

# INDEX

<b>Research Activities</b> .....	1
Full Research .....	3
Incubation Studies .....	79
Completed Research (CR) Follow-up Grants .....	81
 <b>The Center for Coordination, Promotion and Communication (CCPC)</b> .....	84
 <b>Outreach Programs and Events</b>	
RIHN International Symposium .....	85
RIHN Forum .....	86
RIHN Public Seminars .....	87
RIHN Kids Seminar .....	87
RIHN Open House .....	87
RIHN Area Seminars .....	88
RIHN Tokyo Seminar .....	88
Nichibunken-RIHN joint Symposium .....	88
The Earth Forum Kyoto; Special Session and International Symposium .....	88
The Earth Hall of Fame KYOTO .....	89
RIHN Seminars .....	89
Lunch Seminars (Danwakai) .....	90
RIHN Annual Open Meeting .....	91
Press Conferences .....	91
Publications .....	92
 <b>Individual Achievements</b> .....	93
 <b>Appendices</b>	
1. Number and Affiliation of Project Members	
2. Research Fields of Project Members	
3. Research Project Sites	



## Research Activities

### ● Full Research

<b>Project No.</b>	<b>C-07 (Project leader: HIYAMA Tetsuya)</b>	<b>p. 3</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>C-08 (Project leader: MURAMATSU Shin)</b>	<b>p. 11</b>
<b>Project Name</b>	Megacities and the Global Environment	
<b>Project No.</b>	<b>C-09-Init (Project leader: WATANABE Tsugihiko)</b>	<b>p. 17</b>
<b>Project Name</b>	Designing Local Frameworks for Integrated Water Resources Management	
<b>Project No.</b>	<b>D-03 (Project leader: OKUMIYA Kiyohito)</b>	<b>p. 21</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: SAKAI Shoko)</b>	<b>p. 25</b>
<b>Project Name</b>	Collapse and Restoration of Ecosystem Networks with Human Activity	
<b>Project No.</b>	<b>D-05 (Project leader: ISHIKAWA Satoshi)</b>	<b>p. 34</b>
<b>Project Name</b>	Coastal Area Capability Enhancement in Southeast Asia	
<b>Project No.</b>	<b>R-04 (Project leader: MOJI Kazuhiko)</b>	<b>p. 42</b>
<b>Project Name</b>	Environmental Change and Infectious Disease in Tropical Asia	
<b>Project No.</b>	<b>R-05 (Project leader: NAWATA Hiroshi)</b>	<b>p. 48</b>
<b>Project Name</b>	A Study of Human Subsistence Ecosystems in Arab Societies : To Combat Livelihood Degradation for the Post-oil Era	
<b>Project No.</b>	<b>R-06 (Project leader: KADA Ryohei)</b>	<b>p. 58</b>
<b>Project Name</b>	Managing Environmental Risks to Food and Health Security in Asian Watersheds	
<b>Project No.</b>	<b>R-07 (Project leader: TANAKA Ueru)</b>	<b>p. 62</b>
<b>Project Name</b>	Desertification and Livelihood in Semi-Arid Afro-Eurasia	
<b>Project No.</b>	<b>E-05-Init (Project leader: SATO Tetsu)</b>	<b>p. 67</b>
<b>Project Name</b>	Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge	

### ● Initiative Feasibility Studies

1. AKITSU Motoki (Kyoto University)  
Food literacy in an age of globalization
2. IJIMA Wataru (Aoyama Gakuin University)  
Shrinking Society: Integrating Ecosystem Health and Social Welfare in East Asia
3. TANIGUCHI Makoto (RIHN)  
Demarcations of environmental managements for human environmental security in Asia-Pacific region  
– Nexus of thermal energy, water, and coastal fishery –

### ● Feasibility Studies

1. ISHIKAWA Mamoru (Hokkaido University)  
Improving Environmental Literacy and Stakeholder Communication
2. TOMITA Shinsuke (Kyoto University)  
Land Use Diversity and Autonomy in Southeast Asia
3. NAKATSUKA Takeshi (Nagoya University)  
Historical Adaptation to Climate Change in Japan: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences
4. HABU Junko (University of California, Berkeley)  
Reevaluating Advantages of Small-Scale Economies: Finding Alternative Strategies to Overcome Vulnerability in Large-Scale Economies
5. MURAMATSU Koichi (Gakushuin University)  
The History of Human-Water Interactions in East Asian Livelihood Complexes

### ● Incubation Studies

p. 79

1. OKUDA Noboru (Kyoto University)  
Biodiversity-driven nutrient cycling in social-ecological systems and their ecohealth
2. TANAKA Masakazu (Kyoto University)  
Conflicts and Environmental Issues
3. OHNO Terufumi (The Kyoto University Museum)  
Literacy for an alternative manner beyond the Globalism. New synthesis proposed from the city of Kyoto
4. AKAI Kenju (The University of Tokyo)  
International comparison of social capital and environmental norms: Experimental economics approach
5. KISHITA Yusuke (Osaka University)  
Scenario Design and Implementation of a Resilient Municipal Energy System: An Exploratory Case Study
6. ONISHI Masayuki (RIHN)  
Biocultural Diversity in the Asia-Pacific — its Significance and Futurability

### ● Completed Research (CR) Follow-up Grants

p. 81

1. YOSHIOKA Takahito (Kyoto University)  
MATSUSHIMA Kenta (Kyoto University)  
Application of environmental scenarios in the revival of the disaster-stricken area
2. SATO Yo-ichiro (RIHN)  
Startup of consortium for in-situ conservation of wild rice
3. TANIGUCHI Makoto (RIHN)  
Formation of a consortium on urban water in Asia
4. OSADA Toshiki (RIHN)  
Development of an interdisciplinary research network utilising human resources obtained in the RIHN Indus Project 2007-2012 (H-03)
5. YUMOTO Takakazu (Kyoto University)  
Research dissemination to the Communities from RIHN Project “A New Cultural and Historical Exploration into Human-Nature relations in the Japanese Archipelago”
6. UMETSU Chieko (Nagasaki University)  
Building a resilience network in Southern Africa and organization of Lusaka Workshop
7. SHIRAIWA Takayuki (Hokkaido University)  
Operation of the Amur Okhotsk Consortium as a multilateral academic network

**Stage: Full Research**

**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 Environments**

**Abbreviated Title: RIHN Siberia Project**

**Project Leader: HIYAMA, Tetsuya**

**Research Axis: Circulation**

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

**Key Words: Global Warming, Water Cycle, Carbon Cycle, Permafrost, Former Inhabitant, Reindeer, Social Adaptation**

### ○ Research Subject and Objectives

#### a) Research objectives and background

Global warming will likely transform Siberian environments. Early evidence indicates that water and carbon cycles are undergoing rapid change, with potentially grave impact on Siberian flora and fauna. Human inhabitants, who have adapted to great changes in social structure and environment in the past, will be forced to adapt again, but to a cascading series of environmental changes whose dimensions are understood only in outline. Local inhabitants depend on agriculture, stockbreeding and on fragile transport, building and water infrastructure. Human survival skills and adaptive capacity to environmental changes depend on unique social structures, history and culture, which have undergone Russian socialistic modernization.

Regional climate in Siberia are based on energy and water exchanges and thus on changes in surface reflectance of snow, ice and vegetation coverage. Such changes should be monitored continuously as long as possible. The Lena River Basin in Eastern Siberia is covered in larch forest but receives little precipitation. The area is an ideal setting in which to study the effects of climate warming, as the forest-permafrost symbiosis is extremely susceptible to abnormal variations in temperature and precipitation.

We have started monitoring of energy and water exchanges between larch forest and the atmosphere since 1998 at Yakutsk, middle part of the Lena River Basin in Eastern Siberia. This monitoring revealed that the region suffered from extraordinary high precipitation in late-summer through winter from 2005 to 2008. This resulted in not only permafrost degradation, but also changes in terrestrial ecosystems and hydrological elements in the region.

#### b) Research methods and organization

This research project takes natural and social science perspectives on three aspects of climate-associated environmental change. It is designed to: 1) describe current variation in water and carbon cycles and predict likely variation in the near future; 2) make field observations of the effect of carbon and hydrologic variability in Eastern Siberian landscapes, and identify key exchanges or driving forces; and 3) examine the capability of the multi-ethnic Siberian peoples, and their distinct social economies, to adapt to predicted change in their climate and terrestrial ecosystems. Three research groups are organized in order to realize these goals. They are the Siberia bird's-eye group (Group 1), the Water cycle and ecosystem interaction group (Group 2), and the Human ecology group (Group 3). This project is jointly conducted by Japanese and Russian universities and research institutes.

### ○ Progress and Results in 2012

Following three topics are the main progress and results in the 2012 fiscal year.

#### 1) Permafrost-ecosystem modelling

Flux and hydro-meteorological observations were operated with the help of Russian institutes from the beginning of this research project. It was found that high precipitation (snow and rain) in the Lena River Basin from 2005 to 2008 has led to tremendous changes in surface conditions. The changes observed include deepening and moistening of the active layers, hindrance to tree growth, and the

expansion of water surface due to floods. Such over-moistening condition of forest soil made larch trees to wither around the monitoring station. However satellite data analyses revealed that such tree withering was in progress only on spot-scales.

Based on the field observation data, we have been revising our models of soil freezing-thawing processes in order to better represent heat, water, and carbon fluxes in permafrost ecosystems. Here we were particularly concerned with the surface soil layer, in which we now see increased thawing depth and surface soil moisture, and an increase of net primary production. It was detected that annual maximum thawing depth (AMTD) gradually increased (deepened) on a decadal scale. Based on climatological analyses of atmospheric water vapor transport over the region, recent increases in precipitation partly related to cyclone activities.

Terrestrial water storage increases in the Lena River Basin derived increases in river base flows during the open water season. It was also indicated that over the 1950–2008 period basin-scale AMTD has been increasing at average rates roughly of the order of 1 cm/year in the areas.

Moistening and warming of surface soil affect methane (CH<sub>4</sub>) production from anaerobic bacterial decomposition in Siberian terrestrial ecosystems. Dramatically rise of the atmospheric CH<sub>4</sub> after industrial evolution, the rate of increase has slowed since the early 1990s. The growth rate decreased to near zero during 1999–2006 with large year-to-year variations, and it has been increasing again after 2007 in unexplained steady state. The cause of a large CH<sub>4</sub> increase in 2007 is still uncertain. We assumed this main reason was CH<sub>4</sub> production from anaerobic bacterial decomposition in wetlands of Western Siberia. Regional CH<sub>4</sub> fluxes were estimated using an inversion model with several aircraft and tower data measured in Siberia. In 2007 and 2008, enhanced wetland flux was estimated in Western Siberia with high temperature under relatively wet condition. Interestingly the CH<sub>4</sub> fluxes after 2008 have gradually decreased in Western Siberia, but the fluxes from Eastern Siberia have increased unsymmetrically.

Such unsymmetrical (seesaw) pattern between Western and Eastern Siberia has been also obtained for carbon dioxide (CO<sub>2</sub>) exchanges in the terrestrial ecosystems. Using our permafrost-ecosystem models, gross primary production (GPP) and ecosystem respiration (ER) was estimated. In 2000's GPP and ER show decreasing trends in Western Siberia but increasing trend in Eastern Siberia. These were primary due to differences of trends in temperature and precipitation between the two regions.

## 2) Adaptation ways of keepers and/or hunters of reindeers to social-environmental changes

Interviews with keepers of domestic reindeer revealed that current climate change has not severely damaged their operations. It appears that so far they have been able to successfully adapt to changes in climate, especially in Eastern Siberia. This might be related to resilient use of microhabitat of the domesticated reindeers around the camping site of the keepers. While on the contrary, they were severely impacted by social changes following the collapse of the Soviet Union.

We are also interested in documenting the migration routes of wild reindeer and whether these are changing in relation to new environmental conditions. We successively tracked routes of eight wild reindeers using an ARGOS satellite system. MODIS satellite data showed that reindeer have moved along rivers and through zones of better vegetation, while avoiding increasingly common forest fires. Migration distance was similar to those documented in North America and North Europe. We also found similar diurnal change in the migration behavior of the wild reindeers.

System dynamics (SD) model was applied in order to diagnose adaptation ways of keepers of domestic reindeers and/or hunters of wild reindeers to social-environmental changes.

## 3) Flood impacts

Using archival sources and remotely sensed data, we were able to make a detailed historical description of changes in annual spring ice-jam floods of the Lena River. Interestingly, spring ice-jam floods have been recognized as benefits except in case ice-jam floods severely damaged to the villages along the Lena River. This is because the spring floods derive nutrient rich water to the river islands, on which the farmers cultivate pastures for cattle-horse pastoralism. While on the contrary, in case summer river floods appear, it has been recognized as hazards. This is because it submerges the pasture completely for a long duration in the season.

We also found that increased flooding disrupts cold-weather transport via ordinarily frozen rivers and warm-weather transport over land. As result we note that Northern communities are increasingly remote and difficult to access. We have begun to study disaster vulnerability, prevention and adaptation in such areas.

### ○Project Members

- ◎ HIYAMA Tetsuya ( Research Institute for Humanity and Nature, Associate Professor, Management of Project, Analysis of permafrost and groundwater )
- 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 )
- INOUE Gen ( Atmosphere and Ocean Research Institute, The University of Tokyo, Visiting Professor, GOSAT data analysis )
- MAKSYUTOV Shamil ( National Institute for Environment Studies, Chief Researcher, Carbon budget estimation from GOSAT and other observation data )
- SAKAI Toru ( Research Institute for Humanity and Nature, Researcher, Flood monitoring using satellite remote sensing )
- KIM Heonsook ( National Institute for Environment Studies, Researcher, Inverse model analysis of GOSAT data )
- KANZAWA Hiroshi ( Nagoya University, Professor, Scenario of global warming in Siberia )
- SATO Hisashi ( Nagoya University, Associate Professor, Ecological modeling )
- OHTA Takeshi ( Nagoya University, Professor, Analysis of water energy and carbon cycles in forests, water balance analysis in a basin scale )
- OSHIMA Kazuhiro ( Research Institute for Humanity and Nature, Researcher, Climate Analysis in Siberia )
- 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 )
- TEI Shunsuke ( Hokkaido University, Ph D Candidate, Reconstruction of past changes in environment and vegetation activity )
- KODAMA Yuji ( National Institute of Polar Research, Associate 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 )
- YAMAMOTO Kazukiyo ( Nagoya University, Associate Professor, Analysis of vegetation phenology using satellite data )
- PARK Hotaek ( JAMSTEC, Senior Researcher, Analysis of snow accumulation processes )
- MAXIMOV Trofim C. ( Insitute for Biological Problems of Cryolithozone, SD, RAS, Head researcher, Analysis of photosynthesis in boreal forests )
- KONONOV Alexander V. ( Insitute for Biological Problems of Cryolithozone, SD, RAS, Researcher, Analysis of photosynthesis in boreal forests )
- MAXIMOV Ayal ( Insitute for Biological Problems of Cryolithozone, SD, RAS, Researcher, Analysis of photosynthesis in boreal forests )
- SHEPELEV Victor ( Melnikov Permafrost Institute, SD, RAS, Vice-Director, Dynamics of suprapermafrost and intrapermafrost groundwater in permafrost region )
- FEDOROV Alexander ( Melnikov Permafrost Institute, SD, RAS, Head researcher, Landscapes (forest) disturbance and permafrost dynamics )
- GOTOVSEV Semen ( Melnikov Permafrost Institute, SD, RAS, Head researcher, Thermo-erosional gullies in permafrost region )
- KOLESNIKOV Alexander ( Melnikov Permafrost Institute, SD, RAS, Researcher, Dynamics of suprapermafrost and intrapermafrost groundwater in permafrost region )
- GAGARIN Leonid ( Melnikov Permafrost Institute, SD, RAS, Researcher, Dynamics of suprapermafrost and intrapermafrost groundwater in permafrost region )
- TAKAKURA Hiroki ( Tohoku University, Associate Professor, Related analysis of freezing water environmental use and an occupation in the rural society of the Lena middle

- region; Relational analysis of an occupation pattern and environmental change in East Siberia )
- OKUMURA Makoto ( Tohoku University, Professor, Survey and analysis of the history and technology of transportation in East Siberia )
- YOSHIDA Atsushi ( Chiba University, Professor, Analysis in Relationship between Subsistence System Patterns and Environmental Changes in West Siberia )
- NAKADA Atsushi ( Hokkaido Museum of Northern Peoples, Chief 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 )
- ISHI Atsushi ( Tohoku University, Associated professor, Analysis of society and development in Sakha Republic from the international viewpoint )
- SASAKI Shiro ( National Museum of Ethnology, Professor, Analysis in Relationship between Subsistence System Patterns and Environmental Changes in Yakutia )
- EHARA Sayuri ( Sapporo Otani University, lecture, 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 )
- FUJIWARA Junko ( Research Institute for Humanity and Nature, Researcher, Cultural anthropology focusing to shamanism )
- YAMADA Hitoshi ( Tohoku University, Associate professor, Mythology, folklore of Siberia )
- EBATA Fuyuki ( Tokyo University of Foreign Studies, JSPS research fellow, Linguistics of Sakha Republic )
- NAGAYAMA Yukari ( Hokkaido University, Assistant Professor, Environmental recognition of native people in Eastern Siberia )

### ○ Future Themes

We will continue to investigate the four collaborative research topics described above, with particular emphasis on describing local peoples' vulnerability and adaptations to the documented changes in climate and environment.

Specific research topics are as follows:

- 1) To investigate resilient use of microhabitat of the domesticated reindeers, focusing on the micromorphology around the camping site and around the migration routes of reindeers.
- 2) To compare migration behaviors of wild reindeers in Siberia to those in the North Europe and North America.
- 3) To get socio-economic and ecological data for the inputs to system dynamics (SD) model, in order to discuss adaptation ways of the keepers of domestic reindeers and/or hunters of wild reindeers to social-environmental changes.
- 4) To investigate ice-jam induced floods more in detail, especially focusing on what hydrological conditions the floods have been recognized as hazards, with the collaborations of hydro-climatology and



social anthropology. We will focus on snow depth and spring air temperature rise in the upper river basins, in special concerns after 1990' s when substantial data were available.

## ●Achievements

### ○Books

#### 【Chapters/Sections】

- Takakura, H. 2012,04 Chapter introduction,5,final -Ethnography of ice: Knowledge and subsistence of Sakha in the middle basin of Lena River. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha. (in Japanese)
- Sasaki,S. 2012,04 Chapter 1-Migration of humankind to the Siberia. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.30-46. (in Japanese)
- Nakada, A. 2012,04 Chapter 2- Historical development of reindeer herding and origin of domestication. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp. 49-66. (in Japanese)
- Fujiwara, J. 2012,04 Chapter 3- Russians in Siberia. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.69-87. (in Japanese)
- Hiyama, T. 2012,04 Chapter 4- Environment in the Far North and Northern High Latitude. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.98-111. (in Japanese)
- Yoshida, A 2012,04 Chapter 6- Reindeer herding and the problem of industrial development and environment in Siberia. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.137-153. (in Japanese)
- Ikeda, T. 2012,04 Chapter 7- Ecological conservation and invasive alien species issues with relation to utilization of furbearers. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.157-171. (in Japanese)
- Okumura,M. 2012,04 Chapter 8-Roadway over the river ice. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.173-191. (in Japanese)
- Nagayama,Y. 2012,04 Chapter 9-Variou language of former inhabitants in Siberia. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, pp.198-218. (in Japanese)
- Yamada,H. 2012,04 Chapter 10-Mythology and world view of the Siberian shamanism. Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. , pp.219-236. (in Japanese)

### ○Editing

#### 【Editing / Co-editing】

- Takakura, H. (ed.) 2012,04 Living in Siberia, a land of extreme cold: Reindeer, ice and indigenous peoples. Shinsensha, 272pp. (in Japanese)

### ○Papers

#### 【Original Articles】

- Tei, S., Sugimoto, A., Yonenobu, H., Hoshino, Y. and Maximov, T.C. 2013,02 Reconstruction of summer Palmer Drought Severity Index from  $\delta^{13}C$  of larch tree rings in East Siberia. Quaternary International 290-291 :275-281.
- Yoshida, R., Sawada M., Yamazaki, T., Ohta, T., Hiyama, T. 2013,02 Influence of Land Cover Change on Regional Water Cycles in Eastern Siberia. Journal of Applied Meteorology and Climatology 52 : 484-497.
- Brutsaert, W. and Hiyama, T 2012,11 The determination of permafrost thawing trends from long-term streamflow measurements with an application in eastern Siberia. Journal of Geophysical Research 117 (D22110). DOI:10.1029/2012JD018344. .

- Hiyama, T. 2012,08 Visit to valuable water springs (98): Water in vicinity of Yakutsk, Eastern Siberia.. *Journal of Groundwater Hydrology* (54) :171-181. (in Japanese)
- Takakura, H. 2012 The shift from herding to hunting among the Siberian Evenki: Indigenous knowledge and subsistence change in Northwestern Yakutia.. *Asian Ethnology* 71 :31-47.
- Lopez, L., Hatano, R., Guggenberger, G., Ohta, T., Gerasimov, E. and Fedorov, A. 2012 Forest fires effects on carbon stocks and soil chemistry in central Yakutia, eastern Siberia. . *Eurasian Journal of Forest Research* (15-1) :9-17.
- Xue, B.L., Komatsu, H., Kumagai, T., Kotani, A., Otsuki, K., Ohta, T. 2012 Interannual variation of evapotranspiration in an eastern Siberian larch forest. *Hydrological Processes* (26) :2360-2368. DOI: 10.1002/hyp.9195.
- Ignatyeva, V. 2012 On the preservation of traditional farming due to global climate change. Ethno-political situation in Russia and neighboring countries in 2011. *Annual report EAWARN and Early Warning 2011* :547-554. (in Russian)
- Dolman, A. J., Shvidenko, A., Schepaschenko, D., Ciais, P., Tchepakova, N., Chen, T., van der Molen, M. K., Beletti Marchesini, L., Maximov, T. C., Maksyutov, S. and Schulze, E.-D. 2012 An estimate of the terrestrial carbon budget of Russia using inventory based, eddy covariance and inversion methods.. *Biogeosciences Discuss* 9 :6579-6626. DOI:10.5194/bgd-9-6579-2012.
- Yamazaki, T., S. Tei, A. Sugimoto and T. Ohta 2012 Long-term estimation of soil freezing and snow cover in a taiga forest in eastern Siberia. *Tohoku Journal of Snow and Life* 27(38) :39. (in Japanese)
- Boyakova S.I. 2012 Legal, social and economic aspects of the development of the Northern Sea Route in today. *Legal and socio-economic problems of the Arctic peoples. Materials Intl. Scientific-practical conference 2011*(9) :56-66.
- Park, H., Walsh, J., Fedorov, A., Sherstiukov, A., Iijima, Y. and Ohata, T. 2012 The influence of climate and hydrological variables on opposite anomaly in active layer thickness between Eurasian and North American watersheds. *Cryosphere Discus* . DOI:10.5194/tcd-6-2537-2012.
- Park, H., Walsh, J., Kim, Y., Nakai, T. and Ohata, T. 2012 The role of declining Arctic sea ice in recent decreasing terrestrial Arctic snow depths. *Polar Science* . DOI:10.1016/j.polar.2012.10.002..

## ○Research Presentations

### 【Oral Presentation】

- Saigusa, N., Suzuki, R., Hiyama, T. and Hayashi, K. Cross-disciplinary research collaboration for early detection of biological feedbacks. *Third International Symposium on the Arctic Research (ISAR-3)*, 2013,01,14-2013,01,17, Tokyo.
- Takakura, H., Yoshikawa, Y., Watanabe, M., Sakai, T. and Hiyama, T. Ice movement in the Lena river and the typology of spring flood: An interpretation of local sources integrated with satellite imagery using a multidisciplinary approach. *Third International Symposium on the Arctic Research (ISAR-3)*, 2013,01,14-2013,01,17, Tokyo.
- Ignatyeva, V. Demographic problems of the Sakha Republic (Yakutia). *International scientific-practical conference "The Arctic zone of the Russian Federation: the north-eastern vector of development"*, 2012,11,28-2012,11,29, St. Petersburg, Russia. (in Russian)
- Nagayama, Y. Cultural succession from folk narratives: A case of Alutor in Kamchatka.. *Hokkaido Ethnological Society, Second Annual Meeting 2012*, 2012,11,11, Sapporo. (in Japanese)
- Yoshida, A. Diversity of food culture among the Siberian indigenous pastoralists. *Public symposium of Japan Society of Cultural Anthropology "Global Journey on Food and Rituals: Siberia and Americas"*, 2012,11,10, Sendai. (in Japanese)
- Oshima, K. Interannual variation of the Lena River discharge and its association with atmospheric water cycle. *Third Symposium on Polar Science/35th Symposium on Polar Meteorology and Glaciology*, November 2012, Tachikawa. (in Japanese)

- Ignatyeva, V. and Romanova, E. "Man - the needle of the Earth": problems of preservation of ethnic identity of indigenous peoples of Yakutia in the era of globalization. International Interdisciplinary Conference "Minority communities in the face of globalization: Uniformization, resistance or updated", 2012, 10, 16-2012, 10, 19, Yakutsk. (in Russian)
- Yamazaki, T., S. Tei, A. Sugimoto and T. Ohta Long-term simulation of soil water content in eastern Siberian taiga forest by a land-surface model. 2012 Annual conference, Japan Society of Hydrology and Water Resources, 2012, 09, 26-2012, 09, 28, Hiroshima. (in Japanese)
- Hiyama, T. Waterlogging risk in Eastern Siberia: A case study in the permafrost region. World Congress on Risk 2012, Risk and Development in a Changing World, 2012, 07, 17-2012, 07, 20, Sydney, AUS.
- Ignatyeva, V. Industrial modernization as a factor in environmental, demographic, and social risks in the Republic of Sakha (Yakutia). Scientific Conference "Problems of the socio-economic and political history of Siberia early XX-XXI centuries", 2012, 06, 14-2012, 06, 15, Yakutsk. (in Russian)
- Ignatyeva, V. and Romanova, E. Anthropology of permafrost: Natural landscape and the "territory ethnicity". International Interdisciplinary Conference "Nature and Culture", 2012, 06, 13-2012, 06, 15, Yakutsk. (in Russian)
- Fujiwara, J. Remote places hard to access in Russian North. Japan Society of Civil Engineers, 2012, 06, 02-2012, 06, 03, Kyoto. (in Japanese)
- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., and Gagarin, L. Monitoring permafrost degradation in Siberia using microwave remote sensing. Japan Geoscience Union (JpGU), 2012, 05, 20-2012, 05, 25, Makuhari, Chiba. (in Japanese)
- Tei, S., Sugimoto, A., Yonenobu, H. and Maximov, T.C. Changes in relationship between larch tree growth and climate in eastern Siberia over past 100 years. Japan Geoscience Union Meeting, 2012, 05, 20-2012, 05, 25, Makuhari, Chiba. (in Japanese)
- Oshima, K. and Hiyama, T. Seasonal and interannual variations of the Lena River discharge and their relationships to atmospheric water cycle. Japan Geoscience Union (JpGU) Meeting 2012, 2012, 05, 20-2012, 05, 25, Makuhari, Chiba. (in Japanese)
- Oshima, K. Interannual variation of the Lena River discharge and its association with atmospheric water cycle. Meteorological Society of Japan 2012 Spring meeting, May 2012, Tsukuba. (in Japanese)

#### **【Poster Presentation】**

- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., Gagarin, L., and Yamaguchi, Y. Permafrost degradation and flood occurrence in the far north of Siberia. Third International Symposium on the Arctic Research (ISAR-3), 2013, 01, 14-2013, 01, 17, Tokyo.
- Ignatyeva, V. Ethnicity as an ideology of consumerism: Anthropological analysis of everyday life of Sakha. International conference "Ethnic and cultural cooperation in Eurasia: Spatial and historical configuration", 2012, 11, 25-2012, 11, 27, Barnaul, Russia.
- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., Gagarin, L., and Yamaguchi, Y. Flood monitoring in the far north of Siberia using ALOS/PALSAR. The 53rd Autumn Conference of the Remote Sensing Society of Japan, 2012, 11, 19-2012, 11, 20, Hiroshima.
- Oshima, K. Comparison of atmospheric and terrestrial water budgets in the three great Siberian rivers among atmospheric reanalyses. Meteorological Society of Japan 2012 Autumn Meeting, October 2012, Sapporo.
- Kotani, A., Ohta, T. Seasonal variation in characteristic of turbulence transport over forest canopy. Japan Society of Hydrology and water Resources Meeting 2012, 2012, 09, 26-2012, 09, 29, Hiroshima.
- Hiyama, T., Asai, K., Kolesnikov, A., Gagarin, L. and Shepelev, V. Estimation of residence time of permafrost groundwater in the Yakutsk region, eastern Siberia. 3rd International Conference on Forest and Water in a changing environment, 2012, 09, 18-2012, 09, 20, Fukuoka.
- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., and Gagarin, L. Long-term flood damage by permafrost degradation in Siberia. International Geoscience and Remote Sensing Symposium (IGARSS) 2012, 2012, 07, 22-2012, 07, 27, Munich, Germany.
- Kotani, A., Ohta, T. Linkage between net ecosystem exchange of H<sub>2</sub>O and CO<sub>2</sub> over boreal forest at eastern Siberia. Japan Geoscience Union (JpGU) Meeting 2012, 2012, 05, 20-2012, 05, 25, Makuhari, Chiba.

- Sugimoto, A., Ishikawa, M., Kodama, Y., Sasaki, M., Yamazaki, T., Matsuura, Y., Uchida, M., Suzuki, R., Iijima, Y., Saito, K., Park, H., Ohta, T., Hiyama, T., Osawa, A. and Ise, T. Change in Terrestrial Ecosystem of Pan-Arctic and effect on Climate. Japan Geoscience Union (JpGU) Meeting 2012, 2012,05,20-2012,05,25, Makuhari, Chiba.
- Oshima, K. Estimation of Net Precipitation over the Three Great Siberian River Basins Using Atmospheric Reanalyses. 4th WCRP International Conference on Reanalyses, May 2012, Washington DC.
- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., and Gagarin, L. Monitoring ground subsidence and springwater by permafrost degradation in Siberia. European Geoscience Union (EGU), 2012,04,22-2012,04,27, Vienna, Austria.
- Hanamura, M., Ohta, T., Kotani, A., Ito S., Maximov, T.C., Kononov, A, Maximov, A. Variability analysis of evapotranspiration in an eastern Siberian larch forest over 12- year (1998-2011). The 123th Japan Forestry Society, 2012,03,26-9999,03,29, Utsunomiya. (in Japanese)
- Hayashi, M, Kotani, A., Ohta, T. Comparison of CO2 flux between two sites in eastern Siberian boreal forest. The 123th Japan Forestry Society, 2012,03,26-9999,03,29, Utsunomiya. (in Japanese)
- Ignatyeva, V. Ethnic and demographic development of the Republic of Sakha (Yakutia): Regional features. Solovetsky Forum 2011, 2011,06,01-9999,06,04, Arkhangelsk, Russia.
- Hiyama, T., Asai, K., Gagarin, L. and Kolesnikov, A. Age estimation of supra-permafrost and intra-permafrost groundwater in Yakutsk region, Eastern Siberia. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.
- Oshima, K., Iijima, Y., Hori, M.E., Inoue, J. and Hiyama, T. Changes in the Lena river discharge and net precipitation over the basin during 2005-2008. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.

---

**Stage: Full Research**

**Project No.: C-08**

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

**Abbreviated Title:**

**Project Leader: MURAMATSU, Shin**

**Research Axis: Circulation**

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

**Key Words: Megacity, developing country, built environment, natural environment, social environment, city sustainable index, scenarios**

---

## ○ Research Subject and Objectives

### a) Research objectives and background

Cities are basically defined as the places in which people congregate. As human-made phenomena, they feature human-built-environments alongside the natural environment and develop their own unique socio-economic environment distinct from the non-urban environment. While cities have been a major force in promoting the progress of human civilization, they have also served as breeding grounds for human disaster and discontent in the form of environmental degradation, epidemics, famine and riots and problems of the built environment. Faced with such challenges, humans have repeatedly demonstrated their ability to overcome adversity through intervention in the urban and non-urban natural environment, the built-environment and socio-economic environment. However, a population of seven billion currently lives in the world, half of which live in cities. Environmental problems and complications are largely attributable to human activities in urban areas, including global warming and declining biodiversity on the earth. (Figure 1) This project will focus on the city, especially on the megacity, as both a major site in which human action create environmental problems that in recent years have become the centre of attention of many of international organizations and researchers.

The objectives of this project are: (1) to reduce environmental impacts attributable to megacities which support huge populations in developing tropical countries that are vulnerable to the effects of global warming; and (2) to provide methods of intervening in the local environment, which is directly related to the lives of people in the environment, with a view to enhancing people's general satisfaction with life and their surroundings. The focus of this study is Jabodetabek, the metropolitan area of Jakarta, Indonesia's capital, which at present has a robust economy and growing population. In the course of our study, 1) we will take measurements and engage in observations and analyses through a cognitive science approach from the perspective of different academic fields of study at different levels (micro and macro) of a megacity, and 2) we will present a scenario of a megacity by the year 2050 from the perspective of design science. Essentially, we intend to develop methods for making scenarios and to show knowledge we have gained in the course of our research in a form that may be applicable to studies of other megacities. In so doing, we hope to link this single study of megacities to global cities, the various problems that plague cities in general, and the global environment in order to resolve the problems.

We have considered the following outcomes: (1) to present a 2050 megacity scenario; (2) to hold a Megacity Scenario 2050 workshop; (3) to provide a framework and an Urban Information Database that can be publicly accessible; (4) to publish one volume in English; and (5) to publish a series of about eight volumes under the title of Megacities and Earth's Environment (provisional title). We also present research findings at international conferences, develop a website presenting results of the project and continue to develop international researchers working in this field.

### b) Research methods and organization

1) The study is divided into two broad areas: clarification of mechanisms (cognitive science) and creation of an urban sphere model (design science). (Figure 2)

Cognitive science-1: Through measurements and observations of megacities from different perspectives (micro and macro), the study will quantitatively and qualitatively determine conditions of the built-environment (building structures, area, types and styles of dwellings including quality of materials),

the natural environment (heat environment, biodiversity, flood risk), and the social environment (values, lifestyle) and will conduct historical analyses of restrictive aspects to elucidate the mechanisms of megacities. Then, we can understand how they negatively affect the global environment, the local environment, and people's values.

Cognitive science-2: Observing the way in which people adjust themselves to the changing built-, natural and social environments, we will develop methods of making a proposal of an "urban sphere model with future potential."

Design Science-1: We will comprehensively consider all existing intervention methods in megacities on both a micro and macro scale, and we will actually hold workshops on these methods. In the workshops, we can clarify and assess methods of intervention and adaptation.

Design Science -2: We intend to hold a Megacity Scenario 2050 workshop to present the Megacity Scenario 2050 and determine how we should present it to the public and how we can receive feedback regarding it. In the workshop, we will analyze various processes and present results including an evaluation.

2) Research framework: We have streamlined the work groups into five according to the research framework as follows: (1) the Supervisory Group which oversees the project as a whole, (2) the Megacity History Group which researches the history of megacities and Jabodetabek, (3) the Lifestyle Group which undertakes measurements, observations, and analyses of people's values and lifestyles, (4) the Environment Group which undertakes measurements, observations, and analyses of the natural environment and the built-environment, and (5) the Urban Policy Group which implements design science including the formulation and verification of the Megacity Scenario 2050. (Figure 3)

## ○ Progress and Results in 2012

Below we describe outcomes achieved to date during the current fiscal year according to the following four categories.

### 1. Results concerning methodology

(1) To analyze megacities in high resolution, we have developed a framework defining "land environment types" based on the built-environment and various indicators for categorizing these (density of dwellings, ground coverage, height and planning). On the basis of these indicators, we proposed four types for Jabodetabek: farming village areas, urban settlement areas (Kampung), high-rise residential areas and planned residential areas which are the subject of ongoing research. (Figure 4)

(2) Using the methodology above, we examined the possibility of applying this framework to other megacities.

### 2. Results concerning cognitive science

(1) In two area types under investigation, farming village areas (low density, interspersed with rice fields, low height, unplanned; Tangerang) and urban settlement areas (high density, building structures, low height, unplanned; Cikini), we have collected local environment measurements (heat surveys, biodiversity surveys, measurement surveys of distance between dwellings) and conducted surveys on lifestyle and environmental awareness (survey on dietary habits, questionnaire survey on awareness and values, survey on daily activities).

(2) Based on results of the above, we have made calculations relevant figures on the following 12 indicators in the three categories below and showed a cobweb chart to make comparison between the research areas.

1) Global environmental impact: the three carbon footprint indicators that can be traced back to three sources: dwellings, food and transportation

2) Local environment conditions: five indicators relating to the heat environment, biodiversity, calories consumed, the area of dwellings, and income

3) Awareness or level of satisfaction: four indicators relating to the natural environment, dwellings, foods, and the community.

(3) Macro study of Jabodetabek: We conducted assessments of the Ciliwung-Cisadane River basin regarding flood risk. We also conducted a questionnaire survey on values in Jabodetabek as a whole (about 1500 subjects). We collected and organized data on urban information infrastructure development. In addition, we organized population data (1680-1789) and made historical ground coverage maps.

### 3. Results concerning design science

(1) In the urban settlement area of Cikini, we held a joint student workshop with students and faculty from the University of Indonesia and Japanese university students. Students presented design intervention regarding how intervention should take place at a micro level and exchanged views with residents of the local community. We published a booklet on the results of this workshop in both English and Indonesian and distributed it.

(2) In our development of new local technology to strengthen fragile buildings, we conducted a demonstration experiment on the construction of a dwelling utilizing bamboo reinforced concrete (batako).

#### 4. Organizational improvement

Outcomes due to improvement in the organizational framework: The holding of monthly meetings with core members contributed to unifying their interests in the project and consolidating data that had been decentralized. The thoughtful advice and abundant suggestions from Professor Terry McGee (British Columbia University from Canada), who joined the project at our invitation, and Visiting Professor Tsuyoshi Kato also enlivened the project.

#### ○ Project Members

- ◎ Muramatsu, Shin ( Research Institute for Humanity and Nature, Professor )
- Alinda Medril Zain ( Bogor Agricultural University )
- Amemiya, Tomohiko ( Faculty & Graduate School of Urban Environment Sciences )
- Aoki, Takenobu ( Center for International Research and Education, Chiba University, Visiting Professor )
- Arai, Kenichiro ( Faculty of International Social Studies, Maebashi Kyoai Gakuen College )
- Araki, Tetsuya ( Graduate School of Agricultural and Life Sciences, The University of Tokyo )
- Arata, Mariko ( Graduate School of Innovation Management, Tokyo Institute of Technology, Assistant Professor )
- Asawa, Takashi ( Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, Associate Professor )
- Ayukawa, Kei ( Institute of Industrial Science, the University of Tokyo, doctoral course )
- Bao, Muping ( Institute of Industrial Science, the University of Tokyo )
- Bi-Matsui, Taotao
- Christodoulou, Aris ( EPFL (Ecole polytechnique federale de Lausanne), Management of Network Industries )
- Chen, Laixing ( Graduate School of Economics, University of Hyogo, Professor )
- Evawani, Elisa ( Faculty of Engineering, University of Indonesia )
- Fukami, Naoko ( Organization for Islamic Area Studies, Waseda University, Senior Researcher (Professor) )
- Fujii, Toyonobu ( University of Aberdeen )
- Guseva, Anna ( NIITAG )
- Harashina, Koji ( Faculty of Agriculture, Iwate University )
- Hayashi, Kengo ( Research Institute for Humanity and Nature )
- Hayashi, Reiko ( Dept of International Research and Cooperation, National Institute of Population and Social Security Research, Director )
- Hirosue, Masashi ( Faculty of Letters, Rikkyo University, Professor )
- Ichinose, Tomohiro ( Faculty of Environment and Information Studies, Keio University )
- Ikejiri, Takashi ( Kinki University )
- Ishikawa, Satoshi ( Department of Fisheries, Tokai University )
- Itakawa, Satoru ( Graduate School of Media and Governance, Keio University )
- Ito, Kaori ( Department of Architecture, Faculty of Science and Technology, Tokyo University of Science )
- Iwai, Shigeki ( Institute for Research in Humanities, Kyoto University, Professor )
- Iwafune, Yumiko ( Institute of Industrial Science, the University of Tokyo, Associate Professor )
- Izumikawa, Hiroshi ( Hiroshima Jogakuin University )
- Kagotani, Naoto ( Institute of Research in Humanities, Kyoto University, Professor )
- Kato, Hironori ( School of Engineering, The University of Tokyo, Associate Professor )
- Kato, Tsuyoshi ( Research Institute for Humanity and Nature, Visiting Professor )

- Kamiya, Akihiro ( Institute of Industrial Science, the University of Tokyo, docotoral course )  
 Kamiyama, Ryutaro ( Graduate School of Agricultural and Life Science, the University of Tokyo )  
 Kim, Jinsuk ( Faculty of Economics, Keiai University )  
 Kimura, Takeshi ( Graduate School of Humanities and Social Sciences, the University of Tsukuba )  
 Kitagaki Ryoma ( Graduate School of Engineering, the University of Tokyo )  
 Kurihara, Shinji ( College of Bioresource Sciences, Nihon University )  
 McGee, Terry ( The University of British Columbia, Institute of Asian Studies, former Director, Professor )  
 Meutia, A. Ami. ( Research Institute for Humanity and Nature )  
 Mori, Koichiro ( Shiga University International, Associate Professor )  
 Matsuda, Hiroko ( Research Institute for Humanity and Nature )  
 Mimura, Yutaka ( Research Institute for Humanity and Nature )  
 ○ Muramakami, Akinobu ( Graduate School of Systems and Information Engineering, University of Tsukuba )  
 Musha, Kaori ( Institute of Industrial Science, the University of Tokyo, d )  
 Nakaookubo, Chiaki ( Graduate School of science and Engineering, Saga University, Associate Professor )  
 ○ Okabe, Akiko ( Graduate School of Engineering, Chiba University )  
 Ota, Hiroshi ( Institute of Industrial Science, the University of Tokyo )  
 Shima, Norihisa ( Center for Sustainable Urban Regeneration, The University of Tokyo, Secretary General and Project Researcher )  
 Shimada, Ryuto ( Seinan Gakuin University, Associate Professor )  
 Shiroyama, Tomoko ( Department of Economics, Hitotsubashi University )  
 Taguchi, Junko ( Institute of Industrial Science, the University of Tokyo, docotoral course )  
 Takaiwa, Yu ( Institute of Industrial Science, the University of Tokyo, Master course )  
 Takeuchi, Wataru ( Institute of Industrial Science, the University of Tokyo, Associate Professor )  
 ○ Tanigawa, Ryuichi ( Kyoto University )  
 Taniguchi, Makoto ( Research Institute for Humanity and Nature )  
 Torigoe, Keiko ( School of Cultural & Creative Studies, Aoyama Gakuin University, Professor )  
 Tsuchiya, Sadao ( K. K. Sadao, President )  
 Uchiyama, Yuta ( Research Institute of Humanities and Nature )  
 Uehara, Wataru ( Graduate School of Commerce and Management, Hitotsubashi University, Associate Professor )  
 Uemura, Yasuo ( Faculty of Letters, Hiroshima University, Professor Emeritus )  
 Washida, Yuichi ( Graduate School of Commerce and Management, Hitotsubashi University, Associate Professor )  
 Widodo, Johaness ( School of Design and Environment, National University of Singapore, Associate Professor )  
 Yagita, Yoshie ( Institute of Industrial Science, the University of Tokyo )  
 Yamada, Kyota ( Graduate School of Asian and African Area Studies, Kyoto University )  
 Yamasaki, Seiko ( Dentsu Communication Institute )  
 Yamashita, Tsuguta ( London school of Economic and Political Science )  
 ○ Yamashita, Yuko ( Graduate School of Commerce and Management, Hitotsubashi University, Associate Professor )  
 Yoshida, Koushi ( College of Agriculture, Ibaraki University )  
 Yoshida, Mari ( College of Business Administration, Ritsumeikan University, Associate Professor )  
 Zenno, Yasushi ( Aoyama Gakuin Women's Junior College )

## ○ Future Themes

### Research Plan

#### FR3 (2012)

##### 1. Research concerning cognitive science:

- 1) Investigate the remaining two “landenvironment types” : high-rise residential areas (high density, built-up areas, high-rise buildings, planned) and planned residential areas (low density, built-up areas, low-rise buildings, planned)



- 2) Undertake a supplementary study of the two “land environment types” studied prior to FR3: farming village areas and urban settlement areas.
- 3) Examine logic that will link the micro and macro aspects of megacities.
- 4) Engage in methodological research of methods for integrating data obtained through cognitive science and the importance therein. Further analyze data by considering the complementary relationship among indicators and the trade-off.
- 5) Obtain data concerning megacities other than Jabodetabek, and conduct comparison study.

### 2. Research concerning design science

- 1) Following on from workshops in urban settlement areas in fiscal 2011, hold workshops with a small number of people to study ways of linking the results obtained in cognitive science with an appropriate scenario.
- 2) Proceed with research on design proposals for dense residential areas.
- 3) Undertake surveys and engage in research for the presentation of the Megacity Scenario 2050

### 3. Other

- 1) Engage in discussion concerning the publication of the project research, one of the final outcomes of the project, taking into consideration matters such as its purport, content and authors, among others.
- 2) Examine the framework and content of the Urban Information Database

## FR4 (2013)

### 1. Research concerning cognitive science

- 1) Consider the possibility of studying other types of categorized areas in addition to the existing four and engage in research of these.
- 2) Conduct supplementary surveys of the four types of areas.
- 3) In addition to the above, continue FR3.

### 2. Research concerning design science

- 1) Undertake surveys and engage in research to present a Megacity Scenario 2050.

### 3. Other

- 1) Engage in discussion concerning the publication of the project research, one of the final outcomes of the project, taking into consideration matters such as its purport, content and authors, among others.
- 2) Examine the framework and content of the Urban Information Database

## ● Achievements

### ○ Books

#### 【 Authored/Co-authored 】

- HAYASHI, Reiko (with) Yoshimi Chitose, Katsuhisa Kojima, Masato Shimizu, Shiro Koike, Masahiro Kishi, Masataka Nakagawa, National Institute of Population and Social Security Research 2013, 03 “2011 Population and Social Security Survey – the Seventh National Survey on Migration” .
- Matsuda, Hiroko: 2013, 03 Transition of Urban Intervention in Hydrological and Topographical Environment of Batavia under the Rule of the Netherlands, Dissertation. the University of Tokyo.
- Ami, M 2012, 10 Kado untuk Pasutri Norma Juliandi, dkk “Cinta Suku” . Pena Nusantara Publishing House

### ○ Editing

#### 【 Editing / Co-editing 】

- YAMADA, K., FUKAMI, N., etc. (ed.) 2012 The report for the Conference on the Cities of whole Earth and History. vol. 8. . ,

## OPapers

### 【Original Articles】

- Matsuda, Hiroko 2013,03 Waterways and Space Formation in Batavia under the Rule of the Dutch East India Company, *Journal of Architecture and Planning*. 78(685) :705-714. (reviewed).
- HAYASHI, Reiko 2012,09 "Urbanization in societies of population decline - A Russia-Japan comparison" . *Proceedings of the 2012 Inter-University Seminar on Asian Megacities*, Pacific National University, Khabarovsk, Russia, :332-338.
- MORI, K. and CHRISTODOULOU, A 2012 Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI). *Environmental Impact Assessment Review*. 32(1) :94-106.
- Liyantono, Tasuku Kato, Koshi Yoshida, Hisao Kuroda 2012 The Influence of El Niño Southern Oscillation on Agricultural Production Sustainability in a Tropical Monsoon Region: Case Study in Nganjuk District, East Java, Indonesia,. *Journal of Developments in Sustainable Agriculture* 7(1) : 65-74.
- Kyota YAMADA 2012 Global Environment and Mega Cities: Cognitive Science, Science for Design and Human-World Interaction Approach. *International Symposium Cities Under Change* :21-23.
- Koshi Yoshida and Issaku Azechi 2012 Impact analysis of future climate change on water resources in Citarum river basin, Indonesia,. *Proceedings of ACES*, :356.

### 【Review Articles】

- HIROSUE, m 2013,03 Comment 2” , in *Floods and Society. Emerging Regional Identity in Thailand*. Center for Integrated Area Studies, Kyoto University, kyoto, pp.65-66.

## OResearch Presentations

### 【Oral Presentation】

- HAYASHI.,Reiko "Urbanization in societies of population decline in the context of Cold Climate Civilization" Academic Exchanges - Innovation and development of urban planning and architectural design, . , 2013,03,24, 瀋陽建築大学, China.
- Kyota YAMADA、 Viewing Sri Lanka from a Perspective of New Moor Street and Ghaus Moidheen Mawata, Colombo、 . *International Conference on Islam and Multiculturalism: Islam, Modern Science, and Technology*, 2013,01,05, Kuala Lumpur, Malaysia.
- Kyota YAMADA、 Global Environment and Mega Cities: Cognitive Science, Science for Design and Human-World Interaction Approach、 . *International Symposium Cities Under Change*、 , 2012,10,17, Kolkata, India.
- HAYASHI.,Reiko "Population ageing in Africa" . UNFPA Symposium "Ageing in the Twenty-First Century: A Celebration and A Challenge" , 2012,10,01, U Thant International Conference Hall, United Nations University.
- YAMASAKI, Seiko "30 Years of WVS outreach" . International symposia "Social Survey and Infrastructure, October 2012, Tokyo (Japan).held by Japanese Association for Social Research, .
- HIROSUE,M The Rise of Indonesian Nationalism and Mixed Marriage between Indonesians and Europeans: Free Love, Concubinage and Marriage. *Seminar Cetak Biru Center of Excellence (Organized by National Archives of the Republic of Indonesia)*, , 2012,09,18-2012,09,19, Indonesia, Jakarta.

### 【Poster Presentation】

- YAMASAKI, Seiko "Economic Development and Cultural Change: World Values Survey" . *World Values Survey Global Meeting*, , March 2013, Qatar.
- YAMASAKI, Seiko "World Values Survey's Achievements, Underutilized Areas of the Survey Materials, and Future Prospects" . *The Behaviormetric Society of Japan*, September 2012, Niigata.

**Stage: Full Research**

**Project No.: C-09-Init**

**Project Name: Designing Local Frameworks for Integrated Water Resources Management**

**Abbreviated Title:**

**Project Leader: WATANABE Tsugihiro**

**Research Axis: Circulation**

**URL: <http://www.chikyu.ac.jp/P-C09/>**

**Key Words: Integrated Water Resources Management (IWRM), local water resources governance, pro-humanistic water resources assessment, Bayesian ANthro-Socioeconomic-Hydrological systems Evaluation Emulator (BANSHEE), Water Consilience**

### ○ Research Subject and Objectives

As a background of this project, IWRM was proposed as a foundational principal for comprehensively carrying out water resources management, in which various sectors and many stakeholders are involved. However, there exist the challenges of IWRM implementation to local communities and effective assessment of the influence of human activities on water environment. Also, the local water resources were under joint management by water users, but are becoming to be under top-down management by public organizations with increasing their participation, which follows modernization and area expansion of irrigation systems. In the midst of this, there are qualitative changes taking place in the structure of society, such as the hastening of private assignment of water management. Therefore, new policy guidelines have been requested in the field of local-to-regional water resources management. Furthermore, the target of IWRM is in the process of moving from “quantity” to “quality.” When assessing global water resources dynamics, water management that considers the water quality of domestic and industrial uses, while at the same time considers the water quantity for agricultural use is being questioned.

The goal of the C-09-Init is to present desirable local water resource management through co-creation of “wisdom of land and water management” as a result of the cooperation between science and society. Several indices will be developed for evaluating management strategy and efficiency of the water resources management of local levels. Tools to contribute to the discussion of implementation techniques and specific goal establishment will also be developed. Furthermore, C-09-Init will assess the influence of local water resources management on the global water resources dynamics through local water budget and virtual water trades. Based on such research results, materials grounded on scientific evidence for the study of futurability will be presented to various stakeholders from policy makers to end water users locally.

C-09-Init will present the implementable resolutions of the following problems to both the end water users and policy makers: **a.** change in the water resources dynamics due to the local water usage; **b.** change in water quality due to changes in the water resources dynamics and the influence of this on the ecosystem; **c.** environmental problems of agricultural land (soil salinization and ecosystem changes); **d.** development of new water resources due to increasing water demand for urban use etc.; **e.** water resources management in order to guarantee the use of water in the environment. In addition, in order to achieve them, the pro-humanistic water resources assessment and local water resources governance will be co-created through scientific and societal practices. The following results will be returned to the local communities and they will be instrumental in working toward a solution of environmental problems: **a.** an efficacy evaluation index for local water resources management; **b.** an assessment of the relationship between local water resources management and water usage/ environment; **c.** necessary conditions for the basis of local desirable water resources management; **d.** contents and roles of wisdom that support local desirable water resources management; **e.** an assessment of the influence of local water resources management on the global water resources dynamics.

### ○ Progress and Results in 2012

The main research results were presented by each study area group.

- 1) Turkey

We clarified that causes to aggravate water environment and land productivity existed in excessive use of irrigation water and fertilizers, and water users had low awareness of water and were uncritical of public policies.

#### 2) Indonesia

We quantified water use and balance in rice cultivation during dry season and clarified that water users in dry-season and respective geographical conditions conducted paddy cultivation while empirically utilizing available, limited water resources. As for operations for observations and survey on managing organizations, we have structured systems in South Sulawesi to execute “co-creation by science and society” supported by various SHs including farmers, local municipalities and an NGO.

#### 3) Egypt

We developed the flood inundation model and executed trial calculations to replicate the stream flow of the Nile and area, water depths and periods of flood inundation.

#### 4) Japan

We clarified that structural/geographical factors would specify water amount from a dam as well as each community has different strategies for their management.

#### 5) Globe

We conducted the uncertainty assessment and parameter sensitivity analysis on the global water resources prediction.

To integrate the above results by the separate study-area groups, we composed a grand design of C-09-Init research progress. We aim at design-scientific integration to present the ideal way and future design of water management to solve problems. We invoked the transdisciplinary research process by Lang et al. (2012) and reorganized the grand design to realize transdisciplinarity through co-creation of science and society. Since such co-creation requires proactive participation of SHs in society, the actual research will be progressed by establishing Working Groups (WGs) to conduct operations necessary at each stage.

We organized the Water Consilience WG to integrate the knowledge obtained in the study areas and prepared a start-up system to aggregate concrete outcomes using the global water resources assessment by WG. Secondly, in each study area, our observational survey promoted scientific elucidation, and based on that, we were able to make a design-scientific “attempt for co-design and co-production of science and society” in collaboration with stakeholders (SHs).

### ○Project Members

- ◎ Tsugihiko WATANABE ( Research Institute for Humanity and Nature, Professor )  
Taikan OKI ( Tokyo University, Professor )
- Masakazu MIZUTANI ( Utsunomiya University, Professor )
- Kaoru TAKARA ( Disaster Prevention Research Institute Kyoto University, Professor )
- Ulara TAMURA ( National Museum of Ethnology )
- Takanori NAGANO ( Kobe University, Associate Professor )
- Haruya KAGAMI ( Kanazawa University, Professor )
- Masanori NAITO ( Doshisya University, Professor )  
Minako YAMANLAR ( Ryukoku University, Professor )  
MIZUNO
- Izumi TAKAMIYA ( Kinki University, Professor )  
Kazuko OGUNI ( Nihon Fukushi University, Associate Professor )  
Kimihiro NAKAMURA ( Kyoto University, Associate Professor )  
Akihiko KOTERA ( Kobe University )  
Hisaki KATO ( Research Institute for Humanity and Nature, Project Research Associates )
- Ken'ichi NAKAGAMI ( Ritsumeikan University, Professor )  
Hironori HAMASAKI ( Research Institute for Humanity and Nature, Research Fellow )  
Takao NAKAGIRI ( Osaka Prefecture University, Associate Professor )
- Michio AKIYAMA ( Shiga Prefecture University, Professor )  
Shigeo YACHI ( Kyoto University, Associate Professor )  
Takuya TANAKA ( Kyoto University )

- Tamaki KASHIO ( Lake Biwa Museum )  
 Naoko HIRAYAMA ( Kanazawa University, Assistant professor )  
 Hiroki OUE ( Ehime University, Professor )  
 Ieko KAKUTA ( Asia University, Professor )  
 Chie IMAGAWA ( Research Institute for Humanity and Nature, Research Fellow )  
 Satoko WATANABE ( Research Institute for Humanity and Nature, Research Fellow )  
 Naota HANASAKI ( National Institute for Environmental Studies )  
 Yuki SHIBATA ( Shiga Prefecture University, Assistant Professeor )  
 Akiko MINAGAWA ( Shiga Prefecture University, Assistant Professeor )  
 Nana ONO ( Shiga Prefecture University, Assistant Professeor )  
 Chnsnul ARIF ( Tokyo University )  
 Sartika LABAN ( Ehime University )  
 Pngping LUO ( Disaster Prevention Research Institute Kyoto University, Visiting Fellow )  
 ○ Erhan AKCA ( Adiyaman University, Turkey, Associate Professor )  
 ○ Mehmet. A. CULLU ( Haran University, Turkey, Professor )  
 Mehmet Emin BAYSAL ( (General Directorate of) State Hydraulic Works, Turkey, Head of a department )  
 Huseyin DEMIR ( GAP Regional evelopment Administration, Turkey, Senior Engineer )  
 Selim KAPUR ( ?ukurova University, Turkey, Professor )  
 Riza KANBER ( ?ukurova University, Turkey, Professor )  
 ○ Suha BERBEROGLU ( ?ukurova University, Turkey, Professor )  
 Sedrettin  
 KARAHOCAGIL ( Republic Of Turkey Ministry Of Development Southeastern Anatolia Project  
 Regional Development Administration, Turkey, Administrator )  
 ○ Budi I. SETIAWAN ( Bogor Agricultural University, Indonesia, Professor )  
 Shaden A. GAWAD ( Shaden A. GAWAD, Director )  
 ○ Agnes RAMPISELA ( Hasanuddin University, Indonesia, Instructor )  
 I. Gde PITANA ( Udayana University, Indonesia, Professor )  
 I Wayan BUDIASA ( Udayana University, Indonesia, Instructor )  
 Satyanto K. SAPTOMO ( Bogor Agricultural University, Indonesia, Instructor )  
 Made SUDARTHA ( Bogor Agricultural University, Indonesia, Research Associate )  
 Mohamad Yanuar  
 Jarwadi PURWANTO ( Bogor Agricultural University, Indonesia, Instructor )

### ○ Future Themes

From FR3 we will continue survey and observation, make qualitative/quantitative descriptions of the “wisdom of land and water management” in each study area, and formulate local wisdom, while proactively cooperating with SHs. And then, the Water Consilience WG will integrate the findings of local wisdom to construct the first edition of the “BANSHEE” and create water resources management scenarios for assessment.

In FR4, we will transfer the wisdom and methods related to land-water management into cross-sectional practice over science and society. While proposing pro-humanistic global water resources assessment for the implementation of the IWRM as the academic fruits, we will propose and implement local water resources governance as the social outcomes.

### ● Achievements

#### ○ Books

#### 【Chapters/Sections】

- Hironori Hamasaki and Hiroyuki Katayama 2013, 03 Environmental Leadership Development A Cambodian Case. Takashi Mino and Keisuke Hanaki (ed.) Environmental Leadership Capacity Building in Higher Education - Experience and Lessons from Asian Program for Incubation of Environmental Leaders. Springer, Tokyo, pp.109-118.

**○Research Presentations****【Oral Presentation】**

- IMAGAWA Chie, HANDOH Itsuki C., TAKEUCHI Junichiro A Bayesian Uncertainty Analysis of the Modelled Surface- and Ground-Water Flows in an Agricultural Watershed. PAWEES 2012 International Conference, 2012, 11, 27-2012, 11, 29, Nonthaburi, Thailand.

**【Poster Presentation】**

- Hironori HAMASAKI, Hisaaki KATO, and Takao NAKAGIRI Possibilities of approach integrating 'hardware' and 'software' for sustainable water resources management: - the case of Bali, Indonesia. The 4th International Water Association Asia-Pacific Young Water Professionals Conference, 2012, 12, 07-2012, 12, 10, Tokyo, Japan..
- Hironori Hamasaki, Hisaaki Kato, Chie Imagawa and Satoko Watanabe Rethinking integrated water resources management (IWRM): Need for reframing IWRM for futurability. 10th International Symposium on Southeast Asian Water Environment in Hanoi, 2012, 11, 08-2012, 11, 10, Vietnam, Hanoi.

---

**Stage: Full Research**

**Project No.: D-03**

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

**Abbreviated Title:**

**Project Leader: OKUMIYA, Kiyohito**

**Research Axis: Diversity**

**URL:**

**Key Words:**

---

## ○ 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 2012

Research findings indicate the following.

- 1) Ecological and cultural adaptation in highlands is characterized as maximal and sustainable utilization of limited but diversified natural resources, flexible management for disasters and simple life with modest virtues.
- 2) The “Himalaya model of lifestyle-related diseases” hypothesis of diabetes acceleration was developed by the interaction among physiological adaptation in high-altitude and the effect of recent change of lifestyles with socio-economic globalization.

### **Ecological and cultural adaptation to the high-altitude environment and recent lifestyle change due to the globalization**

Subsistence lifestyle and economic conditions supporting the base of “highland civilizations” were studied in the three ecologically distinct zones in Himalaya-Tibet region: Arunachal Pradesh and Bhutan in the forest zone, Ladakh in the oasis zone, and Qinghai in the grassland zone. Vertical distribution of vegetation, ethnic groups, subsistence lifestyle and alien plant invasion were described from 200 to 4000 m in Arunachal Pradesh (Kosaka 2010). The detailed household interview and analysis of satellite image revealed the recent decrease in the number of livestock, the increasing use of chemical fertilizer, and the distribution pattern of spreading abandoned land at Domkhar village in Ladakh. Shortage of fodder, heavy snowfall, and less accessibility to social services were identified as the reasons for migration of pastoral people from Changthang highland to Leh city in Ladakh. Risk assessment of glacial lake collapsing, recording the restoration process from flooding damage (Yamaguchi 2011), and analysis of the climatic aspect of disaster occurrence have also been conducted in Ladakh.

### **“Himalaya model of lifestyle-related diseases” : The interaction between long-term physiological high-altitude adaptation and recent lifestyle change.**

There was the association between physiological hypoxic adaptation and lifestyle-related diseases. Han people had higher hemoglobin concentration compared with Tibetans in Qinghai. Increasing prevalence of diabetes mellitus was strongly associated with increases in hemoglobin levels related to adaptation to hypoxia in Ladakh, Yushu, and Arunachal (Okumiya 2010) .

There was the association between high-altitude and lifestyle-related diseases. High blood sugar, pulmonary disorder by dust, sleep disorder (Ladakh), hypertension and hyperlipidemia (Arunachal) were more prevalent in higher-altitude dwelling people (Ishimoto 2011).

There was the association among ecological environment, globalization and food diversity. The food diversity score was highest in Arunachal (humid), moderate in Qinghai (semi rid) and lowest in Ladakh (arid). In Ladakh there was lower food diversity in people in rural area than urban one.

There was the association between settlement, livelihood change and lifestyle-related diseases. Lifestyle-related diseases were more prevalent in urban area of Yushu than rural area of Haiyan in Qinghai (Okumiya 2010) . Official workers and monks had more prevalence of obesity, hypertension and diabetes than agro-pastoral local people in urban areas of Yushu and Leh.

The prevalence of diabetes was low in the traditional lifestyle in pastoral people in Arunachal and Haiyan (3000 m) but the prevalence of prediabetes in Ladakh was high in Ladakh (2900-3800 m) where natural resource is lowest and they may be fragile to lifestyle change. There was more prevalence of high hemoglobin level and high blood sugar with obesity and hypertension in Yushu (3600 m) than in Ladakh. Change of lifestyle in hypoxia-adapted people may accelerate lifestyle-related diseases: ” Diabetes acceleration hypothesis” .

### **Health care design for elderly people in highlands for successful aging with high QOL**

We started follow-up monitoring of blood pressure, body weight and amount of exercise with the collaboration of local health staffs in Ladakh. Comprehensive geriatric functional analysis in all elderly people in Khaling in Bhutan were assessed and we are developing geriatric care system by the collaboration with local health staffs including traditional medical staffs and monks to promote health, high spirituality and QOL (Sakamoto 2011).



**○Project Members**

- ◎ Kiyohito Okumiya ( Research Institute for Humanity and Nature, Associate Professor, Supervision )
- Kozo Matsubayashi ( Center for Southeast Asian Studies, Kyoto University, Professor, Supervision, Health and Disease in Highlands, Aging and Culture )
- Masayuki Ishine ( Yasugi Clinic, Researcher, Lifestyle-related diseases )
- Kuniaki Otsuka ( Medical Center East, Tokyo Women's University, Professor, Arteriosclerosis and Hypoxia )
- Yoriko Kasahara ( Faculty of Medicine, Kyoto University, Student, Nursing Care )
- Yasuko Ishimoto ( Faculty of Medicine, Kyoto University, Student, Exercise Therapy )
- Yumi Kimura ( Faculty of Medicine, Kyoto University, Student, Nutrition )
- Taizo Wada ( Center for Southeast Asian Studies, Kyoto University, Researcher, Mental Health )
- Ryota Sakamoto ( Research Institute for Humanity and Nature, Student, Field Medicine, Public Health )
- Motonao Ishikawa ( Medical Center East, Tokyo Women's University, Assistant Professor, Psychosomatic Medicine )
- Michiko Fujisawa ( Primate Research Institute, Kyoto University, Assistant Professor, Evolutionary Medicine )
- Norio Yamamoto ( National Museum of Ethnology, Emeritus Professor, Supervision, Agricultural Culture, Highland Civilization )
- Tetsuya Inamura ( Department of Literature, Aichi Provincial University, Professor, Livestock Farming and Environmental Exploitation )
- Akio Hongo ( Department of Animal Science, Obihiro University of Agriculture and Veterinary Medicine, Professor, Domestication of Livestock )
- Masayoshi Shigeta ( Center for African Area Studies, Kyoto University, Professor, Plant Use, Agricultural Culture )
- Morie Kaneko ( Center for African Area Studies, Kyoto University, Assistant Professor )
- Shuichi Ohyama ( Department of Geography, Tokyo Metropolitan University, Associate Professor, Change of Livelihood along with Environmental Change )
- Yuji Tohkura ( Cooperative Research Center, Obihiro University of Agriculture and Veterinary Medicine, Coordinator, Grassland Use )
- Yoshi Kawamoto ( Primate Research Institute, Kyoto University, Associate Professor, Evolutionary Adaptation at High-altitude Environment )
- Kiyoaki Saito ( Research Institute for Humanity and Nature, Former Professor, Nature View, Tibetan Civilization )
- Tshul khriims skal bzang ( Department of Buddhist Studies, Otani University, Professor, Buddhism and Tibetan Civilization )
- Kazuo Ando ( Center for Southeast Asian Studies, Kyoto University, Associate Professor, Supervision, Locally Existing Technologies and Rural Development )
- Akinobu Kawai ( Faculty of Industry and Technology, The University of The Air, Professor, Sustainable Agricultural and Rural Development )
- Naoji Okuyama ( Koyasan University, Professor, Tantric Buddhism )
- Koichi Usami ( Graduate School of International Development, Nagoya University, Professor, Agricultural Livelihood and Rural Market )
- Kazuharu Mizuno ( Graduate School of Asian and African Area Studies, Kyoto University, Associate Professor, Plant Geography and Human Activities in Highland )
- Nobuhiro Ohnishi ( Faculty of Bioenvironmental Science, Kyoto Gakuen University, Associate Professor, Environmental Conservation, Resource Management for Tourism )
- Tetsuya Kinoshita ( Research Institute for Humanity and Nature, Professor, History of Chinese Philosophy )
- Shinji Miyamoto ( Biwako Museum, Researcher, Paleo-Environment )
- Yasuyuki Kosaka ( Center for Southeast Asian Studies, Kyoto University, Researcher, Ethnological Plant Use )
- Jyoti Prakash Tamang ( Sikkim University, Professor, Fermented food and Health )
- Luo Er-hu ( Graduate School of Shanghai University, Professor, Paleo-Livelihoods )
- Toshihiro Tsukihara ( Faculty of Education and Regional Studies, Fukui University, Associate Professor, Highland-Lowland Interaction, Pastoralism in Extreme Highland )
- Masahiro Hirata ( Department of Agro-Environment Science, Obihiro University of Agriculture and Veterinary Medicine, Associate Professor, Milk Processing Techniques )
- Naho Ikeda ( National Research Institute for Earth Science and Disaster Prevention, Researcher, Transhumance Grazing Systems )

- Shinya Takeda ( Graduate School of Asian and African Area Studies, Kyoto University, Associate Professor, Supervision, Forest Ecology, Forest Resource Use )
- Mitsuhiro Nose ( Research Institute for Humanity and Nature, Research Associate, Forest Ecology, Forest Resource Use )
- Makoto Kato ( Graduate School of Human and Environmental Studies, Kyoto University, Professor, Biota and Bioresource )
- Reiji Suzuki ( Graduate School of Asian and African Area Studies, Kyoto University, Assistant Professor, Soil and Land Use )
- Fumikazu Ubukata ( Faculty of Environmental Science and Technology, Okayama University, Researcher, Resource Use and Social Movement )
- Tetsuyoshi Yamaguchi ( Kyoto Gakuen University, Researcher, Transhumance and Environmental Exploitation )
- Ayako Sasaki ( Division of Forest and Biomaterials Science, Kyoto University, Postdoctoral Fellow, Forest Resource Use )
- Isamu Yamada ( Center for Southeast Asian Studies, Kyoto University, Emeritus Professor, Forest and Eco-Tourism )
- Akiyo Yatagai ( Research Institute for Humanity and Nature, Assistant Professor, Change of Climate in Highlands )
- Naoyuki Kobayashi ( Kobayashi Photo Studio, Photographer, Photographing )
- Takayuki Shiraiwa ( Institute of Low Temperature Science, Hokkaido University, Associate Professor, Evaluation of High-Altitude Environment, Snow Ice )

### ○ Future Themes

Manifestations of global environmental issues in the human body has been clarified in the changing highland civilizations under the twin influences of socioeconomic globalization and global warming. Verifying the difference of adaptation and maladaptation in “Himalaya model of lifestyle-related diseases” -diabetes acceleration hypothesis, the integration of medical and cultural/ecological team will be promoted. Pursuing culturally and ecologically fitted health care design with high QOL and presenting wisdom of the aged and wisdom of coexistence to deal with aging and disease, we will reconsider present lifestyles and the future of modern civilization.

---

**Stage: Full Research**

**Project No.: D-04**

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

**Abbreviated Title: Ecosystem Networks**

**Project Leader: SAKAI Shoko**

**Research Axis: Diversity**

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

**Key Words: Biodiversity, Land cover change, Simulation model, Social networks**

---

## ○ Research Subject and Objectives

### Research Objectives

The goals of the project are to promote understanding of the environmental problems associated with ecological resources, and contribute to their solution using the concept of the ecosystem network. Although our project can be regarded as a study on social-ecological systems, we pay attention to the interactions among different subsystems and various actors in society by introducing the concept of an ecosystem network. By analyzing and integrating the case studies in the two research areas, we establish a theory of the ecosystem network, which is expected to contribute to the understanding and management of other ecosystems and ecological resources.

In this project, we address two concrete environmental problems under contrasting ecological settings: tropical rainforests in Southeast Asia (Sarawak, Malaysia) and grasslands in Central Asia (Mongolia). In both Sarawak and Mongolia, we are conducting research in three core steps: (1) identification of ecosystem network structures responsible for the problems, (2) scenario analyses, and (3) establishment of a general conservation theory.

### Background

Most ecosystems on the planet have been seriously degraded by human activities and are now in critical condition. Although various approaches for dealing with social-ecological systems have been developed to understand environmental problems and explore better ways to make both ecosystems and human lives sustainable, we still do not have a clear perspective for solving the problems partly owing to the complexity and diversity of ecosystems and human societies.

To cope with this complexity and diversity, we propose the concept of an “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 identify different actors in a human society within the ecosystem network, and regard human activities as part of the interactions within the ecosystem network. Some actors do not directly interact with the ecosystem but indirectly through other actors.

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

The project contributes to the mission of the RIHN because the ecosystem network is an interdisciplinary concept. The clarification of ecosystem networks requires the close cooperation between natural and social scientists. In addition, the project aims to establish a generalized theory beyond case studies; rather, it will be a core of the research field of the global environmental study created by 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 2012**

#### **(1) Scenario Analyses**

In order to present the project findings in an easily understood format, we constructed several scenarios for Mongolia and Sarawak. Each scenario includes a set of policies and institutions, based on which we use different indices to estimate land cover and forecast environmental, social, and economic conditions 30 years from the present.

In the case of Sarawak, we examined three scenarios with different combinations of operational or planned institutions, designed by the international community to suppress overexploitation of tropical forests. While all three scenarios predicted greater retention of forests and ecosystem services compared with a Business-As-Usual scenario, the distribution of benefits among the international community, the enterprises, and the local people differed considerably.

In Mongolia, on the other hand, the potential contribution of the international community towards maintaining ecosystem services may be relatively small. This is because grasslands in Mongolia do not have high biomass or biodiversity, and therefore, the conservation of Mongolian grasslands provides fewer ecosystem services to the international community compared with those of tropical forests. Since Mongolian grasslands are mainly used by local people, the regulation of livestock grazing by local people is essential to sustainable production.

## (2) Implications for ecosystem conservation from the ecosystem network perspective

We closely analyzed the ecosystem networks of Mongolia and Sarawak, and found an important difference between Mongolia and Sarawak is the relationship between enterprises and local people. Enterprises and local people have different mobility and dependence on the local ecosystems. Ecosystem deterioration affects local people more significantly than enterprises. Enterprises can utilize ecosystems in different areas if necessary, whereas local people cannot migrate as easily as the enterprises, even if their current environment becomes degraded. In Mongolia, ecological resources are used by local people and the products made are sold to the enterprises. In this manner, people and enterprises are mutually dependent. However, in the case of Sarawak, enterprises also directly exploit ecological resources, and therefore, compete with local people for the same resource base. In addition, tropical forests contain greater biodiversity and biomass and may thus have greater international importance than grasslands in terms of providing ecosystem services.

The differences suggest that the appropriate policies and institutions would also differ between the two areas. In Mongolia, there is potential for sustainable management via a negative feedback mechanism to suppress the overuse of pastures, since the degradation of ecological resources and other ecosystem services directly affects the users. For sustainable management, it is therefore essential to identify factors that weaken feedback mechanisms and to implement policies and institutions that enhance such feedback. In contrast, feedback does not act to suppress overuse in Sarawak, where the main users are enterprises. In this case, sustainable management therefore requires policies to introduce feedback or restrict the intensity of resource use.

The differences in productivity and biomass (or resource) distribution of the two ecosystems may be one of the main factors in the differing structures between the two areas. In grasslands, resources are scattered and both spatially and temporarily unpredictable, owing to low productivity and rapid turnover of one to several years. Harvesting such resources does not attract enterprises, which seek to maximize the return from their investment. Enterprises therefore choose to buy products from local people rather than exploit the resources themselves. In contrast, biomass produced for more than 100 years is accumulated above ground in Sarawak. Therefore, biomass is significant and evenly distributed, which is highly attractive to enterprises.

## (3) Publication of project achievements

We organized RIHN international symposium together with three other projects. The papers in the symposium will be published as two books in the RIHN series published by Springer. Besides, we organized symposia in Mongolia and Japan, and publish books in English and Mongolian language. We are editing two Japanese books.

### ○Project Members

- ◎ Sakai, Shoko ( Research Institute for Humanity and Nature (RIHN), Associate Professor, General Supervision )

#### Modelling Work Group

- Yamamura, Norio ( Doshisha University, Professor, Modelling Work Group Supervision, Mathematical Modelling )
- Ishii, Reiichiro ( Research Institute for Global Change (JAMSTEC), Research Fellow, Group Leader, Construction of Simulation Model )
- Ohgushi, Takayuki ( Center for Ecological Research, Kyoto University, Professor, Network Analyses )
- Kitagawa, Kazuhiko ( Graduate School of Integrated Arts and Sciences, Kochi University, Graduate Student, Forest measurements )
- Kobayashi, Hideki ( Frontier Research Center for Global Change (JAMSTEC), Research Fellow, Construction of Simulation Model )
- Kobayashi, Yutaka ( Graduate School of Science, The University of Tokyo, Research Fellow, Ecosystem Modelling )
- Kondo, Michio ( Faculty of Science and Technology, Ryukoku University, Associate Professor, Food Web Analysis )
- Saizen, Izuru ( The Graduate School of Global Environmental Studies, Assistant Professor, GIS Analysis )

- Suzuki, Rikiei ( Research Institute for Global Change (JAMSTEC), Sub Leader, Research Scientist, Remote Sensing )
- Takada, Takenori ( Graduate School of Environmental Earth Science, Hokkaido University, Professor, Theoretical Ecology )
- Tayasu, Ichiro ( Center for Ecological Research, Kyoto University, Associate Professor, Stable Isotope Ecology )
- Dennis Dye ( US Geological Survey, Southwest Geographic Science Team, Research Geographer, Remote Sensing )
- Nakamaru, Mayuko ( Graduate School of Division Science and Technology, Tokyo Institute of Technology, Lecturer, Social Model Analyses )
- Matsuoka, Masayuki ( Kochi University Research and Education Faculty Natural Sciences Cluster Agriculture Unit, Associate Professor, Remote Sensing )
- Kato, Satoshi ( Research Institute for Humanity and Nature (RIHN), Research Fellow )
- Tsutsumida, Narumasa ( The Graduate School of Global Environmental Studies, Assistant professor )
- Nakano, Takanori ( Research Institute for Humanity and Nature (RIHN), Professor )
- Yachi, Shigeo ( Center for Ecological Research, Kyoto University, Associate Professor Environmental Ecology, Social Model Analyses )
- Sarawak Work Group**
- Ichikawa, Masahiro ( Kochi University Research and Education Faculty Natural Sciences Cluster Agriculture Unit, Professor, Social Systems in Sarawak )
- Nakashizuka, Tohru ( Tohoku University, Professor, Scenario Analysis )
- Igarashi, Shuichi ( The United Graduate School of Agricultural Sciences, Ehime University, Graduate Student, Sarawak Plant-Physiology Surveys )
- Ichie, Tomoaki ( Kochi University Research and Education Faculty Natural Sciences Cluster Agriculture Unit, Associate Professor, Sarawak Plant-Physiology Surveys )
- Itioka, Takaaki ( Graduate School of Human and Environmental Studies, Kyoto University, Associate Professor, Group Leader, Sarawak Insect Surveys )
- Ichikawa, Tetsu ( Rikkyo University Sightseeing Department, Program Coordinator, Sarawak Chinese-Society Surveys )
- Inoue, Yuta ( The United Graduate School of Agricultural Sciences, Ehime University, Graduate Student, Tree Physiological ecology )
- Onuma, Ayumi ( Faculty of Economics, Keio University, Professor, Sarawak Environmental Economy Surveys )
- Kato, Yumi ( Waseda University Institute of Asia-Pacific Studies, Assistant, Sarawak Biological Resource Surveys )
- Kanazawa, Kentaro ( Shinshu University whole school education mechanism, Associate Professor, Sarawak Biological Resource Surveys )
- Kamoi, Tamaki ( The United Graduate School of Agricultural Sciences, Ehime University, Graduate Student, Sarawak Bird Surveys )
- Kishimoto, Keiko ( The University of Tokyo, Graduate School of Arts and Sciences, Japan Society for the Promotion of Science Research Fellow, Sarawak Insect Surveys )
- Koizumi, Miyako ( Tropical forest area Environmental Studies, Kyoto University Graduate School of Agriculture, Department of Forest Science, Researcher Fellow, Sarawak Biological Resource Surveys )
- Kanoh, Satoko ( Graduate School of Science and Technology, Kochi University Graduate School of Integrated Human Studies, Graduate Student )
- Samejima, Hiromitsu ( Center for Southeast Asian Studies, Kyoto University, Researcher Fellow, Sarawak Biological Resource Surveys )
- Shimamura, Tetsuya ( The United Graduate School of Agricultural Sciences, Ehime University, Assistant Professor, Sarawak Forest Structure Surveys )
- Soda, Ryoji ( Graduate school literature graduate course, Osaka City University, Associate Professor, Sarawak Social Structure Surveys )
- Tanaka, Sota ( Graduate School of Kuroshio Science, Kochi University, Assistant Professor, Sarawak Biological Resource Surveys )
- Choy, Yee Keong ( Faculty of Economics, Keio University, Researcher visit, Sarawak Social Structure Surveys )
- Tsukamoto, Jiro ( Kochi University Research and Education Faculty Natural Sciences Cluster Agriculture Unit, Professor )
- Tokumoto, Yuji ( Graduate School of Bioagriculture Sciences, Nagoya University, Graduate Student )
- Naito, Daisuke ( Research Institute for Humanity and Nature (RIHN), Assistant Professor )

- Nakagawa, Michiko ( Graduate School of Bioagriculture Sciences, Nagoya University, Associate Professor, Sarawak Mammal Surveys )
- Nagamasu, Hidetoshi ( The Kyoto University Museum, Section of Material Examination and Technical Service, Associate Professor )
- Hatada, Aya ( Kyoto University of Foreign Studies, Lecturer, Sarawak Environment Surveys )
- Osono, Takashi ( Center for Ecological Research, Kyoto University, Associate Professor )
- Handa, Chihiro ( Graduate School of Human and Environmental Studies, Kyoto University, Graduate Student, Sarawak Insect Surveys )
- Hyodo, Fujio ( Research Core for Interdisciplinary Sciences, Okayama University, Assistant Professor )
- Fujita, Wataru ( Konan Women's University, Lecturer, Sarawak Social Structure Surveys )
- Matsumoto, Takashi ( Graduate School of Human and Environmental Studies, Kyoto University, Researcher, Sarawak Insect Surveys )
- Shimizu, Kaya ( Department of Human and Environmental Studies, Kyoto University, Graduate Student )
- Morishita, Akiko ( Center for Southeast Asian Studies, Kyoto University, Specific researcher, Sarawak Politics Surveys )
- Takano, Kohei ( Graduate School of life Science, Tohoku University, Researcher, Sarawak Biodiversity Surveys )
- Tanaka, Hiroshi ( Research Core for Interdisciplinary Sciences, Okayama University, Researcher Fellow )
- Mishima, Yuhki ( Graduate School of Science and Technology, Kochi University Graduate School of Integrated Human Studies, Graduate Student )
- Yoneyama, Aogu ( The United Graduate School of Agricultural Sciences, Ehime University, Graduate Student )
- Mongolia Work Group**
- Fujita, Noboru ( Research Institute for Humanity and Nature (RIHN), Assistant Professor, Group Leader, Ecology Studies for Mongolia )
- Zamba, Batjargal ( Research Institute for Humanity and Nature (RIHN), Foreign researchers invited )
- Oniki, Shunji ( Japan International Research Center for Agricultural Sciences, Senior Research Fellow, Mongolia Agricultural Economy Surveys )
- Kamimura, Akira ( Tokyo University of Foreign Studies, Lecturer, Mongolia Environmental Society Surveys )
- Koda, Ryosuke ( Research Institute for Humanity and Nature (RIHN), Researcher Fellow, Mongolia Biological Resource Surveys )
- Konagaya, Yuki ( National museum of Ethnology, Professor, Mongolia Nomadic Society Surveys )
- Kondo, Junji ( Graduate School of Environmental Science, Okayama University, Graduate Student, Mongolian Land cover Analysis )
- Sugita, Michiaki ( Graduate School of Life and Environmental Sciences, University of Tsukuba, Professor, Mongolia Water Circulation )
- Nachinshonor G.U ( Okayama University Graduate School of Environmental Studies, Assistant Professor, special contract staff, Mongolia Nomadic Society Surveys )
- Hirobe, Muneto ( Graduate School of Environmental Science, Okayama University, Associate Professor, Mongolia Material Circulation )
- Mori, Shinichi ( IMG, NGO organizer, Mongolia local Economy Surveys )
- 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 )
- Wada, Eitaro ( Research Institute for Humanity and Nature (RIHN), Kyoto University, Professor emeritus )
- Shohei, Yoshida ( Graduate School of Science and Technology, Kochi University Graduate School of Integrated Human Studies, Graduate Student )

- Ishikawa, Mamoru ( Research Institute of Environmental Earth Science, Hokkaido University, Associate Professor )
- Kusano, Eiichi ( Japan International Research Center for Agricultural Sciences, Fixed-term researcher )
- Kodama, Kanako ( Chiba University, Faculty of Letters, Associate Professor )
- Tarmiji bin Masron ( University Sains Malaysia, Senior Lecturer )

### ○ Future Themes

Some of major achievements of the project remain to be published. We will write up them as academic papers of books and journals, and present in domestic and international science meetings.

### ● Achievements

#### ○ Books

##### 【 Authored/Co-authored 】

- Ohgushi T, Schmitz OJ, Holt RD 2012, 12 Trait-Mediated Indirect Interactions: Ecological and Evolutionary Perspectives. Cambridge University

##### 【 Chapters/Sections 】

- Ohgushi T 2012, 12 Community-level consequences of herbivore-induced plant phenotypes: bottom-up trophic cascades. Ohgushi T, Schmitz OJ, Holt RD (ed.) Trait-Mediated Indirect Interactions: Ecological and Evolutionary Perspectives. Cambridge University, Cambridge, pp.161-185.
- Ohgushi T, Schmitz OJ, Holt RD 2012, 12 Trait-Mediated Indirect Interactions: Ecological and Evolutionary Perspectives. Ohgushi T, Schmitz OJ, Holt RD (ed.) Cambridge University, Cambridge, pp. 526-529.
- Ohgushi T, Schmitz OJ, Holt RD 2012, 12 Trait-Mediated Indirect Interactions: Ecological and Evolutionary Perspectives. Cambridge University, pp.1-5.
- S. KATO, N. Fujita, and N. Yamamura 2012, 09 A quantitative prediction for ecological and economical sustainability under different scenarios in Mongolian pastoral systems.. Batjargal Z, Fujita N, Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. Ulaanbaatar,, pp.95-102. (in Mongolian)
- Koda R, Amartuvshin S, Amartuvshin N, Fujita N 2012, 09 How much amount of pasture plants does one livestock eat in a day?. Batjargal Z, Fujita N and Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. Ulaanbaatar, pp.243-246.
- Kusano E 2012, 09 Supply and demand for livestock products.. Batjargal Z, Fujita N and Yamamura N (ed.) Pastoralism and ecosystem network in Mongolia. , pp.306-329. (in Mongolian)
- Koda R, Amartuvshin S, Fujita N. 2012, 09 Present status of wild animals: a case study of red deer population in Hustai National Park. Batjargal Z, Fujita N and Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. Ulaanbaatar, pp.247-253.
- Koda R, Amartuvshin S, Amartuvshin N, Fujita N 2012, 09 Soil alkalization by overgrazing can delay the recovery of pastureland. Batjargal Z, Fujita N and Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. Ulaanbaatar, pp.95-102.
- Suzuki, Y 2012, 09 Conflict between mining development and nomadism in Mongolia. Yamamura, N., Fujita, N., Maekawa, A (ed.) The Mongolian Ecosystem Network. Springer, Tokyo., pp.269-294.
- Tsutsumida N., Saizen I. 2012, 09 Land privatization and its spatial expansion. Batjargal Z., Fujita N., Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. ADMON, Mongolia, pp.372-379. (in Mongolian)
- Osono, T. 2012, 07 Fungal disease and the diversity and long-term dynamics of forest communities. María Sol Arias Vázquez and Adolfo Paz Silva (ed.) Environmental Impact and Role in Disease. Nova Science Publishers, New York: USA, pp.173-196.
- Tsutsumida, N., Saizen, I 2012 Land privatization and its spatial expansion. Batjargal, Z., Fujita, N., Yamamura, N. (ed.) Pastoralism and Ecosystem Network in Mongolia. , pp.372-379. (in Mongolian)



- Kato Y, Soda R 2012 Oil Palm Smallholding by Longhouse Villagers in Inland Area Sarawak. *Equatorial Biomass Society* . , pp.1-5.
- Saizen, I. 2012 Changes in livestock species and their spatial distribution. Yamamura, N., Fujita, N., Maekawa, A (ed.) *The Mongolian Ecosystem Network –Environmental Issues Under Climate and Social Changes*. Springer.
- Saizen, I. 2012 Distribution and density of livestock. Batjargal, Z., Fujita N., Yamamura N (ed.) *Pastoralism and Ecosystem Network in Mongolia*. , pp.286-305. (in Mongolian)

## OPapers

### 【Original Articles】

- Nakagawa M, Momose K, Kishimoto-Yamada K, Kamoi T, Tanaka HO, Kaga M, Yamashita S, Itioka T, Nagamasu H, Sakai S, Nakashizuka T 2013,01 Tree community structure, dynamics, and diversity partitioning in a Bornean tropical forested landscape. *Biodiversity and Conservation*. 22 :127-140. DOI:10.1007/s10531-012-0405-0. (reviewed).
- Kishimoto-Yamada K., Hyodo F., Matsuoka M., Hashimoto Y., Kon M., Ochi T., Yamane S., Ishii R. and Itioka T 2012,12 Effects of remnant primary forests on ant and dung beetle species diversity in a secondary forest in Sarawak, Malaysia. *Journal of Insect Conservation* .(reviewed).
- Hagiwara Y, Osono T, Ohta S, Agus W, Hardjono A 2012,12 Colonization and decomposition of leaf litter by ligninolytic fungi in *Acacia mangium* plantations and adjacent secondary forests. *Journal of Forest Research* 17 :51-57. (reviewed).
- Ichie, T., Igarashi, S., Yoshida, S., Kenzo, T., Masaki, T., Ichiro, T. 2012,12 Are stored carbohydrates necessary for seed production in temperate deciduous trees?. *Journal of Ecology* . DOI: 10.1111/1365-2745.12038. (reviewed).
- Nakagawa M, Matsushita M, Kurokawa H, Samejima H, Takeuchi Y, Aiba M, Katayama A, Tokumoto Y, Kume T, Yoshifuji N, Kuraji K, Nagamasu H, Sakai S, Nakashizuka T. 2012,11 Possible negative effect of general flowering on tree growth and aboveground biomass increment in a Bornean tropical rainforest. *Biotropica* 44 :715-719. (reviewed).
- Nakagawa, M. Matsushita M, Kurokawa H, Samejima H, Takeuchi Y, Aiba M, Katayama A, Tokumoto Y, Kume T, Yoshifuji N, Kuraji K, Nagamasu H, Sakai S, Nakashizuka T 2012,11 Possible negative effect of general flowering on tree growth and aboveground biomass increment in a Bornean tropical rainforest. *Biotropica* 44 :715-719. (reviewed).
- Kagata H, Ohgushi T 2012,11 Carbon to nitrogen excretion ratio in lepidopteran larvae: relative importance of ecological stoichiometry and metabolic scaling. *Oikos* 121 :1869-1877. (reviewed).
- Kagata H, Ohgushi T 2012,11 Non-additive effects of leaf litter and insect frass mixture on decomposition processes. *Ecological Research* 27 :69-75. (reviewed).
- Laurance WF, et al. (215 authors in total, Nakagawa M is 155th author, Sakai S 177th) 2012,09 Averting biodiversity collapse in tropical forest protected areas. *Nature* 489 :290-294. (reviewed).
- Gundale M, Hyodo F, Nilsson M.-C. and Wardle D.A. 2012,07 Nitrogen niches revealed through species and functional group removal in a boreal shrub community. *Ecology* 93 :1695-1706. (reviewed).
- Hyodo F., Kusaka S., Wardle D.A., Nilsson M.C. 2012,07 Changes in stable nitrogen and carbon isotope ratios of plants and soil across a boreal forest fire chronosequence. *Plant and Soil* .(reviewed).
- Tanaka HO, Itioka T 2012,07 Effects of a fern-dwelling ant species, *Crematogaster difformis*, on the ant assemblages of emergent trees in a Bornean tropical rainforest. *Annals of the Entomological Society of America* 105 :592-598. (reviewed).
- Kagata H, Ohgushi T 2012,07 Positive and negative impacts of insect frass quality on soil nitrogen availability and plant growth. *Population Ecology* 54 :75-82. (reviewed).
- Handa C, Ueda S, Tanaka H, Itino T, Itioka T 2012,05 How do scale insects settle into the nests of plant-ants on *Macaranga myrmecophytes*? Dispersal by wind and selection by plant-ants. *Sociobiology* 59 :435-446. (reviewed).
- Naoe S, Sakai S, Masaki T. 2012,04 Effect of forest shape on habitat selection of birds in a plantation-dominant landscape across seasons: Comparison between continuous and strip forests. *Journal of Forest Research* 17(2) :219-223. (reviewed).

- Hyodo F, Nishikawa J, Kohzu A, Fujita N, Saizen I, Tsogtbaatar J C, Enkhtuya M, Gantomor D, Amartuvshin N, Ishii R, Wada E. 2012,04 Variation in nitrogen isotopic composition in the Selenga river watershed, Mongolia. *Limnology* 13 :155-161. (reviewed).
- Tanaka S, Lattirasuvan T, Sritulanon C, Iwasaki K, Sakurai K. 2012 Soil fertility status under various types of upland farming in northern Thailand. Case study of a village located in a mixed deciduous forest. *ペドロジスト* 56 :2-12. (reviewed).
- Tanaka S. 2012 Influence of Burning Practice in Shifting Cultivation under Different Climates on Nutrient Dynamics. *ペドロジスト* 55 :403-414. (reviewed).
- Hiromi, T., Ichie, T., Kenzo, T., Ninomiya, I 2012 Interspecific variation in leaf water use associated with drought tolerance in four emergent dipterocarp species of a tropical rain forest in Borneo. *Journal of Forest Research* 17 :369-377. (reviewed).

## ○Research Presentations

### 【Oral Presentation】

- Soda R, Kato Y Impacts of oil palm smallholdings on rural-urban household economy: a case in Bintulu, Sarawak. International Workshop on "The Last Oil palm Frontier: Oil palm Smallholders and the Emerging Socio-economic Landscape of Rural Sarawak", December 2012, Kuching, Malaysia.
- Koda R. Relationship between livestock and pasture in Mongolia. RIHN 7th International Symposium "Complexification and Simplification: Ecosystems, human health and lifestyle in Asia", 2012,10,24-2012,10,26, Kyoto, Japan..
- S. Kato, N.Fujita and N.Yamamura. Quantitative comparison of sustainability between nomadic and sedentary system in Mongolian pasture.. International Symposium "Complexification and Simplification: Ecosystems, human health and lifestyle in Asia", 2012,10,24, Kyoto, Japan.
- Takano Takenaka Kohei, Itioka Takao, Nakagawa Michiko, Kishimoto-Yamada Keiko, Yamashita Satoshi, Tanaka O. Hiroshi, Tokumoto Yuji, Fukuda Daisuke, Kamoi Tamaki, Kato Yumi, Nagamasu Hidetoshi, Ichikawa Masahiro, Momose Kuniyasu, Nakashizuka Tohru, and Sakai Shoko. Land use change and loss of biodiversity in Sarawak, Malaysian Borneo. 第7回地球研国際シンポジウム 複雑化・単純化するアジア 生態系、ひとの健康と暮らし, October 2012, 京都, 日本.
- Kato Y. Interaction of human activities and ecological resources: Focusing on the change of people's living environment in Malaysia. RIHN 7th International Symposium, October 2012, Kyoto, Japan.
- Koda R. Relationship among livestock grazing, pasture plants, and soil alkalization. International Symposium "Pastoralism and Ecosystem Network in Mongolia", 2012,09,11, Ulaanbaatar, Mongolia.
- S. Kato, N.Fujita and N.Yamamura. Quantitative comparison of sustainability between nomadic and sedentary pastoralism after 30 years in Mongolia. International Symposium "Pastoralism and Ecosystem Network in Mongolia", 2012,09,11, Elite Center, Ulaanbaatar, Mongolia.
- Kusano E Supply and demand for livestock products. Nature and Society with a pastoralism: Ecosystem network in Mongolia, September 2012, , Ulaanbaatar, Mongolia.
- Sakai S Research on tropical forests in Sarawak, Malaysia: Toward understanding the ecosystems and social-ecological systems. International Symposium "Southeast Asian Tropical Rain Forest Research, related with Climate Change and Biodiversity", September 2012, Tokyo, Japan.
- Saizen I. Modelling the spatial distribution of livestock population by GIS in Mongolia.. International Symposium "Pastoralism and Ecosystem Network in Mongolia, September 2012, Ulaanbaatar, Mongolia.
- Koda R. Function of deer as a driver of forest vegetation in the evergreen broad-leaved forests on Yakushima Island. The 55th Symposium of IAVS (International Association for Vegetation Science), 2012,07,23-2012,07,28, Mokpo, Republic of Korea.
- Paing TN, Tui LC, Abdu A, Sakurai K, Tanaka S. Soil characteristics in an oil palm field, Central Pahang, Malaysia with special reference to micro management site and slope Position. 日本熱帯生態学会, June 2012, 横浜.
- Soda R, Kato Y. Potentiality of oil palm smallholdings in rural communities in Bintulu, Sarawak. International Seminar on Riverine Society, June 2012, Kuching, Malaysia.

- Kato Y. Socio-economic impacts of oil palm industry on rural communities in Sarawak, Malaysia. The 11th Borneo Research Council Conference, June 2012, Bandar Seri Begawan, Brunei.

**【Poster Presentation】**

- S. KATO, N. Fujita, and N. Yamamura. Quantitative comparison of sustainability between Nomadic and Sedentary System in Mongolian Pasture. The International Forum on Ecosystem Adaptability IV, “Interface Between Science and Policy” , 2012,12,13, Sendai, Japan.
- Hideyuki Doi and Satoshi Kato. Indicators to evaluate trophic-niche aggregation in a food web and population using stable-isotope biplot space. the ASLO Aquatic Sciences Meeting 2012, 2012,07,12, Otsu, Japan.

**Stage: Full Research**

**Project No.: D-05**

**Project Name: Coastal Area Capability Enhancement in Southeast Asia**

**Abbreviated Title:**

**Project Leader: ISHIKAWA Satoshi**

**Research Axis: Diversity**

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

**Key Words: Southeast Asia, Coastal Area, Fisheries Resource Management, Rural Development, QoL**

---

### **○ Research Subject and Objectives**

We try to make new research frameworks and approaches for harmonizing between ecosystem health conservation and improving QOL (Quality of Life) in Southeast Asian coastal area, based on the detailed case studies conducted by the collaboration of local society, government, and researchers. Then, we would like to publish guidelines for consensus building that can achieve effective adaptive management of coastal ecosystem services.

There is growing concern for marine ecosystems and resources. Coastal area ecosystems in particular have been deteriorating rapidly, as they are often affected by environmental change and intensive human activity both on land and at sea. This interdisciplinary project investigates the complexity of coastal ecosystem health in relation to human use in tropical Southeast Asia.

Coastal area ecosystem services are indispensable for rural people, but also easily damaged by human use. Many coastal areas with high biodiversity and biological production are located in tropical zones of developing countries, as is the case in Southeast Asia. In such areas, ecosystem services, local livelihood and culture are closely related, but no clear research methods have been established to evaluate coastal ecosystem health in relation to human uses and needs. Resource management methods commonly used in temperate regions tend to target single ecologies and commercial resources with little consideration of how multiple ecologies and livelihood strategies overlap in culturally diverse contexts, and so cannot be easily applied to tropical coastal areas.

In this project, we conduct survey and compile various data and information regarding the coastal ecosystem health and service, besides, we compile the utilization situation and importance of the ecosystems for local people from various point of views, e.g. economical, traditional, food safety, job opportunity, etc. Then we propose a new concept for evaluation of rural development named "Area Capability" based on the linkages between human and nature. Under the Area Capability concept, close linkage between natural resources and/or capitals and human holding high conservation concern receive high acclaim. And a huge variety of natural resource uses and livelihoods also win raves. Wide use of this Area Capability concept for develops planning in worldwide, we expect the harmonization between conservation and rural development will be promoted with human welfare building.

### **Project Framework**

This project develops a holistic concept of area capability to permit consideration of the socio-ecological dynamics and tradeoffs in rural coastal area development. Natural science methods identify key factors maintaining ecosystem health and services, or what we call ecosystem capability. Social and anthropological methods are used to describe patterns of resource use and how they may be linked to improvements in local livelihoods, or social and human capability. Field research is based on collaboration with local people and governmental institutions. In combination, such considerations can serve as a guide for sustaining biocultural diversity in tropical coastal area development.

The concept of area capability was presented at the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 (June 2011, Bangkok), and at seminars in the Philippines of researchers from Kagoshima University, Research Institute for Humanity and Nature, UPV and SEAFDEC in 2011 and 2012. These events have allowed us to develop the concept in dialogue with members of local institutions and fishery departments in ASEAN countries, as well as in the Food and Agriculture Organization, World Wildlife Federation, among others.

This project is based on the joint research efforts of Southeast Asian Fisheries Development Center (SEAFDEC), Faculty of Fisheries of Kasetsart University, the University of the Philippines Visayas (UPV), and Japanese researchers who are members of the RIHN project. Aklan State University and Eastern Marine Fisheries Research and Development Center of Department Fishery, Thailand, are active participants as well. Through this collaboration, we can realize “area capability” and to generate a new approach toward rural development based on the harmonization between ecosystem health conservation and improvement of local people’s quality of life. .

#### Future tasks

Underway since 2012, we will examine coastal area resources, ecosystem services and communities in the Rayong area of Thailand, Panay Island in Philippines, and in Ishigaki Island and Mikawa Bay, Japan as full research. Local ecosystem primary productivity, material cycles, and food webs will be analyzed. The project will also examine the present state, fluctuation and migration of important biotic resources, and will develop equipment for such measurement as necessary.

Social research will investigate economic activities, including distribution and pricing mechanisms, working conditions, local culture and customs as they inform livelihood strategies, and health and disaster measures and resilience. A set-net fishery and the sale of seafood by local fishery groups will be researched in the Rayong area of Thailand, as will a fish farming enterprise in Batan Bay, Philippines, in order to describe the full effect of such endeavors on local environments and livelihoods, and to better inform effective resource management in these areas.

In total, this project aims to clarify the most salient local issues, constraints and opportunities that define the area capability of coastal tropical regions. A process of continual feedback of such data will deepen dialogue with local people and governmental institutions and is expected both to improve project research and support ecologically sound local and regional development.

Ecosystem service are indispensable for rural people, and it is fostered by high biodiversity and primary productivity though these are deteriorated by intensive human use. This project aims to solve this dilemma using a new concept of development named “Area Capability”, based on the actual relationships between ecosystem health and human utilization in the coastal areas of Southeast Asia.

Consolidated database regarding the livelihood of the local people and resource utilization is established through interdisciplinary field 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 2012

As FRI for this project without PR study, identifying the geographical area based on the ecosystem survey data, establishment and strengthen the human network for multidisciplinary study at study areas are set for the main targets for this year. As a first step, we compiled existing data and information through field surveys and meetings.

#### Outcomes and activities

We held a general meeting and three times core member meeting for discussion of research plan based on data, information ideas exchanges. And we set up 4 groups important themes, Fishery group, Biodiversity group, Environment group, Social group, and 3 groups for collaboration studies, Set-net group, Stock enhancement group, Island group, and management group.

Fishery group developed new questionnaire for fishing gear and operation based on the field survey in Thailand and Philippines. And this group compiled four years statistical data (1990, 1999, 2006, 2012) and former researches on fishery in Panaly Is. Philippines. Besides, daily fishery activity reports (Log-book) data were collected from 9 fishermen in Rayong, Thailand and 3 fishermen in Miyagao Philippines.

Biodiversity group established sample management system in Philippine University Museum and collaboration network with Thailand National Museum for sample store. And, this group collected 168

individuals in 21 species from Thailand and 122 inds. In 12 specimen for taxonomic and genetic analyses. Besides, 48 tuna can from 8 ASEAN countries for species identification using genetic analysis.

Environmental group collect water, sediment, fish mangrove samples from Thailand (241), Philippines (489), Vietnam (24) and Japan (Mikawa Bay)(48). Metal pollution and material flow analyses are conducting using these samples.

Social group developed a research manual and questionnaires for coastal village survey, based on the data and information of preliminary survey on Panay Is. In Philippines, and Rayong in Thailand. Using these questionnaires, 461 households data from Panay Is. In Philippines, 12 households data from Rayong in Thailand were collected. Besides, the linkage and conflict between tourism and fishermen were observed in Thailand and Isigaki Is. Based on the interview survey and anthropologic survey.

Set-net group has been conducted the Japanese Type community-based Set-net installation in Rayong in Thailand for ten years. This group collected data of fishery catch, operation, households activities, transportation of fish catch, value chain of fishery product, through the collaboration with set-net fishermen.

Stock enhancement group held group meeting with the local communities, local government and collaborative research institutes around Batang Bay in Philippines, where we are planning to conduct release works of shrimp. The time schedule of release work was settled and seeds of shrimp for release works can be obtained from local hatchery.

Island group conduct field survey of natural resource utilization in coral reef and archeological remains survey around Ishigaki Is.. Besides, this group collected environmental samples e.g. water, soil, fish, plants for stable isotope analysis in Ishigaki Is.. A town seminar for marine resource utilization for Ishigaki development in Ishigaki Is.. Through this seminar, existing data and information were collected and human network of local people and researchers was developed. And concern points of conservation and rural development of local people were discussed.

### OProject Members

- ◎ ISHIKAWA Satoshi ( Research Institute for Humanity and Nature, Associate Professor, General Management )
- MIYATA, Tsutomu ( National Research Insitute of Fisheries Science, Fisheries Research Agency, Head of Fisheries Socioeconomics Group, Social Group Leader )
- ARIMOTO, Takafumi ( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Professor, Set-net Group Leader )
- KAWADA Makito ( School of Contemporary Sociology, Chukyo University, Professor, Social Group Sub-leader )
- KUROKURA Hisashi ( Graduate school of Agricultural and Life Sciences, The University of Tokyo, Professor, Stock Enhancement Group Leader )
- IKEMOTO Yukio ( Instetute for Advanced Studies on Asia, The University of Tokyo, Professor, Theory Group, Capability )
- KOUNO Yasuyuki ( Center for Southeast Asian Studies, Kyoto University, Professor, Theory Group, Index )
- SIMIZU Hiromu ( Center for Southeast Asian Studies, Kyoto University, Director, Theory Group, Philippines study )
- KANZAKI Mamoru ( Graduate School of Agriculture, Kyoto University, Associate Professor, Environmental Group, Sub-leader )
- NAKAYAMA Kouji ( Graduate School of Agriculture, Kyoto University, Assistant Professor, Biology Group, Genetic Anaysis )
- MUTOU Nozomu ( Research Institute for Humanity and Nature, RA, Biology Group, Genetic Anaysis )
- TAKAHASHI Hiroshi ( National Fisheries University, Assistant Professor, Biology Group, Genetic Anaysis )
- NISHIDA Mutsumi ( University of the Ryukyus, Vice President, Biology Group, Genetic Anaysis )
- BABA Osamu ( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Professor, Set-net Group Supply Chain )
- MATSUOKA Tatsuro ( Fuculty of Fisheries, Kagoshima University, Professor, Theory Group, Philippines study )
- MOTOMURA Hiroyuki ( The Kagoshima University Museum, Professor, Biology Group, Taxonomy )
- YAMADA Yoshihiko ( School of Marine Science and Technology, Tokai University, Professor, Ishigaki Group, Leader )

- YOSHIKAWA Takashi ( School of Marine Science and Technology, Tokai University, Associate Professor, Environmental Group, Leader )
- MUTOU Fumihito ( School of Marine Science and Technology, Tokai University, Associate Professor, Biology Group, Leader )
- NOHARA Kenji ( School of Marine Science and Technology, Tokai University, Assistant Professor, Biology Group, Genetic Anaysis )
- MATSUURA Hiroyuki ( School of Marine Science and Technology, Tokai University, Associate Professor, Mikawa Group, Plankton )
- SAKAGAMI Norimitsu ( School of Marine Science and Technology, Tokai University, Associate Professor, Ishigaki Group, Device development )
- Ly Yinji ( School of Marine Science and Technology, Tokai University, Assistant Professor, Ishigaki Group, Social Survey )
- ONO Rintarou ( School of Marine Science and Technology, Tokai University, Assistant Professor, Ishigaki Group, archaeological study )
- NIKI Masato ( School of Marine Science and Technology, Tokai University, Associate Professor, Mikawa Group, Coastal engineering )
- KAWASAKI Ippei ( School of Marine Science and Technology, Tokai University, Professor, Mikawa Group, Antholopology )
- KOBAYASHI Takahiro ( School of Marine Science and Technology, Tokai University, Assistant Professor, Social Group, Antholopology )
- NAKANO Takanori ( Research Institute for Humanity and Nature, Professor, Environmental Group, Stable Isotope analysis )
- AKIMICHI Tomoya ( Research Institute for Humanity and Nature, Emeritus Professor, Theory Group, Commons )
- HORI Mina ( Research and Education Faculty, Multidisciplinary Science Cluster, Kuroshio Science Unit, Kochi University, Assistant Professor, Social Group, Small Scale Fishery )
- KOYAMA Jirou ( Faculty of Fisheries, Kagoshima University, Professor, Environmental Group, Pollution )
- NISHI Takaaki ( Faculty of Fisheries, Kagoshima University, Associate Professor, Fishery Group, Sub-leader )
- ISHIZAKI Munechika ( Faculty of Fisheries, Kagoshima University, Associate Professor, Fishery Group, Payao )
- ANRAKU Kazuhiko ( Faculty of Fisheries, Kagoshima University, Associate Professor, Fishery Group, Philippines study )
- EBATA Keigo] ( Faculty of Fisheries, Kagoshima University, Associate Professor, Fishery Group, Thailand study )
- KOTANI Tomonari ( Faculty of Fisheries, Kagoshima University, Associate Professor, Stock Enhancement Group, Aquaculture technology )
- OGIHARA Gouta ( The United Graduate School of Agricultural Sciences, Kagoshima University, Graduate Student, Biology Group, Taxonomy )
- MATSUNUMA Mizuki ( The United Graduate School of Agricultural Sciences, Kagoshima University, Graduate Student, Biology Group, Taxonomy )
- MEGURO Masatoshi ( The United Graduate School of Agricultural Sciences, Kagoshima University, Graduate Student, Biology Group, Taxonomy )
- YOSHIDA Tomohiro ( The United Graduate School of Agricultural Sciences, Kagoshima University, Graduate Student, Biology Group, Taxonomy )
- NISHIYAMA Hajime ( The United Graduate School of Agricultural Sciences, Kagoshima University, Graduate Student, Biology Group, Taxonomy )
- ICHINOSAWA Junpei ( Depatment of International Studies, Miyagi Gakuin Women's University, Associate Professor, Social Group, Tourism )
- TAKEDA Seiichi ( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Professor, Set-net Group, Vessel survy )
- MIYAMOTO Yoshinori ( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Associate Professor, Acoustic Group, Leader )
- TAKAGI Akira ( Research Institute for Humanity and Nature, Senior Project Researcher, Management, Sub-leader, Philippine study )
- OGAWA Hisashi ( Global Collaboration Center, Osaka University, Assistant Professor, Social Group, Thailand study )
- YAP Minlee ( Research Institute for Humanity and Nature, Project Researcher, Management, Thailand Study )
- OKAMOTO Yuuki ( Research Institute for Humanity and Nature, Project Researcher, Management, Environmetal study )

- MABUCHI Kouji ( Atmosphere and Ocean Research Institute, The University of Tokyo, Assistant Professor, Biology Group, Genetic Anaysis )
- TAKESHIMA Hirohiko ( Graduate school of Agricultural and Life Sciences, The University of Tokyo, Assistant Professor, Biology Group, Genetic Anaysis )
- OGATA Yuka ( Graduate School of Frontier Sciences, The University of Tokyo, Project Researcher, Stock Enhancement Group, Aquaculture technology )
- YAMIYAMA Ryutaro ( Graduate school of Agricultural and Life Sciences, The University of Tokyo, Graduate Student, Social Group, Philippines study )
- WATANABE Kazuya ( Faculty of Agriculture, Yamagata University, Associate Professor, Environmental Group, Bandon Bay study )
- KAWABATA Zenichiro ( Research Institute for Humanity and Nature, Emeritus Professor, Environmental Group, Micro-organisms )
- KUDOU Takatsugu ( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Graduate Student, Set-net Group, Economic analysis )
- KON Koetsu ( Faculty of Life and Environmental Sciences, University of Tsukuba, Assistant Professor, Environmental Group, Food Web analysis )
- OGAWA Yuuya ( Graduate School of Agriculture, Kyoto University, Graduate Student, Environmental Group, Mangrove study )
- TAKAHASHI Soyo ( Okinawa University, Project Researcher, Social Group, Okinawa study )
- SATO Tetsu ( Research Institute for Humanity and Nature, Professor, Theory Group, Research Flaming )
- FUSHIMI Hiroshi ( Fukuyama University, Professor, Stock Enhancement Group, Planing and Monitering )
- Jon Altamirano ( Aquaculture Department, Southeast Asian Fishereis Development Center (Philippines), Researcher, Stock Enhancement Group, Planing and Monitering )
- Ratana Munprasit ( Easten Marine Resource Development Center (Thailand), Director, Set-net group, Rayong area study )
- Monton Anongponyoskun ( Faculty of Fisheries Kasetsart University (Thailand), Assistant Professor, Acoustic Group, Thailand Study )
- Anukorn Boutson ( Faculty of Fisheries Kasetsart University (Thailand), Associate Professor, Fishery Group, Thailand study )
- Jintana Salaenoi ( Faculty of Fisheries Kasetsart University (Thailand), Assistant Professor, Environmental Group, Thailand Study )
- Methee Kaewnern ( Faculty of Fisheries Kasetsart University (Thailand), Assistant Professor, Social Group, Thailand study )
- Suriyan Tunkijjanukij ( Faculty of Fisheries Kasetsart University (Thailand), Dean, Management, Thailand Study )
- Prachya Musikasinthorn ( Faculty of Fisheries, Kasetsart University (Thailand), Assistant Professor, Biology Study, Taxonomy in Thailand )
- Somboon Siriraksophon ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Seniore Researcher, Management, Thailand Study )
- Sumitra Ruangsivalul ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Researcher, Social Group, Thailand study )
- Yuttana Theparoonrat ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Seniore Researcher, Acoustic Group, Thailand Study )
- Isara Chanrachkij ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Researcher, Fishery Group, Thailand study )
- Iaweekiet Amornpiyakrit ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Researcher, Set-net Group, Thailand Study )
- Somnuk Pornpatimakorn ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Seniore Researcher, Biology Group, Taxonomy in Thailand )
- Penchan Laongmanee ( Training Department, Southeast Asian Fisheries Development Center (Thailand), Researcher, Fishery Group, Thailand study )
- Nathaniel C. Anasco ( University of Philippines Visayas (Philippines), Assistant Professor, Environmental Group, Philippines study )
- Harold M. Monteclaro ( University of Philippines Visayas (Philippines), Professor, Fishery Group, Philippines study )
- Gerald Qunitio ( University of Philippines Visayas (Philippines), Professor, Biology Group, Philippines study )
- Ricardo Babaran ( University of Philippines Visayas (Philippines), Professor, Management, for Philippines study )
- Alice Ferrer ( University of Philippines Visayas (Philippines), Associate Professor, Social Group, Philippines study )



UCHIDA Keiichi	( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Assistant Professor, Acoustic Group, Coastal Measurement )
KATAGIRI Chiaki	( Okinawa Prefectural Museum and Art Museum, Curator, Ishigaki Group, Historical science )
HASEGAWA Kouhei	( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Graduate Student, Acoustic Group, Telemetry )
SATO Takashi	( National Museum of Nature and Science, Project Researcher, Biology Group, Genetic Analysis )
NAKAHARA Naotomo	( Graduate School of Marine Science and Technology, Tokyo University of Marine Science and Technology, Associate Professor, Social Group, Socio-economic analysis )
IKEJIMA Kou	( Research and Education Faculty, Natural Sciences Cluster, Agriculture Unit, Kochi University, Associate Professor, Environmental Group, Mangrove study )
Mae Grace Gareza NILLOS	( Department of Chemistry, University of Philippines Visayas (Philippines), Associate Professor, Environmental Group, Material Flow analysis )
OOSAKA Emi	( Research Institute for Humanity and Nature, Office staff, Accountant )

### ○ Future Themes

The data and information collection of governmental institution and regulation for resource management and land use are bit late. Stable isotope analyses and genetic analyses are also bit late, due to the difficulty for the transportation of samples to RIHN. Interview surveys on the tourists and local people of Ishigaki Is. have not been conducted yet. And Index making of Area Capability has just started in the end of fiscal year.

Institution and regulation information collection will be done as soon as possible by the researcher who is in charge of this theme. Material and genetic analysis are facilitated by the environment and biodiversity groups. Interview survey in Ishigaki Is. will be conducted in next August in collaboration with Ishigaki City government and local community. Index making will be done through workshops which are held in this year. We plan 3 or 4 times workshop in this matter.

### ● Achievements

#### ○ Books

##### 【 Authored/Co-authored 】

- MUNPRASIT Aussanee, AMORNPIYAKRIT Taweekiet, YINGYUAD Weerasak, ARIMOTO Takafumi 2012, 11 Enhancing Community-based Management through Set-net Fisheries: A regional Fishery Collaborative Venture.. Fish For the people, , 10. SEAFEC, Bangkok, Thailand, 21pp. ISSN:1685-6546.

#### ○ Editing

##### 【 Editing / Co-editing 】

- MOTOMURA, H. and ISHIKAWA S. (ed.) 2013, 02 Fish collection building and procedures manual. English edition. Kagoshima University Museum and the Research Institute for Humanity and Nature, Kagoshima Prefecture, and Kyoto Prefecture, 70pp.

#### ○ Papers

##### 【 Original Articles 】

- ONO Rintaro, KATAGIRI Chiaki, SAKAGAMI Norimitsu, KAN Nobuhiro, MIYAGI Hiroki, and YAMAMOTO Yuji 2013, 03 Research and Future Prospects of Maritime Cultural Heritages in Yaeyama Islands, Okinawa: Preliminary Report of research at Yarabe Under-water site in Ishigaki Island. . The Bulletin of the Yaeyama Museum 22 :20-24. (reviewed).
- MOTOMURA Hiroyuki, HASHIMOTO Tsukasa, NISHIYAMA Kazuhiko 2012, 12 Record of *Oxycheilinus orientalis* (Labridae) from Amami-oshima Island, Ryukyu Islands, with notes on distributional implication and habitats in Japanese waters. Bulletin of the Biogeographical Society of Japan 67 :75-80.

- MOTOMURA, H., KANEHIRA N. and IMAMURA H 2012,11 Redescription of a poorly known southeastern Pacific scorpionfish (Scorpaenidae), *Phenacoscorpius eschmeyeri* Parin and Mandrytsa. *Species Diversity* 17(2) :145-150. (reviewed).
- MOTOMURA, H., R. CAUSSE and STRUTHERS C. D. 2012,11 *Phenacoscorpius longilineatus*, a new species of deepwater scorpionfish from the southwestern Pacific Ocean and the first records of *Phenacoscorpius adenensis* from the Pacific Ocean (Teleostei: Scorpaenidae). *Species Diversity* 17(2) :151-160. (reviewed).
- MOTOMURA, H. and PERISTIWADY T. 2012,09 First equatorial records of *Neosebastes entaxis* and *N. longirostris* (Scorpaeniformes: Neosebastidae) from northern Sulawesi, Indonesia. *Biogeography* 14 : 31-36. (reviewed).
- KUROKURA Hisashi, TAKAGI Akira, SAKAI Yutaro, YAGI 2012,06 TUNA GOES AROUND THE WORLD ON SUSHI.. *Aquaculture Economics & Management* 16(2) :155-166. (reviewed).
- TAKAGI Akira, OGATA Yuka, TANAKA Hironori, KUROKURA Hisashi, NAKAMURA Satoshi. 2012,06 Processing methods of traditional freshwater fish food in Lao P.D.R- View acculturation of Laotian food culture from homely food in Vientiane-. *Journal of international cooperation for agricultural development* 12 :26-33. (in Japanese) (reviewed).
- ISHIKAWA Satoshi 2012,05 Efforts of the Steering Committee for the Colloquium on Fishing Technology for reconstruction assistance of the earthquake disaster.. *Nippon Suisan Gakkishi* 78(3) :488-488. (in Japanese) Special public symposium: "Fisheries in the stricken area of the Great East Japan Earthquake and restoration of Fishing villages" .
- MOTOMURA H., YAMASHITA M., ITOU M. I, HARAGUCHI Y. and IWATSUKI Y. 2012,04 First records of the Two-tone Goatfish, *Upeneus guttatus*, from Japan, and comparisons with *U. japonicus* (Perciformes: Mullidae).. *Species Diversity* 17(1) :7-14. (reviewed).
- OKAMOTO Yuki, TANAKA Ueru, MIZUNO Kei, LE Van An 2012,04 Spatial Transition of Fishery Activities in Sam-An Truyen Lagoon, Central Vietnam.. *Journal of the Japanese Agricultural Systems Society* 28(2) : 63-71. (reviewed).

## ○Research Presentations

### 【Oral Presentation】

- ISHIKAWA Satoshi, YOSHIKAWA Takashi, MATSUURA Hiroyuki, NIKI Masahito, TAGUCHI Rie, ISHIKAWA Kaneo, SUZUKI Satoshi Database development for coastal biodiversity and environment of Hazu coastal area in Mikawa bay, Japan No.3 - Environmental education based on fisheries information. The 2011 spring meeting of the Japanese Society of Fisheries Science, 2013,03,28-2013,03,31, Tokyo University of Marine Science and Technology, Minato-ku Tokyo. (in Japanese)
- HAYASE Yoshimasa, TANEKURA Toshiyuki, SHAKEMA Taro, MATSUNAGA Yasuyuki, YOSHIKAWA Takashi, MATSUURA Hiroyuki, ISHIKAWA Satoshi Database development for coastal biodiversity and environment of Hazu coastal area in Mikawa bay, Japan No.4 - Shellfishery fauna in the tidal zone. The 2011 spring meeting of the Japanese Society of Fisheries Science, 2013,03,28-2013,03,31, Tokyo University of Marine Science and Technology, Minato-ku Tokyo. (in Japanese)
- EBATA Keigo, BOUTSON Anukorn, KUDOH Takatsugu, ARIMOTO Takafumi, CHNRACHKIT Isara Small scale coastal fisheries in Rayong, Thailand. The Japanese Society of Fisheries Science Spring Meeting 2013, 2013,03,26-2013,03,30, Minato, Tokyo. (in Japanese)
- KUDOH Takatsugu, ARIMOTO Takafumi, BABA Osamu, EBATA Keigo, BOUTSON Anukorn, MUNPRASIT Aussanee , MANAJIT Nopporn Operation System Analysis of setnet in Rayong, Thailand, from the view point of cost-profit simulation with fuel consumption assessment. The Japanese Society of Fisheries Science Spring Meeting 2013, 2013,03,26-2013,03,30, Minato, Tokyo. (in Japanese)
- EBATA Keigo, BOUNTSON Anukorn, KUDO Takatsugu, ARIMOTO Takafumi, CHANRACHKIT Isara Field study of small scale fishery in Rayong, Thailand.. The 2013 spring meeting of the Japanese Society of Fisheries Science, 2013,03,26-2013,03,30, Tokyo University of Marine Science and Technology, Minato-ku Tokyo. (in Japanese)

- KAMIYAMA Ryutaro, MIYATA Tsutomu, KUROKURA Hisashi, ISHIKAWA Satoshi. Quantitative impact analysis of social capitals on incentives of fisheries management in coastal area of developing country, A case study in Batan bay, Philippines. . The 2013 spring meeting of the Japanese Society of Fisheries Science, 2013,03,26-2013,03,30, Minato-ku Tokyo. (in Japanese)
- KUDO Takatsugu, ARIMOTO Takafumi, BABA Osamu, EBATA Keigo, BOUNTSON Anukorn, MUNPRASIT Aussanee, MANAJIT Nopporn Impact analysis of set-net fishery installation into Thailand on fishermen incomes and environment.. The 2013 spring meeting of the Japanese Society of Fisheries Science, 2013,03,26-2012,03,30, Tokyo University of Marine Science and Technology, Minato-ku Tokyo. (in Japanese)
- SIMIZU Hiromu Hybrid Creation of a Subsistence Culture: Quilt-Making on Caohagan Island, Philippines. International Conference on “Plural Coexistence and Sustainability: Asian Experiences in Interdisciplinary Perspectives,” jointly sponsored by CSEAS and School of Humanities and Social Sciences, Nanyang Technological University,, 2013,03,11-2013,03,12, HSS Conference Room, Kyoto.
- KONO Yasuyuki A Sustainable Humansphere Approach to Southeast Asian Studies. . International Conference on Plural Coexistence and Asian Sustainability: Asian Experiences in the Interdisciplinary Perspectives,, 2013,03,11-2013,03,12, Singapore.
- MIYATA Tsutom Practical extraction method of fisher’s household and data collection precaution,. Regional workshop on improvement of fisheries information collection in coastal small-scale and inland fisheries of the Southeast Asia, 2013,01,28-2013,01,30, Bangkok, Thailand.
- HORI Mina Collecting small-scale inland fisheries data, case study from Cambodia. Regional workshop on improvement of fisheries information collection in coastal small-scale and inland fisheries of the Southeast Asia, 2013,01,28-2013,01,30, Bangkok, Thailand. .
- MIYATA Tsutom Data collection method of fish catch-The case of fisher’s association in Japan-. Regional workshop on improvement of fisheries information collection in coastal small-scale and inland fisheries of the Southeast Asia, 2013,01,28-2013,01,30, Bangkok, Thailand. .
- MIYAMOTO Yoshinori, MATSUSHITA Souichiro, UCHIDA Keiichi, THEPAROONART Yuttana, ANONGPONYOSKUN Monton, ISHIKAWA Satoshi, YAP Minlee, SASAKURA Toyoki Carrying knowledge into new fields: Trial of acoustic surveys in coastal shallow area. Asian Fisheries Acoustics Society, 2012, 2012,11,26-2012,11,27, Busan, Republic of Korea.
- MOTOMURA H Surveys on the diversity of Southeast Asian marine and freshwater fishes in the past seven years. International Symposium of ITP, Conservation of biodiversity in the tropical Asia, 2012,11,09-2012,11,09, Kagoshima, Japan.
- TAKAGI Akira, ISHIKAWA Satoshi, OGAWA Hisashi, MUTO Fumihito Possibility of canned Tuna species identification. The 2012 autumn meeting of the Japanese Society of Fisheries Science., 2012,09,14-2012,09,17, National Fisheries University in Shimonoseki, Yamaguchi, Japan. (in Japanese)
- MOTOMURA Hiroyuki Taxonomic study of fish in Indo-Pacific Oceans . The 48th annual meeting of The Japanese Society of Systematic Zoology, 2012,06,10-2012,06,10, Toho University in Funabashi, Chiba, Japan. (in Japanese)

#### **【Poster Presentation】**

- KON Koetsu, TONGNUNUI Prasert, KAWAMURA Tomohika, KUROKURA Hisashi Do allochthonous inputs represent an important food resource for benthic macrofaunal communities in estuarine mudflats?.. The First Asian Marine Biology Symposium, 2012, 2012,12,13-2012,12,17, Phuket, Thailand.
- HAYASE Yoshimasa, TANEKURA Toshiyuki, MATSUNAGA Yasuyuki, HASEGAWA, YAMAZAKI, NOBA, KAMIYA, YOSHIKAWA Takashi Life cycle and morphological features of *Lacuna (Lacuna) carinifera* (A.. The 2012 annual meeting of the malacological society of Japan, 2012,04,14-2012,04,14, Tokyo Kasei Gakuin University in Chiyoda-ku, Tokyo. (in Japanese)

**Stage: Full Research**

**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, filariasis, water-borne diseases, tropical monsoon Asia**

---

### **○ Research Subject and Objectives**

We naturally and naively think that both environment and health are important. We imaginably and instinctively know that they are mutually linked positively; good health is being sustained by sound environment, and sound environment is indispensable for good health. But, the contrary happened in the past if we see the phenomena in the global level as shown below. The profound issue of "global health and global environment" is the lack of novel health concept suitable for the era of global environmental changes. We are stuck in the 20th century's health and development model. This RIHN project would like to propose "ecohealth" as the novel concept of environment and health for the future relation of humanity and nature.

In the last 200 years or so, especially in the 20th century, human health and hygiene indicators such as life expectancy and sanitation coverage improved dramatically (Riley, 2001), while the global environment has been deteriorated under the name of "development". Life expectancy is longer in the developed countries than the developing (or under-developed) countries, whereas ecological footprint or burden to the local, regional, and global environment is much bigger in the developed countries. According to the 20th-century's health and development model, development was thought as the solution for ill-health and poor hygiene. In this model, to be developed, to be industrialized, to be market-oriented, to be rich, to be clean, and to be healthy are thought as the inseparable, achievable and desirable goal, progress, and virtue for the human society as well as for the human life.

Innovation in science and technology, especially in the medical field, promoted this model. The modern health concept, that health is scientifically and objectively measurable, thus universal, pervaded. With the modern health concept, people started to be aware of their health, and put the value on it. Diseases became the problem which should be treated scientifically by trained specialist. Laymen were not allowed to raise objections against the decision of specialists. Then, the medical-oriented approach dominated the national and international health realm. Even the "Health for All by the Year 2000" and the "Primary Health Care (PHC)" advocated by World Health Organization (WHO) and UNICEF rely too much on the universal medical measures. The world believed that there is the universal and common goal of human health, and that the measures to attain it should be same. Control of infectious diseases such as malaria and filariasis was conducted by the standardized method all over the world. The medical-oriented approach based on the modern health concept was very successful in some parts and less successful in other aspects and areas. The outcome is the present world health situation.

While we (or some of us) are enjoying prosperity and health, there are large and ever-widening health divide/gap between rich and poor countries, and between rich and poor people within a country. To make things worse, the medical-oriented approach, being once thought as successful in the well-off countries, started to be less successful. With the demographic and societal changes, medical expense is rapidly increasing, and the medical service provision system is no more sustainable without further economic development. Should we count on further economic development? Does wealth enhance health in developed countries? The effect seems doubtful, witnessing the worldwide pandemic of obesity and other lifestyle-related diseases.

Limitation of the 20th-century's health and development model is now well-recognized. It does not pay attention to the environmental costs. It does not have the long-term sustainable view of the global level. Facing with the global environmental change (GEC), we need to change our way of life to mitigate GEC and adapt our societies to the coming GEC. We need to have the 21st-century's health and environment model. In order to do so the RIHN Ecohealth Project thought that we need to rethink the modern health concept itself.

Medical science, which is the foundation of the modern health concept, operationally see a living organism as an individual entity relatively independent from environment. It is prone to neglect personal historical experiences. Otherwise, medical science cannot deal it objectively. Medical science examines human itself with the same manner as examining cells, tissues, organs, or systems. We need not to blame medical science because of these. But, health concept in the 21st Century should not be based only on the medical science. As human health is related strongly with their ecosystem/environment, we should see human health and the ecosystem/environment as an integrated entity. This is the concept of "ecohealth"

The RIHN Ecohealth Project "Environmental Change and Infectious Disease in Tropical Asia" has conducted field researches in tropical monsoon Asia. In summary, the field findings would be interpreted as follows: The health profile of a human population is a product of the human ecosystem (social-ecological system). Therefore, environment and health should not be separately studies. It should be recognized as an entity of ecohealth. From this viewpoint, ecohealth is unique for each ecosystem and each population. This means that strategies to promote good health should be unique for each ecosystem/environment. This view is very different from the universal goal and strategy of medical-oriented health.

What is needed now is, while understanding the diversity and uniqueness of local and regional ecohealth, to pursue the universal goal of sustainable global health for all. The project could not reach to this point. The project, however, accumulated the field data to elucidate the linkages between environmental changes and human infectious diseases in various setting of the tropical monsoon Asia. We think that this diversity of ecohealth itself characterizes the tropical monsoon Asia. The RIHN Ecohealth Project established good platforms and networks of ecohealth in this region. Using these platforms and networks, the project members both inside and outside Japan shall expand and deepen the scientific understanding and education/communication of ecohealth in this region.

### ○ Progress and Results in 2012

The project has conducted field researches in Lao PDR, Vietnam, Bangladesh, and southern China in collaboration with various government and non-government institutions and projects. Main topics studied in Lao PDR were liver fluke and malaria infection in Savannakhet province. In the final report, we focused on conferences and meetings where the project results were presented.

I. Studies in Lao P.D.R. : 1) National Institute of Public Health, Ministry of Health (NIOPH) and Savannakhet (SVK) Provincial Health Department were the major counterparts In Lao P.D.R. Japanese Consortium of Lao Health Research (JC-HR- Lao) was established and meetings were held 3 times in Japan with the participation of Lao counterparts 2) Since 2007 (the PR period), NIOPH organized the National Health Research Forum (NHRF) annually in collaboration with the RIHN Ecohealth Project. The NHRF is the first annual international gathering in the field of public health in Lao, offering the very unique and good opportunities especially for young Lao researchers and health staff. The number of participants were around 150. 3) The 6th NHRF was held in Savannakhet in September 2012. Many young researchers from NIOPH and health staff from the district level of SVK province participated in the forum. Some made poster presentation. 4) Results of the project study in the Lahanam HDSS (Health and Demographic Surveillance System) covering 7,000 people, and in the Sepon HDSS covering 4,500 people were reported. 5) By introducing the finger-vein bio-metric identification to the HDSSs (2012), linkage among various epidemiological data sets became feasible both in Lahanam and Sepon. 6) These HDSS sites are the first two HDSSs in Lao, and offering the study fields for PhD and Master course students both from Lao P.D.R. and Japan. 7) Follow-up parasitological stool examination for school children/students and their

parents in Lahanam was conducted together with ecohealth education in schools. The same operation will be done in Sepon in March 2013. 8) Environmental liver fluke egg contamination study was advanced applying the environmental DNA analysis and the water analysis for E.coli. 9) Hazard map of potential Ov infection based on distribution of intermediate host snails in the water body was advanced. 10) Village health volunteers and health staff are getting active through the mobile-phone network and training/communication meetings. The fund for constructing the Sepon VHV training center is under review in MOFA, Japan. 11) Fact-finding investigation for bed-net use was conducted. 12) In the national level, in collaboration with Lao National University Faculty of Education, ecohealth curriculum and proposed and pre-tested. 13) The national first study on HIV and sexual behavior of sex workers were done in SVK in collaboration with National Center for Global Health and Medicine (NCGM). The Asia HIV/AIDS Research Network Meetings were held in 2011 and 2013. 14) Water quality map making was started in SVK covering all the health centers. 15) Research funds for continuing the similar studies were obtained. Then, the ecohealth study in SVK based on HDSS will continue.

## II. Studies in Vietnam (with the Khan Phu Malaria Research Center, Quang Tri Province)

1) The RIHN Ecohealth Project supported the multidisciplinary study in Khan Phu Malaria (ACHIEVEMENTS IN FULL RESEARCH, CONTINUED 1)

Research Center, by hosting the first Vietnam-Japan symposium on monkey forest malaria in 2010. Then, the JSPS AA-platform program was started. The two project collaborated and advanced the integrated malaria study in this area. The 2nd symposium was held in Nha Tran in February 2012 and the third one in Inuyama in December 2012. 2) The Border malaria control and joint research is now active between Sepon, SVK, Lao P.D.R. and Quang Tri, Vietnam. 3) Malaria study in Quang Tri Province, Vietnam was conducted and data on Lao patients were also collected. 4) Entomological study collaboration was started between Lao P.D.R. and Vietnam. 5) DNA of monkey malaria Pk was found in Vietnam and in Lao. But, we could not find monkey malaria Pk itself from human in these countries. This is very different from east Malaysia. 6) The Japan-Vietnam (and Lao) research team will continue to make this research after finishing the RIHN project.

III. Bangladesh: Climate change and human health : Bangladesh International Symposium on Neglected Tropical Diseases (NTDs) were held in 2008, 2010, and 2012 in Dhaka. The project contributed much for this. 2) Japanese Consortium for Bangladesh Health Research (JC-HR-Bangladesh) was established in 2012 with the name change from Filaria-Free Bangladesh (established in 2008). 3) The collaborative research with ICDDR,B (International Center for Diarrhea Disease Research, Bangladesh) on climate/weather and health was advanced. 4) Filariasis study was advanced in north-western part of Bangladesh. Savar Filaria and General Hospital was open in the suburb of Dhaka. Further collaborative study on ecohealth is planned there. 5) Ecohealth environmental community activity named "Beautiful Bangladesh Ecohealth Initiative" to control mosquitoes and flies was started. The Initiative are involving filariasis victims/patients as community workers. 6) The project collaborated with the SATREPS Leishmaniasis Project in Bangladesh. A RIHN researcher will join to this project after finishing this project.

IV. Studies in China : Biannual International Congress on Ecohealth (Ecohealth 2012) was held in October 2012 in Kunming, China. The project participated in it as the only group from Japan. 2) Ecohealth community monitoring was conducted in 10 villages in Yunnan in collaboration with YHDRA, Yunnan Health and Development Research Association. A book was published. 3) Collaboration with Chinese CDC (Center for Disease Control and Prevention), Chinese Preventive Medicine Association, Hainan Provincial CDC, Fujian Medical University, Yunnan University, Kunming Medical University was promoted. The project results were reported at the first international forum for tropical diseases and the 4th international forum for sustainable vector management. Three group of the CDC delegates visited RIHN. 4) Other infectious disease network (mainly on HIV/AIDS) with Beijing, Shanghai, Fujian were made. 5) The history team collected data/reports on disease control in China (Schistosomiasis et al .)

V. Ecohealth profile of the tropical monsoon Asia and global environmental change: 1) The project is establishing a network of ecohealth research in the Greater Mekong Sub-regions. 2) Through this network, we will continue to find out ways to provide solution for "health and ecosystem/environment"

of resource-poor people to increase their capability and preparedness for coming local and global environmental changes.

### ○Project Members

- ◎ MOJI, Kazuhiko ( Research Institute for Humanity and Nature (RIHN), professor, project leader: human ecology and population health )
- MASCI-TAYLOR, Nicholas CG ( Cambridge University, UK, professor, bio-anthropology )
- KOBAYASHI, Shigeo ( Kyoto University, Graduate School of Asian and African Area Studies, professor, agro-forestry )
- IIJIMA, Wataru ( Aoyama Gakuin University Faculty of Letters, professor, history, history of disease control policies in East and Southeast Asia )
- AHMED, Kamurddin ( Oita University Institute of Scientific Research, associate professor, molecular epidemiology )
- HASHIZUME, Masahiro ( Nagasaki University Institute of Tropical Medicine, assistant professor, environmental epidemiology, climate change and health )
- SUNAHARA, Toshihiko ( Nagasaki University Institute of Tropical Medicine, assistant professor, vector ecology and entomology )
- YAMAMOTO, Taro ( Nagasaki University Institute of Tropical Medicine, professor, international health )
- KOBAYASHI, Jun ( National Center for Global Health and Medicine (NCGM), group head, parasitology and international health policy )
- BOUPHA, Bounngong ( National Institute of Public Health (NIOPH), Lao PDR, director/professor, public health policy )
- KOUNNAVONG, Sengchanh ( Nagasaki University Graduate School of Biomedical Sciences/NIOPH, senior researcher, maternal and child health and nutrition )
- PONGVONGSA, Tiengkham ( Savannakhet Malaria Station, Lao PDR, director, malaria and parasitology )
- ISLAM, Sirajul ( ICDDR, B, Bangladesh, department head, environmental microbiology )
- HUNTER, Paul ( University of East Anglia, UK, professor, environmental epidemiology )
- HOSSAIN, Moazzem ( Ministry of Health and Family Welfare, Bangladesh/ IACIB, director, professor, epidemiology and control of neglected tropical diseases )
- RAHMAN, Mamudur ( IEDCR, Bangladesh, director, professor, epidemiology )
- TOMITA, Shinsuke ( University of Tokyo Graduate School of Agricultural and Life Sciences, assistant professor, area study of Southeast Asia )
- ASAKURA, Takashi ( Tokyo Gakugei University, professor, health sociology )
- TOJO, Bunpei ( RIHN, project researcher, area study and GIS )
- CAI, Guoxi ( RIHN, project researcher, social epidemiology )
- NISHIMOTO, Futoshi ( RIHN, project researcher, social anthropology )
- KANEKO, Satoshi ( Nagasaki University Institute of Tropical Medicine, professor, epidemiology )
- ITO, Makoto ( Aichi Medical University, professor, parasitology )
- FUKUSHI, Yuki ( RIHN, project researcher, Chinese history of hygiene system )
- JIANG, HongWei ( RIHN, project researcher, human ecology )
- IWASA, Mithuhiro ( National Museum of Ethnology, research fellow, medical anthropology and ethics )
- ICHIKAWA, TOMO ( Shanghai Jiao Tong University, Lecturer, Japanese history of hygiene system )
- IWASAKI, Shinpei ( RIHN/JSPS, postdoc researcher, environmental study )
- WATANABE, Chiho ( University of Tokyo Graduate School of Medicine, professor, environmental toxicology and human ecology )
- MURAYAMA, Nobuko ( Niigata University of Health and Welfare, professor, public health nutrition and human ecology )
- TAKAGI, Masahiro ( Nagasaki University Institute of Tropical Medicine, professor, medical entomology )
- NAKAZAWA, Shusuke ( Nagasaki University Institute of Tropical Medicine, assistant professor, malariology )
- MAENO, Yoshimasa ( Fujita Health University, associate professor, molecular biology )
- WATANABE, Hisami ( Ryukyuu University, professor, environmental immunology )
- TSUZUKI, Ataru ( Nagasaki University Institute of Tropical Medicine, postdoc researcher, entomology and public health )

ABE, Tomoko	( Nagasaki University Institute of Tropical Medicine, posdoc researcher, public health nursing of malaria )
KANO, Shigeyuki	( NCGM Research Institute, department head, malariology )
IWAGAMI, Moritoshi	( NCGM Research Institute, research fellow, malariology )
XANGSAYARATH, Phonepadith	( Nagasaki University Institute of Tropical Medicine/NIOPH, grad student, malariology )
SOURAXAY, Phommala	( National Institute of Public Health, Lao PDR, deputy director, public health management )
PANOM, Phongmany	( Savannakhet Provincial Health Department, Lao PDR, director, public health administration )
SAMLANE, Phompida	( Center Of Malariology, Parasitology And Entomology, Lao PDR, director, malariology )
CRAVIOTO, Alejandro	( ICDDR, B, Bangladesh, director/professor, microbiology )
CAIRNCROSS, Sandy	( London School of Hygiene and Tropical Medicine, professor, tropical environment health )
WAGATSUMA, Yukiko	( Tsukuba University Graduate School of Comprehensive Human Sciences, professor, epidemiology and international health )
HAYASHI, Taiichi	( Kyoto University Disaster Prevention Research Institute, associate professor, meteorology )
TERAO, Toru	( Kagawa University, associate professor, meteorology )
MURATA, Fumie	( Kochi University, assistant professor, meteorology )
TANIMURA, Susumu	( Hyogo Prefectural University, associate professor, spatial epidemiology )
GOTO, Kensuke	( Nagasaki University Institute of Tropical Medicine, assistant professor, disaster information studies )
TOMOKAWA, Sachi	( Shinshu University, assistant professor, health education and school health )
FARUQUE, A. S. G.	( ICDDR, Bangladesh, senior researcher, clinical chemistry )
NONAKA, Daisuke	( University of Tokyo Graduate School of Medicine, assistant professor, international health and malariology )
SATO, Megumi	( Niigata University, assistant professor, parasitology and helminthology )
AOYAGI, Kiyoshi	( Nagasaki University Graduate School of Biomedical Sciences, Professor, Hygiene and Public health )
MORITA, Eitaro	( Asia Health and Education Fund (AHEF), Secretary general, international cooperation )
KITAMURA, Hitoshi	( AHEF, President, international cooperation )
ZHANG Konglai	( Union Medical Colledge, Beijing, China, Professor, public health )
ZHANG Kaining	( Yunnan Health and Development Research Association, China, Professor, public health )
ZHOU Qiong	( Yunnan University, Professor, environmental history )
LI Yushang	( Shanghai JiaoTong University, Professor, environmental history )
MORINAKA, Koichi	( Non Profit Organization Asia Health and Education Fund, Member, International medical cooperation, Project management )

### ○ Future Themes

Activities scheduled in FY2013: CR-1 will be conducted.

Other related projects are as follows:

- 1) DIAS-GRENEEi Ecohealth Project (2012-2015) with the University of Tokyo
- 2) Geo/Eco-health Project on Water Quality in Lao P.D.R.



On October 15-16, We shall join the 7th National Health Research Forum in Vientiane with NIOPH, and JCHR-Lao P.D.R.

### ● Achievements

### ○ Papers

#### 【Original Articles】

- Masahiro Hashizume, Luis Fernando Chaves, A. S. G. Faruque, Md Yunus, Kim Streatfield, Kazuhiko Moji 2013,03 A Differential Effect of Indian Ocean Dipole and El Nino on Cholera Dynamics in Bangladesh. PLoS One. 8(3). DOI:10.1371/journal.pone.0060001.
- Miao Miao, Zenglei Wang, Zhaoqing Yang, Lili Yuan, Daniel M. Parker, Chaturong Putaporntip, Somchai Jongwutiwes, Phonpadith Xangsayarath, Tiengkham Pongvongsa, Kazuhiko Moji, Trinh Dinh Tuong, Tomoko Abe, Shusuke Nakazawa, Myat Phone Kyaw, Guiyun Yan, Jeeraphat Sirichaisinthop, Jetsumon Sattabongkot, Jianbing Mu, Xin-zhuan Su, Osamu Kaneko, Liwang Cui 2013,03 Genetic Diversity and Lack of Artemisinin Selection Signature on the Plasmodium falciparum ATP6 in the Greater Mekong Subregion. PLoS One. 8(3). DOI:10.1371/journal.pone.0059192.
- Sachi Tomokawa<sup>1</sup>, Toshio Kobayashi<sup>2</sup>, Tiengkham Pongvongsa<sup>3</sup>, Bangon Nisayngang<sup>4</sup>, Eiko Kaneda<sup>5</sup>, Sumihisa Honda<sup>6</sup> 2012,05 RISK FACTORS FOR OPISTHORCHIS VIVERRINI INFECTION AMONG SCHOOLCHILDREN IN LAO PDR. Southeast Asian J Trop Med Public Health 43(3) :574-585.

---

**Stage: Full Research****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://arab-subsistence.jzz.jp/>****Key Words: Arab societies, Alien invasive species control, Environmental impact assessment, Human life support mechanisms, Post-oil era, Universal access to scientific data**

---

**○ 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 the oil-rich countries of the Middle East have put excessive pressures on the earth's energy, water, and food resources. In prioritizing economic prosperity, 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. This pattern of development has increased social and economic differences within the Middle East just as the region faces a turning point in modern oil-based industrial development. Fossil fuel-based interdependencies must now be transformed into new relations that can support viable future societies.

This project focuses on human subsistence ecosystems of the region: low energy-intensity life-support mechanisms and modes of production, such as hunting, gathering, fishing, herding, farming, and forestry. In doing so it also reflects on the role of advanced technologies in economic development, and measures adopted thus far to combat desertification. Field research investigates keystone species, ecotones, and traditional knowledge and examines the sustainability of subsistence economies under site-specific conditions.

**【 Research Methods 】**

Field surveys are conducted in semi-arid lands between the Nile River and the Red Sea in Sudan, with the Red Sea coast, Butana area, and Nile River areas as the main survey areas. Additional surveys will be conducted at 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.

We will develop and implement our study of human subsistence ecosystems 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 to prevent the emergence of new environmental problems
- 3) sharing of research results to support local decision making.

Our research method combines two main approaches:

- (1) analysis of subsistence ecosystems, focusing on keystone species such as camels, date palm, dugong, mangrove, and coral reefs

(2) examination of the sustainability and fragility of Arab societies, focusing on the ecotones such as wadi beds, riverbanks, mountainsides, and seashores.

### **【 Project Organization 】**

The members of this project include social and natural scientists, members of local NGOs and project managers, who are divided into four study groups: 1) Alien invasive species control group, 2) Coastal zone environmental impact assessment group, 3) Support for local decision making group, and 4) Local ecosystems comparative studies group.

#### **(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 2012

### Major Achievements:

#### Suggestions for resource management in Marine Protected Areas (MPAs) through studies on fishing culture and behavioral characteristics of dugongs

The local people have historically depended on sea products (fish, shellfish, dugong, dolphin, and sea turtles) for their diet in unique coastal ecosystem of the arid tropics: coexistence of mangrove forests (dominant species: *Avicennia marina*) and coral reefs and complex relationship of the both. On the other hand, the coastal zones presents a large development frontier, therefore, it may also lead to environmental degradation such as destruction of mangrove forests, coral reefs, and seagrass beds and releasing highly concentrated saline water into the sea. In order to suggest frame works for a new environmental assessment with community participating for prevention of global environmental problems, we have conducted multi-principal studies focusing on mangroves, coral reef, camels, dugongs, and fishing culture in the coastal areas of Sudan, Egypt, and Saudi Arabia, surrounding the Red Sea.

We have conducted surveys on fishing culture in Dugonab Bay in one of the MPAs in Sudan and have found that the local fishermen were catching fishes based on accurate recognition of their subsistence space and detailed understanding of ecology of the target fish. The fishermen find 77 fishing grounds accurately by using both maps and marine charts. Besides, it was suggested that fishing restriction due to harsh environmental conditions such as strong winds for half a year and hot temperature in summer may control over harvesting of the marine resources. On the other hand, there is a growing concern about over fishing of sea cucumbers which are coastal stationary species that inhabit shallow waters, because they are easily taken and traded at high price. It is also concerned that mangrove trees are used for processing the sea cucumbers.

Biologging studies of dugongs revealed behavioral characteristics of their space use. Dugongs stayed in the shallow waters less than 4 m for more than 96 % of their time, sometimes showing rapid dives down to 40 m. Strong site fidelity was also suggested because the animal repeatedly visited a specific feeding ground. Vocal communication is expected to be revealed by further analysis.

Most of the fishing grounds and the dugong habitats in Dugonab Bay did not overlap. It was shown that by catch of the dugongs in gill nets can be avoided by time-spatial segregation of fishermen and dugongs (Fig. 3).

We clarified precautions for development and resource management prior to waves of public projects and development. Accumulation of academic data by this project contributes to concrete input of framework and contents of management of MPA, and at the same time, it can be used as reference for assessment of environmental impact in the whole area of Red Sea and also coastal areas of arid tropics.

### ○ Project Members

- ◎ Nawata, Hiroshi ( Research Institute for Humanity and Nature, Associate Professor, Cultural anthropology, Social ecology )
- Sakata, Takashi ( Faculty of Science and Engineering, Ishinomaki Senshu University, Professor, Nutrient physiology )
- Hoshino, Buho ( College of Agriculture, Food and Environment Sciences, Rakuno Gakuen University, Professor, Remote sensing and GIS )
- Babiker, Abdel Gabar ( Sudan University of Science and Technology, Professor, Bio-chemistry )  
E. T.
- Yasuda, Hiroshi ( Tottori University, Associate professor, Hydrology )
- Inoue, Tomoe ( Arid Land Research Center, Tottori University, Researcher, Plant physiology )
- Ushida, Kazunari ( Kyoto Prefectural University, Professor, Microbial ecology and physiology )
- Hakoyama, Fumiko ( Faculty of International Studies, Meiji Gakuin University, Part-time lecturer, Development studies )

- Fujii, Yoshiharu ( Graduate school of Agriculture and Technology, Tokyo University, Professor, Bio-chemistry )
- Yoda, Kiyotsugu ( Ishinomaki Senshu University, Associate professor, Plant physiology )
- Abdel Basit, Muhammad ( Tottori University, Project researcher, Hydrology )
- El-Fatih, Muhammad ( Agricultural Research Cooperation, Researcher, Biochemistry )
- Abdel Magid, Afaf A. ( Agricultural Research Cooperation, Researcher, Biochemistry )
- ElKhalifa, Abdel Wadoud A. ( Sudan University of Science and Technology, Associate professor, Forest/ products/ Charcoal )
- Eldoma, Ahmed Mohamed Adam ( Sudan University of Science and Technology, Associate professor, Tree physiology )
- Taha, Awad K. ( Sudan University of Science and Technology, Associate professor, Entomologist / Biological control )
- Mohamed, Abdalla A. H. ( Sudan University of Science and Technology, Associate professor, Entomologist / Biological control )
- Elrasheed, Mutasim Mekki Mahmoud ( Sudan University of Science and Technology, Associate professor, Agricultural Economist/ Environmental economics )
- Hussin, Mohamed Badawi ( Sudan University of Science and Technology, Associate professor, Agricultural Extension/ Extension education )
- Makki, Hattim Makki Mohamed ( Sudan University of Science and Technology, Associate professor, Food technology )
- Ahmed, Ahmed Elawad Elfaki Mohamed ( Sudan University of Science and Technology, Associate professor, Food quality and safety )
- Ati, Shadia Abdel ( Sudan University of Science and Technology, Associate professor, Physiology of digestion and nutrition )
- Ahmed Idris, Yousif Mohamed ( Sudan University of Science and Technology, Associate professor, Food technology )
- Gaiballa, Abdelaziz Karamalla ( Sudan University of Science and Technology, Professor, Remote sensing and range management )
- El Tayeb, Nagat Mubarak ( Ministry of Agriculture, Sudan, Manager of research section, Weed science )
- Ibrahim, Mobamed Elgamri A. ( Sudan University of Science and Technology, Associate professor, Forestry )
- Mohamedain, Mahgoub, Suliman ( Sudan University of Science and Technology, Lecturer, Remote sensing and GIS )
- Miyamoto, Chiharu ( Action for Mangrove Reforestation, Trustee, Plantation )
- Yoshikawa, Ken ( Graduate School of Environmental Science, Okayama University, Professor, Forest ecology )
- Arai, Nobuaki ( Kyoto University, Professor, Aquatic bioinformatics )
- Kishi, Akira ( Shin-nippon Environmental Research Co. Ltd., President, Marine biology )
- Ichikawa, Kotaro ( Research Institute for Humanity and Nature, Project researcher, Bioacoustics )
- Kogo, Kiyomi ( Action for Mangrove Reforestation, Senior researcher, Plantation )
- Kogo, Motohiko ( Action for Mangrove Reforestation, Chairman, Plantation )
- Suda, Seiji ( Action for Mangrove Reforestation, President, Plantation )
- Takayama, Haruo ( Kajima Technical Research Institute, Chief Research Engineer, Plant ecology )
- Nakashima, Atsushi ( Wakayama University, Professor, Plant ecology )
- Nakamura, Ryo ( Research Institute for Humanity and Nature, Project researcher, Cultural anthropology )
- Hori, Nobuyuki ( Nara University, Professor, Geography )
- Matsuo, Naoko ( Mie University, Assistant professor, Forest hydrology )
- Miyagi, Toyohiko ( Tohoku Gakuin University, Professor, Environmental topography )
- Teraminami, Tomohiro ( Graduate School of Environmental Science, Okayama University, Graduate student, Plant physiology )
- Al-Wetaid, Abdullah H. ( National Commission for Wildlife Conservation and Development, Saudi Arabia, Manager of Department of Plant Studies, Plant ecology )
- Sambus, Anas Zubeir ( National Commission for Wildlife Conservation and Development, Saudi Arabia, Manager of Marine Research, Marine biology )
- Tarik, Al-Abbasi ( National Commission for Wildlife Conservation and Development, Saudi Arabia, Director of Terrestrial Researches, Plant ecology )

- Khushaim, Omar ( National Commission for Wildlife Conservation and Development, Saudi Arabia, Director of Marine Research, Marine biology )
- Mohamed, Abbas Tahoon ( Wadi El Gemal National Park, Egypt, General Manager, Geology )
- Amgad Ali El-Shaffai ( Wadi El Gemal National Park, Egypt, Assistant General Manager, Ocean )
- Tamer, Mahmoud ( Wadi El Gemal National Park, Egypt, Assistant General Manager, Botany )
- Abdelwahab, Afefe Abdelwahab ( Egyptian Environmental Affairs Agency, Egypt, Environmental Researcher, Agronomy )
- Laureano, Pietro ( Traditional Knowledge World Bank, Italy, Director, Architecture )
- Abu Sin, Abdalla M. A. ( Gezira University, Trustee, Agro-economics )
- Shinoda, Kenichi ( National Museum of Nature and Science, Head of the Division & Curator of the Center for Molecular Biodiversity Research, Physical Anthropology )
- Watanabe, Tsugihiko ( Research Institute for Humanity and Nature, Professor, Agricultural engineering )
- Manger, Leif ( Bergen University, Professor, Social anthropology )
- Abdel Hadi A, W. M. Mohamed ( Agricultural Research Cooperation, Sudan, Associate Professor, Water management )
- Onuma, Hiroyasu ( Appropriate Agriculture International Co., President, Village development )
- Kodama, Kanako ( Chiba University, Associate professor, Cultural anthropology )
- Takaki, Keiko ( Obirin University, Professor, Cultural anthropology )
- Meziani, Rim ( Abu Dhabi University, Assistant professor, Urban planning )
- Abdel Bagi M. Ali ( Agricultural Research Cooperation, Sudan, Professor, Plant physiology )
- Okamoto, Yoko ( Research Institute for Humanity and Nature, Project research associates )
- Wan, Na ( Research Institute for Humanity and Nature, Project research associates, Humanity )
- Mizuma, Sakiko ( Research Institute for Humanity and Nature, Project research associates )
- Kawatoko, Mutsuo ( Research Institute for Islamic Archaeology and Culture, Director, Islamic archaeology )
- Benkhalifa, Abdrahmane ( Ecole Normale Supérieure de Kouba Algérie, Lecturer, Fungology )
- ◎ Ishiyama, Shun ( Research Institute for Humanity and Nature, Project researcher, Cultural anthropology )
- Kume, Takashi ( Faculty of Agriculture, Ehime University, Associate professor, Hydrology )
- Nagasawa, Ryota ( Tottori University, Professor, landscape ecology )
- Kubota, Junpei ( Research Institute for Humanity and Nature, Professor, Forest hydrology )
- Suzuki, Hideaki ( The Toyo Bunko, Research fellow, History )
- Nishimoto, Shin'ichi ( Cyber University, Professor, Architecture )
- Ota, Keiko ( University of Tokyo Center for Philosophy, Research fellow, History )
- Ozaki, Kikuko ( National Defense Academy of Japan, Associate professor, Islamic culture, History )
- Kikuchi, Hiroko ( Kitakami City Archaeological Operation Center, Research fellow, Archaeology )
- Sakamoto, Tsubasa ( Waseda University, Graduate student, Archeology )
- Shimada, Yoshihito ( Nagoya University, Professor, Religious anthropology )
- Shindo, Yoko ( College of Literature, Aoyama Gakuin University, Part-time lecturer, Islamic archaeology )
- Takahashi, Nobuo ( Hanamaki City Museum, Director, Archaeology )
- Maruyama, Daisuke ( Kyoto University, Graduate student, Cultural anthropology )
- Yasuoka, Yoshifumi ( Vienna University of Technology, Graduate student, Architectural History )
- Ishikawa, Hiroki ( Tokyo University of Foreign Studies, Assistant professor, History )
- Shinoda, Ken'ichi ( Department of Anthropology, Division of Human Evolution, National Museum of Nature and Science, Head of the Division, Natural taxonomy )
- Sekihiro, Naoyo ( Kyoto Prefecture Research Center for Archaeological Properties, Researcher, Archeology )
- Seo, Akihiro ( Ryukoku University, Academic affairs assistant, Plant taxonomy )
- Endo, Hitoshi ( Research Institute for Humanity and Nature, Visiting researcher, Archeology )
- El-Hadj, Hamadi ahmad ( Aulef Junior High school, Teacher, Education )
- Hutiyah, Muhammad ( Adrar University, Professor, History )

- Wassila, Benslimane ( Ecole Normale Supérieure Kouba Algérie, Part-time teacher, Biology )  
 Tamoud, Benfetima ( Centre National de développement des Ressources Biologiques, Algérie, Researcher, Biology )  
 Hafiz Qoura Mohamed ( Research Institute for Humanity and Nature, Project researcher, Archaeology )  
 Fathy  
 Yoshimori, Ichido ( Okayama University, Graduate student, Forest ecology )  
 Mohamed El Amin ( Red Sea University, Professor, Fisheries science, Marine resource management )  
 Hamza EL Amin  
 Ahmed AbdelAziz ( Red Sea University, Professor, Agriculture, immunology, )  
 Ahmed  
 Abdelgadir Dafaalla ( Red Sea University, Professor, Marine biology )  
 Elhag Mohamed  
 Abdelmoneim ( Red Sea University, Lecturer, Marine biology )  
 Karamalla Gaiballa  
 Adir  
 Nishida, Harufumi ( Chuo University, Professor, Plant systematics, Palaeophytology )  
 Ishihara, Aiko ( Okayama University, Graduate student, Forest ecology )

### ○ Future Themes

Challenges for the last year of this project is to present a persuasive contention by connecting the particular factual data and integrate the result of analysis for “Human subsistence ecosystems in Arab societies”. We will reveal human subsistence ecosystems in the seaside such as relationship between mangrove, coral reef, camels, dugongs, and fishing culture through our previous studies, and by comparing trees (wild species: *A. marina*, cultivated species: date palm, and alien invasive species: *Prosopis*), we will reevaluate them as new resources for energy and food.

These research results will be exhibited as “Surviving in the desert (tentative)” at National Museum of Nature and Science. Last year, we have compiled a book “Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries of the Middle East” (RIHN Book series, Showado) and volume 1 and 2 of multilingual books (in Arabic, English, French, and Swahili) as Arab Subsistence Monograph Series (Shoukadoh Book Sellers). We will also compile a series of books in Japanese “Human subsistence in Arab Societies” (10 volumes, Rinsen Book Co.), and a book “Knowledge for sharing water in the desert (tentative)” (National Museum of Nature and Science, Tokai University Press) to conclude the study results and pass them on to the local society.

### ● Achievements

#### ○ Books

#### 【Chapters/Sections】

- Nawata, H. 2013,03 “Meeting point of the Yellow belt and the Blue belt- Coastal zone of the arid tropics as corridors of early human dispersal out of Africa”. Sato, Y. and Taniguchi, M. (ed.) Environmental history of the Yellow belt. Civilization and Environmental history series of the RIHN. Koubundou, Chiyoda-ku, Tokyo, Japan, pp.168-190. (in Japanese)
- Nawata, H. 2013,03 “A viable future lifestyle without oil”. Ishiyama, S. and H. Nawata (ed.) Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries of the Middle East. RIHN Book Series. Showado, Sakyo-ku, Kyoto, Japan, pp.215-228. (in Japanese)
- Nawata, H. 2013,03 “A view at the top of oil era -What have we lost and what should we preserve?”. Nawata, H. and Ishiyama, S. (ed.) Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN Book series. Showado, Sakyo-ku, Kyoto, Japan, pp.13-58. (in Japanese)
- Kishi, A., and Anas Zubeir Sambah 2013,02 “Conservation Plan for Dugong along the Northeastern Coast of the Red Sea in the Kingdom of Saudi Arabia”. Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.28-30. (in English and Arabic)

- Ichikawa, K. 2013,02 "Notes on the aerial surveys". Nawata, H. (ed.) *Dryland Mangroves: Frontier Research and Conservation*. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, pp.31.
- Onuma, H. 2013,02 "The Master Plan for the Restoration, Conservation, and Management of Mangrove in the Sultanate of Oman". Nawata, H. (ed.) *Dryland Mangroves: Frontier Research and Conservation*. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.18-21. (in English and Arabic)
- Nawata, H. 2013,01 "Exploitation and Conservation of Middle East Tree Resources in the Oil Era: A Study of Human Subsistence Ecosystems in Arab Societies". Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) *Exploitation and Conservation of Middle East Tree Resources in the Oil Era*. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.9-18. (in English and Arabic)
- Nakamura, R. 2013,01 "Utumiaji wa Mikoko katika Kilwa Kisiwani, Kusini mwa Mwambao wa Kiswahili, Tanzania (Direct and Environmental Uses of Mangrove Resources on Kilwa Island, Southern Swahili Coast, Tanzania)". Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) *Exploitation and Conservation of Middle East Tree Resources in the Oil Era*. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.103-132. (in Swahili, English, and Arabic)
- Ishiyama, S. 2013,01 *Déforestation et foyer amélioré au sub-Sahara: Efficacité sous les conditions pratiques dans les ménages*. Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) *Exploitation and Conservation of Middle East Tree Resources in the Oil Era*. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.75-101. (in French) (in French, English, and Arabic)
- Nawata, H. 2013,01 "About Research Project". Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) *Exploitation and Conservation of Middle East Tree Resources in the Oil Era*. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.6-8. (in English and Arabic)
- Nawata, H., Muhammad Ahmad 'Asiri, Rabi' 'Abd al-Rahmand Hananin', and Tariq Muhammad al-'Abbasi' 2013,01 "Traditional Natural Resource Use and Conservation of Juniper Woodlands in the Arabian Peninsula: A Case Analysis of Raydah Nature Reserve". Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) *Exploitation and Conservation of Middle East Tree Resources in the Oil Era*. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.19-74. (in English and Arabic)
- Nawata, H. 2013,01 "Preface". Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) *Exploitation and Conservation of Middle East Tree Resources in the Oil Era*. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.4-5. (in English and Arabic)
- Ishiyama, S. 2013,03 "Environmental Change and Dynamism of Livelihood -Goumanché, an agricultural People of African semi-arid land". Sato, Y. and Taniguchi, M. (ed.) *Environmental history of the Yellow belt. Civilization and Environmental history series of the RIHN*. Kobundo, Chiyoda-ku, Tokyo, Japan, pp.98-111. (in Japanese)
- Ishiyama, S. 2013,03 "Is it possible to prescribe against the global environmental problem?". Ishiyama, S. and H. Nawata (ed.) *Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries of the Middle East*. RIHN Book Series. Showado, Sakyo-ku, Kyoto, Japan, pp.1-11. (in Japanese)
- Ishiyama, S. 2013,03 "Thinking energy problem from rural life". Ishiyama, S. and H. Nawata (ed.) *Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries of the Middle East*. RIHN Book Series. Showado, Sakyo-ku, Kyoto, Japan, pp.169-198. (in Japanese)
- Nawata, H. 2013,02 "Preface". Nawata, H. (ed.) *Dryland Mangroves: Frontier Research and Conservation*. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.4-5. (in English and Arabic)
- Nawata H. 2013,02 "About Research Project". Nawata H. (ed.) *Dryland Mangroves: Frontier Research and Conservation*. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kyoto, Japan, pp.6-9.



- Nawata H. 2013,02 "Relationships between Humans and One-humped Camels in the Coastal Zones of the Arid Tropics: An Anthropological Case Analysis of the Beja on the Red Sea Coast of Eastern Sudan". Nawata H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.42-47. (in English and Arabic)
- Nawata H. 2013,02 "Coastal Resource Use by Camel Pastoralist: A Case Study of Gathering and Fishing Activities among the Beja in Eastern Sudan". Nawata H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kyoto, Japan, pp. 48-65. (in English and Arabic)
- Kogo, M., C. Miyamoto, and S. Suda 2013,02 "Study and Activities on Mangrove Afforestation in Arabia". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.10-13. (in English and Arabic)
- Shoji, T. 2013,02 "A Handbook for an Avicennia marina Nursery and Transplantation: Technical Guidelines for Afforestation". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.20-21. (in English and Arabic)
- Suda, S. 2013,02 "Method for Mangrove Afforestation in Qatar". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.16-17. (in English and Arabic)
- Yoshikawa, K. 2013,02 "Ecological and Genetical Studies of Mangrove (Avicennia marina) Forests in the Sultanate of Oman". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.36-37. (in English and Arabic)
- Miyagi, T. 2013,02 "Long-term Maintenance of Arid Mangroves: Mangrove Distribution and Use in Iran and Pakistan". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.32-34. (in English and Arabic)
- Nakamura, R. 2013,02 "Mangrove Use on the Kilwa Island, Southern Swahili Coast in Tanzania". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, pp.38-41. (in English and Arabic)
- Tamaei, S. 2013,02 "Study of Gray Mangrove (Avicennia marina) Afforestation for Greening a Desert Coast: Gray Mangrove Afforestation on the Banks of an Artificial Channel across a Sabkha and Established Biotic Community". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.22-27. (in English and Arabic)
- Miyamoto, C, and Abdullah Al-Wetaid 2013,02 "An Inspection of the Status of Coastal Mangroves of the Southern Red Sea". Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.14-15. (in English and Arabic)
- Nawata, H., N. Koga, A. A. Elkhalfa, and A. Eldoma 2012,12 "Use of the alien invasive species mesquite (Prosopis juliflora) for wood fuel/charcoal to support local incomes and improve energy efficiency in an arid land of Sudan". A Mendez-Vilas (ed.) Fuelling the future: Advances in science and technologies for energy generation, transmission and storage. Brown Walker Press, Florida, pp. 128-132.

## ○Editing

### 【Editing / Co-editing】

- Ishiyama, S. and H. Nawata (ed.) 2013,03 Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries of the Middle East. RIHN Book series. Showado, Sakyo-ku, Kyoto, Japan, 231pp. (in Japanese)
- Nawata, H. (ed.) 2013,02 Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, 132pp. (in English and Arabic).

- Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) 2013, 01 Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, 248pp. (in Arabic, English, French, and Swahili).
- Nawata, H. (ed.) 2012, 09 Investigative Report (2nd edition): a Study of Human Subsistence Ecosystems in Arab Societies Along the Red Sea in Sudan (2011-2013). RIHN, Kyoto, Japan, 104pp.

## OPapers

### 【Original Articles】

- Yasuda, H., T. Kawai, Mohamed Abd Elbasit Mohamed Ahmed, H. Nawata 2012, 12 "Seasonal variation of precipitation time series in arid Sudan". *Journal of Arid Land Studies* 22(2) :357-361. (in Japanese) (reviewed).
- Yasuda, H., T. Kawai, Mohamed Abd Elbasit Mohamed Ahmed, H. Nawata 2012, 12 "Cyclic pattern of precipitation time series in arid Sudan". *Journal of Arid Land Studies* 22(2) :363-367. (in Japanese) (reviewed).
- Yasuda, H., Mohamed Abd Elbasit Mohamed Ahmed, T. Inoue, K. Yoda, T. Kawai, W. Tsuji, H. Nawata, T. Saito 2012, 09 "Groundwater uptake of alien invasive plant, mesquite in arid environment: Double peak pattern of diurnal groundwater level fluctuation due to the midday depression phenomenon". *Journal of Japan Society of Hydrology and Water Resources* 25(5) :315-321. (in Japanese) (reviewed).
- Hoshino, B., Abdelaziz Karamalla, Mohamed Abd Elbasit, K. Manayeva, K. Yoda, Mahgoub Suliman, Mohamed Elgamri, H. Nawata, H. Yasuda 2012, 06 "Evaluating the invasion strategy of mesquite (*Prosopis juliflora*) in eastern Sudan using remotely sensing technique". *Journal of Arid Land Studies* 22(1) : 1-4. (reviewed).
- Mohamed A. M. Abd Elbasit, H. Yasuda, K. Yoda, Ahmed M. Eldoma, H. Nawata, B. Hoshino, Magzoub K. Magzoub 2012, 06 "Mesquite (*Prosopis* spp.) Water Uptake under Different Simulated Drought Conditions". *Journal of Arid Land Studies* 22(1) :5-8. (reviewed).
- Nawata, H. 2012, 06 "To Combat a Negative Heritage of Combating Desertification: Developing Comprehensive Measures to Control the Alien Species Mesquite (*Prosopis juliflora*) in Sudan". *Journal of Arid Land Studies* 22(1) :9-12. (reviewed).
- Yoda, K., Mohamed A. M. ABD ELBASIT., Hoshino, B., Yasuda, H. and Nawata, H. 2012, 06 "Root system development of *Prosopis* seedlings under different soil moisture conditions". *Journal of Arid Land Studies* 22(1) :13-16. (reviewed).
- Ozaki, K. 2012, 05 "Food and Medicine in the Arab Islamic World". *Journal of Oriental Studies* 51(1) : 63-91. (in Japanese) (reviewed).

## OResearch Presentations

### 【Oral Presentation】

- Ichikawa, K., T. Akamatsu, T. Shinke, N. Arai, and K. Adulyanukosol Clumped distribution of vocalising dugongs (*Dugong dugon*) monitored by passive acoustic and visual observations in Thai waters. *Acoustics 2012 Fremantle: Acoustics, Development and the Environment*, 2012, 11, 21-2012, 11, 23, Perth, Australia.
- Nakamura, R. Multi-ethnic Coexistence in a Swahili Maritime Society as seen through Basic Ecology and Fishing Cultures of Kilwa Island, Tanzania. *Workshop on Afro-Eurasian Dry Lands in the Central Eurasian Studies Society 2012 Annual Conference*, 2012, 10, 17-2012, 10, 18, Indiana University, Indiana, USA.
- Nawata, H., N. Koga, A.A.ElKhalifa, and A ElDoma A Method for Wood Fuel/Charcoal of the Alien Invasive Species Mesquite (*Prosopis juliflora*) to Support Local Incomes with Better Energy Efficiency in Arid Land of Sudan. *The Energy & Materials Research Conference*, June 2012, Torremolinos, Spain.
- Ichikawa, K., T. Akamatsu, K. Adulyanukosol, G. Damiani, J. Lanyon, and H. Nawata Intraspecific variation in vocal repertoire among dugong populations. *THE ACOUSTICS 2012 HONG KONG*, 2012, 05, 13-2012, 05, 18, Hong Kong.

- Kogo, M. Why seaside?. Mangrove paleontological research organization, 2010,09,18-92012020, RIHN, Kyoto.

**【Poster Presentation】**

- Ishiyama, S. Humanistic Approaches of Arab Subsistence Project, RIHN - A case of Algerian Sahara field Survey. International Workshop on Humanistic Approaches towards Global Environmental Change, 2013,03,16-2013,03,17, Sakyo-ku, Kyoto, Japan.
- Nawata, H., S. Nishimoto, Y. Yasuoka, A. Yasuoka, and Y. Shindo Architectural and Anthropological Survey on Coral Buildings in Sinai Peninsula, Egypt. 12th International Coral Reef Symposium, July 2012, Cairns, Australia.
- Ishiyama, S., H. Nawata, Mutasim Mekki Mahmoud Elrasheed, and Mussab Hassan Abbass A Study of Traditional Rainfed Agriculture in African Semiarid Area. 23rd Annual meeting of The Japanese Association for Arid Land Studies, 2012,05,26-2012,05,27, ObihiroCity, Hokkaido, Japan. (in Japanese)

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

- Nawata, H. A Bridge between 'Knowledge' in Japan and 'Tradition' in Sudan: To combat a negative heritage of combating desertification. International Biennial of Cultural and Landscape Heritage, November 2012, Florence, Italy.

**Stage: Full Research****Project No.: R-06****Project Name: Managing Environmental Risks to Food and Health Security in Asian Watersheds****Abbreviated Title: LakeHEAD (Food Risk Project)****Project Leader: KADA Ryohei****Research Axis: Resources Program****URL: <http://www.chikyu.ac.jp/rihn/project/R-06.html>****Key Words: Ecological risk, Food and health security, Watershed management, Payment for Ecosystem Services, GIS based Risk Mapping**

---

**○ Research Subject and Objectives**

This research project investigates the direct and complex links between environmental change, ecological degradation, food availability and quality, and human health. Research is conducted at Santa Rosa Watershed and other sites in the Laguna Lake region, a highly populated and variegated region in which rich ecological resources are threatened by rapid land use change, urbanization and industrialization. Study sites are representative of the challenges facing many other Asian watersheds.

The project has four principal objectives: 1) to document the current levels and pathways of heavy metals pollution in the aquatic resources of Laguna Lake; 2) to investigate the health condition of local residents and their perception of food risks; 3) to analyze the ecological effects of agrochemical inputs, and their cumulative impact on food production and relation to subsequent ecosystem deterioration; and 4) to describe land use changes in the Laguna Lake area and their impact on water and material cycles, including impacts on sedimentation, groundwater level, and its quality.

**Research Organization**

Five research teams are comprised mainly of researchers at RIHN, Yokohama National University and University of the Philippines; they work in collaboration with government agencies such as the Laguna Lake Development Authorities (LLDA) and local government units. The Environmental Risk Assessment Team identifies the exact sources of, and factors responsible for, particular pollutants in the food chain, utilizing stable isotope and other analytical techniques. The Socio-Economic Evaluation Team explores how market- and nonmarket-based instruments can be used to improve water quality, food security and public health. The Health Risk Evaluation Team describes human nutrition, history of disease, and life expectancy in the region, especially in relation to socio-economic dynamics. The Payment for Ecosystem Services (PES) Team investigates the design of ecosystem service payment programs. The GIS-based Risk Mapping Team supports the entire research project by creating a spatially-explicit database of key variables associated with risk in the food chain.

**○ Progress and Results in 2012**

The major research outcome in its first year of the Full Research can be summarized as follows:

The Environmental Risk Assessment Team has created water quality maps for the Laguna Lake and its watersheds. The maps show that heavy metals are markedly high in the western region as compared to the eastern region likely reflecting the urbanization in the western region. The pathways of heavy metals from source to food will be investigated by analyzing lead stable isotope compositions of water, sediment and edible fish/water plant samples which would be used as a 'tracer' of heavy metals.

The Socio-Economic Evaluation Team will grapple with the following research subjects: (i) consumer behavior and perception of food & health risk; (ii) economic and environmental values by agricultural/agro-forest land use; (iii) waste management and community development; (iv) long-term comparison of food & health security. Several household and farm surveys have been conducted in the Sta. Rosa Sub-watershed and control area since last fall. With the collected data and information, we will employ statistical and econometric approaches.

The Health Risk Evaluation Team has completed the baseline evaluation to clarify the type and severity of environmental exposures affecting human health. Description of the health status of households and dietary diversity in the Santa Rosa sub-water shed area has also completed. A pilot study on health assessment of environmental pollutants exposure among community residents near Laguna Lake area was

done. Further analysis of community exposure to environmental pollutants and risk communication strategies will be formulated.

PES (Payment for Ecosystem Services) Analysis Team estimates the farmers' adoption decisions of agroforestry and derives regional supply of ecosystem services from agriculture. We also evaluate people's willingness-to-pay (WTP) for enhancing ecosystem services in the region. Combining these results, we will eventually conduct policy simulations and derive the PES scheme, desirable for both ecological services and people's livelihood in the region.

The GIS risk analysis team constructed "spatial analysis data map" which were aggregated spatial data (paper maps, satellite images) and various information from other teams. Furthermore we created new factors (land use and land use changes) and applied spatial analysis. We plan to construct efficient information-sharing structure in a local community in the current fiscal year.

### ○Project Members

- ◎ KADA Ryohei ( Research Institute for Humanity and Nature, Professor, Environmental Economics )
- MASUDA Tadayoshi ( Research Institute for Humanity and Nature, Senior Researcher, Agricultural Resource Economics )
- YAOTA Kiyoyuki ( Research Institute for Humanity and Nature, Researcher, Spatial Econometrics, GIS, Remote Sensing )
- SAITO Satoshi ( Research Institute for Humanity and Nature, Researcher, Stable Isotope Earth Science )
- NAKANO Takanori ( Research Institute for Humanity and Nature, Professor, Isotopic Environmental Science )
- ARIMA Makoto ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Earth Science )
- YUMOTO Takakazu ( Primate Research Institute Kyoto University, Professor, Forest Ecology )
- RAZAFINDRABE Bam H. N ( University of the Ryukyus, Associate Professor, Disaster Risk Management )
- MASUNAGA Shigeki ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Environmental Chemistry )
- MIZUSHIMA Shunsaku ( Graduate School of Medical Sciences, Yokohama City University, Professor, Preventive Epidemiology )
- TANAKA Katsuya ( Research Center for Sustainability and Environment, Shiga University, Associate Professor, Resource Economics )
- NAKAI Satoshi ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Environmental Risk Epidemiology; Epidemiological Evaluation of Chemicals )
- NAGAI Takashi ( National Institute of Agro-Environmental Sciences, Researcher, Organic Chemistry Risk Analysis )
- TAN, J. Galvez ( Medical School, University of the Philippines at Manila, Professor, Public Health )
- RANOLA, R. F. ( College of Agriculture, University of the Philippines at Los Banos, Professor, Resource Economics )
- CONCEPCION, R. N. ( College of Agriculture, University of the Philippines at Los Banos, Visiting Professor, Environmental & Resource Economics )
- BORJA, A. C. SANTOS ( Research Department, Lake Laguna Development Authority, Director, Biological Limnology )
- MOLINA, V. B. ( Medical School, University of the Philippines at Manila, Associate Professor, Public Health )
- PANGANIBAN L. C. R. ( Medical School, University of the Philippines at Manila, Associate Professor, Environmental Epidemiology )
- ZAFARALLA Macrina T. ( College of Agriculture, University of the Philippines at Los Banos, Professor, Biology, Water Quality Assessment )
- MACANDOG Damasa ( College of Agriculture, University of the Philippines at Los Banos, Professor, Plant Ecology, Evaluation of Soil Erosion )

### ○ Future Themes

Including the Pre-Research (PR) period, almost two years have passed since this project started. Through the field work, laboratory experiment, interviews and discussions with stakeholders as well as household, farm, and biomedical surveys, each team is submitting rigorous or preliminary research results. In the second year of 2012/2013, the Community Forum 2012 was held as a community-based social

experiment in September in Laguna, the research site, and it worked as a showcase of our research activities. The feedback from the local stakeholders will be utilized for the interdisciplinary study next year.

## ● Achievements

### ○ Books

#### 【Chapters/Sections】

- Ryohei kada 2012 Why is change to satoyama and satoumi a concern?. Satoyama- Satoumi Ecosystems and Human Well-Being Socio-Ecological Production Landscapes of Japan. United Nations University Press, Shibuya-ku, Tokyo, pp.125-154.

### ○ Papers

#### 【Original Articles】

- Saito, S., Arima, M., Nakajima, T., Tani, K. , Miyazaki, T., Senda, R., Chang, C., Takahashi, T., Hirahara, Y. and Kimura, J.-I. 2012 Petrogenesis of the Kaikomagateke granitoid pluton in the Izu Collision Zone, central Japan: implications for transformation of juvenile oceanic arc into mature continental crust. Contributions to Mineralogy and Petrology 163 :611-629. (reviewed).

### ○ Research Presentations

#### 【Oral Presentation】

- Ryohei Kada & Tadayoshi Masuda Managing Environmental Risks for Food and Health Security in Southeast Asian Watersheds. International Conference "Climate Change & Natural Disasters in Asia: Emerging Food Security and Eco-Health Issues", 2013, 03,14-2013, 03,15, Monash University Sunway campus, Malaysia .
- Katsuya Tanaka The Cost-Effective Design of Payment for Ecosystem Services in the Philippines. International Conference "Climate Change & Natural Disasters in Asia: Emerging Food Security and Eco-Health Issues", 2013, 03,14-2013, 03,15, Monash University Sunway campus, Malaysia .
- Jaime Z. Galvez Tan A Baseline Description of the Health Status and Food Security of Households in the Santa Rosa Sub-watershed Area. International Conference "Climate Change & Natural Disasters in Asia: Emerging Food Security and Eco-Health Issues", 2013, 03,14-2013, 03,15, Monash University Sunway campus, Malaysia .
- Roberto F. Ranola Building Disaster Resilience to Address Household Food Security: The Case in Silang-Sta. Rosa Subwatershed. Monash University Sunway campus, Malaysia , 2013, 03,14-2013, 03,15, Monash University Sunway campus, Malaysia . .
- Rogelio N. Concepcion Community-Based Exchange of Knowledge, Learning and Communication of Ecological Risks Amidst Climate Change: Yaman ng Lawa Project. International Conference "Climate Change & Natural Disasters in Asia: Emerging Food Security and Eco-Health Issues", , 2013, 03,14-2013, 03,15, Monash University Sunway campus, Malaysia .
- D.B. Magcale-Macandog, A.P.O. de Guia, D. C. Pagaduan, M.A. Bragais, R.L.P. Mojica, R. Castillo, J. Llamas, and W. Reyes Land Use and Biodiversity Changes in the Sta. Rosa-Silang Subwatershed and its Implications to Food Security.. 2012 ISSAAS International Symposium and Congress, 2012, 11, 13-2012, 11, 16, Bicol University, Legazpi City, Albay, Philippines.
- Damasa M. Macandog, Maria Francesca O. Tan, and Dalton Erick S. Baltazar Biophysical Profile and Environmental Impacts of Agricultural and Agroforestry Systems an Silang-Sta. Rosa Subwatershed.. 2012 ISSAAS International Symposium and Congress, 2012, 11, 13-2012, 11, 16, Bicol University, Legazpi City, Albay, Philippines.
- Bam H.N. Razafindrabe Community Resilience to Flood Disasters - Case Study of Santa Rosa Subwatershed. Community Forum 2012, 2012, 09, 27-2012, 09, 28, DAP, Tagaytay City, Philippines.

- Rañola, Roberto Jr Impact of Environmental Hazards and Risks on the Environment and Food Security: A Framework. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Jaime Z. Galvez Tan Baseline Description of Health Status and Health-related Factors of Households in the Sta. Rosa Sub-watershed Area. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Lynn R. Panganiban Risk Factors to Heavy Metal Poisoning Among Residents in Four Communities in Santa Rosa City, Laguna. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Noel R. Juban Baseline Assessment of Food Insecurity and Coping Strategies in Households in the Santa Rosa Sub-watershed Area. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Macrina T. Zafaralla Degraded Creek Habitat Restoration through Use of an Aquatic Macrophyte Biosorption System (AMBS): Biodiversity Evaluation. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Katsuya Tanaka Payment for Ecosystem Services Through Agroforestry in the Philippines. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Victorio B. Molina HEALTH RISKS FROM HEAVY . Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Fe M. Ranola. RF Ranola, Jr., JT Dizon, MC Casin, MFO Tan and DES Baltazar Food Insecurity of Households in Downstream Watershed Communities in the Laguna Lake Region. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Fe M. Ranola Food Insecurity of Households in Watershed Communities in the Laguna Lake Region. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Satoshi (Tetsu) Saito Present levels of heavy metals in river and lake waters and bottom sediments in the Laguna de Bay watershed. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Kiyoyuki YAOTA1 Spatial Data Integration for Risk Identification and Awareness (Linking Science to Community). Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Rogelio N. Concepcion “Yaman ng Lawa” Community-based Ecology Learning Center. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Tadayoshi Masuda Where and How Are Food & Health Risks Distributed? From Household Surveys in the Santa Rosa Sub-Watershed, Laguna, the Philippines. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.

#### **【Poster Presentation】**

- Dr. Damasa B. Magcale-Macandog Impact of land-use change on plant, mammal and bird diversity and its implications on food security in the Sta. Rosa-Silang subwatershed. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.
- Dr. Macrina T. Zafaralla Degraded Creek Habitat Restoration Through Use of an Aquatic Macrophyte Biosorption System. Community Forum 2012, 2012, 09, 27–2012, 09, 28, DAP, Tagaytay City, Philippines.

**Stage: Full Research**

**Project No.: R-07**

**Project Name: Desertification and Livelihood in Semi-Arid Afro-Eurasia**

**Abbreviated Title: Desertification in Afro-Eurasia**

**Project Leader: TANAKA Ueru**

**Research Axis: Resources**

**URL: <http://www.kazehitotsuchi.com/>**

**Key Words: Afro-Eurasia, Desertification, Poverty, Vulnerable people, Livelihood, Human-environment interrelations, Practical techniques for desertification control, Socio-ecological adaptability, Development assistance**

## ○ Research Subject and Objectives

### Research objectives

The objectives of this research are as follows: 1) to identify socio-ecological characteristics and types of desertification in some targeted areas of Semi-arid Afro-Eurasia as a premise to solve/mitigate the problems related to desertification; 2) to re-examine techniques/approaches to cope with desertification and to enhance rural development assistance; 3) to understand mechanisms and processes of socio-ecological adaptation being functioned under environmental and demographic changes; 4) to seek feasible and practical techniques/approaches to prevent/mitigate desertification; and 5) to propose integrative/holistic solutions to encourage ways of improving livelihood security for the people who live with uncertainty and fragility in socio-ecological environment.

### Background

In ratifying the United Nations Convention to Combat Desertification in 1994, the international community, including Japan, signed its commitment to solve the problems related to desertification. So far, there have been many efforts made by international organization, local government and NGOs, however, the problems still remain unsolved and become more serious year by year. Why desertification have not been prevented and even became worse? It may be explained from its causes and its linkages with poverty. As defined in UNCCD (1994), the causes of desertification are both climatic factors and human activities. If the latter are carefully focused, the causes are the daily activities to support people's livelihood and basic needs for survival, such as cropping, animal husbandry and gathering of fuel woods. Nobody can force them to stop the livelihood activities of local people for desertification control. Difficulty of desertification control may also be explained from its complexity. Climatic factors include short and uneven distribution of rainfall, excess rain and flooding, and wind. Livelihood activities are varied under different landscape, soils, vegetation, food customs, traditions of techniques, socio-economic condition and so on. Susceptibility of land resources and ecosystems under the pressure of human activities and the impact of climatic factors are also different for each place. Thus, desertification can be considered as a sum of these combinations.

### Perception and contribution to global environmental problems

Desertification is one of the problems at global concern and, at the same time, the phenomena of desertification are the combinations of accumulated causes and consequences at local and human-scale under complex socio-ecological environments. This means that solutions should be designed by the combination of the actions at local and human-scale.

## ○ Progress and Results in 2012

Sahel region of West Africa is one of the frontlines of desertification. Due to the increase of human impact, traditional fallow cultivation, which maintains soil fertility and prevents soil erosion, is no more standing. Prolonged exposure of land surface accelerates soil erosion and, thus, the decrease of soil fertility. Nearly 20 years have passed since the ratification of UNCCD (1994) by international communities. Several efforts have been poured to desertification control and rural development, however, most of them are not necessarily adopted and extended to local level. Why it happened? It may be explained from the causes of desertification and close linkages with poverty. The



major causes of desertification are the daily activities to support people's livelihood and basic needs for survival, such as cropping, animal husbandry and gathering of fuel woods. This fact suggests that a technique should maintain beneficial effects both to satisfy needs of daily life first and, then, to control desertification. Based on such understanding, we innovated a practical technique, so-called "fallow-band system", to improve crop performance concurrently with reduction of soil erosion by wind.

### **Coping activities as socio-ecological adaptations**

We conducted the field research on the people's coping activities in the years of crisis in order to identify the requisites of socio-ecological adaptation in the Sahelian condition. The Fakara area in Western Niger receives approximately 400mm of annual rainfall, and frequently suffers drought, irregular rainfall, and locust outbreaks. We asked cultivators and pastoralists to remember years of crisis since the 1970s, and the coping strategies they employed. Cultivators identified 1973, 1984, and 1991 as years of crisis, while pastoralists named 1984, 1992, 1998 and 2005. Household vulnerability differed by ethnicity, as different ethnic groups typically rely on distinct livelihood strategies. Major coping activities were sale of livestock, food aid, seasonal migrant works, borrowing food and money, consumption of stored food, gathering of useful plants and insects, sale of fuel woods, and donation and remittance of money from family members working abroad. Pastoralists tended to manage within the range of their livelihood systems i.e. they would sell livestock, while, by contrast, cultivators tended to combine plural activities and depend on external support.

### **Fallow-band system**

**Design:** Fallow-band system was designed to improve crop performance, both growth and grain yield, and to reduce wind erosion. At the beginning of rainy season, the bands with 5 m width and stretching from the north to the south are set at the interval of 30 m to 60 m in cultivated field. In each band, seed of pearl millet are not sown, weeding practice is not done and, consequently, a band with wild grasses and herbs is established. The fallow-band, left during dry season after crop harvest, captures top soils and coarse organic matter blown by seasonal easterly wind. In the rainy season of next year, the position of the fallow-band is shifted on the windward.

**Functions:** We set some plots in the experiment farm of ICRISAT-Niamey, western part of Niger, to verify the functions of the fallow-band system in wind erosion control and improvement of crop performance. For the effect on wind erosion control, we monitored the amount of top soil and coarse organic matter (OM) blown by wind during dry season. The amount captured by a single fallow-band prevented 74 % of soil loss and 58 % of OM loss. For the effect on the improvement of crop performance, difference of crop growth was clearly shown in the field under continuous cultivation and in the field one year after the fallow-band. This drastic effect was explained by the loss or accumulation of relatively fertile top soil and organic matter, i.e. nutrients for crop, by wind. Since the residual effect remains for three to four years, the grain yield from the entire cultivated field, including the one under continuous cropping and once placed under fallow-band, increases year by year. Although the effect can not be kept with the increasing trend, the result is attractive for local cultivators.

**Extension:** The technique of fallow-band system was endorsed to the JICA Grassroots Project "Formation and dissemination of practical techniques for mitigation of desertification and improvement of household income in Niger" (April 2010-March 2013). As of December 2012, the technique has been extended and practiced by 439 households in 75 villages, 23 districts and 5 regions in Niger

### **Social network in a Sahelian community**

We examined the dissemination of the fallow band system within the commune of Finare, in Say District, Niger. The location of households that practiced and did not practice the technique was plotted and the networks of information and confidence are drawn as the diagram of network. Households using the technique were located in and near Finare sub-village, where the chief of the commune lives. A village chief is commonly designated as an access point in participatory approach by many rural development projects. Why was the introduced technique not disseminated throughout the entire commune despite its proven benefits? The reasons may be given by the state of the networks of information and confidence in the commune. The sub-villages of Finare and Gardje have relatively dense network of

information. Some households in Winde Gaoude and Koma are, however, isolated from the network. In addition, the chief, though he is a point of access to the community, is not in a key node of the network of confidence. These facts mean that the common participatory approach has some shortcomings and room for improvement. This study further suggests that some persons or households who are in the key nodes of the network in the community may enable future adoption of introduced techniques. This project will investigate the further practical advantages of interweaving such analysis of social networks into agricultural extension and rural development services.

### ○Project Members

- ◎ TANAKA Ueru ( RIHN, Associate Professor, Project management, Agricultural Studies )
- ISHIMOTO Yudai ( RIHN, Researcher, Sub-leader, Anthropology )
- SHINJO Hitoshi ( Kyoto University, Assistant Professor, Soil Science )
- IKAZAKI Kenta ( Cosmopolitan University of Tokyo, Assistant Professor, Soil Science )
- KOBAYASHI Hirohide ( Kyoto University, Associate Professor, Architecture )
- NAKAMURA Hiroshi ( Global Environmental Forum, Researcher, Social Economics )
- MIURA Rei-ichi ( Kyoto University, Lecturer, Tropical Ecosystems )
- UCHIDA Satoshi ( Japan International Research Center for Agricultural Science, Principal Researcher, Remote Sensing )
- ISHIKAWA Hirohiko ( Kyoto University, Professor, Climatology )
- SAKURAI Takeshi ( Hitotsubashi University, Professor, Rural Economics )
- MIYAZAKI Hidetoshi ( RIHN, Researcher, Boundary Agriculture )
- SASAKI Yuko ( RIHN, Researcher, Rural Sociology )
- SHIMIZU Takao ( RIHN, Researcher, Anthropology )
- TESHIROGI Koki ( RIHN, Researcher, Geography )
- MIZUNO Kazuharu ( Kyoto University, Associate Professor, Geography )
- OHYAMA Shuichi ( Kyoto University, Associate Professor, Area Studies )
- SETO Shinichi ( Global Environmental Forum, Researcher, Rural Development )

### ○ Future Themes

To achieve the research objectives, some corresponding sub-topics being conducted by the interim evaluation (at the end of FR2) are listed as follows.

1. To identify socio-ecological characteristics and types of desertification in some targeted areas of Semi-Arid Afro-Eurasia as a premise to solve/mitigate the problems related to desertification

1-1. Collection of general information (e.g. climate, vegetation, soil, topography, demographic statistics, household components, etc.) of the selected sites through village survey, literature review and analyses of satellite imagery by GIS

1-2. Identification of causes and types of dominant desertification phenomena in relating with the changes of livelihood activities under demographic and economic pressure, climatic trend and intervention from outside

2. To re-examine techniques/approaches to desertification control and rural development assistance

2-1. Collection and review of cases in the past and current projects related to desertification control conducted in Burkina Faso, Niger, Namibia and India

2-2. Re-examination of techniques (e.g. tree planting for reforestation, water harvesting) and approaches (e.g. participatory rapid appraisal) through the analyses of ecological suitability and affordability in labour allocation using the case reviews mainly in Burkina Faso and Niger

3. To understand mechanisms and processes of socio-ecological adaptation being functioned under environmental and demographic changes in the selected sites

3-1. Identification of endogenous and exogenous socio-ecological pressures to land resources, ecosystems, livelihood and communities derived from environmental and demographic changes

3-2. Identification of “years of crisis”, its causes and the coping activities referring to the experiences in Niger

3-3. Case study of “Cote d’ Ivoir shock” affecting Burkina Faso since 2002, focusing on the impact of demographic pressure to land resources, coping activities to mitigate/buffer the shocks

3-4. Case study of “Chronic drought and transition of local husbandly” in Burkina Faso, Niger, Namibia and India focusing on the changes of major livelihood activities (e.g. cultivation and livestock raising), the significance of seasonal/subsidiary jobs (e.g. migration labouring, petit-trading, and gathering) to ensure livelihood security

3-5. Case study of “Conflict and co-existence among different ethnics” in Niger and Burkina Faso focusing on the chronological records of conflicts, the seasonal interaction (e.g. spatial and temporal use of land resources for cultivation and grazing), the trading of local commodities at community level, the borrow and lend over commodities and land properties, and the competition in receiving outsider’ s support

3-6. Comparative study on socio-ecological adaptation in India, Burkina Faso, Niger and Namibia under similar climatic and ecological condition with differences in demographic pressure, land use systems of livelihood activities, and ethnic interrelations

4. To seek feasible and practical techniques/approaches to prevent/mitigate desertification

4-1. Collection and identification of indigenous/conventional techniques related to prevent/mitigate desertification, to improve land productivity and to restore degraded ecosystems

4-2. Action research for “Technology transfer within Africa” with on-site experiments in selected site of Burkina Faso, Niger and Namibia to restore deforested land using the combination of Zai (indigenous tree planting pit) and Diguette (line of stones and/or grass), and to prevent land degradation due to wind erosion using the technique of “fallow-band system”

4-3. Action research for “Identifying pre-requisites and processes of indigenization” in selected sites of Niger using some transferred techniques as tracer(s) to depict the information dissemination channels within and outside the community, to find the appealing points and processes for decision-making, acceptance, modification and succession of new technique(s)

5. To propose integrative/holistic solutions to encourage ways of improving livelihood security for the people who live with uncertainty and fragility in socio-ecological environment

5-1. Proposition of some packages of feasible and practical techniques effective to prevent/mitigate desertification phenomena (especially concerning to wind erosion in the Sahel of Niger), to restore degraded land and ecosystems, and to improve livelihood security through increasing household income sources and stabilizing agricultural/livestock production

## ● Achievements

## ○ Research Presentations

### 【Oral Presentation】

- Koki TESHIROGI Natural environments and livestock farming in arid land, Namibia.. RIHN-HUAF Collaboration Seminar on “African Development Assistance with Asia, 2013,03,06, Hue, Vietnam.
- Yuko SASAKI Technology dissemination and social networks at rural areas in the Sahel, West Africa. . RIHN-HUAF Collaboration Seminar on “African Development Assistance with Asia”, 2013,03,06, CARD, Hue University of Agriculture and Forestry, Hue, Vietnam.
- Takao SHIMIZU Protecting environment and human life in Sahel : A case study of “Planting Andropogon” on Fakara, Republic of Niger.. RIHN-HUAF Collaboration Seminar on “African Development Assistance with Asia”, 2013,03,06, CARD, Hue Univ. of Agri. and Forestry, Hue, Vietnam.
- Takao SHIMIZU “Taribé and “Street Children” in Ouagadougou: how students of Qur’ anic school became “Street Children” ? . International Union for Ethnological and Anthropological Sciences “Children and youth in the changing world” , 2012,10,26-2012,10,30, Bhubaneswar, India..

- Ueru, TANAKA, Yuko SASAKI, Takao SHIMIZU, Kenta IKAZAKI Practical techniques and extension method for desertification control in the Sahel, West Africa.. International Symposium on Sustainability/ Survivability Science for Resilient Society Adaptable to Extreme Weather Condition, 2012, 08, 03-2012, 08, 04, Obaku Plaza, Uji, Kyoto.

---

**Stage: Full Research**

**Project No.: E-05-Init**

**Project Name: Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge**

**Abbreviated Title: ILEK project**

**Project Leader: SATO Tetsu**

**Research Axis: Ecosophy program/OICOS initiative**

**URL: <http://en.ilekcrp.org/index.html>**

**Key Words: knowledge production, adaptive governance, residential research, multi-scale translator, meta-analysis**

---

## ○ Research Subject and Objectives

### Research purpose:

Diverse ecosystem services should be managed as commons by collaboration of various stakeholders with different values and interests. Through the accumulation and meta-analysis of diverse case studies from all over the world, we examine mechanisms to facilitate production and utilization of the integrated knowledge base for the stakeholder driven creation and sustainable management of such commons. The project aims to clarify the process and mechanisms for local stakeholders to effectively integrate and utilize scientific as well as various types of local knowledge to achieve adaptive governance of local communities. Roles and functions of diverse multi-scale translators mediating knowledge flow across different scale levels from global to local are analyzed in detail to elucidate multi-scale mechanisms to solve global environmental problems. These results will contribute to formation of science for society to produce knowledge bases to be utilized by stakeholders (knowledge users), and social systems for effective use of science to solve global environmental problems.

### Background of research:

Bottom-up approaches driven by diverse stakeholders of local communities are essential to solve diverse global environment problems including worldwide degradation of ecosystem services which comes up to the surface on the basis of locally specific problem structures. Scientific as well as various types of local knowledge systems are required for the stakeholders to effectively manage ecosystem services. Studies have been accumulated to describe characteristics and structures of these knowledge bases, but design-oriented analyses of production and circulation mechanisms of knowledge to contribute to adaptive governance of ecosystem services have not been conducted in detail. This research focuses on the roles and functions of residential researchers and bilateral knowledge translators as important actors to provide knowledge basis for decision makings and actions by local stakeholders, and production and circulation of the Integrated Local Environmental Knowledge (ILEK), a transdisciplinary blend of science and various types of local knowledge, to understand mechanisms to facilitate collaboration of diverse actors to achieve adaptive governance of local communities to design sustainable future.

### Contribution to solutions of global environmental problems:

This research contributes to bottom-up solutions of diverse global environmental problems by clarifying adaptive governance systems of ecosystem services supported by production and circulation of the Integrated Local Environmental Knowledge (ILEK). It aims to clarify theory and approaches of solutions of global environmental problems from the viewpoints of knowledge users (stakeholders) to establish adaptive governance systems of diverse ecosystem services by effectively integrating scientific knowledge and various types of local knowledge deeply embedded in everyday life.

## ○ Progress and Results in 2012

### Research plan:

The research plan of this project was originally designed assuming one year pre-research (PR) period with the following research topics. (1) Detailed analysis of case study sites selected in the FS stage from the viewpoints of knowledge users to establish candidates of social experiment sites. (2)

Accumulate examples of multi-scale knowledge translators and establish analytical frameworks. (3) Establish interactive approaches between empirical case studies and theoretical analysis. We also made a research plan for the full-research first year (FR1) as follows. (1) Promote understanding of roles and functions of ILEK productions and circulations in the adaptive governance processes of local commons through emergence and dynamic changes of the roles of knowledge producers in the local communities. (2) Determine social experiment sites to start logistical setup and consensus building among stakeholders. (3) Start up multi-scale analysis. As the FR1 has been launched immediately without PR phase, we tried to incorporate all these research topics in this FR1.

**Research methods:**

This project effectively inherits research outcomes of cognitive sciences from previous RIHN projects and integrates them with various cases of solution-oriented design science approaches from the world involving collaborative interactions between scientists and stakeholders to produce and utilize ILEK for creation and sustainable management of local commons. With this unique approach, the project aims to elucidate pathways to promote science for society as well as to design social systems to digest and effectively utilize scientific knowledge. The Integrated Local Environmental Knowledge (ILEK) has been formed in the process of bringing solutions to local environmental problems in various local communities in the world integrating local wisdoms to manage and utilize ecosystem services in everyday life and scientific knowledge providing cause effect relationships and predictability. Residential researchers conducting scientific research as members of local communities and bilateral knowledge translators promoting knowledge circulation and utilization across the border between scientists and stakeholders play important roles in these processes. The project analyzes scientific processes and outcomes of various cases of solution-oriented knowledge productions by residential and other types of researches including RIHN projects from the viewpoints of knowledge users, based on the hypothesis that the multiple roles and functions of these important actors to produce and circulate ILEK support the adaptive governance of local communities for sustainable futures. We have established the preliminary conceptual models of ILEK-based adaptive governance based on the framing of local stakeholders and potential responses of stakeholder networks. We aim to elaborate these theoretical frames from meta-analysis of case studies and modeling to produce verifiable hypothesis for designing social experiments. We also conduct analysis of roles and functions of bilateral knowledge translators in the contexts of multi-scale collaboration mediated by knowledge flow across multiple scale levels from local to global. With the approaches integrating empirical studies, social experiments and theoretical analysis, the project aims to elucidate the way forwards toward solution of global environmental problems.

**Research organizations:**

In the year 2012, we made particular emphasis on establishment of research group structures and methodologies through the screening and reorganization of case study sites, accumulation of diverse cases of multi-scale translators, and design of task forces (TFs) crosscutting research groups with particular concepts and issues. This project is characterized by participation of researchers, either residential or visiting, deeply committed to local communities of the case study sites to examine dynamism of adaptive governance caused by intense interactions among stakeholders including transformation of researchers themselves. Therefore, we spent much effort to identify cases allowing such approaches with dedicated researchers for the analysis of local communities and multi-scale translators. As the results, we have been establishing sufficient quantity and quality of case study sites and case examples of multi-scale translators. We also designed taskforces (TFs) focusing key concepts and issues in order to facilitate collaborations toward project ideas and goals among diverse researchers based on the common research interests. At the end of the fiscal year 2012, we established an effective set of TFs including Residential Research TF and Sato-umi /Fisheries Resource Management TF crosscutting case studies and multi-scale analysis, Environmental Governance TF connecting empirical studies and theoretical analysis, and Ethical Aspect of Design Oriented Science TF dealing science and society interfaces. On the other hands, we encountered difficulties in recruiting new post-doctoral project researchers in the middle of the academic year, resulted in delays in establishments of research integration systems and database / websites for effective information sharing.

### Research outcomes of the year 2012:

The project made a significant progress in the blushing up of approaches to integrate results of diverse case studies through meta-analysis. We had opportunities to share and discuss basic approaches of integration in the pre-full project meeting with Japanese project members in May and the first full-project meeting with international members in July. We convened the kickoff symposium of the project titled "Community-based Knowledge Production, Activities and Adaptive Governance" in September to introduce project ideas and approaches to the public. Each research group convened one or two research meetings focusing research protocols and meta-analysis approaches, and the outcomes were shared with the entire project community. Based on the analysis and discussions regarding diverse local communities where the project members were deeply involved, a total of 61 case study sites were identified to conduct meta-analysis and to design social experiments which is scheduled to launch in FY3. Case examples of multi-scale translators promoting cross-scale knowledge circulations has been accumulated, with significant new additions of the Ramsar Convention, Globally Important Agricultural Heritage Systems (GIAHS) of FAO, and Barefoot Ecologist Systems in the coastal fisheries managements. Multiple thematic task forces (TFs) have been established to crosscut existing research groups, strengthening support for information gathering and analysis. These TFs include Ethical Aspects of Design-oriented Science TF corresponding to requirements of in depth ethical analysis related to intensive science-society interactions, Residential Research TF focusing on the key concept of the project, Sato-umi / Fisheries Resource Management TF dedicated to community-based natural resource management, and Environmental Governance TF conducting theoretical analysis of adaptive governance processes on the basis of case studies in the real world. Preliminary results of case study groups and TFs were presented in the special sessions organized by project members at the Japanese Society for Science and Technology Studies (November at Hayama, Residential Research TF), Wildlife Conservation Society Japan (November at Utsunomiya, wildlife management), and Pacific Congress of Marine Science and Technology (December at Kailua-Kona, Hawaii, Sato-umi TF).

Development of meta-analysis methodologies and analytical frameworks have been progressing to integrate diverse case studies and multi-scale analysis to elucidate adaptive governance mechanisms, based on the results of interviews to RIHN project leaders at the FS stage and the Guideline on Collaboration between Local Communities and Scientists published by the Local Science Network for Environment and Sustainability (LSNES) established by the previous JST-RISTEX project. Adaptive governance mechanisms driven by ILEK production and circulation (including multi-scale interactions) have been categorized into two processes: i.e. Knowledge production and circulation bring about societal changes (1) via transformation of decision and actions of individuals or small groups of people, or (2) directly affect social systems including formal and informal institutions. Adaptive governance systems were hypothesized as a mutually interactive triangle with apexes of knowledge production, decision making / action, and adaptive societal change. Preliminary criteria of adaptive governance processes were proposed based on this conceptual model from the interview records at the FS stage and brainstorming with the project members. Discussions have been in progress with theory group members to bluish up these criteria to be applied in mathematical modeling. Various approaches of theoretical modeling have been listed as candidates to describe adaptive governance systems, including theories associated with knowledge structures and cognitive dynamics (scenario analysis, participatory visioning, learning machine model, semantic network), dynamic networks of local communities (network theories, community ecology models) and theories to connect individual behavioral changes to societal dynamism (self-organization, dynamic game theories, evolutionary theories). The network of researchers in the project has been well established to bridge the gap between the real world of local communities and abstract theoretical analysis, activating dynamic interactions between theory and empirical sciences.

### ○ Project Members

◎ SATO, Tetsu ( Research Institute for Humanity and Nature, Professor, Local Science for Environment and Sustainability Team leader of Developing country team: Case study group )

### Management Group

○ ISHIHARA, Hiroe ( Research Institute for Humanity and Nature, Project Researchers, Environmental Sociology )

- ◎ KIKUCHI, Naoki ( Research Institute for Humanity and Nature, Associate professor, Residential Research, Team leader of East Asia team of Case study group, and Residential Research TF )
- KAKUMA, Shinichirou ( Extension Office for Fishery, Okinawa Prefectural Government, Chief Officer, Fisheries Resource Management, Team leader of Bottom up team of Multi-scale analysis group and Sato-umi TF )
- SAKAI, Akiko ( Graduate School of Environment and Information Science, Yokohama National University Vice-chairperson and in charge of administration office, Japanese Coordinating Committee for MAB, Associate professor, Protected Area Management, Team leader of Top down team of Multi-scale analysis group )
- SHIMIZU, Mayuko ( Faculty of Policy Science Ryukoku University, Lecturer, Environmental Sociology )
- TAKEMURA, Shion ( Research Institute for Humanity and Nature, Project Researchers, Landscape Ecology )
- TOKITA, Kei ( Graduate School of Information Science Nagoya University, Professor, Statistical Physics, Team leader of Theory and modeling group )
- NAKAGAWA, Chigusa ( Research Institute for Humanity and Nature, Project Researchers, Environmental Sociology )
- MATSUDA, Hiroyuki ( Graduate School of Environment and Information Sciences, Yokohama National University, Professor, Resource Management, Team leader of Europe/North America team of Case study group )
- MIYAUCHI, Tsisuke ( Hokkaido University Graduate School of Letters, Professor, Environmental Sociology, Team leader of Environmental governance TF )
- YANAKA, Shigeru ( Faculty of Regional Sciences, Tottori University, Associate professor, Rural Sociology )
- YAMAKOSHI, Gen ( Graduate School of Asian and African Area Studies, Kyoto University, Associate professor, African Studies )
- YUMOTO, Takakazu ( Primate Research Institute, Kyoto University, Professor, Ecology )
- ALEXANDRIDIS, Konstantinos ( Univ. of the Virgin Islands (US Virgin Islands), Associate professor, Network Theory )
- ARICO, Salvatore ( UNESCO Biodiversity Initiative (France), Director, Biodiversity Policy )
- CHABAY, Ilan ( Institute for Advanced Sustainability Studies, Potsdam (Germany), Professor, Sustainability Science )
- CROSBY, Michael P ( Mote Marine Laboratory (USA), President, Coastal Management )
- GUTSCHER, Heinz ( University of Zurich (Switzerland), Professor, Social Psychology )
- THAMAN, Randolph ( The University of the South Pacific (Fiji), Professor, Coastal Management )

#### Case Studies Group / East Asia Team

- AKAISHI, Daisuke ( Suzu City Hall, Research Fellow for Society Co-existing with Nature, Satoyama Management )
- IGARASHI, Tsubasa ( Social Innovation Course, Doshisha University Graduate School of Policy and Management, Masters Course Student, Satoyama Management )
- KAMATANI, Kaoru ( Kobe Women's University, part-time lecturer, History )
- KIMURA, Motoko ( One of Tsushima Rangers in charge of conservation of biological diversity, Research fellow, Residential Research )
- KORIYAMA, Shiho ( Graduate School of Letters, Kobe Women's University, Research Worker, Modern Japanese History )
- TAKAHASHI, Toshimori ( Satoyama Science Research Center, Faculty of Agriculture, Utsunomiya University, Special-appointed Associate Professor, Satoyama Management )
- TERABAYASHI, Akira ( Norinchukin Research Institute, Research fellow, Environmental Sociology )
- NIITSUMA, Hiroaki ( Council of Energy In My Yard, Japan(EIMY), Tohoku University, Director, Renewable Energy )
- HATTORI, Shiho ( Faculty of International Studies, Tenri University, Lecturer, Cultural Anthropology )
- HOSHI (TOMITA) , Sho ( Council of Energy in My Yard, Japan(EIMY) , EIMY Yumoto Regional Conference, Senior Researcher, Residential Research )
- MASUDA, Yasushi ( Shiretoko Nature Foundation, Director general, Residential Research )
- MITSUHASHI, Hiromune ( Institute of Natural and Environmental Science, University of Hyogo, Lecturer for the Museum of Nature and Human Activities, Hyogo, Lecturer, Residential Research )



**Case Study Group / Europe-North America Team**

- ONISHI, Hideyuki ( Department of Social System Studies, Faculty of Contemporary Social Studies, Doshisha Women' s College of Liberal Arts, Associate professor, Cultural Anthropology )
- KUME, Takashi ( Faculty of Agriculture, Ehime University, Associate professor, Soil Hydrology )
- SAKURAI, Ryo ( Graduate School of Environment and Information Sciences, Yokohama National University, Research fellow, Wildlife Management )
- TSUCHIYA, Toshiyuki ( Graduate School of Agriculture, Tokyo University of Agriculture and Technology, Professor, Nature Reserve Management )
- FUKUNAGA, Mayumi ( Research Organization for the 21st Century, Osaka Prefecture University, Associate professor, Environmental Ethics )
- MIURA, Shizue ( The Japan-Turkey Society, Member, Local Knowledge Studies )
- AKCA, Erhan ( Adiyaman University (Turkey), Professor, Agricultural Ecosystem )
- BOZAKLI, Hikmet ( Agricultural Chamber of Karapinar (Turkey), President, Agricultural Ecosystem )
- MACHO, Gonzalo ( University of Vigo (Spain), Research Fellow, Fisheries Resource Management )
- RAGSTER, LaVerne E. ( Univ. of the Virgin Islands (US Virgin Islands), Professor emeritus, Coastal Management )
- WEBB, William Alexander ( Univ. of the Virgin Islands (US Virgin Islands), Doctoral course, Network Theory )

**Case Study Group / Developing Countries Team**

- ONUMA, Ayumi ( Faculty of Economics, Keio University, Professor, Environmental Economics )
- KAMIMURA, Masahito ( Director of Committee for the Conservation of Shiraho Sea, WWF Coral Reef Conservation Research Center, Director, Nature Conservation Theory )
- KOBAYASHI, Takahiro ( School of Marine Science and Technology, Tokai University, Lecturer, Environmental Sociology )
- SATO, Takanori ( Palau International Coral Reef Center, Research Fellow, Coastal Management )
- SHIMAGAMI, Motoko ( i-i-network, Research & Action for Community Governance, Vice Representative, Commons Theory )
- TORII, Takashi ( Kagoshima University, Faculty of Fisheries, Associate professor, Fisheries Economics )
- NISHINO, Hikaru ( Eelgrass Support (Amamo Supporters), Representative, Coastal Management )
- NISHIMURA, Satoru ( Kagoshima University, Faculty of Law, Economics and Humanities, Professor, Agricultural Economics )
- HOSOKAI, Mizuki ( One of Tsushima Rangers in charge of conservation of biological diversity, Research fellow, Resource management )
- BRIGHOUSE, Genevieve ( National Marine Sanctuary (American Samoa), Director, Nature Reserve Management )
- CASTILLA, Juan Carlos ( Pontificia Universidad Cat?lica de Chile (Chile), Professor, Fisheries Management )
- KITOLELEI, Jokim ( Kagoshima University, Faculty of Fisheries, Doctoral course, Coastal Management )
- KOHLER, Florent ( Universite de Sorbonne (France), Director, Anthropology )
- LE TOURNEAU, Francois-Michel ( Universite de Sorbonne (France), Director, Geography )

**Multi-scale Group / Top-down Team**

- OIKAWA, Hiroki ( Graduate School of Environment and Information Sciences, Yokohama National University, Associate professor, Environmental Law )
- OHTANI, Ryu ( The National Institute of Advanced Industrial Science and Technology, Research fellow, Science and Technology Studies )
- OKANO, Takahiro ( Kagoshima University Education Center, Special-appointed Associate Professor, Nature Conservation Policy )
- KAJI, Koichi ( The Graduate School of Agriculture, Tokyo University of Agriculture and Technology, Professor, Wildlife Management )
- TANAKA, Toshinori ( Graduate School of Frontier Science, The University of Tokyo, Special-appointed Assistant Professor, Nature Conservation Policy )
- TOBAI, Sadayoshi ( WWF Japan Nature Conservation Office, Office chief, Nature Conservation Theory )
- TOI, Akiko ( Faculty of Environmental Systems, Rakuno Gakuen University, Professor, Environmental Law )

- MAKINO, Atsushi ( Department of Integrated Human Studies, Faculty of letters, Kumamoto University, Professor, Residential Research )
- BOUAMRANE, Meriem ( UNESCO, Division of Ecological and Earth Sciences (France), Programme Specialist, Resource Management )
- DEDEURWAERDERE, Tom ( Universit? Catholique de Louvain (Belgium), Professor, Political Science )
- LAUSCHE, Barbara ( Mote Marine Laboratory (USA), Director, Marine Policy Institute, Marine Policy )
- NILES, Daniel ( Research Institute for Humanity and Nature, Assistant Professor, Knowledge Theory )
- REED, Maureen G ( University of Saskatchewan (Canada), Professor, Environmental Governance )

#### Multi-scale Group / Bottom-up Team

- AKAMINE, Jun ( School of Humanities and Social Sciences, Nagoya City University, Associate professor, Resource Management )
- ONO, Rintaro ( School of Marine Science and Technology, Tokai University, Lecturer, Fisheries Resource Management )
- SUGA, Yutaka ( Institute for Advanced Studies on Asia, The University of Tokyo, Professor, Ethnology )
- TAKEKAWA, Daisuke ( Faculty of Humanities, The University of Kitakyushu, Professor, Ecological Anthropology )
- NAKAMURA, Koji ( Kanazawa University Center for Regional Collaboration, Special-appointed Professor, Satoyama Management )
- FURUTA, Naoya ( IUCN Jpana Project Office, Senior Project Officer, Nature Conservation Theory )
- MAKINO, Mitsutaku ( National Research Institute of Fisheries Science, Fisheries Research Agency, Group Leader, Resource Management )
- YANAGI, Tetsuo ( Research Institute for Applied Mechanics, Kyushu University, Special-appointed Professor, Satoumi Studies )
- YANAGIDA, Ipei ( INO, Board Member, Fisheries Resource Management )
- CLAUS, Annie ( Yale University (USA), Ddoctoral course, Environmental NGO Analysis )

#### Theory and Modeling Group

- AKIYAMA, Eizo ( Graduate School of Systems and Information Engineering, Tsukuba University, Professor, Statistical Physics )
- OURA, Takeshi ( Research Institute for Humanity and Nature, RA, Statistical Physics )
- KANEKO, Kunihiko ( Graduate School of Arts and Sciences, The University of Tokyo, Professor, Complex System Science )
- SATAKE, Akiko ( Hokkaido University Graduate School of Environmental Sciences, Associate professor, Theoretical Biology )
- FUJIMOTO, Koichi ( Graduate School of Science, Osaka University, Associate professor, Mathematical Biology )
- MARUYAMA, Yasushi ( Graduate School of Environmental Studies, Nagoya University, Associate professor, Environmental Sociology )
- MULLER, Erinn ( Mote Marine Laboratory (USA), Research fellow, Coastal Management )

#### Ethical Aspects of Design-oriented Science TF

- KANZAKI, Nobutsugu ( Faculty of Education, Shiga University, Associate professor, Environmental Ethics, TF leader )
- KIHIRA, Tomoki ( General Education Center, Hyogo University of Health Science, Associate professor, Environmental Ethics )
- KURATA, Nobuo ( Hokkaido University Graduate Scholl of Letters, Professor, Environmental Ethics )
- TERAMOTO, Tsuyoshi ( Faculty of Science and Engineering, Chuo University, Assistant Professor, Environmental Ethics )
- YOSHINAGA, Akihiro ( College of Sociology, Edogawa University, Lecturer, Environmental Ethics )

#### Environmental Governance TF

- OHNUMA, Susumu ( Hokkaido University Graduate School of Letters, Associate professor, Environmental Governance )
- OGATA, Seiichi ( Graduate School of Environmental Studies, Nagoya University, Research fellow, Environmental Governance )
- KAIDA, Naomi ( Graduate School of Humanities and Sociology, The University of Tokyo, Ddoctoral course, Environmental Governance )

KADO, Kazunori	( Hokkaido University of Education Asahikawa Campus, Associate professor, Environmental Governance )
KITOH, Shuichi	( Graduate School of Frontier Science, The University of Tokyo, Professor, Environmental Governance )
KINJYOU, Tatsuya	( Hokkaido University Graduate School of Letters, Doctoral course, Environmental Governance )
KURODA, Satoru	( Department of Contemporary Culture and Society, Rikkyo University, Assistant Professor, Environmental Governance )
SUGIMOTO, Ayumi	( Akita International University, Lecturer, Environmental Governance )
SUZUKI, Katsuya	( Institute of Natural and Environmental Sciences, University of Hyogo, Lecturer, Environmental Governance )
SEKI, Reiko	( Department of Contemporary Culture and Society, Rikkyo University, Professor, Environmental Governance )
TAKASAKI, Yuko	( Hokkaido University Graduate School of Letters, Doctoral course, Environmental Governance )
TAKEUCHI, Kengo	( Aomori City Namioka Primary School, Teacher, Environmental Governance )
TASHIRO, Yushu	( Tokushima Prefecture Sanago Biodiversity Experience Center, Director, Environmental Governance )
TATSUZAWA, Shirow	( Hokkaido University Graduate School of Letters, Assistant Professor, Environmental Governance )
TOMITA, Ryoto	( Faculty of Agriculture, Shizuoka University, Assistant Professor, Environmental Governance )
NISHIKIDO, Makoto	( Faculty of Humanity and Environment, Hosei University, Associate professor, Environmental Governance )
NINOMIYA, Sakiko	( Kanto Gakuin University College of human and Environmental Studies, Lecturer, Environmental Governance )
HIRAKAWA, Zenki	( Hokkaido University of Research Faculty of Agriculture, Research Fellow, Environmental Governance )
HIRANO, Yu-ichiro	( Forestry and Forest Products Research Institute, Research Fellow, Environmental Governance )
MIKAMI, Naoyuki	( Hokkaido University of Institute for the Advancement of Higher Education, Associate professor, Environmental Governance )
MEGURO, Norio	( Graduate School of Frontier Science, The University of Tokyo, Research Fellow, Environmental Governance )
YASUDA, Akito	( Graduate School of Frontier Science, The University of Tokyo, Research Fellow, Environmental Governance )
YAMAMOTO, Shinji	( Field Science Center, Faculty of Agriculture, Iwate University, Associate professor, Environmental Governance )
KARIN, Ree	( Graduate School of Frontier Science, The University of Tokyo, Doctoral course, Environmental Governance )

### ○ Future Themes

As expected from the beginnings, important knowledge regarding inspiring case examples from all over the world has been accumulated rapidly. On the other hand, we are experiencing lacks of human and methodological resources for information processing, meta-analysis and theorization to integrate massive information from diverse case studies. We also expect difficulties to secure human resources in many case study sites for data-processing and additional surveys required for meta-analysis. The project invited a new project co-leader (Environmental Sociology) with sophisticated skills of deep interview and discourse analysis in February. We will establish an efficient research management team with the co-leader and newly assigned project researchers (Europe and North America team in Case Study Group, and Database / Information sharing System) to promote analysis required for integration. Theory Group and Environmental Governance TF will work together with international members to establish diverse approaches and methods for multifaceted analysis and integrations.

This project will make a significant contribution to the quest of transdisciplinarity in the entire RIHN research by providing new models of co-design and co-production between science and society especially at the local scales. We believe that the ILEK project will be able to provide existing and newly developing

RIHN projects with important knowledgebase and methodologies to achieve transdisciplinarity through intensive interactions with stakeholders in various local communities in the world.

## ● Achievements

### ○ Books

#### 【 Authored/Co-authored 】

- Akamine Jun, 2013,03 Conserving biodiversity for cultural diversity: A multi-sited ethnography of sea cucumber wars. Tokai University Press, Kanagawa, Japan, 286pp.
- Laudjeng, H., Latjupa, S., and Shimagami M. 2012,07 Dunia Orang Tompu (World of Tompu People). INSIST Press, Yogyakarta, Indonesia, 79pp. (Other)

#### 【 Chapters/Sections 】

- Akiyama, E., Ishikawa, R., Kaneko, M. and Kline, J.J. 2013,03 Inductive Game Theory: A Simulation Study of Learning a Social Situation. H. Hanappi (ed.) Game Theory. InTech, pp.55-76.
- Suga, Y. 2013,03 The Tragedy of the Conceptual Expansion of the Commons. Murota, T. & Takeshita, K. (ed.) (ed.) Local Commons and Democratic Environmental Governance. United Nations University Press, Tokyo, pp. 3-18.
- Fujimoto, K. & Sawai, S. 2013,01 Collective Decision-Making and Oscillatory Behaviors in Cell Populations. Mikhailov, A. S., Ertl, G., (ed.) (ed.) Engineering Chemical Complexity. World Scientific, Singapore, pp.279-298.
- Ishihara, H., Pascual, U. 2012,08 Capital and Collective Action in Environmental Governance: What are the missing links?. E. Broussau, T. Dedeurwaedere, P. Jouvét, M. Willinger (ed.) Global Environmental Commons: Analytical and Political Challenges in Building Governance Mechanisms. Oxford University Press, Oxford, pp.199-221.
- Yanagi, T. 2012,04 Integrated Management in the Seto Inland Sea, Japan. H. Kremer • J. Pincney (ed.) Integrated Management of Estuaries and Coastal Seas. Elsevier, pp.205-226.
- Miyazawa, Y. & Makino, M. 2012,04 Role of fisheries and ecosystem-based management: Shiretoko, Japan. Amareswar, Galla (ed.) (ed.) World Heritage: Benefits Beyond Borders. UNESCO and Cambridge University Press, Cambridge, pp.253-263. DOI:<http://dx.doi.org/10.1017/CB09781139567657>.027.
- Makino, M. 2012,04 Ecosystem-based fisheries management in the Shiretoko World Natural Heritage, Japan. G. Kruse, H. Browman, K. Cochrane, D. Evans, G. Jamieson, P. Livingston, D. Woody, & C. I. Zhang (ed.s) (ed.) Global Progress on Ecosystem-Based Fisheries Management. Alaska Sea Grant, Anchorage, pp.237-256.
- Kohler F., Le Tourneau F.M. 2012 Conservation de la biodiversité et savoirs indigènes: mise en œuvre difficile de la Convention pour la diversité biologique au Brésil. In C. Fleury et A.C. Prévot-Julliard (dirs) (ed.) L'exigence de la réconciliation - Biodiversité et société. Paris, Fayard - MNHN, Paris, pp.25-36. (in French)
- Kohler F., Le Tourneau F.M. 2012 Conservation de la biodiversité et savoirs indigènes: mise en œuvre difficile de la Convention pour la diversité biologique au Brésil. In C. Fleury et A.C. Prévot-Julliard (dirs) (ed.) L'exigence de la réconciliation - Biodiversité et société. Paris, Fayard - MNHN, Paris, pp.25-36. (in French)
- Kohler F., Le Tourneau F.M. 2012 Conservation de la biodiversité et savoirs indigènes: mise en œuvre difficile de la Convention pour la diversité biologique au Brésil. In C. Fleury et A.C. Prévot-Julliard (dirs) (ed.) L'exigence de la réconciliation - Biodiversité et société. Paris, Fayard - MNHN, Paris, pp.25-36. (in French)

**○Editing****【Editing / Co-editing】**

- Brondizio, E. S. and E. F. Moran (eds.) (ed.) 2012 Human-Environment Interactions: Current and Future Directions. Dordrecht, 17. Springer Scientific Publishers, The Netherlands, 434pp.

**○Papers****【Original Articles】**

- Yumoto, T., Iwata, Y., Morimoto, Y. 2013,03 Evaluating cultural value of Satoyama using the preference method. *Global Environment* 17(2) :105-117. (reviewed).
- Tsujino, R., Yumoto, T. 2013,03 Vascular plant species richness along environmental gradients in a cool temperate to sub-alpine mountainous zone in central Japan. *Journal of Plant Research* 126 : 203-214. (reviewed).
- Ishihara, H., Pascual, U. 2013,03 Re-Politicizing Social Capital: Revisiting Social Capital and Collective Action in Common Pool Resource Management. UNU-IAS Working Paper Series 170.
- Masaki, N., Fujimoto, K., (equally contributed), Honda-Kitahara, M., Hada, R., & Sawai, S. 2013,03 Robustness of self-organizing chemoattractant field arising from precise pulse-induction of its breakdown enzyme: a single cell level analysis of PDE expression in *Dictyostelium*. *Biophysical Journal* 104 :1192-1202. (reviewed).
- Sorgog K, Saito M, Hironaka Y, Higashiura Y, Matsuda H. 2013,03 Influence of agricultural activities on grassland arthropod in Inner Mongolia. *Environment and Natural Resources Research* 3 :33-41. (reviewed).
- Akiyama, E, 2013,01 Evolutionary Leader Game and Social Hierarch. *SICE Journal of Control, Measurement, and System Integration* 6(2) :102-107. (reviewed).
- Matsuda H 2012,12 Biodiversity and fisheries resource management in the Satoumi. *Global Environmental Research* 16 :181-187. (reviewed).
- Makino, M. & Sakurai, Y. 2012,12 Adaptation to climate change effects on fisheries in the Shiretoko World Natural Heritage area, Japan. *ICES Journal of Marine Science* 69 :1134-1140. (reviewed).
- Hayashi N, Watanabe E, Matsuda H. 2012,10 Relationship between threatened vascular plants and human population in Japan. *Journal of Ecology and Field Biology* 35 :331-341. (reviewed).
- Reed, M.G., and Egnyu, F. 2012,09 Management effectiveness in UNESCO biosphere reserves: Learning from Canadian periodic reviews. *Environmental Science & Policy* 25 :107-117. (reviewed).
- Ohta U, Jusup M, Mano T, Tsuruga H, Matsuda H 2012,09 Adaptive management of the brown bear population in Hokkaido, Japan. *Ecol Model* 242 :20-27. (reviewed).
- Kaneko, M., Kline, J.J., Akiyama, E, 2012,07 "A Simulation Study of Learning a Structure Mike's Bike Commuting." In *Proceedings of 2nd International Conference on Simulation and Modeling Methodologies . Technologies SIMULTECH 2012* :208-217. (reviewed).
- Akiba H, Miller CA, Matsuda H. 2012,05 Public attitudes and factors influencing preference for eradication project of raccoons in Kanagawa, Japan. *Human Dimension of Wildlife* 17 :1087-1209. (reviewed).
- Hori Y, Hayashi N, Matsuda H. 2012,05 The long-term trends of satoyama capital stocks and ecosystem services; case study on Mt. Hakusan Biosphere Reserve and its vicinity. *Global Environmental Research* 16 :189-196. (reviewed).
- Goto, R., Yamakoshi, G., & Matsuzawa, T. 2012,05 A novel brood-site pollination mutualism?: The root holoparasite *Thonningia sanguinea* (Balanophoraceae) and an inflorescence-feeding fly in the tropical rainforest of West Africa. *Plant Species Biology* 27 :164-169. (reviewed).
- Irie, H. & Tokita, K 2012,05 Species-area relationship for power-law species abundance distribution. *International Journal of Biomathematics* 5(1260024) :9. (reviewed).

## ○Research Presentations

### 【Oral Presentation】

- Onishi, H. Collapse of the Soviet Union and Adaptation Strategies of the Indigenous People: land use and livelihood strategies in two Nanai villages. Russo-Japanese Collaborative Symposium Cultural Adaptation of the People in the Forest Areas in Northeast Asia Institute of History, Archeology and Ethnography of the Far East Peoples, Far Eastern Branch of the Russian Academy of Sciences, 2013, 03, 07, Vladivostok, Russia.
- Claus, C. Anne. Re-visiting Coral Gardens and their Magic: Philosophies of Ecological Restoration in Okinawa. Society for Applied Anthropology Annual Meeting, March 2013, Denver CO.
- Fujimoto, K. Design principle of group-level decision making in cell populations. The 1st annual winter Q-bio conference, 2013, 02, 18-2013, 02, 21, Hawaii, USA.
- Fujimoto, K. Design principle of group-level decision making in cell populations. The 1st annual winter Q-bio conference, 2013, 02, 18-2013, 02, 21, Hawaii, USA.
- Yamakoshi, G. Toward humanizing nature conservation in Africa. First International CIAS Seminar on "Area Environments and Global Sustainability Challenges", 2013, 02, 05, Kyoto, Japan. .
- Yamakoshi, G., Ito, M. & Kobayashi, S. Diversity of agro-landscape management in the Forested Guinea, West Africa: Importance of oil palms and raphia palms. The International Workshop on "Incentive of Local community for REDD and semi-domestication of non-timber forest products (Global Environment Research Fund: E-1002, " . Ministry of Environment: FY2010-2012), 2013, 01, 25-2013, 01, 26, Kyoto, Japan. , .
- Reed, M.G. Enhancing ecological and social learning in Biosphere Reserves: Experiences from Canadian Biosphere Reserves. Special lecture sponsored by the Japan Coordinating Committee for UNESCO-MAB, 2013, 01, 23, Yokohama, Japan.
- Reed, M.G. Gazing through the looking glass at both ends: Studying sustainability in Canadian biosphere reserves from the bottom up and the top down. Invited presentation to the International Workshop on Transdisciplinary Research on Global Environmental Issues, 2013, 01, 21, . .
- Akamine Jun, Whale meat foodways in the contemporary Japan: From fish sausages in the 1960s to whale tongue dishes in the 1990s. International Conference on Food and Heritage: A Perspective of Safeguarding the Intangible Cultural Heritage, 2013, 01, 03-2013, 01, 05, Hong Kong .
- Sato, T. Integrated Local Environmental Knowledge supporting adaptive co-management of SATO-UMI social-ecological systems. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Shimizu, M. Residential research bridging science and practice for adaptive governance of Sato-umi. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Tobai, S. Interaction of Multi-Scale Partnerships for Marine Biodiversity Conservation: A Case in the Yellow Sea. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Nakagawa, C. The local resource management in Japanese spiny lobster fishing. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Fukunaga, M. Power of Storytelling: Building a Local Environmental Knowledge Platform for Sato-Umi Governance. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Makino, M. & Matsuda, H. Co-management of the marine social-ecological systems in Shiretoko World Natural Heritage Site. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii.
- Kakuma, S. Institutional Aspects of Satoumi in Coral Reefs - To Harmonize Conservation and Sustainable Fisheries -. Pacific Congress on Marine Science and Technology, 2012, 12, 10-2012, 12, 14, Kailua-Kona, Hawaii, USA.

- Yanaka, S. Satoumi as a reconstruction of commons through coastal resource management by fishermen. Case study: Practices implemented by Onna Village Fisheries Cooperative Association in Okinawa Prefecture. Pacific Congress on Marine Science and Technology, 2012, 12, 10–2012, 12, 14, Kailua-Kona, Hawaii, USA. .
- Kamimura, M. International Stone Tidal Weir Summit in Shiraho, Japan for Creating SATOUMI 2010. Pacific Congress on Marine Science and Technology, 2012, 12, 10–2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Yanagi, T. Concept and Practices of Satoumi in Japan and Lessons Learned. Pacific Congress on Marine Science and Technology, 2012, 12, 10–2012, 12, 14, Kailua-Kona, Hawaii, USA.
- Suga, Y. Into the Bullring: The Significance of "Empathy.". American Folklore Society 2012 Annual Meeting, 2012, 10, 24–2012, 10, 27, New Orleans, Louisiana, USA.
- Reed, M.G. and Godmaire, H. Scaling up participatory and community-based research for policy and practical change: Reflecting on research with Canadian biosphere reserves. Annual Institute for the Society of Policy Scientists. Human Rights in World Public Order: Freedom, equality, and dignity. University of Saskatchewan, 2012, 10, 18–2012, 10, 20, Saskatoon, SK, Canada.
- Reed, M.G. and Massie, M. What's left of wilderness in contemporary conservation practice?. Beyond the culture of nature: Rethinking Canadian and Environmental Studies Conference, 2012, 09, 28–2012, 09, 30, Vancouver BC.
- Makino, M. Contribution of Japanese Fishery Management System to Targets 6 & 11 of Aichi Biodiversity Targets. IUCN World Conservation Congress 2012, 2012, 09, 06–2012, 09, 15, Jeju.
- Akiyama, E. (with M. Kaneko, J. Kline, R. Ishikawa), A Simulation Study of Learning: Mike's Bike Commuting. International Workshop on Game Theory, Epistemic Logic, & Related Topics, 2012, 08, 27–2012, 08, 30, Tsukuba, Japan.
- Fujimoto, K. Tuning collectivity in cell fate decision. The 13th International Conference of Systems Biology, 2012, 08, 19–2012, 08, 23, Tronto, Canada.
- Akiyama, E. Individual irrationality and lack of common knowledge of rationality in experimental asset markets. Summer Workshop on Economic Theory (SWET 2012), 2012, 08, 11, Kushiro, Japan.
- Kohler F. & Greissing A., Globalization in quilombola communities of the Amazon. 54th International Congress of Americanists, 2012, 07, 15–2012, 07, 20, Wien, Austria.
- Maruyama, Y & M. Nishikido, et.al., Social acceptance of Wind Energy and Social Experiment of Community Power in Japan. 11th World Wind Energy Conference 2012, 2012, 07, 03–2012, 07, 05, Bonn, Germany.
- Maruyama, Y Activities of Local Society toward Community Power. 11th World Wind Energy Conference 2012, 2012, 07, 03–2012, 07, 05, Bonn, Germany.
- Tokita, K. Adaptive species interactions promote species abundance. International Symposium, Advances in Theory of Species Interactions: Linking Individual Behavior, Population Processes and Community Dynamic, 2012, 06, 18–2012, 06, 19, Kyoto, Japan. .
- Reed, M.G. Embracing ecological and social learning: Biosphere reserves as exemplars of changing conservation practices. Canadian Association of Geographers at the Congress of the Social Sciences and Humanities, 2012, 06, 01, Waterloo, ON.
- Yamakoshi, G. Oil palms may stabilize the agricultural system of tropical West Africa. 13th Congress of the International Society of Ethnobiology, 2012, 05, 20–2012, 05, 25, Montpellier, France. .

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

- Reed, M.G. Learning to Learn: Evolving Sustainability Practices in UNESCO Biosphere. The United Nations University-Institute of Advanced Studies Yokohama, 2013, 01, 24, Yokohama, Kanagawa.
- Matsuda, H. Living harmony with nature: fisheries co-management in Shiretoko World Heritage. Pew Fellows in Marine Conservation Annual Meeting 2012, 2012, 12, 09, Panama.
- Brondizio, E. S. 3st. International workshop Building Resilience with Common Capital: Managing Shared Resources, Meeting the challenges of a rapidly transforming world under climate and ecosystem change. Asian Pacific Network of Global Change, 2012, 12, 03–2012, 12, 05, Kobe, Japan.

- Tokita, K., Oura, T. & Obuchi, T. Statistical mechanics of a biological community with complex interactions. Joint Symposium of Osaka University and Groningen University on Particle-Nuclear and Condensed Matter Physics: New Challenges and Opportunities, 2012,11,26-2012,11,27, Suita, Osaka.
- Matsuda, H. Innovation for sustainable use of the sea of fertility. Techno Ocean 2012, 2012,11,19, Kobe, Japan.
- Matsuda, H. Risk of radioactive contamination in fisheries resources. Exploring the impacts of the Fukushima Dai-ichi Nuclear Power Plant Accidents on the Ocean, 2012,11,14, Tokyo, Japan.
- Sato, T. Integrated Local Environmental Knowledge supporting adaptive governance of local communities. AIU International Conference on “University Leadership for Integrating Knowledge Diversity for Sustainability, 2012,10,05-2012,10,07, Alor Setar, Kedah, Malaysia.
- Matsuda, H. Fisheries co-management in Shiretoko World Heritage. 2012 International Conference of Marine Environmental Governance, 2012,09,26, Kaohsiung, Taiwan.
- Matsuda, H. Integrated Local Environmental Knowledge and Involvement of Local Stakeholders in Shiretoko and Yakushima World Heritages. World Conservation Congress, 2012,09,10, Jeju, Korea.
- Tokita, K. Origin of neutrality: Why is it a good approximation?. 2012 1st China-Japan-Korea International Conference on Mathematical Biology (CJKICMB2012), 2012,05,22-2012,05,25, Busan, Korea. .



## Incubation Studies

Biodiversity-driven nutrient cycling in social-ecological systems and their ecohealth

OKUDA Noboru (Center for Ecological Research, Kyoto University)

We developed a new technique with phosphate oxygen isotopes ( $\delta^{18}\text{O}_p$ ) to evaluate healthiness of watershed ecosystems based on their nutrient cycling functions. The analytical system was introduced into cooperative research facility in RIHN. This technique was applied to the largest tributary river of the Lake Biwa Watershed to validate its utility for studies on phosphorus cycling. The preliminary analysis revealed that the  $\delta^{18}\text{O}_p$  is a useful indicator to identify anthropogenic phosphorus loadings and evaluate the relative importance of biological recycling. Using this tool, we constructed the fundamental framework of methodology for watershed governance, which needs the common interest to be shared among a variety of stakeholders for establishment of recycling-oriented sustainable society.

Conflicts and Environmental Issues

TANAKA Masakazu (Institute for Research in Humanities, Kyoto University)

This Incubation Study (IS) aimed to understand the global impact of armed conflicts and related military activities on natural and social environments within a framework of multi-disciplinary studies. Following the suggestion of the IS evaluation committee, I have reviewed the literature on the environmental consequences of armed conflicts and visited major international centers in Europe, including The Stockholm International Peace Research Institute, Peace Research Institute Oslo, and London University, where I met several experts in the field and exchanged opinions. I received advice on the scientific measurement of noise and soil pollution on and around military bases in Japan, and I invited some experts to join in future research collaborations. In January and February 2012, I organized two meetings in Tokyo and Kyoto, respectively, where some Japanese specialists talked about the future project. I proposed a panel for the 14th Global Biennial Conference of the International Association for the Study of the Commons to be held in Yamanashi in June 2013. The panel is closely related to the IS topic.

Literacy for an alternative manner beyond the Globalism. New synthesis proposed from the city of Kyoto

OHNO Terufumi (The Kyoto University Museum)

The aim of our IS project is proposing a novel life manner practicable even for normal citizens in order to cope with the present environmental crises and coining out a method to spread this manner among society. In our IS phase, we held two steering meetings, three symposiums and one workshop and came to the following two conclusions. Without confronting with and gaining deep insight into the whole range of human nature, from rational to irrational, it is impossible to make sound basis for proposing practicable life manner, which is truly friendly for environments. Such topic is hard to be dealt with by current analytical and reductionistic research methods. Therefore, in our coming FS phase, we organize a research group of humanities and sciences to develop an effective method to deal with even irrational domains of human nature. In our coming FS phase, we also start action plan for enforcing school system, encouraging stronger engagements of people with their local schools, as well as encouraging dialogues and debates among pupils on environmental issues, because through our analysis, it became clear that these three points may play a key role in disseminating the life manner we propose.

### International comparison of social capital and environmental norms: Experimental economics approach AKAI Kenju (School of Engineering, The University of Tokyo)

In the global environmental issues, we face many conflicts between stakeholders, nations, and cultures so that we need a next step to overcome the conflicts. According to the human history, social capital and environmental norms are too important to ignore to create corporate schemes for fighting the global environmental hazards. Our goal in this study is to experimentally explore the international differences in the relationship between social capital and environmental norms which can become a key to cope with global environmental problems such as the global warming. We have been discussing how to co-create a new scheme used by economics, humanics, and environmentology in the RIHN and found the lack of economics and a need for relationship between economics and historical, cultural and social norms to improve the social systems for the environmental problems. Based on this discussion, we applied our new idea to SUMITOMO foundation and it was accepted. We conducted several experiments in Germany and Japan and found that the environmental norms are not affected by the income both in two nations and “Equal” justice is preferred. The next step is to make a team to design better social innovation to cope with environmental changes caused by natural disasters.

### Scenario Design and Implementation of a Resilient Municipal Energy System: An Exploratory Case Study KISHITA Yusuke (Center for Environmental Innovation Design for Sustainability, Osaka University)

The aftermath of the 2011 Great East Japan Earthquake provided humanity with an opportunity to discuss energy systems, with a particular emphasis on resilience, among various stakeholders. Much effort is thus currently being devoted to exploration of a desirable transition of energy systems, of which environmental-friendliness, economic performance, and security lie at the heart of solutions towards global environmental problems. This study aimed to describe future visions and possible transitions of resilient energy systems in the local community and, more broadly, the local socio-ecological system. We performed an intense literature review of energy systems and resilience and extended the concept of resilience to include energy systems of interest. A method for writing backcasting scenarios was proposed. We then organised three workshops to write scenarios focusing on energy systems and resilience of Suita City, Osaka, Japan in the following two steps: (1) scenarios of energy systems that lead to bankruptcy of the community and (2) scenarios of energy systems for a resilient community to avert the bankruptcy described in (1). The scenario writing enabled to plan various types of measures for enhancing resilience of the community, and helped observe perception gaps among stakeholders.

### Biocultural Diversity in the Asia-Pacific — its Significance and Futurability ONISHI Masayuki (RIHN)

This Project aims to study correlations between biodiversity and cultural diversity, and investigate the futurability of mechanisms which sustain such relationship, in four diversity hotspots in the Asia-Pacific.

We interpret “interaction between human and nature” as correlation between various factors constituting biological, cultural and linguistic diversities characterising each region, and investigate the complex mechanisms which maintain such relationship, by integrating outcomes of research using quantitative and qualitative parameters. We will also analyse social and natural factors which have contributed to the maintenance and degradation of such mechanisms in target regions. Throughout our research, we will work in close collaboration with local people and try to find out and implement strategies appropriate to each region to sustain such mechanisms.

Following such objectives, we have tried to form a network of local people and researchers in each target field, and discussed the project plan with them. We have also had seminars with some of the core members of the project in order to examine the concept of biocultural diversity and research methodologies. As a result, our research team has had a stronger organisation now, and we have developed a better perspective on our research issues and methodologies.

## Completed Research (CR) Follow-up Grants

These grants allow CR Project Leaders or team members to disseminate their research results to both the academic community and the general public, to contribute to the RIHN Archive, and to incubate new research ideas for future development as RIHN projects.

### Application of environmental scenarios in the revival of the disaster-stricken area

YOSHIOKA Takahito (Kyoto University)

MATSUSHIMA Kenta (Kyoto University)

The purpose of the project is the verification of the applicability of environmental scenarios, a method comprehensively checked in the RIHN project “Interactions between the environmental quality of a watershed and environmental consciousness”, to the reconstruction of the Tohoku area in Japan, which has suffered severely from the East Japan great earthquake disaster.

In this year, we have conducted a workshop on the reconstruction of Kamaishi city in the northeast Honshu island of Japan, which is administratively supported by the Netherlands embassy and Tohoku University, in order to obtain preliminary information for the project. Citizens, staffs of the local government and companies participated in the workshop. It involved the following aspects: (1) How do people act to reconstruct their city in a sustainable way, a so-called “a smart city”? (2) In a local society with low birthrate, high ratio of aged persons and therefore decreasing population, targets should be identified for the creation of a locality with security, comfortable livelihoods, and effective utilization of local resources. A case study in the Netherlands presented in the workshop could be a useful reference. (3) With the participation of citizens, government staff and local enterprises, the workshop aimed to reach a shared understanding of the most important points through discussion among all stakeholders, in order to achieve the policy objectives.

### Startup of consortium for in-situ conservation of wild rice

SATO Yo-ichiro (RIHN)

The aim of the project for in-situ preservation of wild rice in South-East Asia is not only to conserve wild rice plants (*Oryza* species) as the original species of cultivated rice, but also the agricultural system in the surrounding areas. A conceptual plan for in-situ preservation was designed according to the conditions found at the research site. Farmers may not fully understand the conceptual plan for in-situ preservation of wild rice, that has the potential to simultaneously contribute to environmental preservation and economic development, because any future agriculture development on farmers’ lands will be subject to the restrictions imposed in the area by the in-situ preservation of wild rice.

In this project, we will set up a consortium that includes farmers, citizens, administrative officers, and researchers to discuss implementing the in-situ preservation of wild rice within a two year period. For the Sato project (H-02), we have already signed a memorandum of agreement with the Rice Department in Thailand and National Agricultural Forestry Research Institute in Laos. On the basis of the discussion outcomes, as part of the project for in-situ preservation of wild rice, a consortium will be set up involving the researcher and the administrative officers of Thailand and Laos.

### Formation of a consortium on urban water in Asia

TANIGUCHI Makoto (RIHN)

This CR activity aims to further develop the Consortium on Urban Subsurface Environment Management in Asia (CUSEMA) which was established by RIHN project “Human impacts on urban subsurface environment”, to share the knowledge of water problems and solutions, to compare the different stages of the problems depending on the urban development, and to discuss with various stakeholders. This consortium started in April 2010, and the first CUSEMA meeting was held in Manila in Oct. 2011. The consortium consists of various stakeholders including national and local governments, private sectors, citizens, and NPO/NGO groups from Indonesia, Philippines, Thailand, and Japan, and will be extended to other Asian countries. In this CR activity, three issues: monitoring, modeling, and making policies, are the main targets for discussion and knowledge sharing based on the RIHN project. Results will be transferred as optimal policies depending on the development stage of the city. Finally, the consortium will be extended to the Asian regional scale in future.

### Development of an interdisciplinary research network utilising human resources obtained in the RIHN Indus Project 2007-2012 (H-03)

OSADA Toshiki (RIHN)

The aim of this CR is to form a new interdisciplinary network among researchers, utilising human resources obtained in the RIHN Indus project (H-03; 2017-2012). The network will be used to nurture the seeds of a new project which will in some way inherit the outcome of the previous RIHN projects including H-03.

We took part in the International Conference of South Asian Archaeology in Paris, in July, 2012, in order to draw the attention of a wider audience and then to expand our network and develop seeds for both RIHN Domain-based and Initiative-based research projects. The outcomes of the Indus project presented there attracted various positive responses, thereby providing some confidence in our interdisciplinary approach which integrates archaeology, Indology, and palaeo-environmental investigations into reconstruction of the ecohistories of key Indus areas. We have confirmed that our main findings such as “the Ghaggar was not a large river as the mighty Sarasvati”, which was originally presented at the Chapman meeting of American Geophysical Union, 2011 (and has now been published as Maemoku *et al.* (2012): Geophysical Monograph Series, 198: 97-102), appear to be one of the key drivers in growing our research network. By and large, we believe that the network sharing our interests will develop several research seeds to launch a new RIHN project.

### Research dissemination to the Communities from RIHN Project “A New Cultural and Historical Exploration into Human-Nature relations in the Japanese Archipelago”

YUMOTO Takakazu (Kyoto University)

During the RIHN Project “A New Cultural and Historical Exploration into Human-Nature relations in the Japanese Archipelago”, we disseminated research results every year to people who live in each study site (Hokkaido, Tohoku, Chubu, Kinki, Kyushu, Ryukyu), and these attempts received high commendation from the PEC. However, it became difficult to continue those dissemination activities after the finishing of the project. In the CR activity, we tried to share our research results and messages with a range of generations in the Ryukyu working group study site to produce new seeds for the next RIHN projects. We convened a seminar titled “Rediscover the benefits of *Cycas*” (8-9 December, 2012) at Meio University in Nago, Okinawa, to transfer the traditional ecological knowledge on *Cycas* as food during famines to younger generations.

#### Building a resilience network in Southern Africa and organization of Lusaka Workshop

UMETSU Chieko (Graduate School of Fisheries Science and Environmental Studies, Nagasaki University)

Southern Africa is a region that has increasingly close relationships with Asia in both economic and political terms. This region has also been experiencing population transfer from Asia and has changed dynamically. There is a concern that development by foreign direct investment is causing environmental problems through exploitation of natural resources. The importance of the resilience of social-ecological systems in this region has been pointed out. In the past, the Resilience Project organized the Lusaka Workshop three times (2007, 2009, 2011) and discussed pressing issues together with researchers, government officials, and staff from NGO and international organizations. The purpose of this CR project is to expand the participants of Lusaka Workshop in Southern Africa region and organize a Southern Africa Resilience Network to discuss resilience of social-ecological systems to environmental change such as climate change and natural disasters. During the FY2012, we are planning to collect information and engage networks at the international meetings for organizing the 2013 Lusaka Workshop. During the FY2013, we are planning to organize Lusaka Workshop in August and form the resilience network. During the FY2014, we will further strengthen network.

#### Operation of the Amur Okhotsk Consortium as a multilateral academic network

SHIRAIWA Takayuki (Institute of Low Temperature Science, Hokkaido University)

The purpose was to operate the Amur Okhotsk Consortium as a multilateral academic network to discuss the sustainable use and conservation of the Amur-Okhotsk ecosystem. We held a joint research cruise in the Amur River from September 25 to 30, 2012. A total of 20 researchers participated in this cruise from Japan, China, Russia and Mongolia, and discussed and specified the most urgent tasks to be solved by multilateral cooperation. They are 1) impacts of large hydropower facilities on Amur water quality and bank erosion, 2) ecological improvement and water purification efforts by restoration of riparian wetland along rivers, 3) influence of climate change, floods and irrigation on iron flux in water ecosystems, and 4) comparative analysis of hydrological processes in Asian big rivers. The participants propose to 1) compile the list of observation stations and scheme of official monitoring network on the Amur Basin rivers, and 2) trace dissolved and suspended material from the headwater to the estuary. Details of the joint cruise will be published in an English report by the end of March 2013.

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

The Center for Coordination, Promotion and Communication (CCPC) is responsible for crossproject, cross-domain investigation, research and support that concerns the entire institute. It has three divisions. The **Division of Coordination** maps out RIHN's mid- and long-term research trajectory and facilitates the cooperative arrangements necessary for its realization in domestic and international domains. The **Division of Promotion** develops and maintains the laboratory facilities necessary for research and fieldwork, particularly in staple isotope and DNA analyses, and builds the databases and archives of past and ongoing research. The **Division of Communication** decides how the new findings and outcomes of research may be best communicated in appropriate academic and public fora. Several recent activities are described in the pages on Research Communication. The CCPC also collaborates with the research department and administrative office to coordinate the task forces, working groups and administrative units involved in RIHN's ordinary operation and special events.

### ● Key Research Tasks

---

In RIHN's second phase, the Core Research Hub has been established within the CCPC. It focuses on the realization of the Futurability Initiatives by conjoining the existing RIHN Domain Programmes through a set of cross-cutting initiatives towards transdisciplinary field of Environmental Humanics of the Earth System. At present it has nurtured an Initiative-based Research Project, "Designing Local Frameworks for Integrated Water Resources Management".

### ● Building Research Data Networks

---

The CCPC plays a key role in facilitating RIHN's environmental networking and communication, especially between academic institutions, cultural institutions, and the general public. It is involved in the creation and maintenance of Asian environmental databases and project archives. It also supports the development of environmental studies curricula in Japan's public elementary, junior high and high schools.

The CCPC promotes cooperation between RIHN and research institutes both at home and abroad. One such activity is the repository for the global environmental studies (tentative name), a project to create environmental information networking nodes among a number of research institutes.

### ● Facilities and Equipment

---

The Division of Promotion maintains eighteen laboratories in the ground level of its main building, including specialized facilities for DNA and stable isotope analysis and mass spectrometry, as well as several rooms for chemical and biochemical analysis, microscopy, incubation, hazardous materials, fieldwork preparation, sample preparation and cold storage.

# Outreach Programs and Events

## 1. RIHN International Symposium

### RIHN 7th International Symposium

In order to diffuse the findings of the three FR projects concluding in March 2013, the RIHN 7th International Symposium “Complexification and Simplification: Ecosystems, human health and lifestyle in Asia” was held on 24-26 October 2012 at the RIHN Lecture Hall. The details of the symposium are as follows.

<Wednesday 24 October>

#### Opening Session

Chair: UYAR, Aysun (RIHN)

- Opening Remarks: TACHIMOTO Narifumi (Director-General, RIHN)
- Objectives of the Symposium: NILES, Daniel (RIHN)/ ABE Ken-ichi (RIHN)
- Keynote Address 1: Biodiversity and Public Health: A Complicated but Important Science-Policy Challenge  
MARTENS, Pim (Maastricht University, The Netherlands)
- Keynote Address 2: Theoretical Frameworks for the Analysis of Social-Ecological Systems  
CUMMING, Graeme S. (University of Cape Town, South Africa)

#### Session 1: Collapse and restoration of social-ecological networks

Chair: YAMAMURA Norio (RIHN/ Doshisha University, Japan)

- Reshaping Neighbourhood Parks for Biodiversity and People: A Case of Unsung Socio-Ecological Systems in Bangalore, India  
DEVY, Soubadra M. (Ashoka Trust for Research in Ecology and the Environment (ATREE), India)
- Co-benefits of Sustainable Forestry  
KITAYAMA Kanehiro (Kyoto University, Japan)
- Interaction of Human Activities and Ecological Resources: Focusing on the Changes of Peoples Living Environment in Malaysia  
KATO Yumi (RIHN/ JSPS)
- Land Use Change and Loss of Biodiversity in Malaysian Borneo  
TAKANO Takenaka Kohei (RIHN)
- Relationship between Livestock and Pasture in Mongolia  
KODA Ryosuke (RIHN)
- Quantitative Comparison of Sustainability between Nomadic and Sedentary System in Mongolian Pasture  
KATO Satoshi (RIHN)
- Discussion

<Thursday 25 October>

#### Session 2: Physiological adaptation and recent lifestyle change in high-altitude environments

Chair: OKUMIYA Kiyohito (RIHN)

- Three Patterns in Hypoxic Adaptation in the Three High-Altitude People and its Evolutional Significance  
BEALL, Cynthia M. (Case Western Reserve University, USA)
- Aging in High Altitudes: Possible Association with Adaptation Methods  
SAKAMOTO Ryota (Kyoto University, Japan)
- Changing Livelihood and Non-Communicable Diseases in the Kingdom of Bhutan: Physiological Adaptation and Recent Lifestyle Change in High-Altitude Environments  
DOPHU, Ugen (Ministry of Health, Bhutan)
- Tibetan Society and their Changing Livelihoods

GOLDSTEIN, Melvyn C. (Case Western Reserve University, USA)

- Discussant: INAMURA Tetsuya (Aichi Prefectural University, Japan)
- Discussion

### Session 3: Ecohealth: Ecological transformation and human health

Chairs: MOJI Kazuhiko (RIHN) & MALLEE, Hein (International Development Research Centre)

- Climate, Climate Change and Human Health  
HASHIZUME Masahiro (Nagasaki University, Japan)
- Liver Fluke and Cholangiocarcinoma in Southeast Asia: Current Status and Prospects for Long Term Prevention and Control  
SITHITHAWORN, Pailoon (Khon Kaen University, Thailand)
- Study of Land Cover Change in Relation with Malaria and Liver-Fluke Infection in Savannakhet Province, Lao PDR  
TOJO Bumpei (RIHN)
- Cooking Up: a Nutrition Lens on Natural Resource Management  
KRAHN, Jutta (Consultant Food, Nutrition, Natural Resources, Laos)
- Discussion

<Friday 26 October >

### Session 4: Synthesis and Summary Discussion

Chair: NILES, Daniel (RIHN)

- Synthesis of Session 1  
SAKAI Shoko (RIHN)
- Synthesis of Session 2  
OKUMIYA Kiyohito (RIHN)
- Synthesis of Session 3  
MOJI Kazuhiko (RIHN)
- Comments: MARTENS, Pim (Maastricht University, The Netherlands)  
CUMMING, Graeme S. (University of Cape Town, South Africa)
- Summary Discussion
- Closing Remarks  
SATO Yo-Ichiro (Deputy Director-General/ Director of CCPC, RIHN)

## 2. RIHN Forum

---

“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 eleventh forum was held in fiscal 2012 as below.

---

### The 11<sup>th</sup> RIHN Forum

Date: 8 July, 2012

Theme: Creating Connections

Venue: Kyoto International Conference Center



---

### 3. RIHN Public Seminars

In order to present RIHN research activity in a manner that accessible to the general public, since November 2004, RIHN has offered public lectures. Four seminars were held in 2012 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.

---

The 46 <sup>th</sup> Public Seminar	11 May, 2012 Search for a new Image of the Indus Civilization MAEMOKU Hideaki (Hiroshima University) OSADA Toshiki (RIHN)
The 47 <sup>th</sup> Public Seminar	22 June, 2012 Environmental Destruction in Southeast Asia and the Future of Our Food KADA Ryohei (RIHN) KURATA Takashi (RIHN)
The 48 <sup>th</sup> Public Seminar	18 January, 2013 We stay with Africa — a case of some technical inovations for desertification control — TANAKA Ueru (RIHN)
The 49 <sup>th</sup> Public Seminar	15 February, 2013 Living a nature you know as yourself NAKANO Tamio (Workshop coordinator/ Doshisha University)

---

### 4. RIHN Kids Seminar

In order to enhance community relations, RIHN has held public lectures for children in neighboring elementary schools since 2010. The fiscal year 2012 seminar was held as below.

---

The 3<sup>rd</sup> Kids Seminar  
Date: 3 August, 2012  
Venue: RIHN  
Theme: What is “Albedo” ?  
HIYAMA Tetsuya (RIHN)

---

### 5. RIHN Open House

In order to introduce RIHN’s research projects and facilities to the surrounding community, RIHN has opened our buildings to the public once a year since 2011. Several interesting events such as joint experiments, public talks, exhibitions, and games were conducted in order to deepen our interaction with local citizens in fiscal 2012.

---

Date: 3 August, 2012  
Venue: RIHN

**6. RIHN Area Seminars**

---

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 2012, two seminars were held as follows.

---

**The 11th RIHN Area Seminar**

East Asian “Environmental” Security: Calling for a Transboundary Solution

Date: 10 June, 2012

Venue: ELGALA Hall (Fukuoka City, Fukuoka)

**The 12th RIHN Area Seminar**

Co-Creation of well-being: Commons

Date: 13 October, 2012

Venue: Fujiyoshida Public Hall (Fujiyoshida City, Yamanashi)

**7. RIHN Tokyo Seminar**

---

In order to gain the attention of researchers and the general public and to promote research cooperation and development, RIHN periodically holds seminars in Tokyo. We invite renowned Japanese researchers as well as public officials to discuss RIHN research project objectives and findings. The seminar was held in fiscal 2012 as below.

---

**4<sup>th</sup> Tokyo Seminar (20<sup>th</sup> NIHU Public Lecture and Symposium)**

“Commons and the Co-Creation of Well-being”

Date: 25 January, 2013

Venue: Yurakucho Asahi Hall

**8. Nichibunken- RIHN joint Symposium**

---

Nichibunken and RIHN develop collaborative publications and seminars in order to explore the frontier of studies of human culture in relation to global environmental issues.

---

“To whom do culture and the environment belong?”

Date: 14 September, 2012

Venue: International Research Center for Japanese Studies

**9. The Earth Forum Kyoto; Special Session and International Symposium**

---

RIHN, Kyoto Prefecture, Kyoto City, Kyoto University, and Kyoto Prefectural University co-host this forum in order to clearly convey our message of the importance of environmental issues to the world. The forum was held in fiscal 2012 as below.

---

**The Earth Forum Kyoto**

“Spreading the Wisdom and Culture of Kyoto to the World: Toward a Global Commons”

Special Session: 16 February, 2013

International Symposium: 17 February, 2013

Venue: Kyoto International Conference Center

## 10. The Earth Hall of Fame KYOTO

The Earth Forum Kyoto invites world-renowned experts and activists to discuss the environmental and cultural bases of more responsible human societies. The Earth Hall of Fame Kyoto Award is given to those who have made exemplary contributions to the protection of the global environment. Organizers of the event are the International Institute for Advanced Studies, the Kyoto International Conference Centre, and RIHN.

The 2012 recipients of the Earth Hall of Fame Kyoto Award:

SHIVA, Vandana (Environmental Philosopher, Physicist)

LOVINS, Amory B. (Chief Scientist of the Rocky Mountain Institute)

## 11. 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 82 <sup>nd</sup>	6 September, 2012 “Yaman ng Lawa” Community-based Lake Ecology Learning Centre CONCEPCION, Rogelio Navea (RIHN/ University of the Philippines Los Baños)
The 83 <sup>rd</sup>	25 September, 2012 Climate Change, Agricultural Adaptation, and Food Prices: Evidence from Israel KIMHI, Ayal (RIHN/ Hebrew University of Jerusalem)
The 84 <sup>th</sup>	28 November, 2012 Pastoralism and Camel Herding in Sudan GAIBALLA ADIER, Abdelaziz Karamalla (RIHN/ Sudan University of Science and Technology)
The 85 <sup>th</sup>	29 January, 2013 Carcinogenic Health Risk of Arsenic Biomagnification in Five Commercially Important Fish from Laguna De Bay, Philippines MOLINA, Victorio Bolanos (RIHN/ Department of Environmental and Occupational Health, College of Public Health, University of the Philippines Manila )
The 86 <sup>th</sup>	29 January, 2013 Changes in permafrost dynamics and the influence on landscapes and social adaptation in Eastern Siberia FEDOROV, Alexander (RIHN/ Melnikov Permafrost Institute, Siberian Branch of Russian Academy of Sciences)
The 87 <sup>th</sup>	28 March, 2013 Science and policy interface on environmental sustainability in Mongolia: social turbulence and climate stress ZAMBA, Batjargal (RIHN/ Consultant, World Meteorological Organization)

## 12. Lunch Seminars (Danwakai)

Lunch Seminars 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 seminars promote creative thinking and constructive debates, they are held on a biweekly basis.

- 
- |        |   |
|--------|---|
| No.191 | 17 April, 2012<br>In search of the new alternative for our lifestyle: <MINGEI><br>KURATA Takashi (Associate Professor)  |
| No.192 | 8 May, 2012<br>A Quantitative Prediction for Ecological and Economical Sustainability Under Different Scenarios in Mongolian Nomadic Pastoral Systems<br>KATO Satoshi (Project Researcher)    |
| No.193 | 22 May, 2012<br>The function of deer as an ecosystem engineer and relationship with human activity: Summary of studies in Yakushima (Japan) and Mongolia<br>KODA Ryosuke (Project Researcher) |
| No.194 | 5 June, 2012<br>Chemical compositions of water and sediment samples from the Laguna Lake Watershed, Philippines<br>SAITO Tetsu (Project Researcher)   |
| No.195 | 19 June, 2012<br>Is there any impact of global warming on variation of Lena River discharge ?<br>OSHIMA Kazuhiro (Project Researcher)   |
| No.196 | 3 July, 2012<br>Discussion on residential research: from the perspective of its academic and practical roles<br>SHIMIZU Mayuko (Assistant Professor)  |
| No.197 | 17 July, 2012<br>Situ, a green open space in Jakarta<br>MEUTIA, Ami Aminah (Project Researcher)   |
| No.198 | 21 August, 2012<br>Inquire about What is “Organizational theory”?<br>KATO Hisaaki (Project Research Associate)  |
| No.199 | 4 September, 2012<br>Organization of Islam and livelihood in “deserting” Sahel<br>SHIMIZU Takao (Project Researcher)  |
| No.200 | 11 September, 2012<br>What Happens to World Food Prices?<br>KIMHI, Ayal (Visiting Research Fellow)  |
| No.201 | 18 September, 2012<br>Stable isotope analysis on the Jomon skeletal remains to reveal diet and migration<br>KUSAKA Soichiro (Visiting Researcher)   |
| No.202 | 2 October, 2012<br>Water Resources Modeling as a tool for Integrated Water Resources Management<br>IMAGAWA Chie (Project Researcher)  |
| No.203 | 16 October, 2012<br>A Fishery Commons in Coastal Lagoons and Water Governance   |

- No.204 IWASAKI Shinpei (Visiting Researcher)  
30 October, 2012  
Environmental Changes and Food-Health Risks: From Fieldwork in the Philippines and Malaysia  
MASUDA Tadayoshi (Senior Project Researcher)
- No.205 MASUDA Tadayoshi (Senior Project Researcher)  
20 November, 2012  
The efficient utilization of spatial information in hilly and mountainous farming area in Japan: A case study of countermeasures for reducing wild beast damages  
YAOTA Kiyoyuki (Project Researcher)
- No.206 YAOTA Kiyoyuki (Project Researcher)  
18 December, 2012  
Micro-scale relationships between livestock herding route and vegetation in Namibia  
TESHIROGI Koki (Project Researcher)
- No.207 TESIROGI Koki (Project Researcher)  
15 January, 2013  
Geochemistry of mineral resources and environment – part 2  
NAKANO Takanori (Professor)
- No.208 NAKANO Takanori (Professor)  
22 January, 2013  
Utilization and environment of fishery area in coastal area, central Vietnam  
OKAMOTO Yuki (Project Researcher)
- No.209 OKAMOTO Yuki (Project Researcher)  
12 February, 2013  
On Invisible Catastrophes; Fukushima-Tokyo/ Auschwitz-Berlin  
TERADA Masahiro (Associate Professor)
- No.210 TERADA Masahiro (Associate Professor)  
5 March, 2013  
Sr–Nd–Pb isotope compositions and granite petrogenesis  
SHIN Kicheol (Assistant Professor)

### 13. 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 over 371 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: 5-7 December, 2012

Venue: Co-op inn Kyoto

### 14. Press Conferences

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. Four press conferences were held in fiscal 2012.

## 15. Publications

---

### 15-1. RIHN Series

The RIHN Series was developed to publish books introducing RIHN's research results to the general public. The following titles were published in fiscal year 2012.

Seibutsutayousei Kodomotachini Doutsutaeruka? (How to teach children about biodiversity?)

Edited by ABE Ken-ichi, Showado, October 2012 (in Japanese).

Posuto Sekiyujidai no Hitodukuri Monodukuri – Nihon to Genyukoku no Miraizou wo Motomete (Human resource development and manufacturing in the post-oil era: Pursuit for a future vision of Japan and oil-producing countries)

Edited by ISHIYAMA Shun, NAWATA Hiroshi, Showado, March 2013 (in Japanese).

### 15-2. RIHN Book Series (in English)

This series introduces the fruit of research findings by RIHN to the international science community. The following title was published in fiscal 2012.

The Dilemma of Boundaries: Toward a New Concept of Catchment

Edited by TANIGUCHI Makoto, SHIRAIWA Takayuki, Springer, May 2012

### 15-3. 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 easy-to read content. Issues 36-41 were published in fiscal 2012.

## Individual Achievements

A	ABE Ken-ichi	Professor
	AKITSU Motoki	Visiting Associate Professor
	ARIMA Makoto	Visiting Professor
C	CONCEPTION, Rogelio Navea	Visiting Research Fellow
E	ENDO Hitoshi	Visiting Researcher
F	FEDOROV, Alexander	Visiting Research Fellow
	FUJISAWA Satoko	Project Researcher
	FUJITA Noboru	Visiting Associate Professor
	FUJIWARA Junko	Senior Project Researcher
	FUKUSHI Yuki	Research Fellow, NIHU Center for Area Studies
	FUKUSHIMA Atsuko	Project Research Associate
G	GAIBALLA ADIER, Abdelaziz Karamalla	Visiting Research Fellow
H	HABU Junko	Visiting Professor
	HAFIZ KOURA, Hafiz Mohamed Fathy	Project Research Associate
	HAMASAKI Hironori	Project Researcher
	HANDOH Itsuki C.	Associate Professor
	HASHIMOTO Watanabe Satoko	Project Researcher
	HAYASHI Kengo	Project Researcher
	HIMIYAMA Yukio	Visiting Professor
	HIYAMA Tetsuya	Associate Professor
I	ICHIKAWA Kotaro	Project Researcher
	IIJIMA Wataru	Visiting Professor
	IMAGAWA Chie	Project Researcher
	IMAMURA Aoi	Project Research Associate
	ISHIHARA Hiroe	Project Researcher
	ISHIKAWA Mamoru	Visiting Associate Professor
	ISHIKAWA Satoshi	Associate Professor
	ISHIMOTO Yudai	Project Researcher
	ISHIYAMA Shun	Project Researcher
J	JIANG, Hong-wei	Project Researcher
K	KADA Ryohei	Professor
	KATO Hisaaki	Project Research Associate
	KATO Satoshi	Project Researcher
	KATO Tsuyoshi	Visiting Professor
	KAWASAKI Masahiro	Visiting Professor
	KIHIRA Tomoe	Project Research Associate
	KIKUCHI Naoki	Associate Professor
	KIMHI, Ayal	Visiting Research Fellow
	KINOSHITA Tetsuya	Guest Professor
	KITAGAWA Hideki	Visiting Professor
	KITAMURA Naoko	Project Research Associate
	KODA Ryosuke	Project Researcher
	KOSAKA Yasuyuki	Project Researcher
	KOU, Xin	Visiting Researcher
	KOYAMA Masami	Project Research Associate
	KOYAMA Shuzo	Visiting Professor
	KUBOTA Jumpei	Professor
	KUMAZAWA Terukazu	Assistant Professor
	KURATA Takashi	Associate Professor
	KUSAKA Soichiro	Visiting Researcher

L	LEKPRICHAKUL, Thamana	Visiting Researcher
M	MALLEE, Hein	Professor
	MASUDA Tadayoshi	Senior Project Researcher
	MATSUDA Hiroko	Project Researcher
	MCGREEVY, Steven Robert	Assistant Professor
	MEUTIA, Ami Aminah	Project Researcher
	MIMURA Yutaka	Project Researcher
	MINAMOTO Toshifumi	Senior Project Researcher
	MIYAZAKI Hidetoshi	Project Researcher
	MIZUMA Sakiko	Project Research Associate
	MOJI Kazuhiko	Professor
	MOLINA, Victorio Bolanos	Visiting Research Fellow
	MORI Soichi	Visiting Professor
	MURAMATSU Koichi	Visiting Associate Professor
	MURAMATSU Shin	Professor
N	NAITO Daisuke	Assistant Professor
	NAKAGAMI Ken'ichi	Visiting Professor
	NAKAGAWA Chigusa	Project Researcher
	NAKAJIMA Tsuneo	Visiting Professor
	NAKAMURA Oki	Visiting Researcher
	NAKAMURA Ryo	Project Researcher
	NAKANO Takanori	Professor
	NAKATSUKA Takeshi	Visiting Professor
	NAWATA Hiroshi	Associate Professor
	NILES, Daniel Ely	Assistant Professor
	NISHIMOTO Futoshi	Project Researcher
	NOSE Mitsuhiro	Project Researcher
O	OGAWA Hisashi	Project Researcher
	OKAMOTO Takako	Project Research Associate
	OKAMOTO Yoko	Project Research Associate
	OKAMOTO Yuki	Project Researcher
	OKUMIYA Kiyohito	Associate Professor
	ONISHI Masayuki	Visiting Researcher
	OSADA Toshiki	Visiting Professor
	OSHIMA Kazuhiro	Project Researcher
S	SAITO Satoshi	Project Researcher
	SAKAI Shoko	Associate Professor
	SAKAI Toru	Senior Project Researcher
	SASAKI Yuko	Project Researcher
	SATO Tetsu	Professor
	SATO Yo-Ichiro	Deputy Director-General, Professor
	SEKINO Tatsuki	Associate Professor
	SHIMIZU Hiromi	Project Research Associate
	SHIMIZU Mayuko	Assistant Professor
	SHIMIZU Takao	Project Researcher
	SHIN Kicheol	Assistant Professor
	SHIRAIWA Takayuki	Visiting Associate Professor
T	TACHIMOTO Narifumi	Director-General
	TAKAGI Akira	Senior Project Researcher
	TAKANO Takenaka Kohei	Project Researcher



	TANAKA Ueru	Associate Professor
	TANIGUCHI Makoto	Professor
	TERADA Masahiro	Associate Professor
	TESHIROGI Koki	Project Researcher
	TOJO Bumpei	Project Researcher
	TOMITA Shinsuke	Visiting Associate Professor
U	UCHIBORI Motomitsu	Visiting Professor
	UCHIYAMA Junzo	Visiting Associate Professor
	UMETSU Chieko	Visiting Associate Professor
	UYAR, Aysun	Assistant Professor
W	WALEED, Hassan Mohamed Abou El Hassan	Visiting Researcher
	WANG, Keng	Visiting Research Fellow
	WANG, Na	Project Research Associate
	WATANABE Mitsuko	Visiting Researcher
	WATANABE Tsugihiko	Professor
Y	YAP, Minlee	Project Researcher
	YAMAMURA Norio	Visiting Professor
	YAMASAKI Eri	Visiting Researcher
	YAOTA Kiyoyuki	Project Researcher
	YASUTOMI Natsuko	Assistant Professor
	YOSHINAGA Kazumi	Project Researcher
Z	ZAMBA, Batjargal	Visiting Research Fellow

※Job titles listed above are as of 31 March, 2013.

(For those who retired in the middle of fiscal 2012, the job titles of that time are listed.)

---

**ABE Ken-ichi**


---

Professor

**Born in 1958.****[Academic Career]**

Department of Tropical Agriculture, Graduate School of Agriculture, Kyoto University, D. Course(1989)

Department of Agriculture Biology, Faculty of Agriculture, Kyoto University(1984)

**[Professional Career]**

Professor, Research Institute for Humanity and Nature(2008)

Associate Professor, Center for Integrated Area Studies, Kyoto University(2006)

Adjunct Associate Professor, School of Advanced Sciences, The Graduate University of Advanced Studies(2000)

Associate Professor, Japan Center for Area Studies, National Museum of Ethnology(1999)

Assistant Professor, Japan Center for Area Studies, National Museum of Ethnology(1996)

Assistant Professor, Center for Southeast Asian Studies, Kyoto University(1989)

**[Higher Degrees]**

M. Agr. (Kyoto University, 1987)

**[Fields of Specialization]**

Area Study

Environmental Anthropology

**[Academic Society Memberships]**

The Japan Society of Tropical Ecology

The International Society of Volunteer Studies in Japan

The Japan Society for Southeast Asian Studies

The Society of the Biosophia Studies

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- ABE Ken-ichi What Should We Do? An Anthropologist in Tsunami Affected Areas, Tohoku, Northeast Japan. The 111th the American Anthropological Association (AAA) Annual meeting, 2012, 11, 15-2012, 11, 17, San Francisco, USA.

---

**FUKUSHI Yuki**


---

Research fellow of RIHN Initiative for Chinese Environmental Issues

**[Academic Career]**

Department of education, Faculty of social studies, Tokyo Gakugei University, M. Course(2000)

Department of sociology, faculty of social sciences, Hitotsubashi University, D. Course(2007)

**[Professional Career]**

Research fellow of JSPS(2007)

Project Researcher, RIHN (2010)

Research Fellow of NIHU Center for Area Studies(2012)

**[Higher Degrees]**

D. Social Sciences (Hitotsubashi University, 2007)

M. Arts (Tokyo Gakugei University, 2000)

**[Fields of Specialization]**

History (Modern and Contemporary China)

**[Academic Society Memberships]**

The Socio-Economic History Society

The Historical Sciences Society of Japan

The Japan Association for Modern China Studies

Asian Society for Social History of Medicine

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- Yuki FUKUSHI Hygienic Behavior in Modern Shanghai. the 6th conference for the Asian Society for the History of Medicine, 2012, 12, 13–2012, 12, 15, Keio University, Tokyo.

**HAMASAKI Hironori**

Project Researcher

**Born in 1979 年.****[Academic Career]**

Graduate School of Policy Science, Ritsumeikan University, Doctoral Course (2008–2010)

The Okuma School of Public Management, Waseda University, Master Course (2003–2005)

College of Political Science and Economics, Waseda University (1998–2003)

**[Professional Career]**

Project Researcher, Asian Program for Incubation of Environmental Leaders (APIEL), Graduate School of Engineering, University of Tokyo (2010)

**[Higher Degrees]**

Ph.D. (Ritsumeikan University, 2011)

MSc (Waseda University, 2005)

**[Fields of Specialization]**

Policy Science

International Public Policy

Water Resources Management/Water Governance/Water Security

**[Academic Society Memberships]**

Public Policy Studies Association JAPAN

Japan Society of Research and Information on Public and Co-operative Economy

Japan Association of Global Governance

## —Achievements—

**[Books]***[Chapters/Sections]*

- Hamasaki, H., H. Katayama 2013,03 Environmental Leadership Development: A Cambodian Case.. Mino, T., K. Hanaki (ed.) Environmental Leadership Capacity Building in Higher Education - Experience and Lessons from Asian Program for Incubation of Environmental Leaders.. Springer, Tokyo, pp.109-118.

**[Papers]***[Review Articles]*

- Hamasaki, H. and K. Nakagami 2012,10 New Paradigm of water management - Water security, water governance, and integrated management. Journal of Environmental Conservation Engineering 41(10) : 8-13. (in Japanese)

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

- Kato, H., H. Hamasaki, S. Watanabe, et al. Reframing Integrated Water Resources Management based on the origination of ordinary people: Field studies in Bali and South Sulawesi, Indonesia. The 8th Convention of the Association of Policy Informatics, 2012,12,01, Chiba University of Commerce, Ichikawa City, Chiba. (in Japanese)
- H. Hamasaki Water Governance in Lake Biwa and Yodo River Basin in perspective of decentralization of power to local governments. International Conference on Sustainability Science in Asia, 2012, 11, 11-2012, 11, 13, Bali, Indonesia.
- Kato, H., C. Imagawa, H. Hamasaki, et al. Policy implication of knowledge fusion between local water resources management and global water circulation model: Main idea from Northern part of Bali. The 20th Convention of Japan Rainwater Catchment Systems Association, 2012, 11, 03-2012, 11, 04, Zamami Village, Okinawa. (in Japanese)
- Imagawa, C., N. Hanasaki, H. Kato, H. Hamasaki, et al. Attempts of uncertainty analysis towards global water resources model estimation for water resources assessment. The 20th Convention of Japan Rainwater Catchment Systems Association, 2012, 11, 03-2012, 11, 04, Zamami Village, Okinawa. (in Japanese)
- Kato, H., H. Hamasaki, et al. "Wisdom of land and water" for Integrated Water Resources Management: Attempts at designing methodology necessary for re-consideration. The 12th Annual Convention of the Society of Environmental Conservation Engineering, 2012,09,03, Ritsumeikan Biwako Kusatsu Campus, Kusatsu City, Shiga. (in Japanese)
- Nakagami, K., H. Hamasaki and M. Akiyama Re-consider the basin governance in the Lake Biwa and Yodo River. The 12th Annual Convention of the Society of Environmental Conservation Engineering, 2012,09,03, Ritsumeikan Biwako Kusatsu Campus, Kusatsu City, Shiga. (in Japanese)
- Sata, M., H. Hamasaki and H. Katayama Quantifying risk factors of water borne disease and current status of water use by infants in developing countries through the fusion of qualitative and quantitative survey. Annual Convention in 2012 of Public Policy Studies Association Japan, 2012,06,16-2012,06,07, Ritsumeikan University, Kyoto. (in Japanese)

*[Poster Presentation]*

- Hamasaki, H., H. Kato and T. Nakagiri Possibilities of approach integrating 'hardware' and 'software' for sustainable water resources management - the case of Bali, Indonesia. The 4th International Water Association Asia-Pacific Young Water Professionals Conference, 2012, 12, 07-2012, 12, 10, Minato-ku, Tokyo.
- Hamasaki, H., H. Kato, et al. Rethinking integrated water resources management (IWRM): Need for reframing IWRM for futurability. 10th International Symposium on Southeast Asian Water Environment (SEAWE), 2012, 11, 08-2012, 11, 10, Hanoi, Vietnam.

- Jana, A., Hashimoto, Y., Kyounjin, A., and Hamasaki, H. Capacity Development towards Sustainable Water Management in Rural Cambodia. International Waters Science Conference 2012, 2012, 09, 24–2012, 09, 26, Bangkok, Thailand.

*[Invited Lecture / Honororary Lecture / Panelist]*

- Hamasaki, H. Water Security in the Mekong River Basin - From Governance Aspect. International Conference on Water Security, 2013, 02, 07–2013, 02, 08, Ritsumeikan Asia-Pacific University, Beppu, Oita.
- Hamasaki, H. Policy implication for international cooperation and business on water. Special Session on "International Cooperation & Water Business" at The 4th International Water Association Asia-Pacific Young Water Professionals Conference 2012, 2012, 12, 09, Minato-ku, Tokyo.

## HANDOH Itsuki C.

Associate Professor

### **Born in 1974.**

#### **[Academic Career]**

School of Environmental Sciences, University of East Anglia, D. Course (2000)

Department of Marine Science and Technology, Tokyo University of Fisheries (1996)

#### **[Professional Career]**

Associate Professor, Research Institute for Humanity and Nature (2011)

Assistant Professor, Center for Marine Environmental Studies, Ehime University (2007)

Visiting Researcher, Research Institute for Humanity and Nature (2007)

Senior Project Researcher, Research Institute for Humanity and Nature (2006)

Consultant, Department of Applied Mathematics, University of Sheffield, Sheffield, United Kingdom (2005)

Research Associate, Department of Applied Mathematics & Sheffield Centre for Earth Observation Science, University of Sheffield, Sheffield, United Kingdom (2004)

Senior Research Associate, School of Environmental Sciences, University of East Anglia, Norwich, United Kingdom (2001)

Teaching Assistant, School of Environmental Sciences, University of East Anglia, Norwich, United Kingdom (1998)

Research Assistant in Physics and Environmental Modelling, Department of Ocean Sciences, Tokyo University of Fisheries (1996)

#### **[Higher Degrees]**

Ph.D. (University of East Anglia, 2002)

#### **[Fields of Specialization]**

Earth Systems Science

Transdisciplinary Mathematical Modelling

#### **[Academic Society Memberships]**

American Geophysical Union

Society for Risk Analysis

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

- Kawaguchi, M., Sugahara, S., Watanabe, Y., Irie, K, Ishida, M., Kurokawa, D., Kitamura, S.I., Takata, H., Handoh, I.C., Nakayama, K., and Murakami, Y. 2012 Nervous system disruption and concomitant behavioral abnormality in early-hatched pufferfish larvae exposed to heavy oil. *Environmental Science and Pollution Research* 19(7) :2488–2497. (reviewed).

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

- Handoh, I.C. Transforming a regional socio-ecological system within Planetary Boundaries. The 1st Asia Future Conference, 2013, 03, 08–2013, 03, 10, Bangkok.
- Handoh, I.C., and Kawai, T. A transdisciplinary risk assessment framework to define Planetary Boundaries for Chemical Pollution. World Congress on Risk 2012, 2012, 07, 18–2012, 07, 20, Sydney.

**HASHIMOTO WATANABE Satoko**

---

Project Researcher

**Born in 1983.****[Academic Career]**

Department of Agricultural Engineering, Faculty of Agriculture, Kyoto University, D. Course(2012)  
 Department of Agricultural Engineering, Faculty of Agriculture, Kyoto University, M. Course(2008)  
 Department of Agricultural Engineering, Faculty of Agriculture, Kyoto University, M. Course(2006)

**[Professional Career]**

Research Fellow of the Japan Society for the Promotion  
 of Science(2010)

**[Higher Degrees]**

D. Agr. (Kyoto University, 2012)  
 M. Agr. (Kyoto University, 2008)

**[Fields of Specialization]**

Soil science  
 Hydrology

**[Academic Society Memberships]**

The Japanese Society of Irrigation, Drainage and Rural Engineering  
 Japanese Society of Soil Science and Plant Nutrition  
 Japanese Society of Soil Physics

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

- Satoko Watanabe, Kimihito Nakamura, Chan Seok Ryu, Michihisa Iida and Shigeto Kawashima 2012,04 Effects of different application timings of methane fermentation digested liquid to paddy plots on soil nitrogen and rice yield. *Soil Science and Plant Nutrition* 58(2) :224-237. DOI: 10.1080/00380768.2012.661949. (reviewed).

**[Research Presentations]***[Poster Presentation]*

- Hironori Hamasaki, Hisaaki Kato, Chie Imagawa and Satoko Watanabe Rethinking integrated water resources management (IWRM): Need for reframing IWRM for futurability. 10th International Symposium on Southeast Asian Water Environment in Hanoi, 2012,11,08-2012,11,10, Vietnam, Hanoi.

**HIYAMA Tetsuya**

Associate Professor

**Born in 1967.****[Academic Career]**

1986-1990: College of Natural Sciences, University of Tsukuba

1990-1995: Graduate School of Geoscience, University of Tsukuba

**[Professional Career]**

1995-1995: JSPS Research Fellow, Institute of Geoscience, University of Tsukuba

1995-2001: Assist. Prof., Institute for Hydrospheric-Atmospheric Sciences, Nagoya Univ.

2001-2001: Assist. Prof., Hydrospheric Atmospheric Research Center, Nagoya Univ.

2002-2010: Assoc. Prof., Hydrospheric Atmospheric Research Center, Nagoya Univ.

2010- : Assoc. Prof., Research Institute for Humanity and Nature

**[Higher Degrees]**

Ph.D. (Science), University of Tsukuba, 1995

**[Fields of Specialization]**

Ecohydrology, Hydrometeorology

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

- Yoshida, R., Sawada, M., Yamazaki, T., Ohta, T. and Hiyama, T. 2013,02 Influence of land cover change on regional water cycles in Eastern Siberia. *Journal of Applied Meteorology and Climatology* 52 : 484-497. DOI:10.1175/JAMC-D-12-043.1. (reviewed).
- Li, W., Hiyama, T. and Kobayashi, N. 2013,01 Seasonal variations of the surface fluxes and surface parameters over the Loess Plateau in China. *Atmospheric and Climate Sciences* 3 :111-120. DOI: 10.4236/acs.2013.31013. (reviewed).

- Brutsaert, W. and Hiyama, T. 2012,11 The determination of permafrost thawing trends from long-term streamflow measurements with an application in eastern Siberia. *Journal of Geophysical Research* 117 (D22110). DOI:10.1029/2012JD018344. (reviewed).
- Hossen, M.S., Mano, M., Miyata, A., Baten, A. and Hiyama, T. 2012,04 Surface energy partitioning and evapotranspiration over a double-cropping paddy field in Bangladesh.. *Hydrological Processes* 26 : 1311-1320. DOI:10.1002/hyp.8232. (reviewed).

### [Research Presentations]

#### [Oral Presentation]

- Takakura, H., Yoshikawa, Y., Watanabe, M., Sakai, T. and Hiyama, T. Ice movement in the Lena river and the typology of spring flood: An interpretation of local sources integrated with satellite imagery using a multidisciplinary approach. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.
- Saigusa, N., Suzuki, R., Hiyama, T. and Hayashi, K. Cross-disciplinary research collaboration for early detection of biological feedbacks. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.
- Hiyama, T. Waterlogging risk in Eastern Siberia: A case study in the permafrost region. World Congress on Risk 2012: Risk and Development in a Changing World, 2012,07,17-2012,07,20, Sydney Convention and Exhibition Centre, Sydney, Australia.
- Oshima, K. and Hiyama, T. Seasonal and interannual variations of the Lena River discharge and their relationships to atmospheric water cycle. 日本地球惑星科学連合 2012 年大会, 2012,05,20-2012,05,25, 千葉・幕張.
- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., Gagarin, L. and Yamaguchi, Y. Monitoring permafrost degradation in Siberia using microwave remote sensing sensor. 日本地球惑星科学連合 2012 年大会, 2012,05,20-2012,05,25, 千葉・幕張.
- Hiyama, T., Asai, K., Kolesnikov, A., Gagarin, L. and Shepelev, V. Age estimation of permafrost groundwater in Eastern Siberia. 日本地球惑星科学連合 2012 年大会, 2012,05,20-2012,05,25, 千葉・幕張.

#### [Poster Presentation]

- Hiyama, T., Asai, K., Gagarin, L. and Kolesnikov, A. Age estimation of supra-permafrost and intra-permafrost groundwater in Yakutsk region, Eastern Siberia. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.
- Sakai, T., Hiyama, T., Fujiwara, J., Gotovtsev, S., Gagarin, L. and Yamaguchi, Y. Permafrost degradation and flood occurrence in the Far North of Siberia. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.
- Oshima, K., Iijima, Y., Hori, M. E., Inoue, J. and Hiyama, T. Changes in the Lena river discharge and net precipitation over the basin during 2005-2008. Third International Symposium on the Arctic Research (ISAR-3), 2013,01,14-2013,01,17, Tokyo.
- Hiyama, T., Asai, K., Kolesnikov, A., Gagarin, L. and Shepelev, V. Estimation of residence time of permafrost groundwater in the Yakutsk region, eastern Siberia. 3rd International Conference on Forest and Water in a changing environment, 2012,09,18-2012,09,20, FIT Hall, Fukuoka, Japan.

## ICHIKAWA Kotaro

Project Researcher

**Born in 1978.**

### [Academic Career]

Faculty of Agriculture, Kyoto University (B.S. 1999-2003)



Biosphere Informatics, Graduate School of Informatics, Kyoto University(M.S. 2003–2005)  
 Biosphere Informatics, Graduate School of Informatics, Kyoto University(Ph. D. 2005–2007)

#### **[Professional Career]**

2005.4–2007.9. Research fellow of the Japan Society for the Promotion of Science (DC1)  
 2007.10.–2008.3 Research fellow of the Japan Society for the Promotion of Science (PD)  
 2008.4–2010.9 Research fellow of the Japan Society for the Promotion of Science (PD)  
 2010.10– Project researcher at Research Institute for Humanity and Nature

#### **[Higher Degrees]**

Bachelor of Agriculture (Kyoto University, 2003)  
 Master of Informatics (Kyoto University, 2005)  
 Doctor of Philosophy of Informatics (Kyoto University, 2007)

#### **[Fields of Specialization]**

Bioacoustics

#### **[Academic Society Memberships]**

Japanese Society of Fisheries Science  
 Acoustical Society of America  
 Advanced Marined Science and Technology  
 Japanese Society of Biologging Science

#### **[Awards]**

1. TOP 10 ARTICLES PUBLISHED IN THE SAME DOMAIN SINCE YOUR PUBLICATION (2010), BioMedLib, Ichikawa K, Akamatsu T, Shinke T, Sasamori K, Miyuchi Y, Abe Y, Adulyanukosol K, Arai N: Detection probability of vocalizing dugongs during playback of conspecific calls. J Acoust Soc Am; 2009 Oct;126(4):1954–9, September 10, 2010.
2. 海洋理工学会平成 19 年度業績賞 (2008), 海洋理工学会, 5 月 16 日 (京都大学情報学研究科バイオテレメトリーチームの一員として受賞)
3. Poster award (2004): Kotaro Ichikawa, Tomonari Akamatsu, Tomio Shinke, Nobuaki Arai, Chika Tsutsumi & Kanjana Adulyanukosol, Acoustical monitoring of dugong, OCEANS' 04/TECHNO-OCEAN, November 10–12, 2004

### **—Achievements—**

#### **[Papers]**

##### *[Original Articles]*

- Kotaro Ichikawa, Tomonari Akamatsu, Tomio Shinke, Nobuaki Arai and Kanjana Adulyanukosol 2012,11 Clumped distribution of vocalising dugongs (Dugong dugon) monitored by passive acoustic and visual observations in Thai waters. Proceedings of Acoustics 2012–Fremantle :130–133. (reviewed).

#### **[Research Presentations]**

##### *[Oral Presentation]*

- Ichikawa, Kotaro, Akamatsu, Tomonari, Shinke, Tomio, Arai, Nobuaki, Adulyanukosol, Kanjana. Clumped distribution of vocalising dugongs (Dugong dugon) monitored by passive acoustic and visual observations in Thai waters. Acoustics 2012 Fremantle: Acoustics, Development and the Environment, 2012, 11, 21–2012, 11, 23, Perth, Australia.
- Kotaro Ichikawa, Tomonari Akamatsu, Kanjana Adulyanukosol, Giovanni Damiani, Janet Lanyon, Hiroshi Nawata Intraspecific variation in vocal repertoire among dugong populations. THE ACOUSTICS 2012 HONG KONG, 2012, 05, 13–2012, 05, 18, Hong Kong.

*[Poster Presentation]*

- Masahiro Nakagawa, Kotaro Ichikawa, Toyoki Sasakura, Hiromichi Mitamura and Nobuaki Arai Development and evaluation of ultrasonic transmitter using frequency modulation for biotelemetry. The 1st Design Symposium on Conservation of Ecosystem (SEASTAR2000), 2013, 03, 18–2013, 03, 19, Kyoto University, Japan.
- Sakura Komiyama, Kotaro Ichikawa and Nobuaki Arai Individual difference of dugong vocalization. The 1st Design Symposium on Conservation of Ecosystem (SEASTAR2000), 2013, 03, 18–2013, 03, 19, Kyoto University, Japan.
- Kazunori Kikuchi, Kotaro Ichikawa, Ko Fujioka, Hiromu Fukuda, Hiromichi Mitamura and Nobuaki Arai Development of a fine-scale acoustic positioning and telemetry system for schooling behavior of bluefin tuna. The 1st Design Symposium on Conservation of Ecosystem (SEASTAR2000), 2013, 03, 18–2013, 03, 19, Kyoto University Clock Tower Centennial Hall, Kyoto, Japan.
- Yuuki Matsuo, Kotaro Ichikawa, Noriko Mizobata, Kozue Kinoshita and Nobuaki Arai Cyclic change of dugong's vocal behavior. The 1st Design Symposium on Conservation of Ecosystem (SEASTAR2000), 2013, 03, 18–2013, 03, 19, .

**IMAGAWA Chie**

Project Researcher

**[Higher Degrees]**

D. Agr. (Kyoto University, 2012)

**[Fields of Specialization]**

Water Resources Management

Hydrology

**[Academic Society Memberships]**

The Japanese Society of Irrigation, Drainage and Rural Engineering

International Society of Paddy and Water Environment Engineering

Japan Rainwater Catchment Systems Association

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

- Chono, S., Maeda, S., Kawachi, T., Imagawa, C., Buma, N., Takeuchi, J. 2012, 06 Optimization model for cropping-plan placement in paddy fields considering agricultural profit and nitrogen load management in Japan. *Paddy and Water Environment* 10(2) :113-120. DOI:10.1007/s10333-011-0272-4. (reviewed).

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

- IMAGAWA Chie, HANDOH Itsuki C., TAKEUCHI Junichiro A Bayesian Uncertainty Analysis of the Modelled Surface- and Ground-Water Flows in an Agricultural Watershed. PAWEES 2012 International Conference, 2012, 11, 27–2012, 11, 29, Nonthaburi, Thailand.
- 加藤久明, 濱崎宏則, 渡部慧子, 今川智絵, 中桐貴生 生活起点発想に基づく統合的水資源管理の再構築: インドネシア・バリ島ならびにスラウェシ島における当事者起点のフィールド研究. 政策情報学会第8回研究大会, 2012, 12, 01–2012, 12, 01, 千葉県市川市, 千葉商科大学. (in Japanese)

- ・加藤久明, 今川智絵, 濱崎宏則, 渡部慧子 地域レベルの水資源管理と全球水循環モデルが持つ知見の融合が持つ政策的意義: バリ島北部を中心に. 第20回日本雨水資源化システム学会大会, 2012, 11, 03-2012, 11, 04, 沖縄県座間味村離島振興総合センター. (in Japanese)
- ・今川智絵, 花崎直太, 加藤久明, 濱崎宏則, 渡部慧子, 半藤逸樹 水資源アセスメントのための全球水資源モデル予測に対する不確実性解析の試み. 第20回日本雨水資源化システム学会大会, 2012, 11, 03-2012, 11, 04, 沖縄県座間味村離島振興総合センター. (in Japanese)

*[Poster Presentation]*

- ・Hironori Hamasaki, Hisaaki Kato, Chie Imagawa and Satoko Watanabe Rethinking integrated water resources management (IWRM): Need for reframing IWRM for futurability. 10th International Symposium on Southeast Asian Water Environment in Hanoi, 2012, 11, 08-2012, 11, 10, Vietnam, Hanoi.

---

## ISHIHARA Hiroe

Project Researcher

### Born in 1974.

#### [Professional Career]

Programme Officer, United Nations Development Programme, Yemen Office  
Ph.D. Fellow, United Nations University, Institute of Advanced Studies

#### [Higher Degrees]

M.A. in Sociology (Hitotsubashi University, 2001)  
M.Phil in Environmental Policy (University of Cambridge, 2006)

#### [Fields of Specialization]

Environmental Sociology  
Ecological Economics

#### [Academic Society Memberships]

International Association of Study of Commons

#### [Awards]

Japan Joint World Bank Scholarship (2007-2009)  
Research Funds from Toyota Foundation (2011)

### —Achievements—

#### [Books]

*[Chapters/Sections]*

- ・Hiroe Ishihara, Unai Pascual 2012, 08 Capital and Collective Action in Environmental Governance: What are the missing links?. E. Broussaeu, T. Dedeurwaedere, P. Juvet, M. Willinger (ed.) Global Environmental Commons: Analytical and Political Challenges in Building Governance Mechanisms. Oxford University Press, Oxford, pp.199-221.

#### [Papers]

*[Original Articles]*

- ・Hiroe Ishihara, Unai Pascual 2013, 03 Re-Politicizing Social Capital: Revisiting Social Capital and Collective Action in Common Pool Resource Management. UNU-IAS Working Paper Series 170.

- Hiroe Ishihara, Unai Pascual 2012, 08 Institutions and Agency in Creating Collective Action for Common Pool Resources. University of Cambridge, Department of Land Economy, Environmental Economics and Policy Research, Discussion Paper Series .

### **[Research Presentations]**

#### *[Oral Presentation]*

- Hiroe Ishihara Institutions and Agency in Creating Collective Action for Common Pool Resources. Design and Dynamics of Institutions for Collective Action'. A Tribute to Elinor Ostrom (1933-2012), 2012, 11, 29-2012, 12, 01, .

## ISHIKAWA Satoshi

---

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 Society of Biosophia Studies

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—**

#### **[Editing]**

##### *[Editing / Co-editing]*

- MOTOMURA Hiroyuki and ISHIKAWA Satoshi (ed.) 2013, 03 Fish Collection Building and Procedures Manual. English Edition. . The Kagoshima University Museum, Kagoshima and the Research Institute for Humanity, Kagoshima, Kyoto, 70pp.

- Hiroyuki Motomura • Satoshi Ishikawa (ed.) 2013,02 Fish Collection Building and Procedures Manual. English Edition. The Kagoshima University Museum, Kagoshima and the Research Institute for Humanity, Kagoshima, 70pp.

### [Papers]

#### [Original Articles]

- SHIKAWA Satoshi 2012,05 Efforts of the Steering Committee for the Colloquium on Fishing Technology for reconstruction assistance of the earthquake disaster. . Nippon Suisan Gakkishi 78(3) :488-488. (in Japanese) Special public symposium: “Fisheries in the stricken area of the Great East Japan Earthquake and restoration of Fishing villages” .
- Kuniko Hanamori, Satoshi Ishikawa, Hiroshi Saito, Katsunori Tanaka, Yo-Ichiro Sato, Yoshihiro Okada 2012,09 Making divergent marker of tropical and temperate types of *Oryza sativa* L. var. *japonica* based on insertion/deletion DNA region and its utilization of carbonated rice from Toro I site. Journal of The School of Marine Science and Technology, Tokai University 9(3) :19-25. (in Japanese) (reviewed).

### [Research Presentations]

#### [Oral Presentation]

- KAMIYAMA Ryutaro, MIYATA Tsutomu, KUROKURA Hisashi, ISHIKAWA Satoshi. Quantitative impact analysis of social capitals on incentives of fisheries management in coastal area of developing country, A case study in Batan bay, Philippines. . The 2013 spring meeting of the Japanese Society of Fisheries Science., 2013,03,26-2013,03,30, Minato-ku Tokyo. (in Japanese)
- ISHIKAWA, Satoshi “ Area Capability” as a new concept of rural development harmonizing ecosystem health and welfare building. BIT’ s 2nd Annual World Congress of Marine Biotechnology, 2012,09,20-2012,09,23, Dalian, China.
- TAKAGI Akira, ISHIKAWA Satoshi, OGAWA Hisashi, MUTO Fumihito. Possibility of canned Tuna species identification. The 2012 autumn meeting of the Japanese Society of Fisheries Science, 2012,09,14-2012,09,17, Shimonoseki, Yamaguchi, Japan. (in Japanese)

#### [Invited Lecture / Honororary Lecture / Panelist]

- ISHIKAWA, Satoshi Co-design, Co-produce of local people, researchers, and governments for sustainable rural development in Southeast Asian Coastal zone. The International Forum on Ecosystem Adaptability, Ecosystem Adaptability GCOE, Tohoku University, 2012,12,12-2012,12,13, Sendai, Japan.

## ISHIYAMA Shun

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, S. 2013,03 Déforestation et foyer amélioré au sub-Sahara: Efficacité sous les conditions pratiques dans les ménages. Hiroshi NAWATA • Shun ISHIYAMA, Ryo NAKAMURA (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Arab Subsistence Monograph Series, Volume 1. Shokadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.75-101. (in French)
- ISHIYAMA, S. 2013,03 Deforestation and improving cooking stoves in sub-Sahara: Effectiveness under practical condition in households. Hiroshi NAWATA, Shun ISHIYAMA, Ryo NAKAMURA (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Arab Subsistence Monograph Series, Volume 1. Shokadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.75-91. (Other) in Arabic
- ISHIYAMA, S. 2013,03 Deforestation and improving in sub-Saharan cooking stoves: Effectiveness under practical condition in households. Hiroshi NAWATA, Shun ISHIYAMA, Ryo NAKAMURA (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Arab Subsistence Monograph Series, Volume 1. Shokadoh Book Sellers, Kamigyo-ku, Kyoto, Japan, pp.75-101.
- ISHIYAMA, S. 2013,03 Thinking energy problem from rural life. Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN Series. Showado, Sakyo-ku, Kyoto, Japan, pp.169-198. (in Japanese)
- ISHIYAMA, S. 2013,03 Is it possible to prescribe against the global environmental problem ?. ISHIYAMA, S. (ed.) Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN Series. Showado, Sakyo-ku, Kyoto, Japan, pp.1-11. (in Japanese)
- ISHIYAMA, S 2012,11 Abéché, Am Timan, Le Chari, Lac Tchad, Tibesti Massif, Bhar el Ghazal, Bardai; Faya Largeau, Ouadaï. Takeuchi, K. (ed.) Geographical Dictionary of the World 3, Africa and Middle East. Asakura Shoten, Shinjuku-ku, Tokyo, Japan, pp.59, 63, 493-494, 607-608, 632, 782-783, 785, 823, 1127. (in Japanese)

**[Editing]**

*[Editing / Co-editing]*

- ISHIYAMA, S. , NAWATA, H. (ed.) 2013,03 Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN Series. Showado, Sakyo-ku, Kyoto, Japan, 231pp. (in Japanese)

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

- ISHIYAMA, S. Humanistic Approaches of Arab Subsistence Project, RIHN - A case of Algerian Sahara field Survey. International Workshop on Humanistic Approaches towards Global Environmental Change, 2013, 03, 16-2013, 03, 17, Kyoto, Japan.
- ISHIYAMA, S. Livelihood of Sahelian Farmer under the Environmental Variation. The Japanese Association for Arid Land Studies, sectional meeting, 2012, 12, 08, Kita-ku, Kyoto, Japan. (in Japanese)
- Ishiyama, S. Changes of Oasis Life in Algerian Sahara -Water Supply, Farm Expansion and Habitations Movement, A Case Study of In Belbel. Colloque International sur La Foggara, 2011, 04, 09-2100, 04, 11, Algeria, Adrar.

*[Poster Presentation]*

- Shun ISHIYAMA, Hiroshi NAWATA, Mutasim Mekki Mahmoud Elrasheed , Mussab Hassan Abbass A Study of Traditional Rainfed Agriculture in African Semiarid Area. 23rd Annual meeting of The Japanese Association for Arid Land Studies, 2012, 05, 26-2012, 05, 27, ObihiroCity, Hokkaido, Japan. (in Japanese)

**KODA Ryosuke**

Project Researcher

**Born in 1983.****[Higher Degrees]**

PhD. (Kyoto University, 2011)

**[Fields of Specialization]**

Forest Ecology

Mammalogy

**—Achievements—****[Books]***[Chapters/Sections]*

- Koda R, Amartuvshin S, Amartuvshin N, Fujita N. 2012 Soil alkalization by overgrazing can delay the recovery of pastureland. Batjargal Z, Fujita N, Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. , Ulaanbaatar, pp.95-102. (in Mongolian) ISBN 978-99962-0-859-1
- Koda R, Amartuvshin S, Amartuvshin N, Fujita N. 2012 How much amount of pasture plants does one livestock eat in a day?. Batjargal Z, Fujita N, Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. , Ulaanbaatar, pp.243-246. (in Mongolian) ISBN 978-99962-0-859-1
- Koda R, Amartuvshin S, Fujita N. 2012 Present status of wild animals: a case study of red deer population in Hustai National Park. Batjargal Z, Fujita N, Yamamura N (ed.) Pastoralism and Ecosystem Network in Mongolia. , Ulaanbaatar, pp.247-253. (in Mongolian) ISBN 978-99962-0-859-1

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

- Koda R, Kawamura T 2012,12 Population density of *Cervus nippon yakushimae* in the grassland area of *Pseudosasa owatarii*. *Mammalian Science* 52(2) :223-227. (in Japanese) (reviewed).

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

- Koda R Relationship between livestock and pasture in Mongolia. RIHN 7th International Symposium “Complexification and Simplification: Ecosystems, human health and lifestyle in Asia”, 2012, 10, 24-2012, 10, 26, RIHN, Kyoto, Japan.
- Koda R. Relationship among livestock grazing, pasture plants, and soil alkalization. International Symposium ” Pastoralism and Ecosystem Network in Mongolia” , 2012, 09, 11-2012, 09, 11, Elite Center, Ulaanbaatar, Mongolia.
- Koda R. Function of deer as a driver of forest vegetation in the evergreen broad-leaved forests on Yakushima Island. The 55th Symposium of IAVS, 2012, 07, 23-2012, 07, 28, Hyundai Hotel Mokpo, Mokpo, Korea.

**KUMAZAWA Terukazu**

---

Assistant Professor

**Born in 1974 年.****[Higher Degrees]**

Dr of Engineering

**[Fields of Specialization]**

Environmental planning

Regional informatics

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- Keishiro Hara, Terukazu Kumazawa, Michinori Uwasu, Helmut Yabar Sustainability Indicator System with Visualized Causal-Links Information - Application of Ontology and a Case Study. The 10th International Conference on EcoBalance (EcoBalance 2012), 2012, 11, 20-2012, 11, 23, Yokohama, Kanagawa, Japan.

**MASUDA Tadayoshi**

---

Senior Project Researcher

**[Higher Degrees]**

Ph.D. in Agricultural and Resource Economics (University of Hawaii, 2007)

M.A. in Food Research / International Development Policy (Stanford University, 1997)



B.A. in Agricultural and Forestry Economics (Kyoto University, 1989)

**[Fields of Specialization]**

Agricultural and Resource Economics

**[Academic Society Memberships]**

International Association of Agricultural Economics

International Food & Agribusiness Management Association

Agricultural and Applied Economics Association

Western Agricultural Economics Association

**[Awards]**

Best Paper Award. (2012) International Food and Agribusiness Management Association (IFAMA) 22nd Annual World Forum and Symposium, Shanghai, China.

Graduate Student Teaching Award of Merit. (2003) North American College and Teachers of Agriculture and the University of Hawaii College of Tropical Agriculture & Human Resources.

Gamma Sigma Delta (Honor Society of Agriculture). (2002)

—Achievements—

**[Papers]**

*[Original Articles]*

- Masuda, Tadayoshi and P.D. Goldsmith. 2012, 09 China's Meat and Egg Production and Soybean Meal Demand for Feed: An Elasticity Analysis and Long-Term Projections. *International Food and Agribusiness Management Review*. 15(3) :35-54. (reviewed).

**[Research Presentations]**

*[Oral Presentation]*

- Masuda, Tadayoshi and P.D. Goldsmith. China's Meat and Egg Production and Soybean Meal Demand For Feed: An Elasticity Analysis and Long-term Projections. Selected Paper prepared for presentation at the International Food and Agribusiness Management Association (IFAMA) 22nd. Annual World Forum and Symposium, 2012, 06, 09-2012, 06, 14, Shanghai, China.

**MCGREEVY, Steven**

Assistant Professor

**Born in 1978.**

**[Academic Career]**

Division of Natural Resource Economics, Graduate School of Agriculture, Kyoto University (2008)

College of Continuing Education, University of Minnesota (2002)

St. John's University- Collegeville, MN (1997)

**[Professional Career]**

Lecturer, Seisen Jogakuin College (2007)

Monbukagakusho Scholar, Graduate School of Agriculture, Kyoto University (2009)

Lecturer, Nagano National College of Technology (2011)

Assistant Professor, Research Institute for Humanity and Nature (2013~)

**[Higher Degrees]**

D.Ag. (Kyoto University, 2012)

M.S. (University of Minnesota-Twin Cities, 2004)

B.A. : Major- Biology; Minor- Environmental Studies (St. John's University- Collegeville, MN, 2000)

**[Fields of Specialization]**

Rural Sustainable Development

Sustainable Agriculture

Socio-ecological Systems

**[Academic Society Memberships]**

Japan Biochar Association

International Biochar Initiative

Japanese Association for Rural Studies

Rural Sociology Society

International Association for the Study of the Commons

**—Achievements—**

**[Books]**

*[Authored/Co-authored]*

- McGreevy, Steven R. 2012 Revitalizing Sustainable Socio-ecological Landscapes: An Examination of Organic Farming, Renewable Energy, and Carbon Sequestration Activities in Rural Japan (PhD Dissertation). Kyoto University

*[Chapters/Sections]*

- McGreevy, Steven R. 2012 Climate-friendly Farming Production and Biochar: Towards Revitalizing Satoyama and Farming. Suzuki, Tatsuya & Hiroya Ushio (ed.) Satoyama Governance. Koyoshobo Publishers, pp.169-181. (in Japanese)

**[Papers]**

*[Original Articles]*

- McGreevy, Steven R. 2012,09 Lost in translation: Incomer organic farmers, local knowledge, and the revitalization of upland Japanese hamlets. Agriculture and Human Values 26(3) :393-412. DOI:10.1007/s10460-011-9347-5. (reviewed).

**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.\*, Yamanaka, H.\*, Takahara, T., Honjo, M. N., Kawabata, Z. (\*equal contribution) 2012,08 Surveillance of fish species composition using environmental DNA. *Limnology* 13(2) :193-197. DOI: 10.1007/s10201-011-0362-4. (reviewed).
- Minamoto, T., Honjo, M. N., Yamanaka, H., Uchii, K., Kawabata, Z. 2012,08 Nationwide Cyprinid herpesvirus 3 contamination in natural rivers of Japan. *Res. Vet. Sci.* 93(1) :508-514. DOI:10.1016/j.rvsc.2011.06.004. (reviewed).
- Yamanaka, H., Minamoto, T., Wu, D., Kong, H., Wei, Z.-H., Liu, B., Kawabata, Z. 2012,06 Spatial-temporal analysis of water temperatures during spring in Lake Erhai, China: implications for fisheries. *Inland Waters* 2(3) :129-136. DOI:10.5268/IW-2.3.455. (reviewed).
- Takahara, T., Minamoto, T., Yamanaka, H., Doi, H., Kawabata, Z. 2012,04 Estimation of fish biomass using environmental DNA. *PLoS ONE* 7(4) :e35868. DOI:10.1371/journal.pone.0035868. (reviewed).
- Minamoto, T., Fuchikawa, T., Shimizu, I. 2012,04 Expression of spliced variants of period mRNA in the Japanese honeybee *Apis cerana japonica*. *Biol. Rhythm Res.* 43(2) :125-135. DOI: 10.1080/09291016.2010.537447. (reviewed).

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

- Uchii, K., Minamoto, T., Kawabata, Z. Persistence of an emerging Cyprinid herpesvirus 3 in a wild host population. Joint Meeting of The 59th Annual Meeting of ESJ and The 5th EAFES International Congress, 2012,03,17-2102,03,21, Otsu City, Shiga, Japan. (in Japanese)

*[Poster Presentation]*

- Minamoto, T., Honjo, M. N., Kawabata, Z. Monitoring of fish pathogenic viruses in freshwater environments. *EcoHealth2012* (The 4th Biennial Conference of the International Association for Ecology & Health), 2012,10,15-2012,10,18, Kunming City, China.

---

**MIYAZAKI Hidetoshi**


---

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, Y. Ishimoto, M. Yamashita, U. Tanaka, C. Umetsu Coping behaviors with extremely heavy rainfalls in Southern Zambia - Comparison between 2007/08 and 2009/10 -. RIHN-HUAF Collaboration Seminar on "African Development Assistance with Asia, 2013,03,06, CARD, Hue University of Agriculture and Forestry, Hue, Vietnam.

---

**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]

- Masahiro Hashizume, Luis Fernando Chaves, A. S. G. Faruque, Md Yunus, Kim Streatfield, Kazuhiko Moji 2013, 03 A Differential Effect of Indian Ocean Dipole and El Nino on Cholera Dynamics in Bangladesh. PLoS One. 8(3). DOI:10.1371/journal.pone.0060001.
- Miao Miao, Zenglei Wang, Zhaoqing Yang, Lili Yuan, Daniel M. Parker, Chaturong Putaporntip, Somchai Jongwutiwes, Phonpadith Xangsayarath, Tiengkham Pongvongsa, Kazuhiko Moji, Trinh Dinh Tuong, Tomoko Abe, Shusuke Nakazawa, Myat Phone Kyaw, Guiyun Yan, Jeeraphat Sirichaisinthop, Jetsumon Sattabongkot, Jianbing Mu, Xin-zhuan Su, Osamu Kaneko, Liwang Cui 2013, 03 Genetic Diversity and Lack of Artemisinin Selection Signature on the Plasmodium falciparum ATP6 in the Greater Mekong Subregion. PLoS One. 8(3). DOI:10.1371/journal.pone.0059192.
- Tiengkham Pongvongsa, Hoang Ha, Le Thanh, Ron P Marchand, Daisuke Nonaka, Bumpei Tojo, Panom Phongmany, Kazuhiko Moji, Jun Kobayashi 2012, 08 Joint malaria surveys lead towards improved cross-border cooperation between Savannakhet province, Laos and Quang Tri province, Vietnam. Malar J. . DOI:10.1186/1475-2875-11-262.
- Sachi Tomokawa<sup>1</sup>, Toshio Kobayashi<sup>2</sup>, Tiengkham Pongvongsa<sup>3</sup>, Bangon Nisayngang<sup>4</sup>, Eiko Kaneda<sup>5</sup>, Sumihisa Honda<sup>6</sup> 2012, 05 RISK FACTORS FOR OPISTHORCHIS VIVERRINI INFECTION AMONG SCHOOLCHILDREN IN LAO PDR. Southeast Asian J Trop Med Public Health 43(3) :574-585.

## 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-)  
 Japanese Society of Cultural Anthropology (2008-)  
 Japan Association for Religious Studies (2008-)  
 Japan Association for Middle East Studies (2009-)  
 Japan Association for Nilo-Ethiopian Studies (2011-)

**—Achievements—****[Books]***[Chapters/Sections]*

- NAKAMURA, Ryo 2013,02 "Mangrove Use on the Kilwa Island, Southern Swahili Coast in Tanzania". Hiroshi NAWATA (ed.) Dryland Mangroves. Arab Subsistence Monograph Series, Volume 2. Shoukadoh Book Sellers, Kamigyō-ku, Kyoto, pp.38-41. (in English and Arabic)
- NAKAMURA, Ryo 2013,01 "Utumiaji wa Mikoko katika Kilwa Kisiwani, Kusini mwa Mwambao wa Kiswahili, Tanzania (Direct and Environmental Uses of Mangrove Resources on Kilwa Island, Southern Swahili Coast, Tanzania)". Hiroshi NAWATA・Shun ISHIYAMA・Ryo NAKAMURA (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Arab Subsistence Monograph Series, Volume 1. Shoukadoh Book Sellers, Kamigyō-ku, Kyoto, pp.103-132. (in Swahili, English, and Arabic)

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

- NAKAMURA, Ryo 2013,03 "Utumiaji wa mikoko katika Kilwa Kisiwani, kusini mwa mwambao wa kiswahili, Tanzania" (in Swahili with English abstract). African Religious Dynamics 1 :111-125.
- NAKAMURA, Ryo 2013,03 "Maritime Anthropology on Fishery in Jizan and Farasan Islands, Southern Part of the Red Sea in the Kingdom of Saudi Arabia (13 March to 29 March, 2013)". A Study of Human Impacts on Mangrove Habitats along the Northern and Southern Parts of the Red Sea Coast in the Kingdom of Saudi Arabia (2011-2013) :1-22.
- NAKAMURA, Ryo 2013,02 "Fishing Culture of Kilwa Island on the Southern Swahili Coast, Tanzania: Bantu Inland-sea Fishery and Arab Open-sea Fishery". Islamic Africa Studies 5 :135-162. (in Japanese)
- NAKAMURA, Ryo and Adel Mohamed Saleh 2012,08 "Maritime Anthropology along the Red Sea in Sudan: Fishing Culture in Dunganab and Boat Culture in Suakin". Hiroshi Nawata (ed.) Investigative Report: A Study of Human Subsistence Ecosystems in Arab Societies (2011-2013). pp.73-86.

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

- NAKAMURA, Ryo "Multi-ethnic Coexistence in a Swahili Maritime Society as seen through Basic Ecology and Fishing Cultures of Kilwa Island, Tanzania". Workshop on Afro-Eurasian Dry Lands in the Central Eurasian Studies Society 2012 Annual Conference, 2012, 10, 17-2012, 10, 18, Indiana University, Indiana, USA.

## 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

**[Awards]**

Ecological Research Award(2009)

**—Achievements—****[Books]***[Chapters/Sections]*

- 2012,06 Geochemical dilemma in coastal aquifer system:lesson from history. Makoto Taniguchi, Takayuki Shiraiwa (ed.) The Dilemma of Boundaries Toward a New Concept of Catchment. Global Environmental Studies. Springer, pp.19-24.

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

- Shikazono, N., Tatewaki, K., Mohiuddin, K. M., Nakano, T., Zakir, H.M. 2012 Sources, spatial variation, and speciation of heavy metals in sediments of the Tamagawa River in Central Japan. *Environmental Geochemistry and Health* 34 :13-26. DOI:10.1007/s10653-011-9409-z. (reviewed).

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

- Takanori Nakano Connection of an ecosystem and yellow sand traced by using a stable isotope. RIHN Global environmental studies lecture, 2013,03,14, Beijing University, Beijing. (in Japanese)
- Takanori Nakano Business of an environmental map; Creation of isotope environmental studies for the Future Asia. The 2nd isotope environmental studies symposium, 2013,02,18-2013,02,19, RIHN. (in Japanese)
- Takanori Nakano Business of an asian environmental map; Environmental diagnosis using a multi-item map of water. The 2nd isotope environmental studies symposium, 2013,02,18-2013,02,19, RIHN. (in Japanese)
- Takanori Nakano Environmental traceability research using a stable isotope technique. Reconstruction assistance seminar, 2013,01,28, Taihaku campus, Miyagi University. (in Japanese)
- Takanori Nakano Survey result report about the water vein of Mt. Chokai 'Explore the underground water vein of Mt. Yoshide from the water quality map. Mt. Chokai forum, 2012,12,24, Yukari Chokai culture hall. (in Japanese)
- Takanori Nakano Environmental map business in Asia. , 2012,12,21, Chiba university. (in Japanese)
- Takanori Nakano Environmental map business in Asia starting from Tohoku area 'Ecosystem service that produces delicious water'. , 2012,10,31, Tohoku University. (in Japanese)
- Takanori Nakano Water quality map creation project by multi-element and isotope: Development of groundwater management based on the circulation. Workshop on the water circulation, 2012,07,13, Japan Riverfront Research Center( Cyuo-ku, Tokyo). (in Japanese)
- Takanori Nakano Deployment to make a map of multi-element and isotope of water and to determine the origin. The Japan Society for Analytical Chemistry, the 7th Display and Origin analysis technology research meeting "The origin estimation technique with isotope ratio of heavy elements", 2012,07,04, Tiara Koto small hall, Koto-ku, Tokyo. (in Japanese)
- Takanori Nakano(RIHN), Daizo Ishiyama(Akita University) The proposal of the resource geology-type environmental research system by creating a multi-item map water quality . The 62th society of resource geology, 2012,06,27-2012,06,29, Koshiba Hall, The University of Tokyo(Bunkyo-ku, Tokyo). (in Japanese)
- Takanori Nakano Explore the connection of yellow sand and ecosystem. The 11th RIHN Area Collaboration Seminar 'Environment' security of East Asia beyond the theory of Windward and Leewind, 2012,06,10, ELGALA Hall, Cyuo-ku, Fukuoka city. (in Japanese)

*[Poster Presentation]*

- Tatsuya Yodose, Hitoshi Chiba, Takanori Nakano, Seiji Maruyama The origin of atmospheric fallout in Chugoku area from a standpoint of sulfur isotope ratio and hydrogen and oxygen isotope ratios. The 2nd isotope environmental studies symposium, 2013,02,18-2013,02,19, RIHN. (in Japanese)
- Maki Morimoto, Seiji Maruyama, Osamu Abe, Takeshi Nakatsuka, Takanori Nakano The examination of the measurement condition and performance evaluation of Gas Bench2 - DELTA V Plus(RIHN) towards carbon and oxygen isotope ratio measurements of carbonate samples . The 2nd isotope environmental studies symposium, 2013,02,18-2013,02,19, RIHN. (in Japanese)
- Takanori Nakano Use of multiple-isotope analytical system into aquatic ecosystem. Aquatic Sciences Meeting: Voyages of Discovery, 2012,07,12, Biwako Hall Center for the performing arts, Shiga, Otsu-city, Shiga prefecture.



- Daizo Ishiyama(Akita University), Takanori Nakano(RIHN) etc. The characteristic of the chemical composition of river water in Akita prefecture—a research example on the proposal of the resource geology-type environmental research system by creating a multi-item map water quality-. The 62th society of resource geology, 2012,06,27–2012,06,29, Koshiba Hall, The University of Tokyo(Bunkyo-ku, Tokyo). (in Japanese)
- Takanori Nakano Water-quality diagnosis of Sabanakett district in central Laos. Japan Geoscience Union Meeting 2012 , 2012,05,20–2012,05,24, Makuhari Messe International Conference Hall. (in Japanese)

*[Invited Lecture / Honorary Lecture / Panelist]*

- Takanori Nakano Spring water ecosystem conservation network starting with making water quality map of Saijo. National convention of spring water conservation forum in Saijo -Along with water until now and also in the future-, 2012,10,12–2012,10,12, Saijo City Synthesis Culture Hall. (in Japanese)
- Takanori Nakano The project for an environmental geochemistry map in Asia area. Annual Meeting of GSJ 2012, 2012,09,11–2012,09,13, Hakozaiki Campas, Kyusyu University. (in Japanese)
- Takanori Nakano Development of multi-tracer of water toward Asian geo-isoscape study. Japan Geoscience Union Meeting 2012, 2012,05,20–2012,05,24, Makuhari Messe International Conference Hall ( Chiba city). (in Japanese)

## NAWATA Hiroshi

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 2013,03 “Meeting point of the Yellow belt and the Blue belt: Coastal zone of the arid tropics as corridors of early human dispersal out of Africa”. Sato, Y. and Taniguchi, M. (ed.) Environmental history of the Yellow belt. Koubundou, Kyoto, Japan, pp.168-190. (in Japanese)
- Hiroshi Nawata 2013,03 “A viable future lifestyle without oil”. Ishiyama, S. and H. Nawata (ed.) Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN Book Series. Showado, Sakyo-ku, Kyoto, Japan, pp.215-228. (in Japanese)
- Hiroshi Nawata 2013,03 “A view at the top of oil era: What have we lost and what should we preserve?”. Ishiyama, S. and Nawata, H. (ed.) Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN series. Showado, Kyoto, Japan, pp.13-58. (in Japanese)
- Hiroshi Nawata 2013,02 “Coastal Resource Use by Camel Pastoralist: A Case Study of Gathering and Fishing Activities among the Beja in Eastern Sudan”. Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Shoukadoh Book Sellers, Kyoto, Japan, pp.48-65. (in English and Arabic)
- Hiroshi Nawata 2013,02 “About Research Project”. Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Shoukadoh Book Sellers, Kyoto, Japan, pp.6-9. (in English and Arabic)
- Hiroshi Nawata 2013,02 “Preface”. Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Shoukadoh Book Sellers, Kyoto, Japan, pp.4-5. (in English and Arabic)
- Hiroshi Nawata 2013,02 “Relationships between Humans and One-humped Camels in the Coastal Zones of the Arid Tropics: An Anthropological Case Analysis of the Beja on the Red Sea Coast of Eastern Sudan”. Nawata, H. (ed.) Dryland Mangroves: Frontier Research and Conservation. Shoukadoh Book Sellers, Kyoto, Japan, pp.42-47. (in English and Arabic)
- Hiroshi Nawata 2013,01 “Preface”. Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Shoukadoh Book Sellers, Kyoto, Japan, pp.4-5. (in English and Arabic)
- Hiroshi Nawata, Muhammad Ahmad 'Asiri, Rabi' 'Abd al-Rahman Hasanin', and Tariq Muhammad al-'Abbasi' 2013,01 “Traditional Natural Resource Use and Conservation of Juniper Woodlands in the Arabian Peninsula: A Case Analysis of Raydah Nature Reserve”. Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Shoukadoh Book Sellers, Kyoto, Japan, pp.19-74. (in English and Arabic)
- Hiroshi Nawata 2013,01 “About Research Project”. Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Shoukadoh Book Sellers, Kyoto, Japan, pp.6-8. (in English and Arabic)

- Hiroshi Nawata 2013,01 "Exploitation and Conservation of Middle East Tree Resources in the Oil Era: A Study of Human Subsistence Ecosystems in Arab Societies". Nawata, H., Ishiyama, S. and Nakamura, R. (ed.) Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Shoukadoh Book Sellers, Kyoto, Japan, pp.9-18. (in English and Arabic)
- Hiroshi NAWATA, N. KOGA, A.A. ELKHALIFAE, and A. ELDOMA 2012,12 Use of the alien invasive species mesquite (*Prosopis juliflora*) for wood fuel/charcoal to support local incomes and improve energy efficiency in an arid land of Sudan. A. Mendez-Vilas (ed.) Fuelling the future: Advances in science and technologies for energy generation, transmission and storage. Brown Walker Press, Florida, pp. 128-132.
- Hiroshi NAWATA 2012,09 Four Analytical Methods for Exploring Life on the Loess Plateau: A Theoretical Framework for Combining Humanities and Social Sciences with Natural Science . Zheng Xiaoyun (ed.) Current Problems of Environment and its Cultural Background. China Book Publisher, Beijing, pp. 45-75.
- Ren'ya SATO, Hiroshi NAWATA, Aosi BUHE, Ryota NAGASAWA, Ruichen JIA, Wenhui ZHANG, Qingchun HOU, and Norikazu YAMANAKA 2012,09 Traditional Land Use on the Loess Plateau (China) and the "Grain-for-Green" Project: A Case from Ansai, Shanxi. Zheng Xiaoyun (ed.) Current Problems of Environment and its Cultural Background. China Book Publisher, Beijing, pp.76-110.

### [Editing]

#### [Editing / Co-editing]

- Ishiyama, S. and H. Nawata (ed.) 2013,03 Human Resource and Engineering in the Post-Oil Era: A Look at Viable Future Societies in Japan and Oil-Rich Countries. RIHN Book Series. Showado, Kyoto, 231pp. (in Japanese)
- Hiroshi Nawata (ed.) 2013,02 Dryland Mangroves: Frontier Research and Conservation. Arab Subsistence Monograph Series, 2. Shoukadoh Book Sellers, Kyoto, 132pp. (in English and Arabic).
- Hiroshi Nawata, Ishiyama, S. and Nakamura, R. (ed.) 2013,01 Exploitation and Conservation of Middle East Tree Resources in the Oil Era. Arab Subsistence Monograph Series, 1. Shoukadoh Book Sellers, Kyoto, 248pp. (in English, Arabic, French and Swahili).

### [Papers]

#### [Original Articles]

- Yasuda, H., T. Kawai, Mohamed Abd Elbasit Mohamed Ahmed, H. Nawata 2012,12 Cyclic pattern of precipitation time series in arid Sudan. *Journal of Arid Land Studies* 22(2) :363-367. (in Japanese) (reviewed).
- Yasuda, H., T. Kawai, Mohamed Abd Elbasit Mohamed Ahmed, H. Nawata 2012,12 Seasonal variation of precipitation time series in arid Sudan. *Journal of Arid Land Studies* 22(2) :357-361. (in Japanese) (reviewed).
- Yasuda, H., Mohamed Abd Elbasit Mohamed Ahmed, T. Inoue, K. Yoda, T. Kawai, W. Tsuji, H. Nawata and T. Saito 2012,09 Groundwater uptake of alien invasive plant, mesquite in arid environment: Double peak pattern of diurnal groundwater level fluctuation due to the midday depression phenomenon. *Journal of Japan Society of Hydrology and Water Resources* 25(5) :315-321. (in Japanese) (reviewed).
- Mohamed A.M. ABD ELBASIT, Hiroshi YASUDA, Kiyotsugu YODA, Ahmed M. ELDOMA, Hiroshi NAWATA, Buho HOSHINO and Magzoub K. MAGZOUN 2012,06 Mesquite (*Prosopis* spp.) Water Uptake under Different Simulated Drought Conditions. *Journal of Arid Land Studies* 22(1) :5-8. (reviewed).
- Kiyotsugu YODA, Mohamed A.M. ABD ELBASIT, Buho HOSHINO, Hiroshi NAWATA and Hiroshi YASUDA 2012,06 Root System Development of *Prosopis* Seedlings under different Soil Moisture Conditions. *Journal of Arid Land Studies* 22(1) :13-16. (reviewed).
- Hiroshi NAWATA 2012,06 To Combat a Negative Heritage of Combating Desertification: Developing Comprehensive Measures to Control the Alien Invasive Species Mesquite (*Prosopis juliflora*) in Sudan. *Journal of Arid Land Studies* 22(1) :9-12. (reviewed).

- Buho HOSHINO, Abdelaziz KARAMALLA, Mohamed A.M. ABD ELBASIT, Karina MANAYEVA, Kiyotsugu YODA, Mahgoub SULIMAN, Mohamed ELGAMRI, Hiroshi NAWATA and Hiroshi YASUDA 2012, 06 Evaluating the Invasion Strategy of Mesquite (*Prosopis juliflora*) in Eastern Sudan Using Remotely Sensed Technique. *Journal of Arid Land Studies* 22(1) :1-4. (reviewed).

### **[Research Presentations]**

#### *[Poster Presentation]*

- Hiroshi NAWATA, Shin'ichi NISHINOTO, Yoshifumi YASUOKA, Aya YASUOKA and Yoko SHINDO Architectural and Anthropological Survey on Coral Buildings in Sinai Peninsula, Egypt. 12th International Coral Reef Symposium, 2012, 07, 09–2012, 07, 13, Cairns, Queensland, Australia.
- Hiroshi NAWATA, Naoki KOGA, A.A. KHALIFA and A.K. GAIBALLA A method for wood fuel/charcoal of the alien invasive species mesquite (*Prosopis juliflora*) to support local incomes with better energy efficiency in arid land of Sudan. The Energy & Materials Research Conference, 2012, 06, 20–2012, 06, 22, Torremolinos, Malaga, Spain.

#### *[Invited Lecture / Honorary Lecture / Panelist]*

- Hiroshi NAWATA A Bridge between 'Knowledge' in Japan and 'Tradition' in Sudan: To combat a negative heritage of combating desertification. International Biennial of Cultural and Landscape Heritage, 2012, 11, 03–2012, 11, 11, Florence, Italy.

## **ONISHI Masayuki**

Visiting 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—****[Books]***[Authored/Co-authored]*

- Masayuki Onishi 2012, 05 A Grammar of Motuna. OGFAUS (Outstanding Grammars from Australia), 9. Lincom Europa, Munich, Germany, 564pp.

**[Research Presentations]***[Invited Lecture / Honorary Lecture / Panelist]*

- Masayuki Onishi Globalisation, Languages and Cultures – with Special Reference to the Folk Music of North Bengal. Invited Lecture, Parimal Mitra Mahavidyalaya, 2012, 05, 26, Malbazar, Jalpaiguri, India. (Other) In Bengali. Reported in the local newspaper Uttarbanga Sambad on 27th May..
- Masayuki Onishi Linguistic Diversity. Invited Seminar, Department of Nepali Language and Literature, Sikkim University, 2012, 05, 21, Ghantok, Sikkim, India.

**SAITO Satoshi (Tetsu)**

Project Researcher

**[Academic Career]**

Doctor of Environment Science (Graduate School of Environment and Information Sciences, Yokohama National University, Japan, 2004). Thesis title: Petrogenesis of the Miocene Kofu Granitic Complex: Syn-tectonic granitoids in the Izu collision zone, central Japan.

Master of Education (Graduate School of Education, Yokohama National University, Japa, 2004). Thesis title: Petrogenesis of the Miocene Kofu Plutonic Complex, central Japan (in Japanese).

Bachelor of Education (Faculty of Education, Yokohama National University, Japan, 1999). Thesis title: Petrological studies of the southern Kofu Plutonic Complex (in Japanese).

**[Professional Career]**

Research Assistant, Graduate School of Environment and Information Sciences, Yokohama National University, Japan (2004)

Research Assistant, Faculty of Education and Human Sciences, Yokohama National University, Japan (2005)

Lecturer, Hosei University Daini Junior High School, Japan (2005)

Part-time lecturer, Faculty of Education and Human Sciences, Yokohama National University, Japan (2005, 2006)

Research Assistant, Graduate School of Environment and Information Sciences, Yokohama National University, Japan (2006)

Research Associate, Department of Geology, University of Maryland, USA (2007)

Postdoctoral Researcher, Institute for Research on Earth Evolution (IFREE), Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan (2008)

Part-time lecturer, Faculty of Engineering, Yokohama National University, Japan (2009, 2010)

**[Higher Degrees]**

Doctor of Environment Science (Yokohama National University, Japan, 2004)

Master of Education (Yokohama National University, Japan, 2001)

Bachelor of Education (Yokohama National University, Japan, 1999)

**[Fields of Specialization]**

Geology

Igneous and metamorphic petrology  
Isotope geochemistry

**[Academic Society Memberships]**

Japan Geoscience Union  
The Geological Society of Japan  
Japan Association of Mineralogical Sciences  
The Geochemical Society of Japan  
American Geophysical Union

—Achievements—

**[Papers]**

*[Original Articles]*

- Saito, S., Arima, M., Nakajima, T., Tani, K., Miyazaki, T., Senda, R., Chang, C., Takahashi, T., Hirahara, Y. and Kimura, J.-I. 2012 Petrogenesis of the Kaikomagatake granitoid pluton in the Izu Collision Zone, central Japan: implications for transformation of juvenile oceanic arc into mature continental crust. *Contributions to Mineralogy and Petrology* 163 :611-629. (reviewed).

**[Research Presentations]**

*[Poster Presentation]*

- Saito, S., Nakano, T., Arima, M., Cabrera, R.R., Tan, M.F.O., Balon, J.L., Baltazar, D.E.S., Santos-Borja, A. and Kada, R. Chemical spot maps of lake and river waters in the Laguna de Bay and its watershed. Community Forum 2012 -Partnership in Saving Laguna de Bay-, 2012,09,27, Conference Center, Development Academy of the Philippines, Tagaytay City, Philippines..
- Saito, S. and Arima, M. Spatial and temporal variations of granitoid plutons in the Izu collision zone, central Japan: Implications for transformation of juvenile oceanic arc into mature continental crust. ULTRA-DEEP DRILLING INTO ARC CRUST ~genesis of continental crust in volcanic arcs~ Workshop in Hawaii, 2012,09,17-2012,09,21, Waikoloa Beach Marriott Resort & Spa, Kona, Hawaii, USA.

*[Invited Lecture / Honorary Lecture / Panelist]*

- Saito, S., Nakano, T., Arima, M., Santos-Borja, A. and Kada, R. Present levels of heavy metals in river and lake waters and bottom sediments in the Laguna de Bay watershed. Community Forum 2012 -Partnership in Saving Laguna de Bay-, 2012,09,27, Conference Center, Development Academy of the Philippines, Tagaytay City, Philippines.

**SATO Yo-Ichiro**

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)

Program Director - Ecohistory

### **[Higher Degrees]**

D.Agr. (Kyoto University, 1986)

### **[Fields of Specialization]**

Plant genetics

### **[Academic Society Memberships]**

Japan Society of Breeding

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—**

### **[Books]**

#### *[Authored/Co-authored]*

- Sato Yo-ichiro 2012,09 Think about food/Shoku wo Kangaeru. Fukuinkan-shoten, Tokyo, 191pp. (in Japanese)

#### *[Chapters/Sections]*

- 2013,03 “Review:Interaction between the People and the Nature in Yellow Belt”. Sato, Y., Taniguchi, M. (ed.) Ecohistory of Yellow Belt from Sahel to Silk Road. Kobundo, Tokyo, pp.6-19. (in Japanese)

### **[Editing]**

#### *[Editing / Co-editing]*

- Sato, Y., Taniguchi, M. (ed.) 2013,03 Ecohistory of Yellow Belt from Sahel to Silk Road . Kobundo, Tokyo, 229pp. (in Japanese)

### **[Papers]**

#### *[Original Articles]*

- Yo-ichiro Sato 2012,12 History of Rice Paddy Transition Over 2000 Years. Nihonshi Kenkyu (607) :1-15. (in Japanese)

### **[Research Presentations]**

#### *[Oral Presentation]*

- The movement of crops in the Old World: The role of nomadic pastoralists. Symposium on “Dispersion of People, Crops, and Language:Hokkaido and Ryukyus”, 2013,02,23-2013,02,24, Research Institute for Humanity and Nature.

- Pastral Scenery - transition history over 200 year. The Japanese Society for Historical Studies annual conference 2012, 2012,10,13, Kyoto . (in Japanese)

*[Invited Lecture / Honoronary Lecture / Panelist]*

- Will the green silk road revive?. Public Seminar/Open house of Arid Land Research Center, Tottori University, 2012,12,15, Tottori. (in Japanese)
- Rice and fish produced by the environment - Food culture variety and environment/culture interaction. Environment and Culture Kyoto Conference 2012, 2012,12,01, Kyoto. (in Japanese)
- Crops and civilization in Afro-Eurasia. QUARIA Agora, 2012,10,25, Kyoto. (in Japanese)
- See future of rice through archaeology. 25th memorial symposium of Hamada Seiryō Prize, 2012,09,30, Kishiwada. (in Japanese)
- Eco-history of rice and fish. Yayoi people nurture course, 2012,07,14, Moriyama. (in Japanese)
- Ancient rice studied from DNA - History of rice. Training session for Kochi Center of Deposits and Cultural Heritage, 2012,07,13, Kochi. (in Japanese)
- Dynamic "Fodo-logy". , 2012,06,09, Maison de la culture du Japon à Paris. (in Japanese)
- History of "Fudo" . , 2012,06,07, Université de Toulouse. (in Japanese)
- Earthquake and Rice Cultivation. , 2012,06,06, Fondation Maison des science de l'homme. (in Japanese)
- Japanese, rice crops and rice - How genetic diversity of rice has changed? . Traditiona l food lecture, 2012,04,06, Osaka. (in Japanese)

## TAKAGI Akira

---

Senior Project Researcher

**[Academic Career]**

BA (International Christian University, 2003)

**[Higher Degrees]**

Ph.D(The University of Tokyo, 2008)

—Achievements—

**[Papers]**

*[Original Articles]*

- Hisashi Kurokura, Akira Takagi, Yutaro Sakai, Nobuyuki Yagi 2012,06 TUNA GOES AROUND THE WORLD ON SUSHI. Aquaculture Economics & Management 16(2) :155-166. (reviewed).

## TAKANO Takenaka Kohei

---

Project Researcher

**Born in 1977.**

**[Academic Career]**

BA, Faculty of Agriculture, Tokyo University of Agriculture and Technology (2001)



MA, Grad. Sch. of Environmental Earth Sci., Hokkaido University (2003)

PhD, Grad. Sch. of Environmental Earth Sci., Hokkaido University (2006)

**[Professional Career]**

PD, Institute of Tropical Medicine, Nagasaki University (Apr 2006–July 2009)

Assistant Professor, Institute of Tropical Medicine, Nagasaki University (Aug 2009–Mar 2010)

Academic affair staff, Grad. Sch. of Biomedical Sci., Nagasaki University (Apr 2010–Mar 2011)

**[Higher Degrees]**

Ph.D. (Hokkaido University, 2006)

**[Fields of Specialization]**

Plant and insect ecology

Ecological genetics

Molecular phylogeny

Molecular evolution

**[Academic Society Memberships]**

Ecological Society of Japan

The Society for the Study of Species Biology

—Achievements—

**[Books]**

*[Chapters/Sections]*

- TAKANO Takenaka Kohei 2012,09 Genetic Resources. Ray Anderson (ed.) Berkshire Encyclopedia of Sustainability Volume 7. China, India, and East and Southeast Asia: Assessing Sustainability. Berkshire, Great Barrington, MA.

**[Research Presentations]**

*[Oral Presentation]*

- TAKANO Takenaka Kohei, ITIOKA Takao, NAKAGAWA Michiko, KISHIMOTO-YAMADA Keiko, YAMASHITA Satoshi, TANAKA O. Hiroshi, TOKUMOTO Yuji, FUKUDA Daisuke, KAMOI Tamaki, KATO Yumi, NAGAMASU Hidetoshi, ICHIKAWA Masahiro, MOMOSE Kuniyasu, NAKASHIZUKA Tohru and SAKAI Shoko. Land use change and loss of biodiversity in Malaysian Borneo. RIHN 7th International Symposium "Complexification and Simplification: Ecosystems, human health and lifestyle in Asia", 2012, 10, 24–2012, 10, 26, Kyoto. Session 1 Collapse and restoration of social-ecological networks.

**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—**

#### **[Books]**

##### *[Authored/Co-authored]*

- Taniguchi, M. and Shiraiwa, T. 2012 The Dilemma of Boundaries - Toward a New Concept of Catchment-. Global Environmental Studies, No.2. Springer, 288pp

##### *[Chapters/Sections]*

- Taniguchi, M. 2012 Groundwater management in Asian cities under the pressures of human impacts and climate change. Treidel H. et al. (ed.) Climate Change Effects on Groundwater Resources: A Global Synthesis of Findings and Recommendations. IAH International Contributions to Hydrogeology. CRC Press Taylor and Francis Group.
- Taniguchi, M. 2012 Linkages between the surface-subsurface and land-ocean boundaries for better environmental management in Asia. Taniguchi, M. and Shiraiwa, T. (ed.) The Dilemma of Boundaries - Toward a New Concept of Catchment- . Global Environmental Studies, No.2. Springer, pp.25-36.
- Taniguchi, M. and Shiraiwa, T. 2012 Introduction. Taniguchi, M. and Shiraiwa, T. (ed.) The Dilemma of Boundaries - Toward a New Concept of Catchment- . Global Environmental Studies, No.2. Springer, pp. 3-8.
- Onishi, T., Taniguchi, M., Shiraiwa, T., Endo, T., Hanamatsu, Y. 2012 The dilemma of boundaries of environmental science and policy: Moving beyond the traditional watershed concept. Taniguchi, M. and Shiraiwa, T. (ed.) The Dilemma of Boundaries - Toward a New Concept of Catchment- . Global Environmental Studies, No.2. Springer, pp.249-256.

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

- Sato, Y., Taniguchi, M. (ed.) 2013,03 Ecohistory of Yellow Belt from Sahel to Silk Road. Kobundo, 229pp. (in Japanese)

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

- Kumar Majumder, R., Shimada, J., Taniguchi, M. 2013,01 Groundwater flow systems in the Bengal Delta, Bangladesh, inferred from subsurface temperature readings. Songklanakarin Journal of Science and Technology 35(1) :1-8.
- Taylor, RG, B. Scanlon, P. Döll, M. Rodell, R. van Beek, Y. Wada, L. Longuevergne, M. Leblanc, J. S. Famiglietti, M. Edmunds, L. Konikow, T.R. Green, J. Chen, M. Taniguchi, M. F. P. Bierkens, A. MacDonald, Y. Fan, R. M. Maxwell, Y. Yechieli, J. J. Gurdak, D. M. Allen, M. Shamsudduha, K. Hiscock, P. J.-F. Yeh, I. Holman & H. Treidel 2012 Groundwater and climate change. Nature Climate Change . DOI:10.1038/nclimate1744.
- Hosono, T., Ono, M., Burnett, W.C., Tokunaga, T., Taniguchi, M., and Akimichi, T. 2012 Spatial Distribution of Submarine Groundwater Discharge and Associated Nutrients within a Local Coastal Area. Environmental Science and Technology 46(10) :5319-5326. (reviewed).

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

- Taniguchi, M. Groundwater and climate change: Problems and ideas for the better management as the water resources. The 3rd GELK International Symposium, 2013,03,05, Kumamoto University, Kumamoto.
- Taniguchi, M. Sharing knowledge on water and subsurface environment management in Asia. Comparing Regional Environmental Governance in East Asia and Europe, 2013,01,24-2013,01,25, Research Institute for Humanity and Nature, Kyoto.
- Taniguchi, M. "Changing concept of water boundaries and security in East Asia". BRIT, 2012,11,14, Fukuoka.
- Taniguchi, M. "Progress of completed research of human impacts on urban subsurface environment". CUSEMA meeting, 2012,10,17-2012,10,18, Jakarta, Indonesia.
- Taniguchi, M. "Developing human habitat: Adaptation to climate change". STS Forum, 2012,10,08, Kyoto International Conference Hall, Kyoto.
- Taniguchi, M. "Coastal vulnerability under global environmental change". RCC4, 2012,10,06, RIHN, Kyoto.
- Taniguchi, M. "Submarine groundwater discharge and its effects on coastal ecosystem". Land-Ocean Connectivity - From Hydrological to Ecological Understanding of Groundwater Effects in the Coastal Zone, 2012,09,24-2012,09,27, Aber Wrac'h, France.
- Taniguchi, M. "Coastal groundwater vulnerability due to global environmental change". 39th International Association of hydrogeologists Congress, 2012,09,18, Niagara Falls, Canada.
- Taniguchi, M. "Subsurface Warming and Geothermal Energy". International Workshop on "Subsurface Warming and Geothermal Energy", 2012,07,25, RIHN, Kyoto, Japan.
- Taniguchi, M. Coastal vulnerability and social/ecological service, 2012,07,14, Piazza Omi, Shiga.
- Taniguchi, M. Submarine groundwater discharge and its effects on coastal ecosystem, SS03 Groundwater-Surface Water Interactions in Freshwater and Marine Environments. American Society of Limnology and Oceanography, 2012,07,10, Biwa-ko hall, Shiga.

---

**TERADA Masahiro**


---

Associate Professor

**[Higher Degrees]**

M.Lit (Osaka University, 1998)

**[Fields of Specialization]**

History

Museum Anthropology

Accademic Communication

**—Achievements—****[Research Presentations]***[Oral Presentation]*

- Masahiro Terada " On Invisible Catastrophes; Fukushima-Tokyo/ Auschwitz-Berlin". 209 th RIHN lunch seminar (Danwakai seminar):, 2013,02,12, Research Institute for Humanity and Nature, Kyoto . (in Japanese)
- Masahiro Terada " A museum anthropological study on the memorial museum of the Great Hanshin Earthquake (1995) : Facts, representation, and direction". Meeting for research project " Methodological study for developping the new ethnography of creative recovery from natural disasters", 2012,07,22, Center for South East Asian Studies, Kyoto University, Kyoto. (in Japanese) Supported by the Grant-in-Aid for Scientific Research (KAKENHI).

*[Invited Lecture / Honororary Lecture / Panelist]*

- Masahiro Terada "Globalization of the memory as cultural praxis : A comparison between Germany, Indonesia, and Japan". SPA Bhopal Knowledge Exchange Series, 2013,02,26, School of Planning and Architecture, Bhopal, India.
- Masahiro Terada " Invisiblity of the disaster : Auschwitz -Berlin / Fukushima -Tokyo". Palimpsest of memories ; Our new narratives after the civil war, the terrorism, the earthquake, and the atomic catastrophe, 2012,12,22, Kyoto. (in Japanese) Sponsored by Center for Integrated Area Studies, Kyoto University.

---

**UMETSU Chieko**


---

Visiting 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 &amp; 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—

**[Research Presentations]**

*[Invited Lecture / Honororary Lecture / Panelist]*

- Umetsu, Chieko keynote speech, “Resilience of Social-Ecological Systems for food security,” . JIRCAS International Symposium 2012: Resilient Food Production System - Roles of Agricultural Technology Development in Developing Regions, 2012, 11, 28-2012, 11, 29, Tsukuba International Congress Center.

UYAR, Aysun

Assistant Professor

**Born in 1980.**

**[Academic Career]**

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

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

Ph.D., 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 (2008-2010)

Part-time lecturer, Faculty of Intercultural Communication, Ryukoku University (2009-)

Part-time lecturer, Faculty of Social Studies, Doshisha University (2010-)

Part-time lecturer, Institute for International Education, Doshisha University (2011-)

#### **[Higher Degrees]**

Ph.D. (Yamaguchi University, 2008), Yamaguchi, Japan

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

B.Sc. (Middle East Technical University, 2001), Ankara, Turkey

#### **[Fields of Specialization]**

International Relations

International Political Economy,

Regionalism, Regional Integration

#### **[Academic Society Memberships]**

International Studies Association (ISA)

International Political Science Association (IPSA)

The Japan Association of International Relations (JAIR)

Japan Association for Asian Studies (JAAS)

European Association for Japanese Studies (EAJS)

Association for the Study of Political Society (ASPOS)

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]*

- Pauline Kent, Ma. Reinaruth D. Carlos, Aysun Uyar and Shinya Park (ed.) 2012 "Policy Dialogue and Governance of Migration: Comparative Cases from Europe and Asia-Pacific". Research Series, 1. Ryukoku University Afrasia Centre,

#### **[Papers]**

##### *[Original Articles]*

- Aysun Uyar, 2012,11 "Anticipating Regional Environmental Cooperation: From International Relations to Integrated Environmental and Interdisciplinary Perspectives". Japanese Review of Political Society 1 :61-72. (in Japanese) (reviewed).

##### *[Review Articles]*

- (Newsletter) Aysun Uyar, 2012,10 "Introduction of RIHN and GEC-Japan Platform". JSPS San Francisco Office Newsletter 27 :8.
- (Newsletter) Aysun Uyar, 2012,04 "2011nendo EPM Benkyoukaino katsudoni tsuite (Activities of EPM Study Meeting in 2011 Academic Year)". RIHN Humanity and Nature Newsletter 36 :10-11. (in Japanese)
- (Media) Aysun Uyar, 2012,10 "Torukono sakanashoku jijyou (Turkish Fish Cuisine)". VESTA 88 :21-24. (in Japanese)

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

- Aysun Uyar, (Seminar) Future Direction of Environmental Policy Studies at RIHN. 20th EPM Study Group, 2013, 02, 26, RIHN, Kyoto.
- Joerg Balsiger and Aysun Uyar, (Conference paper) Comparative Analysis of European and East Asian Regional Environmental Governance . Tokyo Conference on Earth System Governance, 2013, 01, 28–2013, 01, 31, Tokyo.
- Joerg Balsiger and Aysun Uyar, (Organization, Chair, Wrap-up) Comparing Regional Environmental Governance in East Asia and Europe (EE-REG) Workshop. , 2013, 01, 24–2013, 01, 25, RIHN, Kyoto.
- Müge Kinacıoğlu and Aysun Uyar, (Conference paper) Changing Concept of Human Security from Traditional to Environmental one along Socio-ecological Boundaries. BRIT XII Conference, 2012, 11, 13–2012, 11, 16, Fukuoka.
- Aysun Uyar, (Conference paper) Shifting Boundaries of Regionalism: Environmental Encounters of the East Asian Regional Economic Cooperation. IPSA 22nd World Congress of Political Science, 2012, 07, 08–2012, 07, 12, Madrid, Spain.
- Aysun Uyar, (Seminar) International Environmental Politics of Rio+20: Where are we heading from now on?. 16th EPM Study Group, 2012, 07, 06, RIHN, Kyoto. (in Japanese)
- Aysun Uyar, (Panelist) Report on the East Asian Environmental Security: Calling for a Transboundary Solution Workshop. 11th RIHN Regional Seminar “Environmental Security of East Asia” , 2012, 06, 10, Kyushu University, Fukuoka. (in Japanese)
- Aysun Uyar, Environmental Regionalism in Regionalizing and Participating East Asia. International Conference of Environmental Governance in China, 2012, 06, 02–2012, 06, 03, Beijing, China.

*[Invited Lecture / Honorary Lecture / Panelist]*

- (Commentator) Governance of International Migration: Perspectives of Sending Countries. University of Philippines Third World Studies Center - Afrasia Center Joint Seminar, 2013, 02, 04, Manila, Philippines.
- (Participant) . ICSU ROAP Asia-Pacific Workshop, 2012, 11, 21–2012, 11, 23, Kuala Lumpur, Malaysia.
- (Chair) Panel I: Women Moving: Micro-Level Case Studies of Migrant Women. The Second Afrasian International Symposium, 2012, 11, 17–2012, 11, 18, Ryukoku University, Kyoto.
- (Commentator) . Panel on “Reflecting on Asian Perspectives on R2P ” , Doshisha Second International Conference on Humanitarian Intervention, 2012, 06, 24–2012, 06, 25, Doshisha University, Kyoto.
- (Participant) . Rio+20 UN Conference on Sustainable Development, 2012, 06, 12–2012, 06, 18, Rio de Janeiro, Brazil.
- (Workshop coordinator) “East Asian Environmental Security: Calling for a Transboundary Solution”. RIHN-Kyushu University Research Institute for East Asian Environments Joint Workshop, 2012, 05, 19–2012, 05, 20, Kyushu University, Fukuoka.
- (Lecturer) “International Cooperation on Environment and Disaster Prevention: Examples from Tohoku Disasters”. Doshisha University JENESYS Program, 2012, 05, 14, Kyoto.
- (Opinion) Aysun Uyar, ORSAM Water Research Program, Expert`s Opinion. , April 2012, .
- (Research project member) Research into the Possibilities of Establishing Multicultural Societies in the Asia Pacific Region: Conflict, Negotiation, and Migration. Afrasia Research Center, Ryukoku University, 2011, 07, 15–2014, 03, 31, .

---

**WATANABE Tsugihiro**


---

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—****[Books]***[Chapters/Sections]*

- Tsugihiro Watanabe 2012, 04 Wise use of water in semi-arid regions - Nurturing local knowledge of land and water. Association of Japanese Agricultural Scientific Societies (ed.) Agro-sciences contributing to conservation and restoration of environment. Yokendo, pp.85-100. (in Japanese)



---

## YAP, Minlee

---

Project Researcher

**[Academic Career]**

Department of Marine Biosciences, Tokyo University of Fisheries (2006)

Graduate school of Marine System Engineering, Tokyo University of Marine Science and Technology (2008)

Graduate school of Applied Marine Environmental Studies, Tokyo University of Marine Science and Technology (2012)

**[Professional Career]**

Project Researcher, Research Institute for Humanity and Nature (2012.04-)

**[Higher Degrees]**

M.Sc (Tokyo University of Marine Science and Technology, 2008)

PhD (Tokyo University of Marine Science and Technology, 2012)

**[Fields of Specialization]**

Coral Reef Ecology

**[Academic Society Memberships]**

The Japanese Society of Fisheries Science

The Japanese Coral reef Society

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

- Minlee Yap, Kakaskasen Andreas Roeroe, Laurentius Theodorus Xaverius Lalamentik, Mineo Okamoto 2013,03 Recruitment patterns and early growth of acroporid corals in Manado, Indonesia. Fisheries Science Volume 79(2).
- Midori Kawabe, Hiroshi Kohno, Reiko Ikeda, Takashi Ishimaru, Osamu Baba, Naho Horimoto, Jota Kanda, Masaji Matsuyama, Masato Moteki, Yayoi Oshima, Tsuyoshi Sasaki, Minlee Yap 2013,02 Developing partnerships with the community for coastal ESD. International Journal of Sustainability in Higher Education Volume 14(Issue 2) :122-132.
- Mineo Okamoto, Kakaskasen A. Roeroe, Minlee Yap, Laurentius Th. X. Lalamentik, Syuichi Fujiwara, Kumi Oyamada 2012,07 Experimental transplantation of corals using sexual reproduction in Manado, Indonesia. Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia, 9-13 July 2012 :20A-5. (reviewed).

---

## YAMAMURA Norio

---

Visiting 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—****[Books]***[Authored/Co-authored]*

- Yamamura, N., Fujita, N. and Maekawa, A. 2012 The Mongolian Ecosystem Network: Environmental Issues under Climate and Social Changes.. Springer

*[Chapters/Sections]*

- Yamamura, N 2012 Ecosystem Network as a socio-ecological system.. The Mongolian Ecosystem Network. Springer.
- Yamamura, N., Kobayashi, Y., Ishii, R. and Saito, Y 2012 A mathematical model of population shift between urban and rural areas. . The Mongolian Ecosystem Network.. Springer.

---

**YAOTA Kiyoyuki**


---

Project Researcher

**Born in 1970.****—Achievements—****[Research Presentations]***[Oral Presentation]*

- Kiyoyuki YAOTA, Rogelio N. CONCEPCION, Ryohei KADA Spatial Data Integration for Risk Identification and Awareness (Linking Science to Community). Community Forum 2012, 2012, 09, 27–2012, 09, 28, Tagaytay City, Philippines.

---

**YASUTOMI Natsuko**


---

Assistant Professor

**Born in 1973.****[Academic Career]**

Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo, D. Course (2003)

Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo, M. Course (1998)

Faculty of Science, Kyoto University (1997)

**[Professional Career]**

Assistant Professor, Research Institute for Humanity and Nature (2010)

Senior Project Researcher, Research Institute for Humanity and Nature (2010)

Project Researcher, Research Institute for Humanity and Nature (2009)

Researcher, Core Research for Evolutional Science and Technology (CREST), Japan Science and Technology Agency (2003)

**[Higher Degrees]**

D. Sc. (The University of Tokyo, 2003)

M. Sc. (The University of Tokyo, 1998)

**[Fields of Specialization]**

Meteorology

Climatology

**[Academic Society Memberships]**

Meteorological Society of Japan

Japan Geoscience Union

American Geophysical Union

American Meteorological Society

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

- A. Yatagai, K. Kamiguchi, O. Arakawa, A. Hamada, N. Yasutomi, A. Kitoh 2012,09 APHRODITE: Constructing a Long-term Daily Gridded Precipitation Dataset for Asia Based on a Dense Network of Rain Gauges. Bulletin of the American Meteorological Society 93(9) :1401-1415. DOI:10.1175/BAMS-D-11-00122.1. (reviewed).

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

- A. Yatagai, K. Kamiguchi, O. Arakawa, A. Hamada, N. Yasutomi, A. Kitoh APHRODITE: Constructing a Long-term Daily Gridded Precipitation Dataset for Asia Based on a Dense Network of Rain Gauges.. International Conference on Open data & Information for a changing planet, 2012,10,28-2012,10,31, Taipei, Taiwan.
- N. Yasutomi, A. Hamada, A. Yatagai Development of Long-term Daily Temperature Dataset Based on Observation. AOGS-AGU (WPGM) Joint Assembly 2012, 2012,08,13-2012,08,17, Sentosa, Singapore.

## Appendix 1 Number and Affiliation of Project Members

Project Number	Title of the project	Total	RIHN	University / College			Inter-University Research Institute	Public Institution	Private Institution	Others	Overseas institution
				National	Public	Private					
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	63	5	31	0	2	2	4	1	0	18
C-08	Megacities and the Global Environment	68	8	34	2	14	0	0	3	1	6
C-09-Init	Designing Local Frameworks for Integrated Water Resources Management	50	5	15	5	6	1	2	0	0	16
D-03	Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in "Highland Civilizations"	47	4	26	1	9	1	0	2	2	2
D-04	Collapse and Restoration of Ecosystem Networks with Human Activity	72	8	45	1	9	1	6	1	0	1
D-05	Coastal Area Capability Enhancement in Southeast Asia	95	10	41	0	16	0	4	0	0	24
R-04	Environmental Change and Infectious Disease in Tropical Asia	85	9	39	1	10	0	1	2	0	23
R-05	A Study of Human Subsistence Ecosystems in Arab Societies : To Combat Livelihood Degradation for the Post-oil Era	93	9	18	1	12	0	5	9	1	38
R-06	Managing Environmental Risks to Food and Health Security in Asian Watersheds	24	7	7	1	0	0	1	0	0	8
R-07	Desertification and Livelihood in Semi-Arid Afro-Eurasia	29	7	15	1	1	0	1	3	0	1
E-05-Init	Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge	112	5	46	6	16	0	8	11	1	19
FS ※ (AKITSU)	Food literacy in an age of globalization	7	4	2	0	0	0	0	0	0	1
FS ※ (UJIMA)	Shrinking Society: Integrating Ecosystem Health and Social Welfare in East Asia	22	7	6	0	6	0	1	0	0	2
FS ※ (TANIGUCHI)	Demarcations of environmental managements for human environmental security in Asia-Pacific region - Nexus of thermal energy, water, and coastal fishery -	40	2	8	3	1	0	3	2	0	21
(FS) ISHIKAWA	Improving Environmental Literacy and Stakeholder Communication	32	1	17	1	7	0	2	0	0	4
FS (TOMITA)	Land Use Diversity and Autonomy in Southeast Asia	23	6	9	1	2	0	1	0	0	4

FS (NAKATSUKA)	Historical Adaptation to Climate Change in Japan: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences	45	0	28	2	7	2	6	0	0	0
FS (HABU)	Reevaluating Advantages of Small-Scale Economies: Finding Alternative Strategies to Overcome Vulnerability in Large-Scale Economies	32	2	5	2	3	1	2	1	1	15
FS (MURAMATSU)	The History of Human-Water Interactions in East Asian Livelihood Complexes	28	2	5	0	15	0	1	0	0	5
	Total	967	101	397	28	136	8	48	35	6	208

FS※= Initiative Feasibility Study

As of 31 March, 2013

**Appendix 2 Research Fields of Project Members**

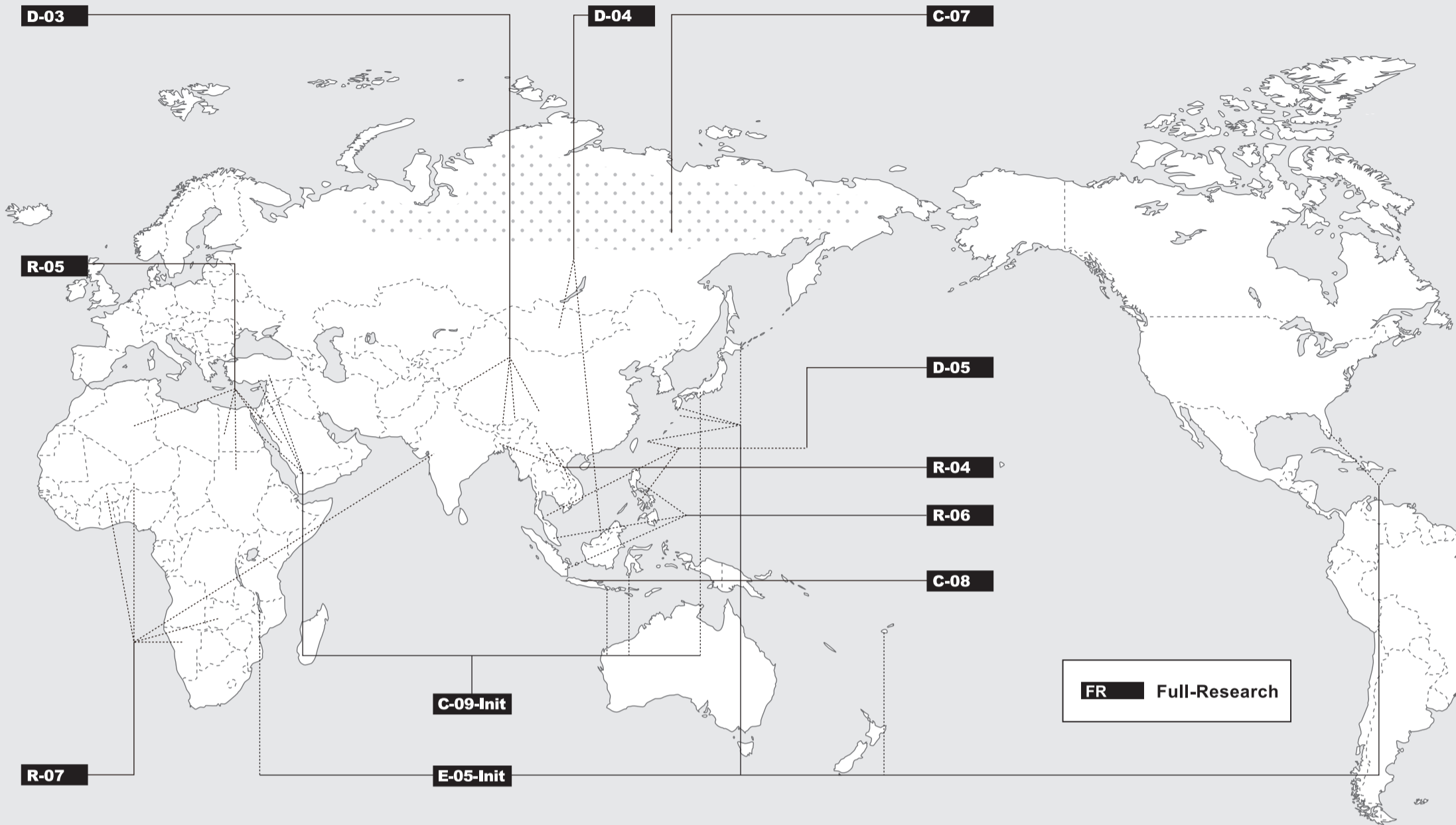
Project Number	Title of the Project	The number of projects members				Research Background of Project Members
		Natural Sciences	Humanities and Social Sciences	Multidisciplinary	Total	
C-07	Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments	48	13	2	63	(Natural Sciences) Ecohydrology, Forestry, Remote sensing and modeling, Atmospheric model, Atmospheric physics, Plant physiological ecology, Terrestrial ecosystems modeling, Conservation ecology, Forest meteorology, Ecosystem impact, Atmospheric chemistry, Meteorology, Water and energy cycle, Ecological model, Isotope hydrology, Ethology, River engineering, Hydrology, Forest meteorology, Climatology, Marine physics, Limnology, Ecology, Environmental conservation, Dendrochronology, Forest science, Earth science, Biological ice-core analysis, Ice core study, Geochemistry, Animal physiological ecology, Frozen ground science, Cryosphere landscape, Groundwater analysis (Humanities and Social Sciences) Civil engineering, Social anthropology, Cultural anthropology, International relations, Sociology, Politics, Russian economy, Descriptive linguistics, History, Religious ethnology, Mythology, Linguistics (Sakha) (Multidisciplinary) Atmospheric chemistry, Ecohydrology
C-08	Megacities and the Global Environment	11	27	30	68	(Natural Sciences) Infrastructure planning and management, Hydrology, Urban landscape planning, City sustainability, Remote sensing, Landscape ecology, Irrigation and drainage, Water resource planning, Architectural environmental engineering, (Humanities and Social Sciences) Japanese economic history, Business administration, Marketing and distribution, Economic history of Dutch East Indies, Religion, Soundscape studies, Regional resources management, Geographic information system, Environmental economics, Axiology, Sociology, Food engineering, Agro informatics, Linguistic anthropology, Food culture, Asian economic history, Chinese history in the early modern ages, Chinese socio-economic history, Study of overseas Chinese, Indonesian modern history, Cultural science, History and culture, Oriental history, Food (marine products) marketing and distribution, Fisheries resource management, Consumer behavior, Commerce, Innovation research, Social science, Urban history, Architectural history, Literacy education for urban environment (Multidisciplinary) Architectural history, Urban history, Urban policy planning, Studies of colonial architecture, Urban history in southeast Asia, Architectural history, Islamic architecture, Cultural anthropology, City planning and spatial information science, Urban redevelopment, City planning, Western urban history, Historical demography, Planning of regional living environment, History of colonial city, Urban study in South East Asia, Chinese urban history, Environmental studies, Architect, Economic geography, Social science, Studies of China-towns, Japanese architecture and cities, History of Urban architecture, Architectonics, Architectural planning, Workplace design, Environmental engineering
C-09-Init	Designing Local Frameworks for Integrated Water Resources Management	27	15	8	50	(Natural Sciences) Hydrospheric atmospheric system, Environmental fate analysis, Natural disaster science, Water control science, Regional planning, Irrigation and drainage, Irrigation engineering, Environmental informatics, Agricultural engineering, Hydrology for Environmental engineering, Rural planning, Theoretical ecology, Global environmental studies, Environmental hydrology, Regional environmental engineering, Global hydrology, Environmental studies, Agricultural meteorology, Soil science, Drainage engineering, Agricultural economics, Land resource science, Eco-engineering, Hydrology, Hydraulic engineering (Humanities and Social Sciences) Cultural anthropology, Economic anthropology, Geography, History of Islamic art and culture, Archaeology, Social development study, Environmental policy, Policy science, Economic geography, Sociology, Environmental science, Development anthropology, Agricultural economics, Environmental sociology (Multidisciplinary) Global environmental studies, Agricultural engineering, Rural planning, Marketing, Regional development planning, Regional information, Water resources and environmental engineering, Environmental assessment
D-03	Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in "Highland Civilizations"	23	8	16	47	(Natural Sciences) Forest resource management, Public health, Pastoral ecology, Psychosomatic medicine, Field medicine, Nursing science, Cardiology, Chrono-medicine, Ecology of water resource, Physical geography, Ecology, Ecology of nomadic pastoralism, Primatology, Neurology, Forest science, Food microbiology, Glaciology, Agrology, Geoecology, Meteorology, Animal husbandry, Geriatrics, Epidemiology (Humanities and Social Sciences) Ethnobotany, Resource economics, History of Indian and Tibetan Buddhism, Anthropology, African area studies, History of Chinese thought, Study of nature, Tibetan Buddhism, Archaeology (Multidisciplinary) Field medicine, Geriatrics, Agroecology, Cultural anthropology, Agricultural economics, Photography, Ethnobotany, Human geography, Area studies, Agricultural management, Grassland science, Neurology, Primatology, Environmental history, Mountain anthropology, Forest ecology
D-04	Collapse and Restoration of Ecosystem Networks with Human Activity	52	16	4	72	(Natural Sciences) Theoretical ecology, Entomology, Isotope ecology, Grassland ecology, Remote sensing, Forest ecology, Environmental studies, Environmental sciences, Ecology, Physical geography, Geocryology, Interaction ecology, Environmental ecology, Environmental sciences, Environmental physics, Mathematical ecology, Soil science, Resources and environment (Humanities and Social Sciences) Environmental sociology, Theoretical sociology, Area development studies, Agro-economics, Cultural anthropology, Area studies, Geography, Anthropology, Environmental economics, Sociology, Ecological anthropology, Politics (Multidisciplinary) Regional planning, Global environmental studies, Nomad ecology
D-05	Coastal Area Capability Enhancement in Southeast Asia	47	20	28	95	(Natural Sciences) Tropical forest research, Fish ecology, Fish taxonomy, Population genetics, Genetics, Fisheries science, Ichthyology, Coastal ecology, Molecular ecology, Planktology, Robotics, Resource geology, Fishing gear, Water quality analysis, Seedling production, Genetic analysis, Marine engineering, Telemetry, Sandy beach ecosystem, Aquaculture, Ecology, Fish behavior, Marine ecology, Fisheries research, Biology, Environmental studies, Water environment studies, Environmental science, Molecular phylogenetics, Coastal environmental research, Aquatic ecology (Humanities and Social Sciences) Economics, Regional development, Cultural anthropology, Fisheries economics, Regional economics, Resource management, Traditional technique, Tourism study, Sociology of fishing communities, Area studies, Anthropology, Social anthropology, Regional development studies, Village development, Sociology, Archaeology, Underwater archaeology (Multidisciplinary) Conservation ecology, Fisheries science, Cultural anthropology, International fisheries development studies, Area studies, SATOUMI SATOYAMA, Software engineering, Area development studies, Ecological anthropology, Coral reef ecology, Fish catching and environmental linkage, Fishery research, Village development
R-04	Environmental Change and Infectious Disease in Tropical Asia	47	17	21	85	(Natural Sciences) Infectious diseases, Epidemiology, Microbiology and immunology, Forest ecology, Insect ecology, Medical entomology, Environmental epidemiology, Climate change and diseases, Infectious disease epidemiology, Biological anthropology, Public health, Parasitology, Environmental microbiology, Microbiology, Clinical chemistry, Environmental health, Malariaology, Tropical environmental health, Disaster information studies, Community and global health, Laboratory medicine, Helminthology, Spatial epidemiology, Meteorology, Global school health, Tropical medicine, Isotope environmental studies, Regional planning, International health, Agriculture, Ecology, Environmental toxicology, Human ecology, Immunology, Health statistics, Socio-epidemiology, Limnology, Fish ecology, Animal ecology, Molecular ecology (Humanities and Social Sciences) Health and Medical Sociology, History of medicine, Area studies, Forestry, Social anthropology, Public system programming, Cultural anthropology, Medical anthropology, International cooperation, Modern Chinese history, Community and global health, International medical cooperation, Geography, Postwar economic history and medical history, GIS (Multidisciplinary) Human ecology, Population health, Social healthcare survey, International agriculture, Social research, Health planning, Epidemiology, Public health, Fight against Malaria, Ecology, Ecological anthropology, Commons studies, Informatics, Regional information, Community health nursing, Health policy, Southeast Asian area studies, Public health nutrition, Nursing science, Health education, Geoinformatics
R-05	A Study of Human Subsistence Ecosystems in Arab Societies : To Combat Livelihood Degradation for the Post-oil Era	50	25	18	93	(Natural Sciences) Nutrient physiology, Forest ecology, Fungology, Bio-chemistry, Physical anthropology (Molecular anthropology), Aquatic biological informatics, Bioacoustics, Plant ecophysiology, Animal physiology, Biological oceanography, Forest hydrology, Soil hydrology, Plant ecology, Revegetation technology, Agricultural chemistry, Natural geography, Hydrology, Tree environmental physiology, Irrigation and drainage, Botany, Biogeography, GIS, City planning, Plant physiology, Water resource management, Forestry, Tree physiology, Entomology, Food science, Weed science, Biology, Geology, Oceanography, Botany, Botanical phylogenetic systematics, Paleobotany (Humanities and Social Sciences) Archaeology, Agricultural economics, Information science, Cultural Anthropology, History, Islamic culture, Folklore, Area studies, Religious anthropology, Development study, Education, Agricultural education (Multidisciplinary) Cultural Anthropology, Remote sensing, Afforestation, Architectonics, Rural development, Landscape ecology, Architectural history, Environmental topography, Social anthropology, Agro-economics, Forestry, GIS, Fisheries, Marine mineral resources, Agriculture, Genetics, Seed
R-06	Managing Environmental Risks to Food and Health Security in Asian Watersheds	15	5	4	24	(Natural Sciences) Environmental chemistry, Plant ecology, Disaster management, Isotope environmental studies, Earth science, Environmental risk, Organic chemistry, Preventive medicine, Isotopic-geochemical study, Environmental medicine, Biology, Lake environmental studies, Public health, Field epidemiology (Humanities and Social Sciences) Environmental economics, Environmental resource economics, Spatial econometrics, Resource economics (Multidisciplinary) Civil and environmental engineering, Public health, Resource economics
R-07	Desertification and Livelihood in Semi-Arid Afro-Eurasia	9	16	4	29	(Natural Sciences) Physical geology, Soil ecology, Weed science, Environmental soil science, Meteorology, Geography, Remote sensing (Humanities and Social Sciences) Area studies, Humanities, Village development studies, Social development studies, Regional development studies, Rural economics, Ethnic geography, Geography, Ethnoarchaeology, Social anthropology, Cultural anthropology, Archaeology (Multidisciplinary) Boundary agriculture, Regional architecture, Regional development studies
E-05-Init	Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge	15	55	42	112	(Natural Sciences) Ecology, Resource management, Statistical physics, Soil hydrology, Fisheries resource management, SATOYAMA management, Theoretical biology, Mathematical biology, Coastal management (Humanities and Social Sciences) Environmental sociology, Folklore, Rural sociology, Environmental ethics, Cultural anthropology, Environmental economics, Economics, Environmental administration, Environment law, International law, Study on Local knowledge, Science ethics, Fishery resources management, Residential research, History, Governance theory, Japanese early-modern history, Resource management, Politics, Nature reserve management, Anthropology, Geography (Multidisciplinary) Regional environment science, Natural energy (Renewable energy), African studies, Residential research, SATOUMI, Nature reserve management theory, Coastal management, Nature conservation, Fishery management, Network theory, Natural reserve management, Commons, Resource management, Administration for nature conservation, Wildlife management, Ocean policy, Policy of Biodiversity, Environmental NGO, Science and technology, Complex system science, Theory of knowledge, Agroecosystem, Ecological anthropology, Cultural anthropology, Agricultural economics, Fisheries economics, Coastal management, Environmental governance
FS ※ (AKITSU)	Food literacy in an age of globalization	5	1	1	7	(Natural Science) Agricultural economics, Hydrology, Environmental anthropology, Plant genetics, Plant nutrition (Humanities and Social Sciences) Human environmental geography, Material culture studies (Multidisciplinary) Forest ecology
FS ※ (IJIMA)	Shrinking Society: Integrating Ecosystem Health and Social Welfare in East Asia	5	11	6	22	(Natural Sciences) Hydrology, Molecular ecology, Ecology, Molecular phylogenetics, Evolution, Botanical genetics, Fish ecology (Humanities and Social Sciences) Social history of medicine, Chinese modern history, Sociology, Ethics, Philosophy, Economics, Welfare policy, Organizational sociology, Political sociology, History, Development economics, Agricultural economics (Multidisciplinary) Social healthcare survey, Human ecology, Demography, Public health, Population Health, Psychology, Area studies, Geography
FS ※ (TANIGUCHI)	Demarcations of environmental managements for human environmental security in Asia-Pacific region- Nexus of thermal energy, water, and coastal fishery -	16	15	9	40	(Natural Science) Coastal fisheries, SATOUMI resources and ecosystem, Balneology, Fisheries biology, Thermal energy, Geothermal sciences, Coastal oceanography, Hydrology, Marine/Coastal geology, Geology (Humanities and Social Sciences) Social behavior, Policy process, Area studies, Public policy, Global environmental policy, Environmental economics, Integrated water management, Geothermal energy policy, Economics, Cultural anthropology, Environmental policy, Sociology (Multidisciplinary) Hydrology, Thermal energy, Linkage model of forest, Human and coastal ecosystems, Geo-heat energy, Conservation ecosystem, Fisheries resource, Integrated water management, Linkage of water and energy, Energy policy
FS (ISHIKAWA)	Improving Environmental Literacy and Stakeholder Communication	10	12	10	32	(Natural Sciences) Environmental remediation, Ecology, Biochemical cycles, Hydrology, Literature, Air pollution, Meteorology, Stable isotope ecology, Agricultural meteorology, (Humanities and Social Sciences) Economics, Sustainability studies, Social psychology, Rural economics, Cognitive psychology, Cultural anthropology, Area studies, Agricultural economics, Ecological anthropology (Multidisciplinary) Geography, Practical environmental studies, Environmental geography, Consortium, Environmental economics and policy, Climatology/Environmental science, Science and technology studies, Social psychology, Science management
FS (TOMITA)	Land Use Diversity and Autonomy in Southeast Asia	6	6	11	23	(Natural Sciences) Hydrology, Ecology, Agroecology, Animal ecology, Agricultural and environmental physics, Demography (Humanities and Social Sciences) Resources research, Silviculture, Social anthropology, Area studies, International relations (Multidisciplinary) Area studies, Geography, Human ecology, Population health, Agriculture, Area informatics, Geoinformatics, Development studies, Agricultural economics, Political ecology, Silviculture

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 (NAKATSUKA)	Historical Adaptation to Climate Change in Japan: Integrating Palaeoclimatological Data with Historical and Archaeological Evidence	23	17	5	45	(Natural Sciences) Isotopic-geochemical study, Climatology, Wood science, Dendrochronology, Wood histology, Glaciology, Paleoclimatology, Earth system dynamics, Climate modeling, Geochronology, Geodynamics, Geochemistry, Isotope meteorology, Paleoceanography (Humanities and Social Sciences) History of Edo period (Social activities by community leaders/Society during the disaster and reconstruction), Regional social history, Preserving historical materials (for preparing a disaster), Japanese archaeology, Theoretical archaeology, Japanese medieval history, Prehistoric archaeology, Japanese history, Historical science (Japanese early-modern history), Japanese economic history, Historical demographic, Japanese early-modern history, Archaeology (Yayoi period, trend of rural community of archaeological remains), Historical botany (Multidisciplinary) Paleoclimatology, Dendrochronology, Chronology, Plant ecology, Historical climatology
FS (HABU)	Reevaluating Advantages of Small-Scale Economies: Finding Alternative Strategies to Overcome Vulnerability in Large-Scale Economies	3	15	14	32	(Natural Sciences) Physical anthropology, Stable isotope ecology, Global environmental oceanography, Paleoenvironment (Humanities and Social Sciences) Anthropology, Ethnology, Hunter-gatherers studies, Archaeology, Lifelong learning, Sociology, Integrated policy science, Political economy, Cultural anthropology, Urban ethnography, Paleocology, East Asian archaeology, Human environmental geography, Material culture studies, Dissemination and enlightenment of environmental issues (Multidisciplinary) Historical ecology, East Asian archaeology, Cultural ecology, Archaeology, Environmental anthropology, Evolutionary ecology, Zooarchaeology, Anthropology, Oceanography, Aquatic marine environmental education research, Botanical archaeology, Bioarchaeology, Agroecology, Environmental archaeology, Silviculture, Area studies, Political ecology
FS (MURAMATSU)	The History of Human-Water Interactions in East Asian Livelihood Complexes	6	22	0	28	(Natural Sciences) Arid land revegetation, Geography, Ecology, Environmental studies, Forest hydrology, Botany (Humanities and Social Sciences) Oriental history, Environmental law and policy, Historical geography, History, Environmental economics, Cultural policy, Cultural anthropology, Area studies
	Total	418	316	233	967	

FS ※ = Initiative Feasibility Study

As of 31 March, 2013





## Full-Research

- 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
  - Lena River Basin, East Siberia
  
- C-08** Megacities and the Global Environment
  - Jakarta Mega-Urban Region
  
- C-09-Init** Designing Local Frameworks for Integrated Water Resources Management
  - Turkey; Egypt; Indonesia; Shiga, Japan
  
- D-03** Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in “Highland Civilizations”
  - The Himalaya, Tibet and the other highlands in the world
  
- D-04** Collapse and Restoration of Ecosystem Networks with Human Activity
  - East-Asia Tropical Rainforest (Malaysia, Sarawak) and Central-Asian Grasslands (Mongolia)
  
- D-05** Coastal Area Capability Enhancement in Southeast Asia
  - Coastal states comprising Southeast Asia; Ishigakijima, Japan
  
- R-04** Environmental Change and Infectious Disease in Tropical Asia
  - Tropical Asia (Lao PDR; Bangladesh; Yunnan, China; Vietnam)
  
- R-05** A Study of Human Subsistence Ecosystems in Arab Societies: To Combat Livelihood Degradation for the Post-oil Era
  - Semi-arid lands in Sudan, the Sinai Peninsula in Egypt, the Red Sea coast in Sudan, Saudi Arabia and Egypt, and Saharan oasis in Algeria
  
- R-06** Managing Environmental Risks to Food and Health Security in Asian Watersheds
  - Laguna Lake area Philippines; Malaysia; Indonesia
  
- R-07** Desertification and Livelihood in Semi-Arid Afro-Eurasia
  - Niger, Burkina Faso, Namibia, Zambia, India
  
- E-05-Init** Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge (ILEK project)
  - Yakushima, Shiretoko, Shiraho, Ishigaki-city, Ayacho, Miyazaki, Japan; Fiji; Virgin Islands of the United States; Sarasota bay, Florida; Lake Malawi, Malawi