### [Books]

#### [Chapters/Sections]

- Lekprichakul, T. 2009 *Ex Ante* and *Ex Post* Risk Coping Strategies: How Do Subsistence Farmers in Southern and Eastern Province of Zambia Cope?. Chieko Umetsu (ed.) Vulnerability and Resilience of Social-Ecological Systems Project Report, FY2008. Research Institute for Humanity and Nature, Kyoto, pp.113-129.

### [Research Presentations]

#### [Oral Presentation]

- Umetsu, C. and T. Lekprichakul. Resilience of Tsunami Affected Households in Coastal Region of Tamil Nadu, India. The Indian Ocean Tsunami: 5 Years Later: Assessing the Vulnerability and Resilience of Tsunami Affected Coastal Regions, Mar 01,2010–Mar 03,2010, Hotel Grand Pacific, Singapore.
- Lekprichakul, T., T. Yamauchi and C. Umetsu. Chronic Under-Nutrition and Obesity in Pre-School Children of a Heavily Indebted Poor Country (HIPC): What Explains the Paradox?. Center for Contemporary Asian Studies (CCAS) and Faculty of Policy Studies, Jan 25,2010, Doshisha University, Kyoto.
- Ranganathan, C.R., Chieko Umetsu, K. Planisami, Thamana Lekprichakul The Impact of Climate Change on Yield and Yield Variability and Optimum Land Allocation for Major Crops in Tamil Nadu, India: An Econometric Approach, . The 20th Annual Conference for the Japan Society for International Development, Nov 21,2009–Nov 22,2009, Ritsumeikan Asia Pacific University.
- Lekprichakul, T., T. Yamauchi and C. Umetsu. Chronically Under-Nourished and Obese among the Under-Fives: What Explains the Paradox?. Symposium on “Recent Developments in Empirical Development Economics: Challenges to Rural Poverty”, Oct 29,2009, Environment and Development Economics and Seminar, Kobe University.
- Lekprichakul, T. and C. Umetsu. Agricultural Drought Analysis: An Oaxaca Decomposition of Malmquist Index. OR 51 Conference, Sep 08,2009–Sep 10,2009, University of Warwick, UK.
- Lekprichakul, T., T. Yamauchi and C. Umetsu. Is child obesity a new face of under-nutrition in Zambia?. The 2nd Lusaka Workshop on Vulnerability and Resilience of Social-Ecological Systems, Aug 28,2009, Mika Lodge, Lusaka, Zambia.
- Lekprichakul, T. Undernutrition and Overnutrition Situation in Zambia: Logical or Pradoxical?. WEAI 84th Annual Conference, Jun 29,2009–Jul 03,2009, Vancouver, Canada.
- Lekprichakul, Thamana Impact of 2004/2005 Drought on Zambia’s Agricultural Production and Economy and Subsistent Farmers’ Coping Behaviors. IHDP Open Meeting 2009, Apr 26,2009–Apr 30,2009, Bonn, Germany.

## MAKIBAYASHI, Keisuke

Senior Researcher

Born in 1972.

### [Academic Career]

Department of Literature, Hiroshima University, Ph.D Course (2004)

Postgraduate, Department of Archaeology, Beijing University (2000)

Postgraduate, Department of Literature, Hiroshima University (1998)

Department of Literature, Hiroshima University, M. Course (1997)

Department of History, Kumamoto University (1995)

### **[Professional Career]**

Assitant, Archaeological Research Center, Hiroshima University (2007)

Assistant Professor, Archaeological Research Center, Hiroshima University (2005)

Assistant, Archaeological Research Center, Hiroshima University (2004)

Teaching Assistant, Hiroshima University (2001)

Researcher, RIHN(2008)

### **[Higher Degrees]**

Ph.D (Literature) (Hiroshima University, 2004)

### **[Fields of Specialization]**

Archaeology

### **[Academic Society Memberships]**

Japanese Archaeological Association

Society of Archaeological Studies

Jpananese Society for Chinese Archaeology

Study Group of Furnace

## **—Achievements—**

### **[Research Presentations]**

#### *[Oral Presentation]*

- MAKIBAYASHI, Keisuke Unity and Diversity in the Formation of Chinese culture : Agriculture, Staple food and Cooking Device(「中國」文化形成上の統一性和多様性—農業・食物・烹調器具). The Fifth Annual Conference The Asian Studies Association of Hong Kong (ASAHK) (第5屆香港亞細亞學會), Jan 08, 2010, Hongkong. (in Chinese)
- MAKIBAYASHI, Keisuke Rice Farming Culture in Lower and Middle Yangtze is not One but Diverse. 13th Harvard University Round Table ETHNOGENESIS OF SOUTH AND CENTRAL ASIA (ESCA), May 30, 2009, Kyoto.
- MAKIBAYASHI, Keisuke The transformation of agricultural culture landscape in Neolithic Yangtze (長江) downstream basin, CHINA. Society of American Archaeology(SAA), Apr 25, 2009, Atlanta.

## **MERTZ, Mechtild**

Visiting Research Fellow

### **Born in 1963.**

#### **[Academic Career]**

Highschool graduation (Abitur), Gymnasium Möckmühl, Germany(1983)

Journeyman' s certificate in cabinetmaking, Ludwigshafen Rhein, Germany(1986)

Intermediate examination, Heidelberg University, Germany(1989)

Bachelor of Arts, Sorbonne University, France(1991)

Language certificate, Keio University, Japan(1993)

“Maitrise, Sorbonne University, France(1994)

Master of Arts, Sorbonne University, France(1996)



Certificate in xylology (wood identification), Paris VII, France(1998)

PHD, National Museum of Natural History, Paris, France(2003)

### **[Professional Career]**

Restoration of antic furnitures, Leitz Antics, Heidelberg, Germany(1998)

JSPS Postdoctoral research fellow, Kyoto University, Research Institute for Sustainable Humanosphere(2006)

Research fellow, Nanjing Forestry University, China(2008)

### **[Higher Degrees]**

PhD

### **[Fields of Specialization]**

Ethnobotany

History of east Asian art

Archaeology

Wood anatomy

### **[Academic Society Memberships]**

Japanese Art History Forum (JAHF)

International Association of Wood Anatomists (IAWA)

Centre de recherché sur les Civilisations de l' Asie Orientale (CRCAO), France

Reseau Asie, France

### **[Awards]**

JSPS postdoc scholarship (2003-2005)

Rotary Foundation scholarship (1992-1993)

ERASMUS scholarship (1989-1990)

## **—Achievements—**

### **[Research Presentations]**

#### *[Oral Presentation]*

- Mechtild Mertz, "Wood identification of shipwreck parts from the sunken fleet of Kublai Khan". Conference: Of Ships and Men: International Conference on New Comparative approaches in Asian Maritime History and Archaeology, Chinese Academy of Social Sciences, Institute of Archaeology, Nov 11, 2009, Beijing.
- Mechtild Mertz, "Wood Culture in Japan and China". oral presentation at RIHN, Oct 07, 2009, Kyoto.

#### *[Poster Presentation]*

- Mechtild Mertz, "Wood Selection and Traditional woodworking in Japan, as perceived by the Craftsmen". , Nov 28, 2009–Nov 29, 2009, Kyoto.

**MINAMOTO, Toshifumi**

Senior Project Researcher

**Born in 1973.**

### **[Academic Career]**

Division of Biological Science, Graduate School of Science, Kyoto University, D. Course (2003)

Division of Biological Science, Graduate School of Science, Kyoto University, M. Course (1999)  
Faculty of Science, Kyoto University (1997)

### **[Professional Career]**

Senior Researcher, Research Institute for Humanity and Nature (2007)  
Postdoctoral Researcher, Institute for Biological Resources and Functions, National Institute of Advanced Industrial Science and Technology (2005)  
COE Research Fellow, Center for Ecological Research, Kyoto University (2003)

### **[Higher Degrees]**

D. Sc (Kyoto University, 2003)  
M. Sc (Kyoto University, 1999)

### **[Fields of Specialization]**

Molecular Ecology  
Microbial Ecology  
Animal Physiology  
Chronobiology

### **[Academic Society Memberships]**

The Zoological Society of Japan  
Japanese Society for Chronobiology  
Ecological Society of Japan  
The Japanese Society of Limnology

## **—Achievements—**

### **[Papers]**

#### *[Original Articles]*

- Minamoto, T., Hanai, S., Kadota, K., Oishi, K., Matsumae, H., Fujie, M., Azumi, K., Satoh, N., Satake, M., Ishida, N. Feb, 2010 Circadian clock in *Ciona intestinalis* revealed by microarray analysis and oxygen consumption. *J. Biochem.* 147(2) :175–184. DOI:10.1093/jb/mvp160. (reviewed).
- Minamoto, T., Honjo, M. N., Kawabata, Z. Nov, 2009 Seasonal distribution of cyprinid herpesvirus 3 in Lake Biwa, Japan. *Appl. Environ. Microbiol.* 75(21) :6900–6904. DOI:10.1128/AEM.01411–09. (reviewed).
- Honjo, M. N., Minamoto, T., Matsui, K., Uchii, K., Yamanaka, H., Suzuki, A., Kohmatsu, Y., Iida, T., Kawabata Z. Nov, 2009 Quantification of cyprinid herpesvirus 3 in environmental water by using an external standard virus. *Appl. Environ. Microbiol.* 76(1) :161–168. DOI:10.1128/AEM.02011–09. (reviewed).

### **[Research Presentations]**

#### *[Oral Presentation]*

- Minamoto, T., Honjo, M. N., Kawabata, Z. Dynamics of the cyprinid herpesvirus 3 in Lake Biwa. The 74th Annual Meeting of the Japanese Society of Limnology, Sep 15, 2009–Sep 17, 2009, Oita City, Japan. (in Japanese)
- Yamanaka, H., Sogabe, A., Omori, K., Minamoto, T., Uchii, K., Honjo, M., Suzuki, A., Kohmatsu, Y., Kawabata, Z. Active thermoregulation and its seasonal change of common carp. The 74th Annual Meeting of the Japanese Society of Limnology, Sep 15, 2009–Sep 17, 2009, Oita City, Japan. (in Japanese)
- Minamoto, T., Honjo, M. N., Kawabata, Z. Seasonal distribution of cyprinid herpesvirus 3 in Lake Biwa. Workshop on CyHV-3 disease in an environment–human linkage, Apr 08, 2009, Kyoto, Japan.

#### *[Poster Presentation]*

- Matsumae, H., Minamoto, T., Hanai, S., Ishiwata, R., Izumi, K., Ogishima, S., Tanaka, H., Satoh, N., Ishida, N. Microarray analysis of circadian gene expressions in *Ciona intestinalis*. The 5th International Tunicate Meeting, Jun 21, 2009–Jun 25, 2009, Naha City, Okinawa, Japan.

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## MITSUTANI, Takumi

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Visiting Professor

**Born in 1947.**

### —Achievements—

#### [Research Presentations]

##### [Oral Presentation]

- Hiromasa Ozaki, Minoru Sakamoto, Mineo Imamura, Hiroyuki Matsuzaki, Toshio Nakamura, Koichi Kobayashi, Shigeru Itoh, Etsuko Niu, and Takumi Mitsutani "Radiocarbon dates of Japanese tree-rings for 1060BC–400AD". 20th International Radiocarbon Conference Hawaii, May 31, 2009–Jun 05, 2009, USA.

##### [Invited Lecture / Honorary Lecture / Panelist]

- Takumi Mitsutani "Tree-ring dating: its precision and Applications in Japan". , Papers presented at the International Symposium of Conservation Science for Cultural Heritage 2008, Dec 02, 2009, National Research Institute of Cultural Heritage.

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## MIYAZAKI, Hidetoshi

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Project Researcher

**Born in 1975.**

#### [Academic Career]

Department of Soil Science, Graduate School of Agriculture, Kyoto University, D. Course (2007)  
 Division of Environmental Dynamics, Environmental Science Graduate School, The University of Shiga Prefecture, M. Course (2001)  
 Department of Biological Resources Management, School of Environmental Science, The University of Shiga Prefecture (1999)

#### [Professional Career]

Researcher, Research Institute for Humanity and Nature (2007)  
 JSPS Research Fellow (2003)

#### [Higher Degrees]

M. Environmental Science. (The University of Shiga Prefecture, 2001)

#### [Fields of Specialization]

Soil Science

#### [Academic Society Memberships]

Japanese Society of Soil Science and Plant Nutrition  
 Japanese Society of Regional and Agricultural Development  
 The Japanese Agricultural Systems Society

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- H. Miyazaki, M. Miyashita, Y. Ishimoto, M. Yamashita, H. Shinjo, U. Tanaka Fluctuation of Maize Production under a Variety of Topography in Southern Province, Zambia. Japanese Society for Tropical Agriculture, Mar 27, 2010–Mar 28, 2010, Chiba. (in Japanese)
- Megumi YAMASHITA, Hidetoshi MIYAZAKI and Mitsunori YOSHIMURA Utilization of multi-spatial and temporal data for understanding the village level's livelihood. Asian Conference on Remote Sensing, Oct 19, 2009–Oct 23, 2009, Beijing, China. Proceedings of the 30nd Asian Conference on Remote Sensing, TS20-4 (CD-ROM).
- Yoshimura M., Yamashita M., OKAMOTO M., MIYAZAKI H., ISHIMOTO Y Geospatial Information Analysis for Vulnerability and Resilience of Social- Ecological System - from the research in southern Zambia -. Asian Conference on Remote Sensing, Oct 19, 2009–Oct 23, 2009, Beijing, China. Proceedings of the 30nd Asian Conference on Remote Sensing, TS20-3 (CD-ROM).

*[Poster Presentation]*

- Hiroyuki Shimono, Hidetoshi Miyazaki, Hitoshi Shinjo, Hiromitsu Kanno, Takeshi Sakurai Effects of Planting Timing on Maize Productivity in Southern Zambia. Crop Science Society of Japan, Mar 30, 2010–Mar 31, 2010, Utsunomiya. (in Japanese)

**MOJI, Kazuhiko**

Professor

**Born in 1953.****[Academic Career]**

Department of Human Ecology, Graduate School of Medicine, The University of Tokyo, D. Course (1983)

Department of Human Ecology, Graduate School of Medicine, The University of Tokyo, M. Course (1980)

Faculty of Medicine, The University of Tokyo (1976)

**[Professional Career]**

Professor, Research Institute for Humanity and Nature (2007)

Visiting Professor, Research Institute for Humanity and Nature (2006)

Head, Research Center of Tropical Infectious Diseases, Nagasaki University Institute of Tropical Medicine (2006)

Professor, Research Center of Tropical Infectious Diseases, Nagasaki University Institute of Tropical Medicine (2002)

Professor, School of Health Sciences, Nagasaki University School of Medicine (2001)

Professor, School of Allied Medical Sciences, Nagasaki University (1999)

Associate Professor, Department of Public Health, Nagasaki University School of Medicine (1987)

Instructor, Department of Human Ecology, School of Health Science, Faculty of Medicine, University of Tokyo (1983)

**[Higher Degrees]**

D. (The University of Tokyo, 1983)

M. (The University of Tokyo, 1980)

**[Fields of Specialization]**

Human Ecology, Population Health in the Tropics

**[Academic Society Memberships]**

The Japanese Society of Tropical Medicine, The Japanese Society of Health and Human Ecology

**—Achievements—****[Papers]***[Original Articles]*

- Ahmed K, Batuwanthudawe R, Chandrasena TG, Mitui MT, Rajindrajith S, Galagoda G, Pun SB, Uchida R, Kunii O, Moji K, Abeysinghe N, Nishizono A, Nakagomi O. Nov, 2009 Rotavirus infections with multiple emerging genotypes in Sri Lanka. *Arch Virol.* 155(1) :71-75.
- Guoxi CAI, Jun KANG, Zhuo ZHANG, Taro YAMAMOTO, Kaining ZHANG and Kazuhiko MOJI Oct, 2009 AIDS/STD Epidemics among Cross-Border Floating Populations in South China. *Journal of International Health* 24(3) :236. (reviewed).
- Magafu MG, Moji K, Igumbor EU, Hashizume M, Mizota T, Komazawa O, Cai G, Yamamoto T. Jul, 2009 Usefulness of highly active antiretroviral therapy on health-related quality of life of adult recipients in Tanzania. *AIDS Patient Care STDS* 23(7) :563-570. DOI:10.1089/apc.2008.0278. (reviewed).
- Uga S, Hoa NT, Noda S, Moji K, Cong L, Aoki Y, Rai SK, Fujimaki Y. Jun, 2009 Parasite egg contamination of vegetables from a suburban market in Hanoi, Vietnam. *Nepal Med Coll J.* 11(2) :75-78. (reviewed).
- Guoxi CAI, Jun KANG, Ling SHEN, Xiangdong MIN, Zhunyou WU, Keming ROU, Taro YAMAMOTO, Zhuo ZHANG, and Kazuhiko MOJI May, 2009 Assessment of a questionnaire used for an AIDS-related KABP survey among physicians in China. *Information, An International Interdisciplinary Journal* 12(3) :721-730. (reviewed).

**[Research Presentations]***[Oral Presentation]*

- CAI G, MOJI K, WU Z, ROU K, ZHANG K An Epidemiological Study on AIDS among Cross-Border Floating Population. International Convention of Asian Scholars (ICAS6), Aug 05, 2009-Aug 07, 2009, Daejeon, Korea .
- CAI G, MOJI K, WU Z, ROU K, ZHANG K AIDS/HIV epidemic among Female Sex Workers in China. The Eleventh International Conference on Fields Crossing, Fusion and Development (ICFCFD' 2008), Sep 14, 2008-Sep 15, 2009, Wuxi, Jiangsu, China.

*[Poster Presentation]*

- Zhang Z, Moji K, Wu XN, Zhang KL, Cai GX, Ali M, Kuroiwa C Does a Blood-borne Pathogen prevention program affect the incidence of exposure to blood? . The Unite For Sight Six Annual Global Health Conference. New Haven, Connecticut, USA, April 2009, New Haven, Connecticut, USA.

**MORI Wakaha**

Senior Researcher

**[Academic Career]**

Department Linguistics, Graduate School of Letters, Kyoto University, D. Course (2002)

Department Linguistics, Graduate School, Kyoto University, M. Course (1996)

Department Linguistics, Faculty of Letters, Kyoto University (1993)

**[Professional Career]**

Senior Researcher, Research Institute for Humanity and Nature (2006–)

Lecturer (part-time), Kyoto University (2004–2005, 2008–)

Researcher (part-time), Center for Eurasian Cultural Studies (2005–2006)

Lecturer (part-time), Doshisya Women's College (2004–)

Research Fellow of the Japan Society for the Promotion of Science (DC 1) (1996)

**[Higher Degrees]**

D.L (Kyoto University, 2005)

M.L (Kyoto University, 1996)

**[Fields of Specialization]**

Sumerian

Linguistics

Cuneiform Studies

**[Academic Society Memberships]**

The Linguistic Society of Japan

The Society for Near Eastern Studies in Japan

**—Achievements—****[Books]***[Chapters/Sections]*

- Mori, W. 2009 Kusabigatamaji-de Namae-wo Kako. Nakamaki, H., T. Morishige and T. Tada (ed.) Gakko-to Hakubutsukan-de Tsukuru Kokusairikaikyoiku. Akashi-shoten, Chiyoda-ku, Tokyo, pp.220–229. (in Japanese)

**[Papers]***[Review Articles]*

- Mori, W. Jan, 2010 Food culture in the ancient Sumer. *Vesta* 77 :30–31. (in Japanese)

NAKADA, Satoshi

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Project Researcher

**Born in 1976.**

**[Academic Career]**

Department of Earth System Science and Technology, Kyushu University, D.Course(2008)

Department of Fishery, Faculty of fishery, Hokkaido University, M. Course(2001)

**[Professional Career]**

Reseracher, Knowledge Consulting for Science Corp. (2002)

Reseracher, Japan NUS Corp. (2005)

**[Higher Degrees]**

Ph. D (Kyushu University, 2008)

M. Fish (Hokkaido University, 2001)

**[Fields of Specialization]**

Physical Oceanography

**[Academic Society Memberships]**

The Oceanographic Society of Japan

**—Achievements—**

**[Research Presentations]**

*[Oral Presentation]*

- Satoshi Nakada, Makoto Taniguchi, Hiroya Yamano Effect of nearshore bathymetry on submarine groundwater discharge and seawater circulation in the subterranean estuarine. Human Impacts on Urban Subsurface Environment, The 3rd International Symposium, Nov 17, 2009–Nov 18, 2009, Taipei, Taiwan.
- Hiroya Yamano, Satoshi Nakada, Makoto Taniguchi, Yu Umezawa Water Resources In Atoll Islands. Majuro Seminar, in Marshall Islands, Aug 06, 2009–Aug 06, 2009, Uriga, Majuro, Marshall Islands.

**NAKAMURA, Oki**

Project Researcher

**Born in 1967.**

**[Academic Career]**

Department of Japanese History, Kokugakuin University, Ph.D Course (1997)

Department of Japanese History, Kokugakuin University, M.Course (1992)

Department of Literature, Faculty of History, Kokugakuin University (1990)

**[Professional Career]**

Guest Researcher, Open Research Center, Kokugakuin University (2006)

Part-time Lecturer, Department of Literature, Kokugakuin University (2005)

Handa Archaeology Fellow, Sainsbury Institute for the Study of Japanese Arts and Cultures, UK (2003)

Part-time Lecturer, Department of Literature, Kokugakuin University (2002)

Assistant Professor, Department of Literature, Kokugakuin University (1997)

**[Higher Degrees]**

MA(Kokugakuin University, 1992)

**[Fields of Specialization]**

Archaeology

**[Academic Society Memberships]**

Society for American Archaeology(SAA)

Japanese Archaeological Association

Japanese Association of Ritual Archaeology

Paleological Association of Japan

**—Achievements—**

**[Books]**

*[Chapters/Sections]*

- NAKAMURA, Oki Mar, 2010 Meaning of Scale for Ritual Archaeology in Jomon Cultures- A Case Study for Hokuriku District. UCHIYAMA, Junzo • NAKAI, Seiichi • NAKAMURA, Oki (ed.) Environment and Culture in the

East Asian Inland Seas. Report of Japan Sea Research Project, 5. Katsura-shobo, Toyama, pp.129-148. (in Japanese)

### [Editing]

#### [Editing / Co-editing]

- UCHIYAMA, Junzo • NAKAI, Seiichi • NAKAMURA, Oki (ed.) Mar, 2010 Environment and Culture in the East Asian Inland Seas. Report of Japan Sea Research Project, 5. Katsura-shobo, Toyama, 364pp. (in Japanese)

### [Papers]

#### [Original Articles]

- NAKAMURA, Oki Mar, 2010 Theoretical Approach to Ritual Archaeology -Cross-Contextual Analysis and Multi-scale Method-. *Bulletin of Research Center for Traditional Culture, Kokugakuin University* (2) :49-58. (in Japanese)
- NAKAMURA, Oki Jun, 2009 Interpretation in Ritual Archaeology: Context and Scale. Ritual and Landscape of Stone Circles. "Materiality and Spirituality of Ritual Sites" Project at Research Center for Traditional Culture, Kokugakuin University, Tokyo, Shibuya-ku, pp.49-58. (in Japanese)

### [Research Presentations]

#### [Oral Presentation]

- NAKAMURA, Oki Burials in Stone Circle Period (the Late Jomon). World Heritage Promotion Forum in 2009, Dec 20, 2009, Akita-shi, Akita. (in Japanese)
- ZEBALLOS, Carlos • NAKAMURA, Oki • MATSUMORI, Tomohiko An Example of Neolithisation -Database and GIS for Hida District. Landscape Seminar 3, Aug 26, 2009, Kita-ku, Kyoto. (in Japanese)
- NAKAMURA, Oki Reading the Landscape-With Considering of Scale and Context. Omi Shell-mound Society, Jul 25, 2009, Otsu-shi, Shiga. (in Japanese)
- NAKAMURA, Oki A Landscape Analysis using GIS - Neolithisation Period in the Hida and Hokuriku District, Japan. Landscape Seminar 2, Jul 24, 2009, Shimogyo-ku, Kyoto. (in Japanese)
- NAKAMURA, Oki Interpretation in Ritual Archaeology: Context and Scale. Ritual and Landscape of Stone Circles, Jun 20, 2009-Jun 21, 2009, Shibuya-ku, Tokyo. (in Japanese)
- NAKAMURA, Oki Stonehenge and Oyu Stone Circle. Seminar at Oyu Stone Circle Museum, Jun 14, 2009, Kazuno-shi, Akita. (in Japanese)

#### [Poster Presentation]

- GILLAM, Christopher • NAKAMURA, Oki • MATSUMORI, Tomohiko From the Hida Mountains to Toyama Bay: Understanding Diversity and Change in Jomon Cultural Landscapes. 1st Landscape Archaeology Conference: LAC 2010, Jan 25, 2010-Jan 29, 2010, Amsterdam, Netherlands.
- NAKAMURA, Oki • MATSUMORI, Tomohiko A Site Location Analysis in Hida: Jomon People and River Valley Landscape. 10th Conference of Kansai Jomon Culture Research Association, Dec 12, 2009-Dec 13, 2009, Omi-hachiman, Shiga. (in Japanese)
- MATSUMORI, Tomohiko • NAKAMURA, Oki • KIMURA, Hiroaki A Development of Historical Research Assistance System Using GIS and RDB. Geoinformation Student Forum 2009 in Kansai, Nov 22, 2009, Kyotanabe, Kyoto. (in Japanese)

**NAKAMURA, Ryo**

Project Researcher

Born in 1976.



**[Academic Career]**

Comparative Studies of Humanities and Social Sciences (Cultural Anthropology), Nagoya University, D. Course (2008)

Comparative Studies of Humanities and Social Sciences (Cultural Anthropology), Nagoya University, M.A. Course (2003)

Shizuoka University, B.A. Course (2000)

**[Professional Career]**

Project researcher, Research Institute for Humanity and Nature (2008—)

Part-time staff, Graduate School of Letters, Nagoya University(2008)

Tutor, Graduate School of Letters, Nagoya University(2006)

Teaching Assistant, Graduate School of Letters, Nagoya University(2003—2007)

**[Higher Degrees]**

Ph. D. (Nagoya University, 2008)

M.A. (Nagoya University, 2003)

B.A. (Shizuoka University, 2000)

**[Fields of Specialization]**

Cultural Anthropology

Environmental Anthropology

Comparative Study on Swahili Maritime Societies

**[Academic Society Memberships]**

Japan Association for African Studies (2003—)

Association for International Research Initiatives for Environmental Studies (2007—)

Japanese Society of Cultural Anthropology (2008—)

Japan Association for Religious Studies (2008—)

Japan Association for Middle East Studies (2009—)

**—Achievements—****[Papers]***[Original Articles]*

- NAKAMURA, Ryo 2009 "Seafood Preservation and Economic Strategy in a Maritime Society: A Case Study of the Dried Fish Trade in Kilwa Kisiwani on the Southern Swahili Coast". Sugimura, Kazuhiko (ed.) *Comparative Perspectives on Moral Economy: Africa and Southeast Asia*. Fukui Prefectural University, Fukui, Japan, pp.195-209.

**[Research Presentations]***[Oral Presentation]*

- NAKAMURA, Ryo *Comparative Study on Western Indian Ocean World: Fishing Culture in Lamu Archipelago, Northern Kenya*. Afro-Eurasia Civilizations: The 2nd International Workshop, Jan 23, 2010–Jan 24, 2010, Nagoya University, Aichi, Japan. (in Japanese)
- NAKAMURA, Ryo *Maritime Environments and Multi-ethnic Coexistence in Swahili Society: The Current Situation of the Former Islamic Kingdom, Kilwa Island, Southern Tanzania*. JSPS AA Science Platform Program, Religious Dynamics of Contemporary Africa concerning the destruction of Traditional Life Mode and New Religious Movement, Dec 13, 2009–Dec 15, 2009, Nagoya University, Aichi, Japan.
- NAKAMURA, Ryo *Spirit (jini) and Magic (uchawi) Beliefs in Kilwa Island, Southern Swahili Coast, Tanzania*. JSPS AA Science Platform Program, Religious Dynamics of Contemporary Africa concerning the

destruction of Traditional Life Mode and New Religious Movement, Oct 10, 2009, Nagoya University, Aichi, Japan.

- NAKAMURA, Ryo *Maritime Environments of the Swahili Coastal Civilizations*. The 16th International Congress of IUAES, Jul 27, 2009–Jul 31, 2009, Yunnan University, Kunming, China.
- NAKAMURA, Ryo *Ecological Basics in Kilwa Island, Southern Swahili Coast*. International Workshop on Afro-Eurasia Inner Dryland Civilizations, Jul 19, 2009–Jul 20, 2009, Nagoya University, Japan.

*[Poster Presentation]*

- NAKAMURA, Ryo *Fish Culture in Swahili Maritime Society: Inland Sea Fishery originated in the Bantu and Open Sea Fishery originated in the Arab in Kilwa Island, Southern Tanzania Coast*. The 46th Research Meetings of Japan Association for African Studies, May 23, 2008–May 24, 2009, Tokyo University of Agriculture, Tokyo, Japan. (in Japanese)

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## NAKANO, Takanori

Professor

### Born in 1950.

#### [Academic Career]

Department of Geology, Faculty of Science, University of Tsukuba, D. Course (1982)

Department of Geology, Faculty of Science, Tokyo University of Education, M. Course (1977)

Department of Geology, Faculty of Science, Tokyo University of Education (1974)

#### [Professional Career]

Professor, Research Institute for Humanity and Nature (2004)

Associate Professor, Institute of Geoscience, University of Tsukuba (1992)

Assistant Professor, Institute of Geoscience, University of Tsukuba (1982)

#### [Higher Degrees]

D. Sc (University of Tsukuba, 1982)

M. Sc. (Tokyo University of Education, 1977)

#### [Fields of Specialization]

Environmental Resource Geology

Isotope Geochemistry

#### [Academic Society Memberships]

The Society of Resource Geology

The Geological Society of Japan

Japanese Association of Hydrological Sciences

The Society of Economic Geologist

### —Achievements—

#### [Books]

*[Chapters/Sections]*

- Nakano, T. Mar, 2010 Traceability of the global environment. Wada, E., Kohmatsu, Y. (ed.) *Glasses Called Stable Isotopes*. RIHN's Library. Showado, pp. 59–100. (in Japanese)
- Nakano, T. Mar, 2010 Variety of qualities of bottled-waters and the global environment. Taguchi, R., Kubo, M., Akimichi, T. (ed.) *Water and Vessels -From Cupped Hands to the Planet-*. , National Institute

for the Humanities, pp.44-45.

- Takanori Nakano, Yu Saitoh, Toshinori Kobayashi Mar, 2010 Connection of rain, geological condition and living creatures in spring water of Mt.Chokai. Tomoya Akimichi (ed.) Water and Life- A Report from Mt.Chokai. Tohoku shuppan kikaku, Tsuruoka-city, Yamagata prefecture, pp.70-101. (in Japanese)
- Nakano, T. Feb, 2010 Water making harmonious coexistence with the global environment. Akimichi, T., Komatsu, K., Nakamura, Y. (ed.) Water and Environment. Human and Water, 1. Bensei Shuppan, pp.3-34. (in Japanese)
- Yamanaka, M., Nakano, T., Shimano, Y. 2009 The famous waters of Kagoshima Prefecture and Yakushima Island. Japanese Association of Groundwater Hydrology (ed.) Scientific study of the new best waters in Japan. Gihodo Shuppan, pp.179-184. (in Japanese)

## [Papers]

### [Original Articles]

- Ando, A., Nakano, T., Kaiho, K., Kobayashi, T., Kokado, E. and Khim, B-K 2009 Onset of seawater  $^{87}\text{Sr}/^{86}\text{Sr}$  excursion prior to Cenomanian-Turonian oceanic anoxic event? new Cretaceous strontium isotope curve from the central Pacific ocean. *Journal of Foraminiferal Research* 39(4) :322-334. (reviewed).
- Nakano-Ohta, N., Kubota, T., Ando, A., Fujii, T., Fukutani, S., Nakata, E., Nakano, T., and Mahara, Y. 2009 Isotopic investigations for the origin of relic from the Matsusaki site, Japan. *Applied Radiation and Isotopes* 67 :1479-1483. (reviewed).
- Kusaka S, Ando A, Nakano T, Yumoto T., Ishimaru E., Yoneda M., Hyodo, F., Katayama, K. 2009 A strontium isotope analysis on the relationship between ritual tooth ablation and migration among the Jomon people in Japan. *Journal of Archaeological Science* 36 :2289-2297. (reviewed).
- Hosono, T., Ikawa, R., Shimada, J., Nakano, T., Saito, M., Onodera, S., Lee, K. K. and Taniguchi, M. 2009 Human impacts on groundwater flow and contamination deduced by multiple isotopes in Seoul City, South Korea. *Science of the total Environment* 407 :3189-3197. (reviewed).
- Shin, K., Kurosawa, M., Anma, R. and Nakano, T. 2009 The genesis and mixing/mingling of mafic and felsic magmas of a back-arc granite pluton: the Miocene Tsushima pluton, southwestern Japan. *Resource Geology* 59 :25-50. (reviewed).
- Nakano, T. 2009 Waseda daigaku kankyo shigen kougakuka ni kitai surukoto. *Waseda daigaku souzou rikou gakubu kankyo shigen kougaku kaihou* (44) :14-15. (in Japanese)
- Kohzu, A., Tayasu, I., Yoshimizu, C., Maruyama, A., Kohmatsu, Y., Hyodo, F., Onoda, Y., Igeta, A., Matusi, K., Nakano, T., Wada, E., Nagata, T. and Takemon, Y. 2009 Nitrogen stable isotopic signatures of basal food items, primary consumers and omnivores in rivers with different levels of human impact. *Ecological Research* 24 :127-136. DOI:10.1008-0489-x. (reviewed).

## [Research Presentations]

### [Oral Presentation]

- Nakano Takanori Variety of qualities of bottled-waters and the global environment. Water and Vessels From Cupped Hands to the Planet, Mar 28, 2010, National Museum of Ethnology. (in Japanese)
- Nakano, T. Diagnostic of traceability of the environment using mapping of stable isotopes. Discussion Group for PLASMA Spectrochemistry, Mar 26, 2010, Oubaku Plaza, Uji Campus, Kyoto University. (in Japanese)
- Nishimoto, S., Katsuyama, M., Saito, Y., and Nakano, T. Analyses of processes of infiltration and outflow of groundwater in granite-forest watershed using Sr isotopes. The annual meeting of The Japan Society of Hydrology and Water Resources, Aug 19, 2009-Aug 21, 2009, Kanazawa, Ishikawa. (in Japanese)

### [Poster Presentation]

- Eriko ISHIMARU, Kicheol SHIN, Hirofumi TERAMURA, Takanori NAKANO and Takakazu YUMOTO Clarification of

hunting and gathering region by strontium isotope analysis. The 13th Annual Meeting of Japanese Zoo-Archaeological Society, Dec 19, 2009–Dec 20, 2009, Ibaraki Natural Museum, Japan. (in Japanese)

- Eriko ISHIMARU, Kicheol SHIN, Hirofumi TERAMURA, Takanori NAKANO and Takakazu YUMOTO Can the hunting area of Jomon period be clarified? : Approach by strontium isotope analysis. The 10th Annual Meeting of Kansai Jomon Cultural Society, Dec 12, 2009–Dec 13, 2009, Shiga Prefectural Azuchi Castle Archaeological Museum, Japan. (in Japanese)

## NAWATA, Hiroshi

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Associate Professor

### Born in 1968.

#### [Academic Career]

Human and Environmental Studies (Cultural Anthropology), Kyoto University, D. Course (2003)

Human and Environmental Studies (Cultural Anthropology), Kyoto University, M. A. Course (1997)

African and Asian Studies (Folklore), University of Khartoum, Sudan, Diploma Course (1994)

Letters, Arts and Sciences (Asian History), Waseda University, B. A. Course (1992)

#### [Professional Career]

Associate Professor, Research Department, Research Institute for Humanity and Nature (2008–present)

Associate Professor, Socioeconomics Division, Arid Land Research Center, Tottori University (2007)

Assistant Professor, Division of Comprehensive Measures to Combat Desertification, Arid Land Research Center, Tottori University (2004–2007)

Part-time Lecturer, Faculty of Foreign Studies, Osaka University of Foreign Studies (2004–2005)

Part-time Lecturer, College of Economics, College of Business Administration, and College of Letters, Ritsumeikan University (2004–2005)

Part-time Lecturer, School of Humanities and Social Sciences, Osaka Prefecture University (2004–2005)

Part-time Lecturer, School of Policy Studies, Kwansei Gakuin University (2003–2004)

Teaching Assistant, Graduate School of Human and Environmental Studies, Kyoto University (1998–1999)

Research Fellow, Japan Society for the Promotion of Science (1997–2000)

#### [Higher Degrees]

Ph. D. (Kyoto University, 2003)

M. A. (Kyoto University, 1997)

Diploma (University of Khartoum, Sudan, 1994)

B. A. (Waseda University, 1992)

#### [Fields of Specialization]

Cultural Anthropology

Social Ecology

Middle Eastern and African Area Studies

Arid Land Studies

Human-livestock Relationship Studies

#### [Academic Society Memberships]

The Japanese Association for Arid Land Studies

Japanese Coral Reef Society

Japanese Society of Cultural Anthropology

Japan Association for African Studies  
 Japan Association for Middle East Studies  
 Japan Association for Nilo-Ethiopian Studies

### [Awards]

Encouragement Award of the Japanese Association for Arid Land Studies(2003)

## —Achievements—

### [Books]

#### [Chapters/Sections]

- Hiroshi NAWATA Nov,2009 Use and Conservation of Juniper Woodlands in the Arabian Peninsula. Kazunobu IKEYA (ed.) *Views from Global Environmental History*. Iwanami Syoten, Tokyo, pp.271-294. (in Japanese)
- Hiroshi NAWATA Jul,2009 Drought. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.20. (in Japanese)
- Hiroshi NAWATA Jul,2009 Fishing and Forestry . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.80. (in Japanese)
- Hiroshi NAWATA Jul,2009 Camel Racing and Arab Societies. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.92-93. (in Japanese)
- Hiroshi NAWATA Jul,2009 “Desert under Moonlight” and Camel. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.104. (in Japanese)
- Hiroshi NAWATA Jul,2009 Greetings and Social Relationships in Saudi Arabia. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.97. (in Japanese)
- Hiroshi NAWATA Jul,2009 Human-Livestock Interactions . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.96. (in Japanese)
- Hiroshi NAWATA Jul,2009 Tourism Development in Arid Lands . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.82. (in Japanese)
- Hiroshi NAWATA Jul,2009 “Le Petit Prince” . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.105. (in Japanese)
- Hiroshi NAWATA Jul,2009 How to Combat Negative Legacy of Combating Desertification. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.226. (in Japanese)
- Hiroshi NAWATA Jul,2009 Reexamining Technology Transfer and Development Policy with Application of Traditional Knowledge. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.225. (in Japanese)
- Hiroshi NAWATA Jul,2009 Juniper Forest Conservation in Saudi Arabia . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies* . Maruzen, Tokyo, pp.164-165. (in Japanese)
- Hiroshi NAWATA Jul,2009 Islam and Traditional Environmental Resource Management . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.163. (in Japanese)
- Hiroshi NAWATA Jul,2009 ‘Grain for Green’ Project in China . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.160-161. (in Japanese)
- Hiroshi NAWATA Jul,2009 Loess Plateau and Desertification. Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.120-121. (in Japanese)
- Hiroshi NAWATA Jul,2009 “Der Wandernde See” and “Dying in Sahara” . Japan Association for Arid Land Studies (ed.) *Encyclopedia of Arid Lands Studies*. Maruzen, Tokyo, pp.108.

### [Research Presentations]

#### [Oral Presentation]

- Hiroshi NAWATA *Camels as Natural Desalination Device: A Case Study of Traditional Water Mangement in the Coastal Zone of the Arid Tropics*. RIHN International Symposium "The Hydrological Cycle and Adaptive Water Management: Experience across Asia", Mar 08, 2010, RIHN, Kyoto.
- Hiroshi NAWATA *Towards an Integrated Plan for Mesquite Management: A Response to a Request from the Local People of Southern Tokar in the Early 1990s*. JSPS AA Science Platform Program-RIHN Project Joint Seminar "Towards a Sustainable Management of the Noxious Weeds Mesquite (*Prosopis* spp.) and *Striga hermonthica* in Sub Saharan Africa, Nov 10, 2009–Nov 11, 2009, Khartoum, Sudan.
- Hiroshi NAWATA *Why do I Study Camel-Dependent Lifestyles in Arab Societies?: To Combat Livelihood Degradation for the Post-Oil Era*. RIHN Ecohistory Programme International Symposium "Towards the Future of Civilization: 3 Science Fiction Novelists Dialogue at the R. I. H. N, Aug 28, 2009–Aug 29, 2009, RIHN, Kyoto.
- Hiroshi NAWATA *Human-camel Relationships in the Coastal Zones of the Arid Tropics: A Case Study of the Beja on the Red Sea Coast in Eastern Sudan*. The 16th Congress of The International Union of Anthropological and Ethnological Sciences held at Kunming, Jul 30, 2009, China.
- Hiroshi NAWATA *Traditional Land Use and Livelihood in Loess Plateau before/after the 'Grain-for-Green' Project in China*. The 16th Congress of The International Union of Anthropological and Ethnological Sciences held at Kunming, Jul 28, 2009, China.
- Hiroshi NAWATA *A Study of "Nariwai (Subsistence)" for the Post-oil Era*. The 43rd Annual Meetings, Japanese Society of Cultural Anthropology, May 31, 2009, Osaka. (in Japanese)
- Hiroshi NAWATA *Subsistence and Local Development on the Coastal Zone of the Arid Tropics*. The 43rd Annual Meeting, Japanese Society of Cultural Anthropology, May 31, 2009, Osaka. (in Japanese)
- Hiroshi NAWATA *The Problem of Mesquite in the Sudan*. The 46th Annual Meeting, Japan Association for African Studies, May 23, 2009, Tokyo. (in Japanese)
- Hiroshi NAWATA *Why do We Focus on Sharing Research Results with Local Peoples?*. Open Symposium "Some Issues for Sharing Research Results with Local Peoples: Focusing on Local Languages and Digital Media", The 18th Annual Meeting, Japan Association for Nilo-Ethiopian Studies, Apr 25, 2009, Kyoto. (in Japanese)
- Hiroshi NAWATA *Publishing Retrospect and Prospect of Mangrove Afforestation and Study in Dryland Environments in Arabic and English*. Open Symposium "Some Issues for Sharing Research Results with Local Peoples: Focusing on Local Languages and Digital Media", The 18th Annual Meeting, Japan Association for Nilo-Ethiopian Studies, Apr 25, 2009, Kyoto. (in Japanese)
- Hiroshi NAWATA *Human-Camel Relationships on the Coastal Zone of the Arid Tropics*. The 266th Meeting "Geography and Area Studies in Human-Animal Relationships", The Human Geographical Society of Japan, Apr 18, 2009, Osaka. (in Japanese)
- Hiroshi NAWATA *How Will You Live after Finishing Oil Resources?*. Open Seminar for the Public "How Will You Live after Finishing Oil Resources?", Apr 17, 2009, Research Institute for Humanity and Nature, Kyoto. (in Japanese)

**[Invited Lecture / Honorary Lecture / Panelist]**

- Hiroshi NAWATA *Environmental Conservation with Traditional Ecological Knowledge and Community Participation: Hima in the Middle East and Satoyama in Japan*. "Egypt-Japan Seminar on Environmental Management," Co-organized by Ain Shams University/ Japan Foundation/ Embassy of Japan, Mar 18, 2010, Cairo, Egypt.
- Hiroshi NAWATA *Environmental Conservation with Traditional Ecological Knowledge and Community Participation: Hima in the Middle East and Satoyama in Japan*. "Balancing Industrial Development and the Environment: Making the Best Use of Local Knowledge and Indigenous Practices," Co-organized by Public Commission for the Protection of Marine Resources, Environment & Wildlife. General Directorate of Environment & Wildlife Protection/ Japan Foundation/ Embassy of Japan, Mar 16, 2010, Kingdom of

Bahrain.

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## NILES, Daniel

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Assistant Professor, Geography

### Born in 1971.

#### [Academic Career]

Ph.D. (Graduate School of Geography, Clark University, Aug 1999–May 2007)

Seminar in College Teaching (Interdisciplinary Unit, Clark University, June–July 2006)

Certificate program in Wood Technology (3 of 4 semesters completed) (Laney College (Peralta Community College District, California), Jan 1998–May 1999, Jun–July 2000)

B.A. in Community Studies (High Honors) (University of California, Santa Cruz, Aug 1989–Mar 1994)

#### [Professional Career]

RIHN Communications Coordinator/PASONA (October 2008–March 2009)

RIHN Contract Worker (August 2008)

MINPAKU Visiting Researcher (1 June 2008–31 March 2009)

Lecturer, Department of Geography, Clark University (August–December 2006)

Editorial Assistant, The Geographical Review (June 2005–July 2006)

Research Assistant, Prof. Turner (August–December 2000)

Research Assistant, Profs. Turner and Kasperson (August–December 1999)

ESL Teacher (March 1998–January 1999)

Research Assistant, Professor Carter Wilson (August 1996–January 1997)

#### [Higher Degrees]

Ph.D. (Graduate School of Geography, Clark University, Aug 1999–May 2007)

B.A. in Community Studies (High Honors) (University of California, Santa Cruz, Aug 1989–Mar 1994)

#### [Fields of Specialization]

Geography

#### [Awards]

Full Tuition Fellowship, Graduate School of Geography, Clark University, 1999–2007

Biodiversity Conservation Award, Regional Environmental Council, Worcester, MA 2005

Pruser-Holtzsauer Award, Graduate School of Geography, Clark University, 2002

Community Service Award, City of San Francisco, CA 1995

Dean's Undergraduate Award, University of California, Santa Cruz, 1994

Highest Honors, Department of Community Studies, University of California, Santa Cruz, 1994

Senior Thesis Honors, Department of Community Studies, University of California, Santa Cruz, 1994

Community Service Award, Crown College, University of California, Santa Cruz, 1994

### —Achievements—

#### [Books]

##### [Chapters/Sections]

- Niles, Daniel Sep, 2009 Social movements: Slow places, fast movements and the making of contemporary rurality. L. Walter (ed.) *Critical Food Issues: Society, Culture and Ethics*. *Critical Food Issues: Problems and State-of-the-Art Solutions Worldwide*. Volume 2: Society, Culture, and Ethics. Praeger

Press, Santa Barbara, CA, pp.139-154.

## [Editing]

### [Editing / Co-editing]

- Niles, Daniel (ed.) Jul, 2009 RIHN Prospectus 2009-2010. RIHN, 64pp. Describes philosophy, structure and research of the Research Institute for Humanity and Nature.
- Niles, Daniel (ed.) 2009 Regulating unknown common resources: Community-science collaboration around groundwater. RIHN, RHIN booklet on integrated water management in Sai.
- Niles, Daniel (ed.) 2009 Water: Integrative research on the universal element. RIHN, RIHN pamphlet.

## [Papers]

### [Original Articles]

- Niles, Daniel Nov, 2009 Edible Landscapes. *Minpaku Anthropology Newsletter* :16-18.
- Niles, Daniel 2009 Moving beyond the orthodoxies in “sustainable agriculture”. *Bulletin of the National Museum of Ethnology* 33(3) :421-452. (in Japanese, in English) (reviewed).

## [Research Presentations]

### [Oral Presentation]

- Daniel NILES Development and/or Diveristy? Water as a managed resource (session chair). International Symposium: Water, Cultural Diversity and Global Environmental Change: Emerging Trends, Sustainable Futures? Co-organized by RIHN, UNESCO-International Hydrological Programme and United Nations University-Institute for Advanced Studies. , Oct 01, 2009-Oct 03, 2009, Kyoto, Japan.
- Daniel NILES What future for traditional landscapes? Thoughts on the contemporary sato-yama landscape in Japan.. 14th International Conference of Historical Geographers, Aug 23, 2009-Aug 27, 2009, Kyoto University.
- Daniel NILES Rural Landscape II. (session chair). 14th International Conference of Historical Geographers, Aug 23, 2009-Aug 27, 2009, Kyoto University.
- Daniel NILES With T. Kurata and C. Umetsu Introduction to RIHN. In: Synthesizing knowledge of the natural and social sciences and humanities: Experience at the Research Institute for Humanity and Nature. Session 1: Humanistic Approaches to Integration. Open Meeting of the International Human Dimensions Programme, Apr 26, 2009-Apr 30, 2009, Bonn, Germany.

### [Invited Lecture / Honorary Lecture / Panelist]

- Daniel NILES Communicating integrative environmental research. Japan-Germany Workshop on Integrated Environmental Research, Mar 14, 2010-Mar 15, 2010, Potsdam, Germany.
- Daniel NILES Looking forward, thinking backward: Japan's traditional landscapes in the age of resource scarcity. Guest seminar, Department of Geography, Mar 05, 2010, Singapore National University.

## NISHIMOTO, Futoshi

Project Researcher

Born in 1972.

### [Academic Career]

Graduate School of Social Sciences, Hitotubashi University, D. Course (2009)

Graduate School of Social Sciences, Hitotubashi University, M. Course (1998)

Faculty of Social Sciences, Hitotubashi University (1996)

### [Professional Career]



Researcher, Research Institute for Humanity and Nature(2009)  
 Researcher, Center for Southeast Asian Studies, Kyoto University(2008)  
 Part-time Lecturer, Ritsumeikan University(2007)  
 Researcher, Research Institute for Humanity and Nature(2005)  
 Part-time Lecturer, Shibaura Institute of Technology(2004)

### **[Higher Degrees]**

M.Soc. (Hitotsubashi University, 1998)

### **[Fields of Specialization]**

Social Anthropology  
 Ethnography of Mainland Southeast Asia

### **[Academic Society Memberships]**

Japanese Society of Cultural Anthropology

## **—Achievements—**

### **[Research Presentations]**

#### *[Oral Presentation]*

- Nishimoto, Futoshi Living with the Guardian Spirit in a New Settlement: Upland Village Relocation in Southeastern Laos. Panel: A-52. Expatiate on the Cultural Background of Environmental Issues. The 16th Congress of IUAES, Jul 26, 2009–Jul 31, 2009, Kunming, China.

#### *[Poster Presentation]*

- Nishimoto, Futoshi and Kazuhiko Moji Fertility Transition in a Relocated Community of Southeastern Laos. The 3rd National Health Research Forum to Support the Health Research System Strengthening in Lao PDR, Oct 02, 2009–Oct 03, 2009, Pakse, Laos.

## **ONISHI, Masayuki**

Senior Project Researcher

### **[Academic Career]**

Completed PhD Course, Department of Linguistics, Faculty of Arts, The Australian National University (1994)

Completed Graduate Diploma Course (TESOL), Faculty of Education, The University of Canberra (1989)

Completed Diploma Course (Bengali Language and Literature), Department of Bengali, Jadavpur University (1979)

Completed BA Course (English Language and Literature), Faculty of Arts, Tokyo University (1975)

### **[Professional Career]**

Senior Research Fellow, Indus Project, RIHN (2007)

Visiting Fellow, Department of Linguistics, Max-Planck Institute (Evolutionary Anthropology) (2005)

Visiting Fellow, Department of Linguistics, RSPAS, The Australian National University (2003)

Professor, Faculty of International Studies, Meio University (1998)

Associate Professor, Faculty of International Studies, Meio University (1997)

Research Assistant, RCLT, The Australian National University (1995)

### **[Higher Degrees]**

PhD (The Australian National University, 1995)

Graduate Diploma (The University of Canberra, 1989)

### **[Fields of Specialization]**

Linguistic Typology

Descriptive Linguistics

### **[Academic Society Memberships]**

Australian Linguistic Society

The Linguistic Society of Papua New Guinea

Okinawa Center of Language Study

### **—Achievements—**

#### **[Editing]**

*[Editing / Co-editing]*

- Masayuki Onishi, Kazuya Inagaki (ed.) Mar, 2010 RIHN Descriptive Linguistics Series 2. RIHN Descriptive Linguistics Series, 2. Indus Project, RIHN, Kyoto, Japan, 200pp.

#### **[Papers]**

*[Review Articles]*

- Onishi, Masayuki, Tida, Shuntaro, Ono, Rintaro, Negishi, Yo, Tadokoro, Hiroshi and Furusawa, Takuo 2009 Review on: Pawley, A., R. Attenborough, J. Golson, and R. Hide (eds.). 2005. *Papuan Pasts: Cultural, Linguistics, and Biological Histories of Papuan-speaking People. People and Culture in Oceania* 24 :81-87.

#### **[Research Presentations]**

*[Oral Presentation]*

- Masayuki Onishi CV Reduction in Motuna. Descriptive Linguistics Study Group meeting, Jan 07, 2010, RIHN, Kyoto, Japan. (in Japanese)
- Masayuki Onishi Documenting Oral Culture of Bengal. Binsar Seminar 2009, Jul 02, 2009–Jul 05, 2009, Binsar, Uttarakhand, India.

### **ONISHI, Takeo**

Senior Project Researcher

#### **Born in 1972.**

#### **[Academic Career]**

Division of Environmental Science and Technology, Graduate School of Agriculture, Kyoto University, M. Course (1998)

Division of Environmental Science and Technology, Graduate School of Agriculture, Kyoto University, D. Course (2004)

#### **[Professional Career]**

Research Fellow of Core Research for Evolutional Science and Technology (CREST) Project, Public Works Research Institute (2006)

Senior Researcher, Research Institute for Humanity and Nature (2009)

#### **[Higher Degrees]**

D. Agr. (Kyoto University, 2004)

M. Agr. (Kyoto University, 1998)

### [Fields of Specialization]

Hydrology

### [Academic Society Memberships]

Japanese Society of Irrigation Drainage, and Rural Engineering

Japanese Society of Civil Engineering

Japanese Association of Groundwater Hydrology

Japan Geoscience Union

Society for Studies on Entropy

Americal Geophysical Union

International Association of Hydrological Science

### —Achievements—

#### [Books]

[Translations / Joint Translations]

- Takeo Onishi, Aya Ryusawa 2009 Air is around you. Fukuinkan, 30pp. (in Japanese) Translation of . ,

## SAKAI, Shoko

Associate Professor

Born in 1971.

### —Achievements—

#### [Papers]

[Original Articles]

- Tokumoto, U., Matsushita, M., Tamaki, I., Sakai, S. and Nakagawa, M. 2009 How does flowering magnitude affect seed survival in *Shorea pilosa* (Dipterocarpaceae) at the predispersal stage in Malaysia?. *Plant Species Biology* 24 :104-108. (reviewed).
- Fujita, N. Amartuvshin, N., Yamada, Y., Matsui, K., Sakai, S. and Yamamura, N. 2009 Positive and negative effects of livestock grazing on plant diversity of Mongolian nomadic pasturelands along a slope with soil moisture gradient.. *Grassland Science* 55 :126-134.
- Sakai, S., Nagamasu, H. 2009 ystematic studies of Bornean Zingiberaceae VI. Three new species of *Boesenbergia* (Zingiberaceae).. *Acta Phytotaxonomica et Geobotanica* 60 :49-57.
- Ishida, C., Kono, M., Sakai, S. 2009 A new pollination system: brood-site pollination by flower bugs in *Macaranga* (Euphorbiaceae) . *Annals of Botany* 103 :39-44. (reviewed).
- Fukuda, D., Tisen, O. B., Momose, K., Sakai, S. 2009 Bat diversity in the vegetation mosaic around a lowland dipterocarp forest.. *Raffles Bulletin of Zoology* (57) :213-221. (reviewed).
- Kishimoto-Yamada, K., Itioka, T., Sakai, S., Momose, K., Nagamitsu, T., Kaliang, H., Meleng, P., Chong, J., Hamid, A. A., Yamane, S., Kato, M. Nakashizuka, T. and Inoue, T. 2009 Population fluctuations of light-attracted chrysomelid beetles in relation to supra-annual environmental changes in a Bornean rainforest. . *Bulletin of Entomological Research* 99 :217-227. (reviewed).

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**SAKAMOTO, Ryota**


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Project Researcher

**Born in 1976.****[Academic Career]**

Faculty of Medicine, Tohoku University (2002)

**[Professional Career]**

Emergency Department, International Medical Center of Japan (2002)

**[Higher Degrees]**

M.D (Japan, 2002)

Ph.D (Kyoto University, 2009)

**[Fields of Specialization]**

Field Medicine

Public Health

International Medicine

**[Academic Society Memberships]**

Japanese Society of Public Health

Japan Geriatric Society

Japanese Society of Mountain Medicine

**—Achievements—****[Papers]***[Original Articles]*

- Sakamoto R, et al. Nov,2009 Is driving a car a risk for Legionnaires' disease?. *Epidemiol Infect* 137(11) :1615-1622. (reviewed).
- Sakamoto R, et al. Aug,2009 *Legionella pneumophila* in rainwater on roads.. *Emerg Infect Dis* 15 :1295-1297. (reviewed).
- Hirosaki M, Ishimoto Y, Kasahara Y, Kimura Y, Konno A, Sakamoto R, Nakatsuka M, Ishine M, Wada T, Okumiya K, Fujisawa M, Otsuka K, Matsubayashi K. Jul,2009 Community-dwelling elderly Japanese people with hobbies are healthier than those lacking hobbies. *J Am Geriatr Soc* 57 :1132-1133. (reviewed).
- Sakamoto R, et al. May,2009 Report of Field Visit to Domkhar in Ladakh. *Himalayan Study Monographs* (10) :16-23. (in Japanese) (reviewed).
- Kimura Y, Wada T, Ishine M, Ishimoto Y, Kasahara Y, Konno A, Nakatsuka M, Sakamoto R, Okumiya K, Fujisawa M, Otsuka K, Matsubayashi K May,2009 Food diversity is closely associated with activities of daily living, depression, and quality of life in community-dwelling elderly people. *J Am Geriatr Soc* 57 :922-924. (reviewed).
- Kimura Y, Wada T, Ishine M, Ishimoto Y, Kasahara Y, Hirosaki M, Konno A, Nakatsuka M, Sakamoto R, Okumiya K, Otsuka K, Matsubayashi K. May,2009 Community-dwelling elderly with chewing difficulties are more disabled, depressed and have lower quality of life scores. *Geriatr Gerontol Int* 9 :102-104. (reviewed).
- Ishimoto Y, Wada T, Hirosaki M, Kasahara Y, Kimura Y, Konno A, Nakatsuka M, Sakamoto R, Ishine M, Okumiya K, Fujisawa M, Otsuka K, Matsubayashi K. May,2009 Age and sex significantly influence fall risk in community-dwelling elderly people in Japan. *J Am Geriatr Soc* 57 :930-932. (reviewed).
- Sakamoto R, et al. Apr,2009 A patient with Legionnaires' disease transferred after a traffic

accident.. *BMJ Case Reports* . (reviewed).

- Sakamoto R, et al. 2009 Comprehensive geriatric assessment of elderly highlanders in Qinghai, China III: oxidative stress and aging in Tibetan and Han elderly highlanders.. *Geriatr Geront Int* . (reviewed).

## SASAKI, Naoko

Project Researcher

### [Academic Career]

Department of Forest and Biomaterials Science, Graduate School of Agriculture, Kyoto University, D. Course (2005)

Department of Bio-resources, Graduate School of Agriculture, Ehime University, M. Course (2001)

Faculty of Agriculture, Ehime University (1997)

### [Professional Career]

Visiting Fellow, The Australian National University (2009)

Project Research Fellow, Research Institute for Humanity and Nature (2006)

Technical Assistant, Research Institute for Humanity and Nature (2005)

### [Higher Degrees]

D. Agr. (Kyoto University, 2006)

M. Agr. (Ehime University, 2001)

### [Fields of Specialization]

Vegetation History

Forest History

Palaeoecology

### [Academic Society Memberships]

The Ecological Society of Japan

Japanese Association of Historical Botany

Palynological Society of Japan

American Quaternary Association

## —Achievements—

### [Papers]

#### [Original Articles]

- Miyabuchi, Y., Sugiyama, S. and Sasaki, N. Feb, 2010 Phytolith and macroscopic charcoal analysis of the Senchomuta drilling core in Asodani Vally, northern part of Aso Caldera, Japan.. *Journal of Geography* 119(1) :17-32. (in Japanese) (reviewed).
- Ooi, N., Sasaki, A. and Sasaki, N. Sep, 2009 Environmental changes since 8000 years ago at Sencho-muta, Kuju, Oita, western Japan. *Japanese Journal of Historical Botany* 17(2) :65-74. (in Japanese) (reviewed).

### [Research Presentations]

#### [Oral Presentation]

- Sasaki, N., Kawano, T. and Takahara, H. Vegetation and fire history in Kurodake-region in Kuju

volcanos during the late Holocene. 50th Annual meeting of Palynological society of Japan, Oct 16, 2009–Oct 18, 2009, Kyoto. (in Japanese)

*[Poster Presentation]*

- Sasaki, N., Kawano, T., Kawano, K., Hase, Y. and Miyabuchi, Y. Modern pollen assemblages in surface soils in Aso region and its significance for interpreting fossil pollen assemblages. 57th Annual meeting of Ecological Society of Japan, Mar 15, 2010–Mar 20, 2010, Tokyo. (in Japanese)
- Sasaki, N., Kawano, T., Kawano, K., Hase, Y. and Miyabuchi, Y. Modern pollen assemblages in surface soils in Aso region and its significance for interpreting fossil pollen assemblages. 24th Annual meeting of Japanese Association of Historical Botany, Nov 06, 2009–Nov 09, 2009, Kumamoto. (in Japanese)

## SATO, Yo-Ichiro

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Deputy Director–General, Professor

### Born in 1952.

#### **[Academic Career]**

Faculty of Agriculture, Kyoto University (1977)

Department of Agronomy, Kyoto University, M. Course (1979)

#### **[Professional Career]**

Assistant at Faculty of Agriculture, Kochi University (1981)

Research Associate at National Institute of Genetics (1983)

Associate Professor at Shizuoka University (1994)

Professor, Research Institute for Humanity and Nature (2004)

Deputy Director–General, Research Institute for Humanity and Nature (2008)

#### **[Higher Degrees]**

D. Agr. (Kyoto University, 1986)

#### **[Fields of Specialization]**

Plant genetics

#### **[Academic Society Memberships]**

Japan Society of Breeding

The Genetics Society of Japan

Society of Evolutionary Studies, Japan

Japan Society for Scientific Studies on Cultural Properties

Society of Tropical Ecology

The Society of Biosophia Studies

Japanese Society for DNA Polymorphism Research

The Society for the Study of Phytogeography and Taxonomy

The Japanese Forest Society

#### **[Awards]**

Ninth Matsushita Konosuke “Hana to midori no hakuran-kai kinen shorei-sho” (2001)

Seventh NHK Shizuoka broadcasting station “Akebono-sho” (2001)

Seventeenth Hamada Seiryō-sho (2004)

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- . VI Interntl Rice Genetics Symp. at IRRI, Nov 22, 2009–Nov 23, 2009, Bangkok, Thailand.

**SEKINO, Tatsuki**

Associate Professor

**Born in 1969.****[Academic Career]**

Department of Zoology, Faculty of Science, Kyoto University, D. Course (1998)

Department of Biology, Faculty of Science, Shinshu University, M. Sc. (1993)

Department of Biology, Faculty of Science, Shinshu University (1991)

**[Professional Career]**

Associate Professor, Research Promotion Center, Research Institute for Humanity and Nature (2002)

Researcher, Research Division, International Lake Environmental Committee Foundation (2001)

COE Scientist, Center for Ecological Research, Kyoto University (1999)

**[Higher Degrees]**

D. Sc. (University of Kyoto, 1998)

M. Sc. (University of Shishu, 1993)

**[Fields of Specialization]**

Information Science

Limnology

Ecology

**[Academic Society Memberships]**

Information Processing Society of Japan

Japanese Society of Limnology

Ecological Society of Japan

**—Achievements—****[Books]***[Chapters/Sections]*

- Sekino, T. Feb, 2010 Collection and analysis of information based on temporal data. Akimichi, T., Komatsu, K. and Nakamura, Y. (ed.) Water and environment. Human and Water. Bensey Publishing Inc., Chiyoda-ku, Tokyo, pp.74–104. (in Japanese)

**[Papers]***[Original Articles]*

- Kubo, M., S. Hara and T. Sekino Jan, 2010 Three-Dimensional Spatiotemporal Model and Its Application to Analysis of Research Resources -. *Journal of the Japanese Society for Artificial Intelligence* 25(1) :50–55. (in Japanese) (reviewed).

- Sekino T. Oct, 2009 Tools to Realize Spatiotemporal Analysis in the Humanities.. *Proceedings of GIS in the Humanities and Social Sciences International Conference* :151-159. (reviewed).
- Sekino, T. 2009 Trial construction of geo-temporal data in interdisciplinary studies. *IPSJ SIG Technical Report 2009-CH-83* :79-94. (in Japanese)
- Sekino, T. 2009 An experimental information analysis based on temporal data: Water-level fluctuation in Lake Biwa, Japan. *Southeast Asian Studies* 46(4) :593-607. (in Japanese) (reviewed).

### [Research Presentations]

#### [Oral Presentation]

- Sekino T. Tools to Realize Spatiotemporal Analysis in the Humanities. GIS in the Humanities and Social Sciences International Conference, Oct 07, 2009–Oct 09, 2009, Taipei, Taiwan.
- Sekino, T. Trial construction of geo-temporal data in interdisciplinary studies. IPSJ SIG-CH-83, Jul 25, 2009–Jul 26, 2009, Tezukayama Univ., Nara. (in Japanese)

## SEO, Akihiro

Project Researcher

### Born in 1972.

#### [Academic Career]

Department of Botany, Graduate School of Science, Kyoto University (2002)

Department of Biology, Graduate School of Science, Kagoshima University (1998)

Faculty of Science, Kagoshima University (1996)

#### [Professional Career]

Research Fellow, Research Institute for Humanity and Nature (2006)

Postdoctoral Scientist, Kyoto University (2002)

#### [Higher Degrees]

D.Sc (Kyoto University, 2002)

M.Sc (Kagoshima University, 1998)

#### [Fields of Specialization]

Plant Taxonomy

Biogeography

#### [Academic Society Memberships]

The Botanical Society of Japan

The Japanese Society for Plant Systematics

The Society for the Study of Species

### —Achievements—

#### [Papers]

##### [Original Articles]

- Daiju Kawase, Saneyoshi Ueno, Yoshihiko Tsumura, Nobuhiro Tomaru, Akihiro Seo and Takakazu Yumoto  
Dec, 2009 Development and characterization of EST-SSR markers for *Sciadopitys verticillata* (Sciadopityaceae).. *Conservation genetics* 10 :1997-1999. (reviewed).



## SHIRAIWA, Takayuki

Associate Professor

**Born in 1964.****[Academic Career]**

Division of Environmental Structure, Graduate School of Environmental Sciences, Hokkaido University, D. Course (1990)

Division of Environmental Structure, Graduate School of Environmental Sciences, Hokkaido University, M. Course (1989)

Department of Geography, Faculty of Education, Waseda University (1987)

**[Professional Career]**

Associate Professor, Research Institute for Humanity and Nature (2005)

Associate Professor, Institute of Low Temperature Science, Hokkaido University (2004)

Assistant Professor, Institute of Low Temperature Science, Hokkaido University (1990)

**[Higher Degrees]**

D. in Environmental Sci. (Hokkaido University, 1993)

M. in Environmental Sci. (Hokkaido University, 1989)

**[Fields of Specialization]**

Glaciology, Physical Geography, Sougou-Chikyu-Kankyogaku

**[Academic Society Memberships]**

The Japanese Society of Snow and Ice, The Association of Japanese Geographers, Japan Association for Quaternary Research, Japanese Geomorphological Union, International Glaciological Society

**—Achievements—****[Books]***[Chapters/Sections]*

- Takayuki Shiraiwa 2009 Glaciers in the Arctic. Hokkaido branch of the Japanese Society of Snow and Ice (ed.) Hokkaido branch of the Japanese Society of Snow and Ice, Sapporo, pp.98-103. (in Japanese)

**[Research Presentations]***[Oral Presentation]*

- Shiraiwa, T. What was the Amur Okhotsk Project ? -Retrospect and prospect-. Closing symposium on the Amur Okhotsk Project 2005-2009, Jan 19, 2010-Jan 20, 2010, Kyoto.
- Shiraiwa, T. and Hanamatsu, Y. "The Giant Fish-Breeding Forest Hypothesis and its conservation". International Symposium on "Environmental Conservation of the Sea of Okhotsk: Cooperation between Japan, China and Russia", Nov 07, 2009-Nov 08, 2009, Sapporo.
- Shiraiwa, T. "Giant" Fish-Breeding Forest: A new environmental system linking continental watershed with open water. The 4th RIHN International Symposium "The Dilemma of Boundaries: Toward a New Concept of Catchment", Oct 20, 2009-Oct 22, 2009, Kyoto.
- Shiraiwa, T. and the Amur-Okhotsk Project members the Amur-Okhotsk system or the "Giant" fish-breeding forest connected by dissolved iron. Land cover and land use changes in North East Asia: problems of sustainable nature management, Sep 06, 2009-Sep 12, 2009, Vladivostok, Russia.

*[Invited Lecture / Honorary Lecture / Panelist]*

- Takayuki Shiraiwa and the Amur-Okhotsk Project Members The Amur-Okhotsk Consortium for the

conservation of the Sea of Okhotsk and Amur River basin. 25th Int. Symposium of Sea Ice and the Sea of Okhotsk, Feb 22, 2010, Monbetsu, Hokkaido. (in Japanese)

- Takayuki Shiraiwa Multilateral effort in conserving the environment of the Amur River and the Sea of Okhotsk. Int. Symposium on Construction of Peace & Environmental Sphere in East Asia, Nov 21, 2009–Nov 21, 2009, Tokyo. (in Japanese)
- Takayuki Shiraiwa Impacts of the land-use change in the Amur River basin on marine primary production in the Sea of Okhotsk and Oyashio region. JSPS Open Symposium, Oct 03, 2009, Tokyo. (in Japanese)

## TACHIMOTO, Narifumi

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Director-General

**Born in 1940.**

### [Professional Career]

Director-General, Research Institute for Humanity and Nature (2007–)

Dean, Graduate School of Global Humanics, Chubu University (2003)

Dean, Graduate School of International Studies and College of International Studies, Chubu University (2001)

Professor, College of International Studies, Chubu University (2001)

Director, Center for Southeast Asian Studies, Kyoto University (1998)

Professor, Center for Southeast Asian Studies, Kyoto University (1980)

Cultural Attaché, Embassy of Japan, Jakarta (1977)

### [Higher Degrees]

Ph. D., Anthropology (University of Chicago, 1974)

M. A., Sociology (Kyoto University, 1967)

### [Fields of Specialization]

Humanics; Anthropology; Sociology; SEA Area Studies

### [Awards]

The Purple Ribbon Medal (2003)

## —Achievements—

### [Research Presentations]

#### [Oral Presentation]

- TACHIMOTO, Narifumi General Review and Comments. *International Workshop "Reconsidering Social History of Maritime Folks in Southeast Asia: Perspectives from the Sama-Bajau."*, Feb 10, 2010, Toyo University, Tokyo. Organized by the Hakusan Society of Anthropology and the Research Project on Comparative Area Studies on Maritime Southeast Asia of Toyo University..

## TANAKA, Hiroki

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Associate Professor

**Born in 1970.**

**[Academic Career]**

1994.3 B.C Faculty of Agriculture, Kyoto University  
 1996.3 M.C, Graduate School of Agriculture, Kyoto University  
 1999.3 Ph.D, Graduate School of Agriculture, Kyoto University

**[Higher Degrees]**

Ph.D (Agricultural Science)

**[Fields of Specialization]**

Environmental Hydrology  
 Forest Hydrology

**[Academic Society Memberships]**

The Japanese Forest Society  
 Japan Society of Hydrology and Water Resources  
 Meteorological Society of Japan

**—Achievements—****[Papers]***[Original Articles]*

- Shinoda T, Higuchi A, Tsuboki K, Hiyama T, Tanaka H, Endo S, Minda H, Uyeda H, Nakamura K 2009 Structure of convective circulation in the atmospheric boundary layer over the northwestern Pacific Ocean under a subtropical high. . *Journal of the Meteorological Society of Japan* 87(6) :979-996.

**[Research Presentations]***[Oral Presentation]*

- Furuzawa FA, Tanaka H, Nakamura K Change of Precipitation over the Changjiang River Area Undergoing Sudden Change Revealed by TRMM Precipitation Radar, PR.. Annual meeting of Meteorological Society of Japan, November 2009, Fukuoka, Japan,. (in Japanese)
- Tanaka H Role of the land surface on the water cycle. . China-Japan Joint Workshop on “Human-Nature Interactions in the Changjiang River Basin of China Experiencing Abrupt Change,” , September 2009, the Poyang Lake Laboratory for Wetland Ecosystem Research, NIGLAS, CAS, Xinzi, China.

**TANIGUCHI, Makoto**

Professor

**Born in 1959.****[Academic Career]**

University of Tsukuba, Japan Ph.D. Hydrology (1987)  
 University of Tsukuba, Japan M.S. Hydrology (1984)  
 University of Tsukuba, Japan B.S. Geosciences (1982)

**[Professional Career]**

Research Institute for Humanity and Nature, Associate Professor (2003 - 2007)  
 Department of Earth Sciences, Nara University of Education, Professor (2000 - 2003)  
 Department of Earth Sciences, Nara University of Education, Associate Professor (1993 - 2000)  
 Department of Earth Sciences, Nara University of Education, Research Associate (1988 - 1990)

Division of Water Resources, CSIRO, Australia, Visiting Scientist (1987 - 1988)

### [Higher Degrees]

D.Sc (The University of Tsukuba, 1987)

M.Sc. (The University of Tsukuba, 1984)

### [Fields of Specialization]

Environmental dynamic analysis

Hydrology/Weather/Oceanic physics

### [Academic Society Memberships]

American Geophysical Union

International Association of Hydrological Sciences

International Association of Hydrogeology

Japanese Association of Groundwater Hydrology

Japanese Association of Hydrological Science

Japan Society of Engineering Geology

The Japan Society of Hydrology and Water Resources

The Association of Japanese Geographers

The Japanese Society of Limnology

### [Awards]

Award of 7th Japanese Association of Limnology (Yoshimura Prize, 2005)

Research award from the Association of Japanese Geographers (1987)

## —Achievements—

### [Papers]

#### [Original Articles]

- Ohta, T., Mahara, Y., Momoshima, N., Inoue, F., Shimada, J., Ikawa, R., Taniguchi, M. Oct, 2009 Separation of dissolved Kr from a water sample by means of a hollow fiber membrane. *Journal of Hydrology* 376 :152-158. (reviewed).
- Taniguchi, M., Yoshikoshi, A., Kaneko, S., Somkid, Buapeng, Robert Delinom, Fernando Siringan, Chung-Ho Wang, Backjin Lee, Shiraki, Y., Endo, T., and Yamashita, A. Sep, 2009 Changes in the reliance on groundwater versus surface water resources in Asian cities. *IAHS publication* 330 :218-224. (reviewed).
- Hosono, T., Buapeng, S., Onodera, S., Yamanaka, T., Shimada, J., Nakano, T., Taniguchi, M. Sep, 2009 Sulfate and strontium isotopic variations of groundwater in the Lower Central Plain, Thailand. *IAHS publication* 329 :284-290. (reviewed).
- Lubis, R.F., Yamano, M., Delinom, R., Sudaryanto, Sakura, Y., Goto, S., Miyakoshi, A., and Taniguchi, M. Sep, 2009 Urban groundwater loading in Indonesia megacities, The red Book of Trends and sustainability of groundwater in highly stressed aquifers. *IAHS publication* :291-298. (reviewed).
- Taniguchi, M. A. Aureli, and J.L. Martin Sep, 2009 Groundwater resources assessment under the pressures of humanities and climate change. *IAHS Publication* 334. (reviewed).
- Umezawa, Y., Onodera, S., Ishitobi, T., Hosono, T., Delinom, R., Burnett, W.C., Taniguchi, M. Sep, 2009 Effect of urbanization on the groundwater discharge into Jakarta Bay. *IAHS publication* 319 :233-240. (reviewed).
- Saito, M., Onodera, S., Umezawa, Y., Hosono, T., Shimizu, Y., Delinom, R., Taniguchi, M. Sep, 2009 Evaluation of nitrate attenuation potential in the groundwater of Jakarta metropolitan area, Indonesia. *IAHS publication* 329 :201-206. (reviewed).

- Taniguchi, M. et al Sep, 2009 Degradation of subsurface environment due to human activities and climate variability in Asian cities. *IAHS Publication 329* :124-129.
- Taniguchi, M. Burnett, W.C. Ness, G.D. Apr, 2009 Erratum to “Integrated research on subsurface environments in Asian urban areas” . *Science of the total environment* 407(9) :3076-3088. (reviewed).
- JAGO-ON A.K., Kaneko, S., Fujikura, R., Fujiwara, A., Imai, T., Matsumoto, T., Zhang, J., Tanikawa, H., Tanaka, K., Lee, B., Taniguchi, M. Apr, 2009 Urbanization and subsurface environmental issues: An Attempt at DPSIR Model Application in Asian cities. *Science of the total environment* 407(9) :3089-3104. (reviewed).
- Yamano, M., Goto, S., Miyakoshi, A., Hamamoto, H., Lubis, R. F., Manyrath, V., Taniguchi, M. Apr, 2009 Reconstruction of the thermal environment evolution in urban areas from underground temperature distribution. *Science of the total environment* 407(9) :3120-3128. (reviewed).
- Kataoka, K., Matsumoto, F., Ichinose, T., Taniguchi, M Apr, 2009 Urban Warming Trends in Several Large Asian Cities over the Last 100 Years. *Science of the total environment* 407(9) :3112-3119.. (reviewed).
- Taniguchi, M., Shimada, J., Fukuda, Y., Yamano, M., Onodera, S., Kaneko, S., Yoshikoshi, A Apr, 2009 Anthropogenic effects on the subsurface thermal and groundwater environments in Osaka, Japan and Bangkok, Thailand.. *Science of the total environment* 407(9) :3153-3164. (reviewed).
- Fukuda, Y., K. Yamamoto, T. Hasegawa, T. Nakaegawa, J. Nishijima and M. Taniguchi Apr, 2009 Monitoring groundwater variation by satellite and implications for in-situ gravity measurements. *Science of The Total Environment* 407(9) :3181-3188. (reviewed).
- Burnett, W.C., Chanyotha, S., Wattayakorn, G., Taniguchi, M., Umezawa, Y., Ishitobi, T Apr, 2009 Underground sources of nutrient contamination to surface waters in Bangkok, Thailand.. *Science of the Total Environment* 407(9) :3198-3207. (reviewed).
- Umezawa, Y., Hosono, T., Onodera, S., Siringan, F., Buapeng, S., Delinom, R., Yoshimizu, C., Tayasu, I., and Nagata, T. and Taniguchi, M Apr, 2009 Erratum to “Source and mechanisms controlling nitrate and ammonium contaminations in groundwater at developing Asian-Mega cities, Metro Manila, Bangkok and Jakarta. *Science of the Total Environment* 407(9) :3219-3231. (reviewed).
- Onodera, S., Saito, M., Sawano, M., Hosono, T., Taniguchi, T., Shimada, J., Umezawa, Y., Lubis, RF, Buapeng, S, Delinom, R. Apr, 2009 Effect of intensive urbanization on chemical environment in deep groundwater; example in Bangkok and Jakarta. *Science of the Total Environment* 407(9) :3209-3217. (reviewed).
- Hosono, T., Ikawa, R., Shimada, J., Nakano, T., Saito, M., Onodera, S., Lee, K., Taniguchi, M Apr, 2009 Human impacts on groundwater flow and contamination deduced by multiple isotopes in Seoul City, South Korea. *Science of the total environment* 407(9) :3189-3197. (reviewed).
- Hayashi. T., Tokunaga, T., Aichi, M., Shimada, J., Taniguchi, M. Apr, 2009 Effects of human activities and urbanization on groundwater environments: An example from the aquifer system of Tokyo and the surrounding area. *Science of the Total Environment* 407(9) :3165-3172. (reviewed).
- Huang, S., Taniguchi, M., Yamano, M., Wang, C Apr, 2009 Detecting urbanization effects on surface and subsurface thermal environment -A case study of Osaka. *Science of the total environment* 407(9) :3142-3152.. (reviewed).
- Delinom, R. , Assegaf, A., Abidin, A. Z., Taniguchi, M Apr, 2009 The contribution of human activities to subsurface environment degradation in Greater Jakarta Area, Indonesia .. *Science of the total environment* 407(9) :3129-3141.. (reviewed).
- Yoshikoshi, A., Adachi, I., Taniguchi, T., Kagawa, Y., Kato, M., Yamashita, A., Todokoro, T. and Taniguchi, M. 2009 Hydro-environmental changes and their influence on the subsurface environment in the context of urban development. . *Science of The Total Environment* 407(9) :3105-3111. (reviewed).
- Taniguchi, M. Aureli, A. Martin, L.J 2009 Ground resources assessment under the pressures of humanities and climate change (graphic). *IAHS publication* 334. (reviewed).

**[Research Presentations]***[Oral Presentation]*

- Makoto Taniguchi Human impacts on Urban Subsurface Environment. The 3rd International Symposium in Taiwan, November 2009, Kyoto, Japan.
- Makoto Taniguchi Linkages of boundaries between surface/subsurface and land. The 4th RIHN International Symposium, October 2009, .
- Makoto Taniguchi Degradation of subsurface environment under the human activities and climate variability in Asian. 8thIAHS/37th IAH congress, September 2009, Hyderabad, India.
- Makoto Taniguchi Changes in the reliance on groundwater versus surface water resources in Asian cities, . 8thIAHS/37th IAH congress, September 2009, Hyderabad, India.
- Makoto Taniguchi Groundwater Resources Assessment under the Pressures of Humanity and Climate Change. UNESCO–GRAPHIC meeting, April 2009, Paris, France.

**TERAMURA Hirofumi**

Project Researcher

**Born in 1977.****[Academic Career]**

Department of Archaeology, Faculty of Letters, Okayama University (2000)

Graduate School of Humanities and Social Sciences (Master's Course), Okayama University (2002)

Graduate School of Humanities and Social Sciences (Doctor's Course), Okayama University (2005)

**[Professional Career]**

Instructor, Faculty of Culture and Information Science, Doshisha University (2005)

Project Researcher, Research Institute for Humanity and Nature (2007)

**[Higher Degrees]**

D. Lit (Okayama University, 2005)

M. Lit (Okayama University, 2002)

**[Fields of Specialization]**

Archaeology

**[Academic Society Memberships]**

Society of Archaeological Studies

Japan Society for Archaeological Information

GIS Association of Japan

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- Hirofumi TERAMURA and Takao UNO 3D modeling of seals and seal impressions excavated at Kanmer. BHUJ ROUND TABLE; International Conference on Gujarat Harappans & Chalcolithic Cultures, Jan 28, 2010–Jan 31, 2010, Bhuj, Gujarat, India.
- Hirofumi TERAMURA and Takao UNO GIS applications in the Indus Project, RIHN –Case studies in progress at Kanmer and Farmana, India. 19TH CONGRESS OF THE INDO-PACIFIC PREHISTORY ASSOCIATION, Nov

29, 2009–Dec 05, 2009, Vietnam, Hanoi.

## Teruhiko TAKAHARA

Project Researcher

### Born in 1976.

#### [Academic Career]

Department of Mechanical and System Engineering, Kyoto Institute of Technology (1999)

Department of Applied Biology, Faculty of Fiber, Kyoto Institute of Technology (2002)

Division of Applied Biology, Graduate School of Science and Technology, Kyoto Institute of Technology, M. Course (2004)

Division of Materials Science, Graduate School of Science and Technology, Kyoto Institute of Technology, D. Course (2007)

#### [Professional Career]

Project Researcher, Research Institute for Humanity and Nature (2009)

Postdoctoral Research Fellow, Medical Institute of Bioregulation, Kyushu University (2008)

Postdoctoral Research Fellow, Venture Laboratory, Kyoto Institute of Technology (2007)

JSPS Research Fellow (DC1), Japan Society for the Promotion of Science (2004)

Technical assistance, Research Institute for Humanity and Nature (2003)

#### [Higher Degrees]

D.Sc (Kyoto Institute of Technology)

M.Sc (Kyoto Institute of Technology)

#### [Fields of Specialization]

Chemical Ecology

Behavioral Ecology

Bioinformatics

#### [Academic Society Memberships]

The Ecological Society of Japan

The Herpetological Society of Japan

The Japanese Society of Applied Entomology and Zoology

### —Achievements—

#### [Papers]

##### [Original Articles]

- Takahara, T., Yamaoka, R. Jun, 2009 Temporal and spatial effects of predator chemical and visual cues for behavioral responses of *Rana japonica* tadpoles. *Current Herpetology* 28(1) :19–25. DOI:10.3105/018.028.0103. (reviewed).

## TSUJINO, Riyou

Project Researcher

**Born in 1976.****[Higher Degrees]**

D.Sc (Kyoto University, 2006)

**[Fields of Specialization]**

Forest Ecology

Plant-Animal Interaction Ecology

**[Academic Society Memberships]**

Ecological Society of Japan

Mammalogical Society of Japan

Mycological Society of Japan

**—Achievements—****[Papers]***[Original Articles]*

- Tsujino R, Sato H, Imamura A, Yumoto T Sep,2009 Topography specific emergence of fungal fruiting bodies in warm temperate evergreen broad-leaved forests on Yakushima Island, Japan. *Mycoscience* 50 :388-399. (reviewed).
- Tsujino R, Sato H, Imamura A, Yumoto T Sep,2009 Topography specific emergence of fungal fruiting bodies in warm temperate evergreen broad-leaved forests on Yakushima Island, Japan. *Mycoscience* 50 :388-399. (reviewed).
- Tsujino R, Yumoto T 2009 Topography-specific seed dispersal by Japanese macaques in a lowland forest on Yakushima Island, Japan. *Journal of Animal Ecology* 78 :119-125. (reviewed).

**UCHII, Kimiko**


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Project Researcher

**Born in 1978.****[Academic Career]**

Ph.D., Center for Ecological Research, Kyoto University (2007)

M.Sc., Center for Ecological Research, Kyoto University (2004)

B.Sc., Faculty of Science, Kyoto University (2002)

**[Professional Career]**

Postdoctoral Researcher, Research Institute for Humanity and Nature (2007)

Research Assistant, Center for Ecological Research, Kyoto University (2006)

Research Assistant, Center for Ecological Research, Kyoto University (2005)

Research Assistant, Center for Ecological Research, Kyoto University (2004)

**[Higher Degrees]**

D.Sc. (Kyoto University, 2007)

M.Sc. (Kyoto University, 2004)

**[Fields of Specialization]**

Ecology

Microbial Ecology



**[Academic Society Memberships]**

Ecological Society of Japan

Japanese Society of Microbial Ecology

**[Awards]**

The 8th Ecological Research Award (2008)

**—Achievements—****[Papers]***[Original Articles]*

- Kimiko Uchii, Kazuaki Matsui, Takaji Iida, Zen'ichiro Kawabata 2009 Distribution of the introduced cyprinid herpesvirus 3 in a wild population of common carp, *Cyprinus carpio*. *Journal of Fish Diseases* 32 :857-864. DOI:10.1111/j.1365-2761.2009.01064.x. (reviewed).
- Toshifumi Minamoto, Mie N. Honjo, Kimiko Uchii, Hiroki Yamanaka, Alata A. Suzuki, Yukihiro Kohmatsu, Takaji Iida, Zen'ichiro Kawabata 2009 Detection of cyprinid herpesvirus 3 DNA in river water during and after an outbreak. *Veterinary Microbiology* 135(3-4) :261-266. DOI:10.1016/j.vetmic.2008.09.081. (reviewed).
- Ryuji Yonekura, Hiroki Yamanaka, Atushi Ushimaru, Kazuaki Matsui, Kimiko Uchii, Atsushi Maruyama 2009 Allochthonous prey subsidies provide an asymmetric growth benefit to invasive bluegills over native cyprinids under the competitive conditions in a pond. *Biological Invasions* 11(6) :1347-1355. DOI:10.1007/s10530-008-9342-y. (reviewed).

*[Review Articles]*

- Kimiko Uchii, Zen'ichiro Kawabata 2009 Biological invasion of a fish pathogen, cyprinid herpesvirus 3, into Japanese freshwater ecosystems. *Japanese Journal of Limnology* accepted. (in Japanese) (reviewed).

**[Research Presentations]***[Oral Presentation]*

- Kimiko Uchii Establishment of cyprinid herpesvirus 3 in a wild population of common carp in Lake Biwa. Workshop on CyHV-3 disease in an environment-human linkage, Apr 08, 2009, Kyoto, Japan.

**UCHIYAMA, Junzo**

Associate Professor

**Born in 1967.**

**[Academic Career]**

Graduate School of Human and Environmental Studies, Kyoto University, D. Course (1997)

Department of Archaeology, Durham University, M.A. Course (1996)

Graduate School of Human and Environmental Studies, Kyoto University, M. Course (1993)

Department of Archaeology, Faculty of Literature, The University of Tokyo, B.A. Course (1991)

**[Professional Career]**

Associate Professor, Research Institute for Human and Nature (2003)

Associate Professor, Faculty of Humanities, University of Toyama (2001)

Lecturer, Faculty of Humanities, University of Toyama (1998)

**[Higher Degrees]**

Ph.D. (The Graduate University for Advanced Studies, 2002)

M.A. (Environmental Archaeology) (with distinction, Durham University, 1996)

M.A. (Human-environmental Studies) (Kyoto University, 1993)

### [Fields of Specialization]

Prehistoric Anthropology

Zooarchaeology

### [Academic Society Memberships]

The Society of Bio-Sophia Studies

## —Achievements—

### [Editing]

#### [Editing / Co-editing]

- UCHIYAMA, Junzo · NAKAI, Seiichi · NAKAMURA, Oki (ed.) Mar, 2010 *Higashi Ajia Naikai no Kankyo to Bunka* (Environments and Cultures in East Asian Inland Seas). Katsura-shobou, Toyama, 373pp. (in Japanese)
- UCHIYAMA, Junzo · LINDSTRÖM, Kati (ed.) Mar, 2010 *Higashi Ajia Naikai bunka-ken no keikanshi to kankyoul: Mizube no tayousei* (Landscape History and Environment on the East Asian Inland Seas: Versatile Waterfronts). Showado, Kyoto, 221pp. (in Japanese)

### [Papers]

#### [Original Articles]

- UCHIYAMA, Junzo Mar, 2010 *Ikai heno akogare to osore ga monogataru nihonkai no fuukei: Jomon kara gendai heno messeiji* (The Japan Sea landscape as seen from the relations with the other world: A message from Jomon). UCHIYAMA, Junzo · NAKAI, Seiichi · NAKAMURA, Oki (ed.) *Higashi Ajia Naikai no Kankyo to Bunka* (Environments and Cultures in East Asian Inland Seas). Katsura-shobou, Toyama, pp. 345-358. (in Japanese)
- LINDSTRÖM, Kati · UCHIYAMA, Junzo Mar, 2010 *Keikan to rekishi: Kankyoun-dandai no ataratana ninshiki he mukete* (Landscape and History: New perspectives of environmental problems). UCHIYAMA, Junzo · LINDSTRÖM, Kati (ed.) *Higashi Ajia Naikai bunka-ken no keikanshi to kankyoul: Mizube no tayousei* (Landscape History and Environment on the East Asian Inland Seas: Versatile Waterfronts). Showado, Kyoto, pp. 1-33. (in Japanese)
- UCHIYAMA, Junzo Mar, 2010 *Naze kaizuka ha kiesattanoka: Idou suru sekai no chushin* (Why did shell-middens disappear?: world centre in transition). UCHIYAMA, Junzo · LINDSTRÖM, Kati (ed.) *Higashi Ajia Naikai bunka-ken no keikanshi to kankyoul: Mizube no tayousei* (Landscape History and Environment on the East Asian Inland Seas: Versatile Waterfronts). Showado, Kyoto, pp. 120-144. (in Japanese)

### [Research Presentations]

#### [Oral Presentation]

- UCHIYAMA, Junzo *Jomon Style and Yayoi Style: Worldview transition with Neolithisation in central Japan*. Second CECT (Centre of Excellence in Cultural Theory) Autumn Conference: Spatiality, memory and visualisation of culture/nature relationships: theoretical aspects, Oct 22, 2009–Oct 24, 2009, Tallinn, Estonia.
- UCHIYAMA, Junzo and LINDSTRÖM, Kati *Landscape, History and Global Environmental Issues: Report on an Interdisciplinary Research Project on East Asian Inland Seas*. The International Human Dimensions Programme on Global Environmental Change (IHDP) Open Meeting 2009, Apr 26, 2009–Apr 30, 2009, Bonn, Germany.
- UCHIYAMA, Junzo and LINDSTRÖM, Kati *Imaging Future: Images of Affluent Past as Models for Future's Landscape*. 14th International Conference of Historical Geographers (ICHG), Apr 23, 2009–Apr 27, 2009,

Kyoto, Japan.

- UCHIYAMA, Junzo Understanding Neolithisation of East Asian Inland Seas: Resource management and landscape diversity in Jomon Japan. Symposium: "Landscape Neolithization along East Asian Inland Seas" for the 74th Annual Meeting of the Society of American Archaeology (SAA), Apr 22, 2009–Apr 26, 2009, Atlanta, USA.

*[Poster Presentation]*

- UCHIYAMA, Junzo, BAUSCH, Ilona Beyond the landscape of "Affluent Foragers": The role of long-distance trade among complex foragers in Jomon Japan. 1st Landscape Archaeology Conference (LAC2010), Jan 26, 2010–Jan 28, 2010, Amsterdam, The Netherlands.

*[Invited Lecture / Honorary Lecture / Panelist]*

- UCHIYAMA, Junzo Keikan toha nanika: keisei no chiikisei to puresesu (What is landscape?: Its regionality and the formation process). International Symposium for the Research Project of the Japan Sea: "Lingual-scapes of the world and Japan", Jan 23, 2010–Jan 24, 2010, Toyama. (in Japanese)
- UCHIYAMA, Junzo Harukana Mizube: Biwako no keikanshi (Landscape history on the waterfronts of Lake Biwa) . Kyoto Seika University Open Class "GARDEN-04": Water in the global era, Jan 19, 2010, COCON Karasuma, Kyoto. (in Japanese)
- UCHIYAMA, Junzo Complex strategy in Jomon Japan: a zooarchaeological perspective. Guest lecture at Leiden University, Oct 29, 2009, Leiden, The Netherlands.
- UCHIYAMA, Junzo Understanding Neolithisation of East Asian Inland Seas. Guest lecture at Tartu University, Oct 26, 2009, Tartu, Estonia.
- UCHIYAMA, Junzo Ikimono no kurashi to kankyou (Life and natural environments: The history of garbage). Special lecture at Muromachi Elementary School for the fourth grade, Oct 02, 2009, Muromachi Elementary School, Kyoto. (in Japanese)
- UCHIYAMA, Junzo Neolithisation and Modernisation: Landscape History on East Asian Inland Seas. Special lecture for the Department of Information and Media, Faculty of Liberal Arts, Doshisha Women's College of Liberal Arts, May 16, 2009, RIHN, Kyoto. (in Japanese)
- UCHIYAMA, Junzo (Organizer) Symposium: "Landscape Neolithization along East Asian Inland Seas" . the 74th Annual Meeting of the Society of American Archaeology (SAA) , Apr 22, 2009–Apr 26, 2009, Atlanta, USA. .

## UMETSU, Chieko

Associate Professor

### **[Academic Career]**

Ph.D. (Agricultural and Resource Economics, University of Hawaii at Manoa, Honolulu Hawaii USA 1995),  
M.A. (International Relations, International University of Japan, Niigata, Japan, 1989)

### **[Professional Career]**

Science & Math Teacher(0 level), Kiriani High School, Meru, Kenya, Japan Overseas Cooperation Volunteers, JICA. (1979)

Training Co-ordinator, Tohoku Branch Office, Japan International Cooperation Agency (JICA) (1982)

Visiting Fellow, Program on Environment, East-West Center, Honolulu, Hawaii. U.S.A. (1995)

Assistant Professor, The Graduate School of Science and Technology, Kobe University, Japan(1997)

Visiting Scholar, Environmental Studies, Research Program, East-West Center, Honolulu, Hawaii, U.S.A. (2001)

Associate Professor, Research Institute for Humanity and Nature, Inter-University Research Institute Corporation, National Institutes for the Humanities, Kyoto, Japan(2002)

### [Higher Degrees]

Ph. D. (University of Hawaii, 1995)

M. A. (International University of Japan, 1989)

### [Fields of Specialization]

Environmental and Resource Economics

Development Economics

Agricultural and Rural Development

Applied Microeconomics

### [Academic Society Memberships]

International Association of Agricultural Economists,

American Agricultural Economics Association (AAEA),

International Society for Ecological Economics (ISEE),

Agricultural Economics Society of Japan (AESJ), 1998–2009.

Society for Environmental Economics and Policy Studies (SEEPS),

Japan Society for International Development (JASID),

Japanese Society of Irrigation, Drainage and Rural Engineering (JSIDRE)

### [Awards]

IAAE-JB Research Award(2001)

Best Article Award from the Agricultural Economics Society of Japan (2003)

## —Achievements—

### [Books]

#### [Translations / Joint Translations]

- Umetsu, Chieko, Chihiro Ito, Hitoshi Shinjo, Tesuya Nakamura, Keiichiro Matsumura, Megumi Yamashita, Mitsunori Yamashita. 梅津千恵子監訳、伊藤千尋、真常仁志、中村哲也、松村圭一郎、山下恵、吉村充則訳 Jun, 2009 “Shakai Seitai Shisutemu ni okeru Rejiriannsu no Hyouka to Kanri-Jitsumusha Workbook” 「社会・生態システムにおけるレジリアンスの評価と管理—実務者ワークブック—」. RIHN Resilience Project, 80pp. (in Japanese) Translation of Resilience Alliance “Assessing and managing resilience in social-ecological systems: A practitioners workbook” version 1.0 June 2007. , 84pp.

### [Papers]

#### [Original Articles]

- Kume, Takashi, Chieko Umetsu, K. Palanisami, Jul, 2009 “Impact of the December 2004 tsunami on soil, groundwater and vegetation in the Nagapattinam district, India” ,. *Journal of Environmental Management*. 90(10) :3147–3154. DOI:10.1016/j.jenvman.2009.05.027. (reviewed).
- K. Palnisami, C. Umetsu, C.R. Ranganathan 2009 Why Farmers Still Invest in Wells in Hard-rock Regions When the Water-table is fast Declining? . *In M. Taniguchi, W.C. Burnett, Y. Fukushima, M. Haigh & Y. Umezawa (Eds.), From Headwaters to the Ocean: Hydrological Changes and Watershed Management, London: Taylor and Francis* :503–508. (reviewed).
- Kume, Takashi, C. Umetsu, K. Palanisami 2009 Monsoon Rainfall Played Large Roles in Desalinization of Soil-groundwater System and Vegetation Recovery Caused by Tsunami in Nagapattinam District, India . *In M. Taniguchi, W.C. Burnett, Y. Fukushima, M. Haigh & Y. Umezawa (Eds.), From Headwaters to the Ocean: Hydrological Changes and Watershed Management, London: Taylor and Francis* :409–414. (reviewed).

**[Research Presentations]***[Oral Presentation]*

- Chieko Umetsu “The impact of climate change on yield and yield variability and optimum land allocation for major crops in Tamil Nadu, India: An econometric approach” ,. Japan Society for International Development (JASID) Annual Meeting, Nov 21,2009–Nov 22,2009, Ritsumeikan Asia Pacific University, Oita..
- Chieko Umetsu “Integrated water management modeling for future climate variability: The case of Seyhan river basin in Turkey” . the 7th Open Meeting of the Human Dimensions of Global Environmental Change Research Community “Social Challenges of Global Change,” , Apr 26,2009–Apr 30,2009, World Conference Center, Bonn, Germany..

**WATANABE, Mitsuko**

Project Researcher

**Born in 1977.****[Academic Career]**

School of Integrated Sciences, Graduate School of Humanities and Sciences, Nara Women’ s University, D. Course (2005)

Department of International Studies for History, Sociology and Geography, Graduate School of Humanities and Sciences, Nara Women’ s University, M. Course (2002)

Faculty of Letter, Nara Women’ s University (2000)

**[Professional Career]**

Project Researcher, Research Institute for Humanity and Nature (2006)

Technical Assistant, Research Institute for Humanity and Nature (2005)

Postdoctoral Research Fellow, Graduate School of Humanities and Sciences, Nara Women’ s University (2005)

Research Assistant, Nara Women’ s University, 21st century COE Program (2004)

Research Assistant, Graduate School of Humanities and Sciences, Nara Women’ s University (2002)

**[Higher Degrees]**

D.Sc. (Nara Women’ s University, 2005)

M.Litt. (Nara Women’ s University, 2002)

**[Fields of Specialization]**

Physical geography

**[Academic Society Memberships]**

Association of Japanese Geographers

Japan Association for Quaternary Research

Japanese Association for Arid Land Studies

Japanese Geomorphological Union

**[Awards]**

Best poster Award(The Japanese Association for Arid Land Studies, Spring meeting 2010)

—Achievements—

**[Papers]***[Original Articles]*

- M. Watanabe and Y. Konagaya Mar, 2010 Landscape Changes in Ordinary Life in the Middle Reaches of the Ili River; Memories of the people living in the Ili River Basin. *Project Report on an Oasis-region* 8(1) :171-214. (in Japanese)
- M. Watanabe Mar, 2010 Historical Change of Pasturage in the Middle Reaches of Ili River. *Project Report on an Oasis-region* 8(1) :164-170. (in Japanese)

**[Research Presentations]***[Oral Presentation]*

- Mitsuko WATANABE, Yuki KONAGAYA, Tomohiro AKIYANA and Jumpei KUBOTA Socialist Modernization and Historical Change of Pasturage in Almaty Region, Republic of Kazakhstan. The Study Meeting of the Association of Japanese Geographers, Spring 2010, Mar 27, 2010–Mar 28, 2010, Hosei Univ. Tokyo. (in Japanese)

*[Poster Presentation]*

- Mitsuko Watanabe, Yuki Konagaya, Tomohiro Akiyama, Jumpei Kubota Historical change of the natural resource use in the semi-arid region in Central Eurasia during the last 100years: A case study of the Ili River basin, Kazakhstan.. The Japanese Association for Arid Land Studies Annual meeting 2010, May 29, 2010–20100230, GE Collage hall, IDEA Consultants, Inc. Tokyo.. (in Japanese)

**WATANABE, Tsugihiko**

Professor

**Born in 1953.****[Academic Career]**

Department of Agricultural Engineering, Graduate School of Agriculture, Kyoto University, D. Course (1983)

Department of Agricultural Engineering, Graduate School of Agriculture, Kyoto University, M. Course (1979)

Department of Agricultural Engineering, Faculty of Agriculture, Kyoto University (1977)

**[Professional Career]**

Professor, Research Institute for Humanity and Nature (2003)

Associate Professor, Research Institute for Humanity and Nature (2001)

Associate Professor, Arid Land Research Center, Tottori University (2001)

Associate Professor, College of Agriculture and Bioscience, Osaka Prefecture University (1995)

Associate Professor, Faculty of Agriculture, Kyoto University (1989)

Research Assistant, Faculty of Agriculture, Kyoto University (1984)

Research Fellow, Japan Society for Promotion of Science (1983)

**[Higher Degrees]**

D. Agr. (Kyoto University, 1989)

M. Sc. (Kyoto University, 1979)

**[Fields of Specialization]**

Irrigation and Drainage Engineering

**[Academic Society Memberships]**

Japanese Society of Irrigation  
 Drainage and Reclamation Engineering  
 Japan Society of Hydrology and Water Resources  
 Japanese Association for Water Resources and Environment  
 Japan Society of Civil Engineers  
 The Japanese Society for Arid Land Studies  
 International Commission on Irrigation and Drainage  
 International Water Resources Association  
 The Association of Rural Planning

### —Achievements—

#### [Papers]

##### [Original Articles]

- Katsuyuki FUJINAWA • Takahiro IBA • Yohichi FUJIHARA • Tsugihiko WATANABE 2009 Modeling interaction of fluid and salt in an Aquifer/lagoon system. *groundwater* 47(1) :35-48.
- Tsugihiko WATANABE • Takashi KUME 2009 A general adaptation strategy for climate change impacts on paddy cultivation : special reference to the Japanese context. *Paddy and Water Environment* 7(1) :313-320.
- Aimin HAO • Tomokazu HARAGUCHI • Yoichi FUJIHARA • Tsugihiko WATANABE • Yoshisuke NAKANO 2009 Quantification of soil water environment for optimum afforestation in Horqin sandy land, China. *Journal of arid land studies* 19(3) :475-482.

##### [Review Articles]

- Tsugihiko WATANABE 2009 Climate Change Impacts on Paddy and Water Management. *The International Society of Paddy and Water Environment Engineering (PAWEES) World Water Forum 5* :3-8.

#### [Research Presentations]

##### [Oral Presentation]

- Tsugihiko WATANABE Methane Emission from Paddy Fields. Working Group on Global Climate Change and Agricultural Water Management, Dec 07, 2009, New Delhi, India.

##### [Invited Lecture / Honorary Lecture / Panelist]

- Tsugihiko WATANABE Regional Workshop on Mainstreaming Climate Change Adaptation into Developmental Planning. Asian Development Bank Institute, Apr 14, 2009-Apr 17, 2009, Minato-ku, Tokyo.

YAMAMOTO, Keiko

Project Researcher

Born in 1974.

### —Achievements—

#### [Papers]

##### [Original Articles]

- Taniguchi, M., Shimada, J., Fukuda, Y., Yamano, M., Onodera, S., Buapeng, S., Delinom, R., Siringan, F., Wang, C., Lee, B., Yasumoto, J., Yamamoto, K. 2009 Degradation of subsurface environment due to human activities and climate variability in Asian cities. Taniguchi, M., Dausman, A., Howard, K.,

Polemio, M., Lakshmanan, E. (ed.) Trends and Sustainability of Groundwater i Highly Stressed Aquifers (Proceedings of Symposium JS.2 at the Joint IAHS & IAH Convention, Hyderabad, India, September 2009). IAHS Publication, 329. IAHS Press, Oxfordshire, UK, pp.124-129. (reviewed).

- Fukuda, Y., Yamamoto, K., Hasegawa, T., Nakaegawa, T., Nishijima, J., Taniguchi, M. 2009 Monitoring groundwater variation by satellite and implications for in-situ gravity measurements. *Science of The Total Environment* 407 :3173-3180. DOI:10.1016/j.scitotenv.2008.05.018. (reviewed).

## [Research Presentations]

### [Oral Presentation]

- Yamamoto, K., Fukuda, Y., Nakaegawa, T., Hasegawa, T., Taniguchi, M. Study of Landwater variation over Chao Phraya river basin using GRACE satellite gravity data. Human Impacts on Urban Subsurface Environment -The 3rd International Symposium in Taiwan, Nov 17,2009-Nov 20,2009, Taipei, Taiwan.
- Hasegawa, T., Fukuda, Y., Yamamoto, K., Nakaegawa, T., Tamura, Y. Long-term trends of terrestrial water storage in south-east Australia detected by GRACE. Human Impacts on Urban Subsurface Environment -The 3rd Symposium in Taiwan, Nov 17,2009-Nov 20,2009, Taipei, Taiwan.

### [Poster Presentation]

- Yamamoto, K., Fukuda, Y., Nakaegawa, T., Taniguchi, M. Study of landwater variation over Chao Phraya river basin using GRACE, satellite altimetry and in situ data. 2009 AGU Fall Meeting, Dec 14,2009-Dec 18,2009, San Francisco, U.S.A..
- Hasegawa, T., Fukuda, Y., Gangyu, F., Wenke, S., Tanaka, Y., Hashimoto, M., Yamamoto, K. Gravity Changes Associated with the 2004 Sumatra-Andaman Earthquake: An interpretation of the postseismic gravity changes by SNRVEI model. IAG 2009 Scientific Assembly, Aug 31,2009-Sep 04,2009, Buenos Aires, Argentina.

## YAMAMURA, Norio

Professor

### Born in 1947.

#### [Academic Career]

Faculty of Science, Kyoto University, B. Course (Graduated, 1969)

Graduate School of Science, Kyoto University, M. Course (Graduated, 1971)

Graduate School of Science, Kyoto University, D. Course (Accomplished credits for doctoral program, 1975)

#### [Professional Career]

Associate Professor, Saga Medical School, Faculty of Medicine, Saga University (1978)

Professor, Saga Medical School, Faculty of Medicine, Saga University (1995)

Professor, Center for Ecological Research, Kyoto University (1996)

Professor, Research Institute for Humanity and Nature (2007)

#### [Higher Degrees]

D.Sc (Kyoto University, 1977)

M.Sc. (Kyoto University, 1971)

#### [Fields of Specialization]

Mathematical Ecology

Evolutionary biology

#### [Academic Society Memberships]



Ecological Society of Japan  
 The Society of Population Ecology  
 Society of Evolutionary Studies Japan  
 Japanese Society for Mathematical Biology  
 International Union for the Study of Social Insects  
 Japan Ethological Society

### [Awards]

Ecological Society of Japan Award (2007)

### —Achievements—

#### [Papers]

##### [Original Articles]

- Fujita, N., Amartuvshin, N., Yamada, Y., Matsui, K., Sakai, S. and Yamamura, N. 2009 Positive and negative effects of livestock grazing on plant diversity of Mongolian nomadic pasturelands along a slope with soil moisture gradient. . *Grassland Science* (55) :126-134. (reviewed).

YAMANAKA, Hiroki

Project Researcher

**Born in 1979.**

#### [Academic Career]

Center for Ecological Research, Kyoto University, Ph.D.Course (-2007)

Center for Ecological Research, Kyoto University, M.Course (-2004)

Faculty of Bioresources, Mie University, B.Course (-2002)

#### [Professional Career]

Postdoctoral Researcher, Research Institute for Humanity and Nature(2007-)

Research Assistant, Center for Ecological Research, Kyoto University (2004, 2005, 2006)

#### [Higher Degrees]

Ph.D. (Center for Ecological Research, Kyoto university, 2007)

M.Sc. (Center for Ecological Research, Kyoto university, 2004)

#### [Fields of Specialization]

Ecology

Fisheries Science

#### [Academic Society Memberships]

Ecological Society of Japan

The Ichthyological Society of Japan

The Japanese Society of Limnology

### —Achievements—

#### [Papers]

##### [Original Articles]

- Ryuji Yonekura, Hiroki Yamanaka, Atushi Ushimaru, Kazuaki Matsui, Kimiko Uchii, Atsushi Maruyama

Jun, 2009 Allochthonous prey subsidies provide an asymmetric growth benefit to invasive bluegills over native cyprinids under the competitive conditions in a pond. *Biological Invasions* 11 :1347-1355. DOI:10.1007/s10530-008-9342-y. (reviewed).

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## YASUTOMI, Natsuko

Project Researcher

### Born in 1973.

#### [Academic Career]

Department of Earth and Planetary Science, The University of Tokyo, D. Course (2003)

Department of Earth and Planetary Science, The University of Tokyo, M. Course (1999)

Faculty of Science, Kyoto University (1997)

#### [Professional Career]

Researcher, Core Research for Evolutional Science and Technology (CREST), Japan Science and Technology Agency (2003)

Project Researcher, Research Institute for Humanity and Nature (2009)

#### [Higher Degrees]

D. Sc. (The University of Tokyo, 2003)

#### [Fields of Specialization]

Meteorology

Climatology

#### [Academic Society Memberships]

Meteorological Society of Japan

Japan Geoscience Union

American Geophysical Union

### —Achievements—

#### [Research Presentations]

##### [Oral Presentation]

- N. Yasutomi Time evolution of the east Asian summer monsoon analysed in highly-resolved gridded precipitation data based on observed rain gauges. The 4th Japan-China-Korea Joint Conference on Meteorology, Nov 08, 2009–Nov 10, 2009, Tsukuba, Ibaraki, Japan.

##### [Poster Presentation]

- N. Yasutomi, M. Kimoto Principal modes of Asian summer monsoon variability: Detection and changes.. American Geophysical Union, 2009 Fall Meeting, Dec 14, 2009–Dec 18, 2009, San Francisco, USA.
- A. I. Yatagai, N. Yasutomi, A. Hamada, K. Kamiguchi, O. Arakawa A 47-Year Daily Gridded Precipitation Dataset for Asia Based on a Dense Network of Rain Gauges –APHRODITE project-. American Geophysical Union, 2009 Fall Meeting, Dec 14, 2009–Dec 18, 2009, San Francisco, USA.

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## YATAGAI, Akiyo

Assistant Professor

**Born in 1968.****[Academic Career]**

Department of Geoscience, University of Tsukuba, D. Course (1996)

Department of Geoscience, University of Tsukuba, M. Course (1992)

Department of Natural Sciences, 1st cluster of colleges, University of Tsukuba (1990)

**[Professional Career]**

Assistant Professor, Research Institute for Humanity and Nature (RIHN) (2002) – present

Lecturer (temporary), Meiji University (2003) – present

COE Research Fellow, Disaster Prevention Research Institute, Kyoto University (2001)

Research Fellow, National Space Development Agency of Japan/Earth Observation Research Center (NASDA/EORC) (1995)

**[Higher Degrees]**

Ph. D (Science) (University of Tsukuba, 1996)

M. Sc. (University of Tsukuba, 1992)

**[Fields of Specialization]**

Atmospheric science

Climatology

Hydrology

Satellite Remote Sensing

Geography

**[Academic Society Memberships]**

Meteorological Society of Japan

The Japan Society of Hydrology and Water Resources

The Association of Geographers

The American Meteorological Society

American Geophysical Union

**—Achievements—****[Papers]***[Original Articles]*

- Yatagai, A. O. Arakawa, K. Kamiguchi, H. Kawamoto, M. I. Nodzu and A. Hamada Jun, 2009 A 44-year daily gridded precipitation dataset for Asia based on a dense network of rain gauges. *SOLA* 5 :137-140. DOI:10.2151/sola.2009-035. (reviewed).
- Geethalakshmi, V., A. Yatagai, K. Palanisamy and C. Umetsu Apr, 2009 Impact of ENSO and the Indian Ocean Dipole on the Northeast Monsoon Rainfall of Tamil Nadu state in India. *Hydrological Processes* 23 :633-647. DOI:10.1002/hyp.7191. (reviewed).
- Yatagai, A. Apr, 2009 Quantitative Estimation of Precipitation Climatology over the Himalayas. *Himalayan Study Monographs* 10 :53-63. (in Japanese) (reviewed). (with English abstract).
- Krishnamurti, T. N., A. K. Mishra, A. Simon, A. Yatagai Apr, 2009 Use of a dense gauge network over India for improving blended TRMM products and downscaled weather models. *J. Meteor. Soc. Japan* 87 :395-416. DOI:10.2151/jmsj.87A.393. (reviewed).
- Takashima, H., A. Yatagai, H. Kawamoto, O. Arakawa and K. Kamiguchi 2009 Hydrological balance over northern Eurasia from gauge-based high-resolution daily precipitation data, M. Taniguchi (eds). M.

Taniguchi, W. C. Burnett, etc (ed.) From Headwaters to the Ocean: Hydrological Change and Watershed Management. Taylor & Francis, London UK, pp.37-41. (reviewed).

### **[Research Presentations]**

#### *[Oral Presentation]*

- Akiyo Yatagai, K. Okumiya, R. Sakamoto Meteorological observation including UV launched in Ladakh, the westernmost part of the Tibetan Plateau. 90th AMS Annual Meeting, Jan 17,2010–Jan 21,2010, Atlanta, CA, USA.
- Yatagai, A., N. Yasutomi, A. Hamada, K. Kamiguchi, O. Arakawa A 47-Year Daily Gridded Precipitation Dataset for Asia Based on a Dense Network of Rain Gauges–APHRODITE project. AGU Fall Meeting, Dec 14, 2009–Dec 18, 2009, San Francisco, California, USA.
- Yatagai, A., T. N. Krishnamurti, A. K. Mishra, A. Simon Use of a Dense Rain-Gauge Network over Monsoon Asia for Improving Blended TRMM Products and Downscaled Weather Models. Fourth Japan-China-Korea Joint Conference on Meteorology, Nov 08, 2009–Nov 10, 2009, Tsukuba, Japan.
- Kamiguchi, K., O. Arakawa, A. Yatagai, H. Kawamoto, M. Nodzu Precipitation Characteristics of APHRO\_PR, High-Resolution Daily Precipitation Data, . Fourth Japan-China-Korea Joint Conference on Meteorology, Nov 08, 2009–Nov 10, 2009, Tsukuba, Japan..
- Yatagai, A. A Development of Quantified Precipitation Climatology over the Himalayas by using TRMM/PR and a Dense Network of Rain-Gauges, MOCA-09. the IAMAS-IAPSO-IACS 2009 Joint Assembly, Jul 19, 2009–Jul 29, 2009, Montréal, Canada.
- Yatagai, A. Quantitative estimation of orographic precipitation over the Himalayas by using TRMM/PR and a dense network of rain gauges. European Geosciences Union General Assembly 2009, Apr 19, 2009–Apr 24, 2009, Vienna Austria..

#### *[Invited Lecture / Honorary Lecture / Panelist]*

- Yatagai, A. Lecture on global and regional climate systems and Asian monsoon. Training Workshop on Climate Applications in ASEAN, Oct 05, 2009–Oct 09, 2009, Kuala Lumpur, Malaysia.

## **YUMOTO, Takakazu**

Professor

### **Born in 1959.**

#### **[Academic Career]**

Faculty of Science, Kyoto University (1982),

Department of Botany, Graduate School of Science, Kyoto University, M. Course (1984),

Department of Botany, Graduate School of Science, Kyoto University, D. Course (1987)

#### **[Professional Career]**

Research Fellow, Japan Society for the Promotion of Science (1987),

Assistant Professor, College for Liberal Arts, Kobe University (1989),

Lecturer, College for Liberal Arts, Kobe University (1992),

Lecturer, Faculty of Science, Kobe University (1992),

Associate Professor, Center for Ecological Research, Kyoto University (1994),

Professor, Research Institute for Humanity and Nature (2003)

#### **[Higher Degrees]**

D. Sc (Kyoto University, 1987)

M.Sc (Kyoto University, 1984)

**[Fields of Specialization]**

Ecology

**[Academic Society Memberships]**

The Ecological Society of Japan,  
 The Botanical Society of Japan,  
 The Japan Society of Tropical Ecology,  
 Japan Society for African Studies,  
 The Society for the Study of Plant Species,  
 Japanese Association of Historical Botany,  
 Wildlife Conservation Society

**—Achievements—****[Papers]***[Original Articles]*

- Tsujino, R. & Yumoto, T. 2009 Topography-specific seed dispersal by Japanese macaques in a lowland forest on Yakushima Island, Japan. *Journal of Animal Ecology* 78 :119-125. (reviewed).
- Kitamura, S., Suzuki, S., Yumoto, T., Wohandee, P. & Poonswad. P. 2009 Evidence of the consumption of fallen figs by Oriental Pied Hornbill *Anthracoceros albirostris* on the ground in Khao Yai National Park, Thailand. *Ornithological Science* 8 :75-79. (reviewed).
- Hosaka, T., Yumoto, T., Kojima, H., Komai, F. & Md. Noor N. S. 2009 Community structure of pre-dispersal seed predatory insects on eleven *Shorea* (Dipterocarpaceae) species. *Journal of Tropical Ecology* 25 :625-636. (reviewed).
- Kusaka, S., Ando, A., Nakano, T., Yumoto, T., Ishimaru, E., Yoneda, M., Hyodo, F., Katayama, K. 2009 A strontium isotope analysis on the relationship between ritual tooth ablation and migration among the Jomon people in Japan. *Journal of Archaeological Science* 36 :2289-2297. (reviewed).

**[Research Presentations]***[Oral Presentation]*

- Yumoto, T. Cultural service provided by Satoyama landscape and its role for the conservation of biodiversity. World Congress of Agroforestry, Aug 23, 2009–Aug 28, 2009, UNEP, Nairobi, Kenya.
- Yumoto, T. Satoyama as refugia of endangered plants and animals in Japan. 10th International Congress of Ecology, Aug 16, 2009–Aug 21, 2009, Brisbane Convention & Exhibition Centre, Brisbane, Australia.

*[Invited Lecture / Honorary Lecture / Panelist]*

- Yumoto, T. Research on maintenance process of semi-natural grassland in Japan: a trans disciplinary approach. Annual meeting of Japanese Society of Grassland Science, Mar 26, 2010–Mar 28, 2010, Tsu, Mie. (in Japanese)
- Yumoto, T. A new exploration into human-nature relations in the Japanese Archipelago- a transdisciplinary approach. Wildlife Management Project, Tokyo University of Agriculture and Technology, Oct 23, 2009, Fuchu, Tokyo. (in Japanese)

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**ZEBALLOS VELARDE, Carlos Renzo**

Project Researcher

**Born in 1968.**

**[Academic Career]**

Bachelor in Architecture. National University of San Agustín, Arequipa, Peru, 1992

Professional Degree of Architect. National University of San Agustín, Arequipa, Peru, 1996

Master in Urban Planning and Environmental Management. National University of San Agustín, Arequipa, Peru, 2002

Master in Sustainable Development. National University of Lanus, Buenos Aires, Argentina, 2003

PhD. Urban Environmental Planning. Kyoto University, Kyoto, Japan. 2007

**[Professional Career]**

ARQUICAD EIRL, General Manager (1996-2002)

SENCICO, Instructor (1997-2002)

Faculty of Architecture, National University of San Agustín. Associate Professor (1999-2002)

Faculty of Architecture, Santa Maria Catholic University. Associate Professor (2002)

Project Research Associate, Research Institute for Humanity and Nature (2006-2007)

Project Researcher, Research Institute for Humanity and Nature (2008)

**[Higher Degrees]**

PhD (Kyoto University, Japan. 2007)

MSc. (Lanus University, Argentina. 2003)

MSc. (San Agustín University, Peru, 2002)

**[Fields of Specialization]**

Architectural Design

Urban Environmental Planning

GIS management

3D modeling

**[Academic Society Memberships]**

Japan Institute of Architects

**[Awards]**

Wiese Bank Award to best Architectural Thesis Project. Peru. (1996)

**—Achievements—****[Editing]***[Editing / Co-editing]*

- UCHIYAMA, Junzo; LINDSTRÖM, Kati; ZEBALLOS, Carlos; NAKAMURA, Oki (ed.) 2009 NEOMAP Interim Report 2008. NEOMAP, Kita-ku, Kyoto, 260pp.

**[Research Presentations]***[Oral Presentation]*

- ZEBALLOS, Carlos; BORRÉ, Caroline Evolution Of Landscape During Modernisation Period In Lake Biwa Area. ICHG 2009, Kyoto, Japan, 20092308-20092708, Kyoto University, Kyoto, Japan.
- ZEBALLOS, Carlos GIS and 3D modeling for public outreach and education. Changes in landscape during modernization period in central Japan. The case of lake Biwa. 2009 Society for American Archaeology (SAA), 20092204-20092604, .

*[Poster Presentation]*

- ZEBALLOS, Carlos The change of the visual and spatial perception of the lakescape in Biwa, Japan, after modernization. CECT Autumn conference 2009, 20092210-20092510, CECT, Tallinn, Estonia.

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**ZHAO Tianbao**


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Visiting Resercher

**Born in 1976.****[Academic Career]**

Climatology, Institute of Atmospheric Physics(IAP), Chinese Academy of Sciences(CAS), Ph.D. (2006)  
 Agricultural meteorology, Nanjing Institute of Meteorology(2000)

**[Higher Degrees]**

Ph. D. (Institute of Atmospheric Physics(IAP), Chinese Academy of Sciences(CAS), 2006)  
 B. S. (Nanjing Institute of Meteorology, 2000)

**[Fields of Specialization]**

Climatology

**—Achievements—****[Papers]***[Original Articles]*

- Tianbao Zhao Mar, 2010 Quality Control of Precipitation and Temperature Data in East Asia. *Global Environment Research Fund The Eco-Frontier Fellowship Fiscal Year 2009* :21-33.
- ZHAO Tianbao, FU Congbin 2009 Applicability evaluation for the ERA-40, NCEP/NCAR and NCEP/DOE reanalysis using the upper air observations over China. *Chinese Journal of Atmospheric Sciences* 33(3) :634-648. (in Chinese) (reviewed).
- ZHAO Tianbao, FU Congbin 2009 Evaluation of 2m temperature from several reanalysis datasets over China. *Plateau Meteorology* 28(3) :594-605. (in Chinese) (reviewed).
- ZHAO Tianbao, HUA Lijuan 2009 Applicability evaluation of surface pressure from several reanalysis datasets over China. *Journal of Applied Meteorological Science* 20(1) :70-79. (in Chinese) (reviewed).
- ZHAO Tianbao, FU Congbin 2009 Intercomparison of the Summertime Subtropical High from the ERA-40 and NCEP/NCAR over East Eurasia and the Western North Pacific.. *ADVANCES IN ATMOSPHERIC SCIENCES* 26(1) :119-131. (reviewed).





**Appendix1 Number and Affiliation of Project Members**

Project Number	Title of the project	Total	RIHN	University / College			Inter-University Research Institute	Public Institution	Private Institution	Post doctoral/ Graduate Student	Others	Overseas institution
				National	Public	Private						
C-04 (FR5)	Human Activities in Northeastern Asia and their Impact on Biological Productivity in the North Pacific Ocean	79	4	35	1	4	1	2	0	1	29	
C-05 (FR4)	Human Impacts on Urban Subsurface Environments	79	4	39	2	11	0	0	0	0	15	
C-06 (FR3)	Effects of Environmental Change on the Interactions between Pathogens and Humans	46	13	15	0	3	0	2	0	0	11	
C-07 (FR1)	Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments	54	6	26	0	1	1	4	2	0	14	
D-02 (FR4)	A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago	132	8	47	12	31	4	18	8	0	4	0
D-03 (FR2)	Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in "Highland Civilizations"	43	7	22	2	6	0	2	2	1	1	
D-04 (FR2)	Collapse and Restoration of Ecosystem Networks with Human Activity	75	7	48	1	6	2	6	1	0	0	4
R-03 (FR3)	Historical Interactions between Multi-Cultural Societies and the Natural Environment in a Semi-Arid Region in Central Eurasia	107	10	50	7	21	5	1	1	0	1	11
R-04 (FR2)	Environmental Change and Infectious Disease in Tropical Asia	76	9	29	1	6	1	5	3	0	1	21
R-05 (FR1)	A Study of Human Subsistence Ecosystems in Arab Societies: To Combat Livelihood Degradation for the Post-oil Era	95	9	14	1	10	0	5	10	0	2	44
H-02 (FR4)	Agriculture and Environment Interactions in Eurasia: Past, Present and Future — A ten-thousand-year history	96	14	28	3	10	5	12	8	0	2	14
H-03 (FR3)	Environmental Change and the Indus Civilization	58	10	25	2	4	4	1	1	0	0	11
H-04 (FR3)	Neolithisation and Modernisation: Landscape History on East Asian Inland Seas	65	10	8	3	11	4	8	0	1	20	
E-04 (FR3)	Vulnerability and Resilience of Social-Ecological Systems	40	8	18	0	1	0	2	2	0	0	9
PR (MURAMATSU)	Megacities and the Global Environment	27	4	16	0	3	0	0	1	0	0	3
FS (ISHIKAWA)	Ecosystems and Social Sustainability in Coastal Southeast Asia	22	0	15	0	6	0	1	0	0	0	0

Project Number	Title of the project	Total	RIHN	University / College			Inter-University Research Institute	Public Institution	Private Institution	Post doctoral/ Graduate Student	Others	Overseas institution
				National	Public	Private						
FS (UNO)	An Environmental History of Nomads and Farmers in Central Asia	9	3	1	0	2	2	1	0	0	0	0
FS (KADA)	Managing Environmental Risks for Sustainable Food and Health in Watershed Planning in Southeast Asia	16	2	7	1	0	0	1	0	0	0	5
FS (SATO)	Genetic Pollution, Farming Ecosystems and New Energy Crops in Tropical Asia	14	2	8	0	0	0	2	0	0	0	2
FS (SUDA)	Development, Migration, Environmental Change and Human Health in Malaysia	14	0	6	0	3	3	0	0	0	0	2
FS (TANAKA)	Agricultural and Hydrological Cycles in the Changjiang Basin	34	0	25	0	2	0	3	0	0	0	4
FS (HAYASHIDA)	Atmospheric Methane and Agriculture in Monsoon Asia	24	2	12	1	3	0	5	0	0	0	1
	Total	1205	132	494	37	144	32	89	43	0	13	221

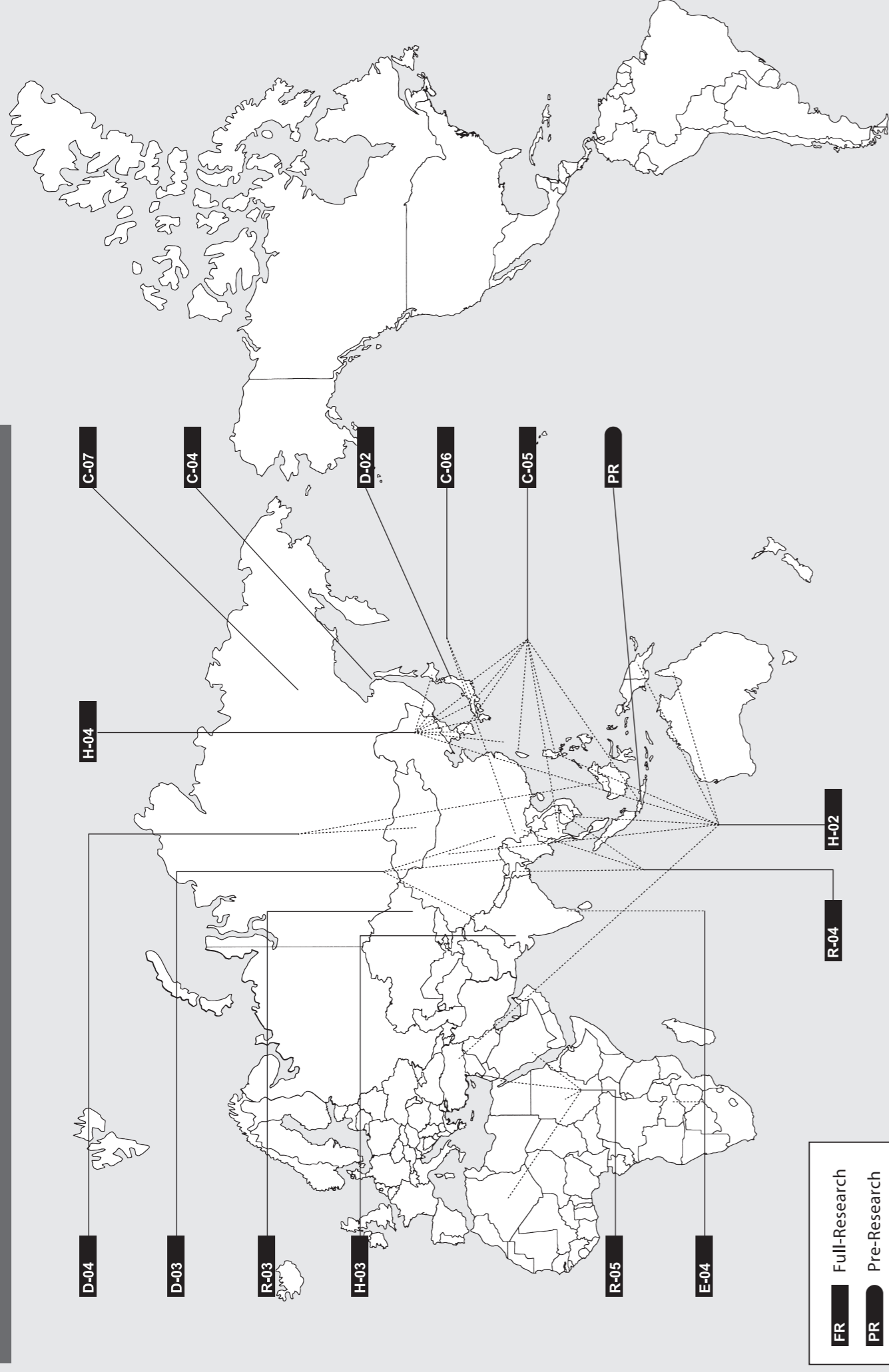
As of March 31, 2010

**Appendix 2 Research Fields of Project Members**

Project Number	Title of the Project	The number of projects members				Research background of project members
		Natural Sciences	Humanities and Social Sciences	Multidisciplinary	Total	
C-04 (FR5)	Human Activities in Northeastern Asia and their Impact on Biological Productivity in the North Pacific Ocean	53	12	14	79	(Natural Sciences) Marine meteorology, Physical oceanology, Chemical oceanology, Biogeochemical oceanology, Geochemistry, Soil conservation science, Hydrology, Analytical chemistry, Surface colloidal science, Oceanography, Paleoclimate reconstruction by ice cores, Coastal physical oceanology, Biological oceanography, Paleo oceanology, Organic geochemistry, Forest ecology, Plankton science, Glacial climatology, Glacial physics, Snow and ice chemistry, Pedology, Soil ecology, Numerical modeling, Meteorology, Soil geochemistry, Data management, Pollution of Amur River, Hydrology of Amur River, Atmospheric chemistry, Forest hydrology, Science outreach, Conservation of Amur River basin, Volcanology and seismology, Silviculture, Plant ecology, Hydrology, Glacial hydrology, Glacial biology, Environmental sciences, Geoenvironmental analytical chemistry, Geology, Soil geochemistry, Paleo ecology, Forest science, Water resource engineering (Humanities and Social Sciences) Economic geography, Land use changes in the Amur River basin, Human geography, Economic of Russian Far East, Politics, Forest environment conservation, Agroecology, International law, Geography (Multidisciplinary) Forest fire in the Amur River basin, Forest hydrology, GIS modeling, Forestry, Geography, Forestry ecology, Marine mammal resources, Ecological management, Remote sensing
C-05 (FR4)	Human Impacts on Urban Subsurface Environments	43	23	13	79	(Natural Sciences) Hydrology, Volcanology, Groundwater analysis, Earth system science, Geochemistry, Gravity satellite analysis, Seismology, Environmental analysis, Biogeochemistry, Meteorology, Isotope hydrology, Geothermics, Engineering geology, Hydrogeomorphology, Hydraulics, Oceanography, Physical hydrology, Geology, Marine geology, Isotope science, Geoscience, Environmental resource production (Humanities and Social Sciences) Social development study, Environmental economics, Geography, Politics, Environmental engineering, Urban geography, Cultural geography, Urban study, Socio-economics analysis, Material flow analysis, Historical geography, Analysis of urban environmental, Environmental policy, GIS, City planning, Demography, Analysis of subsurface environment, Analysis of water resources (Multidisciplinary) Environment conservation study, Analysis of urban climate, Regional environment study, Analysis of subsurface temperature, Geography, Analysis of subsurface environment, Groundwater analysis, Analysis of water resources
C-06 (FR3)	Effects of Environmental Change on the Interactions between Pathogens and Humans	31	7	8	46	(Natural Sciences) Nanotechnology, Ecology, Fish ecology, Molecular biology, Molecular ecology, Environmental conservation, Plant breeding, Sanitary, Mathematical ecology, Aquatic ecology, Legionella ecology, Behavioral ecology, Stable isotope ecology, Plant ecology, Sciences, Animal ecology, Agricultural sciences, Ecosystem ecology, Microbial ecology, Environmental resource geology, Isotope geoscience, Toxicology, Environment assessment and Ecopolicy, Environmental fate analysis, Bioinformatics, Fish ecology, Medical science (Humanities and Social Sciences) Economics, Food culture, Law, Environmental economics, Sociology, Geoenvironmental science (Multidisciplinary) Ecology, Health science, Sanitary, Medical science, Environmental conservation, Environmental medicine
C-07 (FR1)	Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments	40	11	3	54	(Natural Sciences) Forestry, Limnology, Remote sensing, Modeling, Ecohydrology, Earth science, Forest meteorology, Plant physiological ecology, Animal physiological ecology, Conservation ecology, Ecosystem impact, Civil engineering, Meteorology, Atmospheric model, Water and energy cycle, Ecological model, Isotope hydrology, Ecology, Ethology, River engineering, Hydrology, Climatology, Marine physics, Limnology, Forestry, Ecology, Environmental conservation, Dendrochronology, Forest meteorology & hydrology, Frozen ground science, Cryosphere landscape (Humanities and Social Sciences) Civil engineering, Social anthropology, International relations, Sociology, Politics, Cultural anthropology, Russian economy, Descriptive linguistics, History (Multidisciplinary) Atmospheric chemistry, Meteorology, Ecohydrology
D-02 (FR4)	A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago	68	54	10	132	(Natural Sciences) Ecology, Forest ecology, Physical anthropology, Animal ecology, Stable isotope ecology, Theoretical ecology, Plant phylogeny, Anthropology, Plant taxonomy, Plant genetic resources, Paleoenvironmental science, Primatology, Zooarchaeology, Reproductive ecology, Ecological anthropology, Environmental design, Botany, Chronology, Isotopic-geochemical study, Paleocology, Plant ecology, Forest biology, Natural geography, Vegetation history, Molecular ecology, Wood anatomy, Tephro-chronology, Paleo-biology, Population genetics, Animal phylogeny, Primate ecology, Molecular phylogeny, Molecular phylogenetics, Historical botany, Volcano geology, Natural history, Wood research (Humanities and Social Sciences) Philosophy, Cultural anthropology, Environmental history, Ethnology, Archaeology, History, Historical economics, Linguistic ethnology, Folklore, Geography, Ecological anthropology, Cultural geography, Environmental history, Environmental economics, Paleo-lithic archeology, Japanese modern history (Multidisciplinary) Conservation ecology, Crop sciences, Forest biosphere, Landscape resource, Paleo-environmental sciences, Ecological anthropology, Primatology
D-03 (FR2)	Human Life, Aging, and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in “Highland Civilizations”	20	8	15	43	(Natural Sciences) Forest resource management, Public health, Geoecology, Psychosomatic medicine, Field medicine, Nursing, Cardiology, Chrono-medicine, Ecology of water resource, Physical geography, Ecology, Primatology, Nutritional science, Forest science, Physical geography, Glaciology, Agrology, Pastoral ecology, Meteorology, Climatology, Animal husbandry, Geriatrics, Epidemiology (Humanities and Social Sciences) Ethnobotany, Resource economics, Anthropology, African area studies, History of chinese thought, Study of nature, Tibetan buddhism, Archaeology (Multidisciplinary) Field medicine, Geriatrics, Agroecology, Cultural anthropology, Agricultural economics, Ethnobotany, Human geography, Area studies, Agricultural management, Grassland science, Neurology, Primatology, Environmental history, Forest ecology
D-04 (FR2)	Collapse and Restoration of Ecosystem Networks with Human Activity	53	19	3	75	(Natural Sciences) Theoretical ecology, Interaction ecology, Grassland ecology, Forest ecology, Ecology, Tree physiological ecology, Entomology, Forest mensuration, Remote sensing, Environmental ecology, Environmental sciences, Physical environmental science, Mathematical ecology, Soil science, Isotope ecology, Forest soil animals, Systematic botany, Environmental sociology, Biogeochemistry, Resources and Environment (Humanities and Social Sciences) Cultural anthropology, Sociology, Environmental economy, Agricultural economy, Anthropology, Environmental sociology, Ethnobotany, Geography, Theoretical sociology, Entomology, Area study, Area development study, Policies, Economics, GIS (Multidisciplinary) Area environmental science, Global environmental science
R-03 (FR3)	Historical Interactions between Multi-Cultural Societies and the Natural Environment in a Semi-Arid Region in Central Eurasia	57	39	11	107	(Natural Sciences) Hydrology, Glacier biology, Glaciology, Soil science, Climate change, Forest ecology, Remote sensing analysis, Groundwater hydrology, Ice core analysis, Sedimentology, Landscape ecology, Physical geography, Modeling of soil organic matter, Agricultural land planning, Hydrological modeling, Dendrochronology, Irrigation planning, Tectonic landform, Isotope hydrology, Irrigation agriculture, Irrigation system, Landscape development, Quaternary research, Synthesis of natural proxies and historical documents, Isotope hydrology, Water circulation, Risk analysis of ecosystem, Irrigation system planning, Geochemistry, Botany & entomology, Climatology, Snow/ice hydrology (Humanities and Social Sciences) Politics, Ethnology, Pastoral nomadism, Chinese history, Archaeology, International relations on water resources, Oriental studies, Central Eurasian history, Social anthropology, Persian documents, Manchurian documents, History, History of religious art (Multidisciplinary) Ethnology, Area studies, Archaeology, Geographical studies, Geoarchaeology
R-04 (FR2)	Environmental Change and Infectious Disease in Tropical Asia	49	13	14	76	(Natural Sciences) Infectious disease epidemiology, Demography, Forest ecology, Parasitology, Environmental epidemiology, Climate change and diseases, Infectious disease epidemiology, Biological anthropology, Public health, Environmental microbiology, Microbiology, Clinical chemistry, Infectious diseases and immunology, Environmental health, Malariaology, International health, Health promotion, Tropical environmental health, Disaster information studies, International school health, Laboratory medicine, Insect ecology, Spatial epidemiology, Nursing, Medical entomology, Epidemiology, Meteorology, Tropical medicine, International health, Health and environmental health, Agricultural science, Environmental toxicology, Human ecology, Immunology, Tropical medicine, Isotope environmental studies, Regional planning, Ecology, Agriculture (Humanities and Social Sciences) Medical sociology, Literary representation, Ecological anthropology, History of medicine, Public system programming, Health and medical sociology, Cultural anthropology, Medical anthropology, International cooperation, Area studies, Forestry, Social anthropology, International health, International medical cooperation, Project management, Geography (Multidisciplinary) Human ecology, Population health, Health planning, Public health, International agriculture, Social research, Health policy, Public health nutrition, International community health, Informatics, Epidemiology, Area informatics, Southeast Asian area studies, Nursing science, Health education
R-05 (FR1)	A Study of Human Subsistence Ecosystems in Arab Societies: To Combat Livelihood Degradation for the Post-oil Era	53	28	14	95	(Natural Sciences) Nutrient physiology, Bio-chemistry, Forest ecology, Fungology, Plant physiology, Water resource management, Plant ecophysiology, Forest hydrology, Soil hydrology, Plant ecology, Revegetation technology, GIS, Marine biology, Information engineering, Afforestation, Agricultural chemistry, Natural geography, Hydrology, Tree physiology, Tree environmental physiology, Irrigation and drainage, Urban planning, Agroforestry, Forestry, Plant systematics, Environmental sciences, Entomology, Pathology, Agricultural engineering, Food science, Nutritional physiology, Clinical pathology, Weed science (Humanities and Social Sciences) Archaeology, Agro-economics, Cultural anthropology, Islamic culture, Ethnology, Development sociology, Religious anthropology, History, Developmental study, Education, Women development (Multidisciplinary) Cultural anthropology, Rural development, Geography, Remote sensing, Afforestation, Architectonics, Landscape ecology, Architectural history, Environmental topography, Social anthropology, Public Health, Apology
H-02 (FR4)	Agriculture and Environment Interactions in Eurasia: Past, Present and Future —A ten-thousand-year history	43	44	9	96	(Natural Sciences) Plant genetics, Breeding, Plant breeding, Anthropology, Archaeobotany, Plant cytogenetics, Plant molecular genetics, Molecular genetics, Agronomy, Plant genetic resources, Tame plant origins, Palynology, Crop science, Genetics, Genetic evolution, Genetic ecology, Glacial biology, Weed ecology, Geochemistry, Isotopic biological earth science, Botany, Cell biology, Architecture, Plant ecology, Environmental archaeology, Applied zoological genetics, Genetic resources, Ethnobotany, Natural science, Plant breeding and Exploration of plant genetic resources (Humanities and Social Sciences) Cultural anthropology, Japanese cultural history, History of tea culture, Philosophy, Folklore, Japanese culture, Archaeology, Chinese ancient history, Loulan history, Ethnology, Linguistics, Business management for the middle mountains area, Linguistics, Human geography, Geography, Southeast asian archaeology, Pre-modern farming history, Regional planning, Chinese literature and Silk road, Japanese archaeology, Assyriology, Art history, Japanese, History, Oriental history (Multidisciplinary) Environmental archaeology, Ethnobotany, Mountainous-area anthropology, Jomon archaeology, Hunter-gatherer archaeology, Historical ecology, Archaeobotany
H-03 (FR3)	Environmental Change and the Indus Civilization	24	24	10	58	(Natural Sciences) Agriculture, Physical geography, Archaeology, Biological science, Earth science, Seismology, Physical geography, Civil engineering, Hydrology, Earth science, Glacial biology, Earthphysics, Geochronology, Resource geography, Geology, Geomorphology, Genetics, Tectonic geomorphology, Ecology, Climatology (Humanities and Social Sciences) Linguistics, Archaeology, Indology, Linguistics (Kinnauri), Economics, Cultural anthropology, History of west Asia (Multidisciplinary) Archaeology, DNA archaeology, Ethnology, Plant genetics and evolution, Archaeo-zoology, Archaeo-botany
H-04 (FR3)	Neolithisation and Modernisation: Landscape History on East Asian Inland Seas	5	40	20	65	(Natural Sciences) Ichthyology, Landscape engineering, Social engineering, Micropaleontology, Diet, Ethology (Humanities and Social Sciences) Sociolinguistics, Trade history, Japanese history, Philosophy, English language, Religious folklore, Folklore, Landscape history, Euro-Japan archaeology, Archaeology, Japanese archaeology, Cultural anthropology, Chinese archaeology, English literature, Japanese linguistics, Chinese folklore, Korean archaeology, Medieval history, Political science, History, Computer engineering, Medieval archaeology, Historical geography, Linguistic environment, Environmental sociology, Human geography (Multidisciplinary) Ecological anthropology, Folklore, Landscape archaeology, Religious folklore, Prehistoric anthropology, Information culture, Archaeobotany, Linguistic informatics, GIS archaeology
E-04 (FR3)	Vulnerability and Resilience of Social-Ecological Systems	17	14	9	40	(Natural Sciences) Atmospheric physics, Soil environmental science, Agronomy, Remote sensing, Soil science, Agricultural meteorology, Forest ecology, Crop science, Botany, Meteorology, Mathematical ecology, Isotopic soil hydrology (Humanities and Social Sciences) Resource & environmental economics, Development economics, Agricultural economics, Development study, Japanese Literature, Anthropology, Human geography, Gender anthropology, Cultural anthropology, Sociology, Geography, Economics (Multidisciplinary) Environmental geography, Environmental & health economics, Ecological anthropology, Palliative medicine, Soil Hydrology Human ecology, Geographic information, Mathematics, Area study, African area study
PR (MURAMATSU)	Megacities and the Global Environment	5	9	13	27	(Natural Sciences) Infrastructure planning and management, Hydrology, Urban landscape planning, City sustainability, Remote sensing (Humanities and Social Sciences) Japanese economic history, Marketing and distribution, Chinese intellectual history, Study of religion, Soundscape studies, Regional resources management, Geographic information system, Environmental economics, Axiology (Multidisciplinary) Architectural history, Urban history, Urban policy planning, Studies of colonial architecture, Urban history in Southeast Asia, Islamic architecture and architectural history, City planning, spatial information science, Urban redevelopment, City planning, Economic geography
FS (ISHIKAWA)	Ecosystems and Social Sustainability in Coastal Southeast Asia	9	4	9	22	(Natural Sciences) Coastal ecology, Population genetics, Genetics, Fisheries Science, Ichthyology, Beach ecosystem, Coral reef ecology, (Humanities and Social Sciences) Regional development, Agricultural cultural geography, Fisheries economics, Regional economics, (Multidisciplinary) Conservation ecology, Fisheries science, Cultural anthropology, Global fisheries science, Area study, Regional development

Project Number	Title of the Project	The number of projects members				Research background of project members
		Natural Sciences	Humanities and Social Sciences	Multidisciplinary	Total	
FS (UNO)	An Environmental History of Nomads and Farmers in Central Asia	5	3	1	9	(Natural Sciences) Plant genetics, Plant cytogenetics, Mineralogists, petrologists and economic geologists, Cultural asset science, Fungi and algae (Humanities and Social Sciences) Social psychology, Ethnosociology, Assyriology (Multidisciplinary) Global environmental studies
FS (KADA)	Managing Environmental Risks for Sustainable Food and Health in Watershed Planning in Southeast Asia	10	2	4	16	(Natural Sciences) Soil ecology, Isotope environmental studies, Environmental chemistry, Environmental ecology, Plant ecology, Environmental risk epidemiology, Organic chemistry, Preventive medicine, Nutrition, Lake environmental studies (Humanities and Social Sciences) Environmental economics, Agricultural economics (Multidisciplinary) Public health, Resource economics, Rural Planning
FS (SATO)	Genetic Pollution, Farming Ecosystems and New Energy Crops in Tropical Asia	3	2	9	14	(Natural Sciences) Plant genetics, Ecology (Humanities and Social Sciences) Ethnology, Religious studies (Multidisciplinary) Genetic ecology, Microbial ecology, Plant genetic, Plant nutrition, Regional environment studies, Crop science, Plantech research
FS (SUDA)	Development, Migration, Environmental Change and Human Health in Malaysia	5	5	4	14	(Natural Sciences) Human ecology, Landscape ecology, Health Sciences (Humanities and Social Sciences) Human geography, Ethnoarchaeology, Social anthropology, Cultural anthropology (Multidisciplinary) Ecological anthropology
FS (TANAKA)	Agricultural and Hydrological Cycles in the Changjiang Basin	20	6	8	34	(Natural Sciences) Biological oceanography, Climatology, Silvics, Eco-hydrometeorology, Geomorphogeny, Physical oceanography, Meteorology, Hydrometeorology, Plant ecology, Environmental remote sensing, Forest hydrology, Satellite meteorology (Humanities and Social Sciences) Sociology, Anthropology, Agricultural economics, Environmental economics, Agricultural marketing (Multidisciplinary) Environmental hydrology, Environmental systems engineering, Erosion control engineering, Water-resource engineering, Historical studies in civil engineering, Impact assessment, Environmental remote sensing,
FS (HAYASHIDA)	Atmospheric Methane and Agriculture in Monsoon Asia	15	0	9	24	(Natural Sciences) Atmospheric science, Plant genetics, Remote sensing, Geochemistry, Agriculture, Drainage engineering, Inverse modeling (Multidisciplinary) Environmental systems engineering, Agriculture, Environmental economics, Hydrometeorology, Statistics, Thremmatology
	Total	628	367	210	1205	

As of March 31, 2010



### Full-Research

- C-04** Human Activities in Northeastern Asia and their Impact on Biological Productivity in the North Pacific Ocean
  - o The Amur River basin, Russia, China; the Sea of Okhotsk; northern North Pacific Ocean
- C-05** Human Impacts on Urban Subsurface Environments
  - o Asian coastal basins including Tokyo, Osaka, Seoul, Taipei, Bangkok, Jakarta and Manila
- C-06** Effects of Environmental Change on the Interactions between Pathogens and Humans
  - o Lake Biwa, Japan and Erhai in Dali, Yunnan, China
- C-07** Global Warming and the Human-Nature Dimension in Siberia : Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments
  - o Lena River Basin, East Siberia
- D-02** A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago
  - o The Japanese Archipelago
- D-03** Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in “Highland Civilizations”
  - o The Himalaya, Tibet and the other highlands in the world
- D-04** Collapse and Restoration of Ecosystem Networks with Human Activity
  - o East-Asia Tropical Rainforest (Malaysia, Sarawak) and Central-Asia Grassland (Mongolia)

### Full-Research

- R-03** Historical Interactions between Multi-Cultural Societies and the Natural Environment in a Semi-Arid Region in Central Eurasia
    - o Ili River basin and its surrounding areas in semi-arid regions of Central Eurasia
  - R-04** Environmental Change and Infectious Disease in Tropical Asia
    - o Tropical Asia (Lao PDR; Bangladesh; Yunnan, China)
  - R-05** A Study of Human Subsistence Ecosystems in Arab Societies: To Combat Livelihood Degradation for the Post-oil Era
    - o Semi-arid lands in Sudan, the Sinai Peninsula in Egypt, the Red Sea coast in Saudi Arabia, and a Saharan oasis in Algeria
  - H-02** Agriculture and Environment Interactions in Eurasia: Past, Present and Future — A ten-thousand-year history
    - o Eurasian Continent and Oceania
  - H-03** Environmental Change and the Indus Civilization
    - o Northwestern India
  - H-04** Neolithisation and Modernisation: Landscape History on East Asian Inland Seas
    - o The Japan Sea rim; the East China Sea rim
  - E-04** Vulnerability and Resilience of Social-Ecological Systems
    - o Rural societies in Southern and Eastern Provinces of Zambia in Semi-arid tropics where environmental variability such as rainfall is large
- Pre-Research**
- PR** Megacities and the Global Environment
    - o Jakarta; Southeast Asia