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Message from the Director-General

The Research Institute for Humanity and Nature (RIHN) was established in April 2001 to conduct integrated research in the field of global environmental studies. In 2004, RIHN became one of the original members of the National Institutes for the Humanities (NIHU), as an Inter-University Research Institute Corporation.

Environmental degradation can be understood as an imbalance in interactions between human beings and natural systems. Our mission is therefore to conduct solution-oriented research aimed at exploring how interactions between humanity and nature ought to be. RIHN conducts interdisciplinary research spanning the natural sciences, humanities, and social sciences, and transdisciplinary research, collaborating with various stakeholders in society.

Fiscal year 2016 marks the beginning of our Phase III Medium-Term Plan. We launched a new set of Research Programs, a Core Program, and the RIHN Center in order to organically integrate and support the Research Programs. With a new structure in place, we are determined to pursue our mission even more vigorously through enhanced collaboration within our institute, across our diverse research community, and with society in general.

As part of RIHN's international activities, RIHN is keeping the Asian Regional Centre for Future Earth, which is expected to promote the overall research and capacity buildings of Future Earth in Asia.

This annual report describes the updated outcome of these activities of RIHN for the FY2016. I do hope this annual report will help you to understand the overall activity within the FY2016.

With best regards,

YASUNARI Tetsuzo
Director-General
Research Institute for Humanity and Nature

Research Activities

●Full Research

[Research Program 1: Transition to a society that can flexibly deal with environmental changes]

Project leader: **HABU Junko** **p. 5**
Project Name: Long-term Sustainability through Place-Based, Small-scale Economies: Approaches from Historical Ecology

Project leader: **NAKATSUKA Takeshi** **p. 16**
Project Name: Societal Adaptation to Climate Change: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences

[Research Program 2: Fair use and management of diverse resources]

Project leader: **SATO Tetsu** **p. 26**
Project Name: Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge

Project leader: **ENDO Aiko** **p. 35**
Project Name: Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus

Project leader: **OKUDA Noboru** **p. 43**
Project Name: Biodiversity-driven Nutrient Cycling and Human Well-being in Social-ecological Systems

[Research Program 3: Design of wellbeing-enhancing living spaces and life styles]

Project leader: **TANAKA Ueru** **p. 52**
Project Name: Desertification and Livelihood in Semi-Arid Afro-Eurasia

Project leader: **ISHIKAWA Satoshi** **p. 59**
Project Name: Coastal Area-capability Enhancement in Southeast Asia

Project leader: **MCGREEVY, Steven Robert** **p. 68**
Project Name: Lifeworlds of Sustainable Food Consumption and Production: Agrifood Systems in Transition

●Pre Research

Project leader: **MIZUNO Kosuke** **p. 78**
Project Name: Toward the Regeneration of Tropical Peatland Societies: Transformability of Environmentally Vulnerable Societies and Establishment of an International Research Network

Project leader: **FUNAMIZU Naoyuki** **p. 86**
Project Name: The Sanitation Value Chain: Designing Sanitation Systems as Eco-Community-Value System

●Individual Collaboration FS

1. KANEKO Shinji (Hiroshima University)
   Water-Energy-Nexus Technology for Marginal Settlements: Socially Optimal Size from the Perspectives of Reciprocity and Indigenous Knowledge

●Institutional Collaboration FS

1. ICHIE Tomoaki (Kochi University)
   Evaluation and Use of Non-monetary Benefits from Protected Tropical Rain Forest Areas in Southeast Asia
2. SAKAKIBARA Masayuki (Ehime University)
   Co-Creation of Regional Innovation for Reducing Risk of Environmental Pollution
3. HOMMA Kosuke (Niigata University)
   Assessing Functional Diversity of Satoyama Paddy Landscapes in East Asia's Monsoon Region
4. MURAYAMA Satoshi (Kagawa University / ICEDS)
   Living Spaces: A Transdisciplinary Study on Locality, Nature and Global Interdependency
5. YOSHIDA Takehito (The University of Tokyo)
   Research and Social Implementation of Ecosystem-based Disaster Risk Reduction as Climate Change Adaptation in Shrinking Societies

●Core FS

1. TAYASU Ichiro (RIHN)
   Proposal and verification of the validity of isotope environmental traceability method in environmental studies
2. KONDO Yasuhisa (RIHN)
   Visualizing and filling gaps of knowledge information between actors in the research to solve social issues
3. UWASU Michinori (Osaka University)
   Science with wisdom: Methodology of value creation, problem recognition, and agenda setting

●Incubation Studies

1. MORI Koichiro (Shiga University) **p. 102**
   Development of Interactive System between Cities and Rural Communities and Creation of Human Well-being
2. NAKAHARA Satoe (Chukyo University) **p. 102**
   Reconstructing Life under Radioactive Contamination: fostering mutual understanding
3. MATSUDA Hirotaka (University of Tokyo) **p. 102**
   Nexus of Agriculture-Nutrition-Health to Build Sustainable Society
4. TOYODA Yukio (Rikkyo University) **p. 103**
   Re-evaluation of hybrid livelihood based on multi-species cultivation
5. KOHSAKA Ryo (Tohoku University) **p. 103**
   Development of socio-ecological network for international resource sharing with geographical indications and transformation of traditional knowledge

Stage: Full Research

Project Name: Long-term Sustainability through Place-Based, Small-Scale Economies: Approaches from Historical Ecology

Abbreviated Title: Small-Scale Economies

Project Leader: HABU, Junko

Program 1: Societal Transformation under Environmental Change

URL: http://www.chikyu.ac.jp/fooddiversity/index.html

Key Words: Small-Scale Economy; Diversity; Networks; Local Autonomy; Long-term Sustainability; North Pacific Rim

○ Research Subject and Objectives

(1) OBJECTIVES

This project examines the importance of place-based, small-scale and diversified economies, particularly the importance of small-scale food production, for the long-term sustainability of human societies. For the purposes of this project, a "small-scale economy" is defined not solely on the basis of the absolute size of the economic unit, but rather in terms of the relative scale of food production within a given socioeconomic context. Our definition of small-scale economy addresses the range of local or regional networks that enable production, circulation and consumption without precluding links to the outside economy. Long-term sustainability can be defined as "the capacity of humans to create, test out, and maintain abilities to adapt to environments" over a span of several hundred to several thousand years. Our working hypothesis was as follows:

Highly specialized subsistence (i.e., food production) strategies can support a larger community for a short period, but a decrease in subsistence and food diversity makes the production system and its associated community more vulnerable in the long-run.

Archaeological and paleoenvironmental studies are used to test this hypothesis, or to examine the long-term impacts of the loss of subsistence/food diversity in relation to other environmental and cultural factors. To link these studies with the current discussion of the scale and methods of alternative food systems, ethnographic and ecological studies of contemporary small-scale food systems and communities were conducted. In combination, studies of the past and present point towards the future, as our research process also involves informing the collaborative design of ecologically sound and equitable food systems.

The theoretical genesis of this project is the approach of historical ecology, which conducts comprehensive research into long-term and short-term cultural change while emphasizing the impact of human activities on the environment. In particular, this project proposes that high levels of **diversity, network** and **local autonomy,** all of which are strongly correlated with the **scale** of the system, are the keys to achieving the **long-term sustainability** of socioeconomic systems. By integrating case studies on food diversity, the mobility of people, goods and information and the initiatives of local stakeholders in relation to the scale and resilience of societies and economies, this study aims to advance theories on the interrelationship between culture and environment, including climate change. Other cultural factors, including technological developments, sociopolitical structure and rituals/religion, are also taken into consideration. We are publishing the results of our research as peer-reviewed articles as well as volumes for the general public in both English and Japanese.

(2) BACKGROUND

This research aims to construct strategies for tackling global environmental problems associated with the rise of large-scale economic systems. These global environmental problems addressed by this project include soil and water contamination, a decrease in biodiversity and long-lasting damage to ecosystems caused by large and homogenized food production. In the case of agriculture, the development of large-scale mono culture with applications of a large amount of pesticides and chemical fertilizers has resulted in serious soil contamination, water pollution, loss of biodiversity, and even the destruction of whole ecosystems. The predominant measures to deal with these global environmental problems are top-down regulations enacted by national/local governments and international agencies. However, these regulations may not be sufficient when we consider long-term environmental effects on a time-span of hundreds or thousands of years. As an alternative approach, this project examines the past

and present practice of place-based, smaller-scale food production systems, evaluates their advantages and limitations, and explores their future potential.

(3) GEOGRAPHIC FOCUS

Geographically, our project focuses on the North Pacific Rim. In particular, we identified northern Japan, with its solid archaeological record and its importance to contemporary food production in Japan, as the core area of our field research. The west coast of North America, with rich traditions of ethnographic and ecological investigation as well as active contemporary food/agriculture movements, provided the main comparative case studies. These two regions share a number of characteristics in common, including climate, vegetation, fauna, and a high level of seismic activity. There are also cultural ties with historical depth as a result of the migration of anatomically modern humans after the late Pleistocene. Historically, the abundance of small-scale economies supported by marine food exploitation and intensive nut-collecting also characterize these two regions.

(4) RESEARCH METHODS AND ORGANIZATION

The project consists of three research groups: (1) the Longue-Durée Group, (2) the Contemporary Society Group and (3) the Implementation, Outreach and Policy Proposal Group:

Group I. Longue-Durée Group: Archaeological, historical and paleoenvironmental studies were used to test our working hypothesis listed above. The core case study of this group examines the mechanisms of the growth and decline of the Middle Jomon culture in northeastern Japan, with a focus on changes in food and subsistence diversity, settlement size, and rituals. Additional sub-projects were conducted to understand the broader contexts of this core case study and to develop new methodologies (particularly chemical and scientific analyses) for future archaeological studies for the region. Key comparative studies in this group come from the west coast of North America (California, the Northwest Coast), and Canadian Arctic.

Group II. Contemporary Society Group: Ethnographic, sociological and agroecological studies of small-scale food production systems and their associated communities were conducted to understand the complex inter-relationships among cultural and natural contributors in contemporary urban and natural settings. The core component of this group is the ethnographic study of rural communities and small-scale food production units in Iwate and Fukushima Prefectures in northern Japan, with a focus on the importance of traditional ecological knowledge (TEK), material culture and social networks. Key comparative studies in this research group come from California and the Northwest Coast.

Group III. Implementation, Outreach and Policy Proposal Group: The ultimate goal of this research group is to make actionable contributions to local/national policies of rural/urban development and food policy. The core component of this group is a series of outreach activities and educational programs that have been developed on the basis of our research in Iwate Prefecture in collaboration with the two other RIHN-based projects (The Nissei project along the Hei River, and a NIHU project on resilience against disasters). Outreach and policy suggestion efforts also extend to the revitalization of indigenous communities and their identities in Hokkaido, California and Alaska, as well as actions through the 8th World Archaeological Congress in Kyoto, summer 2016 and collaborations with IHOPE (Integrated History and Futures of People on Earth).

In conclusion, this project has tested and modified the original working hypothesis through more than 50 sub-projects and case studies, clustered into three groups, each with a major focus on northern Japan, and informed by several comparative case studies. Results are already informing policy formulation, as well as making substantive and original contributions to scholarship in the relevant areas.

○ Progress and Results in 2016

Major outcomes of this research project include the following:

Research results of the **Group I** demonstrated the relevance of past case studies in the current discussion of long-term sustainability of human-environmental interactions.

Our project started with a hypothesis emphasising the correlations between food diversity, systems' long-term sustainability and the scale of economy/community,but our results also indicate the importance of social networks, local autonomy and traditional ecological knowledge which are often

embedded in rituals and religions, local and individual identities, repetitive human actions reflected in the material culture, and traces of human impacts on the environment in relation to biodiversity. All these aspects were studied by both **Groups I&II.**

While the project duration (3 years) was too short to finalize all the action plans proposed by **Group III ,** quite a number of sub-projects implemented new practices, held over a dozen outreach workshops, and made multiple statements that can be used for concrete policy proposals.

Through a series of international workshops/meetings, we were able to make **theoretical contributions** to the broader interdisciplinary discussion of local and global environmental problems, food production, demography and social inequality in the past,present and future.

Results of our project proved that **transdisciplinarity** is critical to understand the context of our research and to implement action plans on the basis of our research results. Stakeholders with which we collaborated include small-scale food producers, members of Native American Tribes, local NPOs/NGOs and local politicians.

SPECIFIC ACTIVITIES OF EACH WORKING GROUP

I. Longue-DuréeGroup

Primary Focus: Early-Middle Jomon (ca.4000-2300 BC) in Northeastern Japan: Using archaeological indicators of food/subsistence diversity, demography, rituals, social inequality, climate change and other socioeconomic/environmental factors, this team tested our main hypothesis with data primarily from the Tohoku region (northern Honshu) and Hokkaido, as well as from the Kanto and Chubu regions (central Honshu). Newly obtained AMS 14C dates confirmed that changes in food/subsistence diversity and settlement patterns occurred at around 3000 BC, 700 years before a major cooling climate hit the area at around 2300 BC (the Bond 3 event). Thus, contrary to previous interpretations suggested by several scholars, our results indicate that the Bond 3 event was not the cause of the population decrease at the end of the Middle Jomon.

Key Comparative Studies: Unlike the Japanese Jomon case,examples from California and the Northwest Coast of North America indicate that wide food diversity allowed native communities in these regions to steadily increase in population through time until European contact. On the contrary, our case study from the Canadian Arctic indicates that the loss of food diversity with a focus on bowhead whaling was followed by a rapid population decrease.

II. Contemporary Society Group

Primary Focus: Rural Communities in Northern Japan: Three areas in northern Japan were chosen to be our main field sites: the Hei River Area (Miyako City, Iwate Prefecture), the Joboji Area (Ninohe City, Iwate Prefecture), and Fukushima Prefecture.

Our interviews of elders, farmers, fishermen, forest industry practitioners and others in the Hei River Area indicate that food/subsistence diversity supported by traditional ecological knowledge (TEK) play a critical role in the resilience of food systems and communities. TEK and local networks have proven to be especially important in cases of floods, typhoons, earthquakes and other disasters. In the mountainous part of this area, depopulation is a particularly serious problem, and large-scale land development plans with anticipated serious environmental damage threaten small-scale food producers. Results of our Hei Project will be published through Tokai University Press, for which we have obtained a book contract.

Our second key field site is Joboji. Subsistence practices in Joboji share a number of things in common with that of the mountainous part of the Hei River Area. Recently, Joboji began to be known as the only place in Japan where small-scale traditional lacquer-sap-collecting is still alive and commercially viable. Our interviews of lacquer sap collectors, entrepreneurs, and co-owners of a small-scale farmers' market indicate that, historically, multiple backup plans supported by wide subsistence diversity and TEK are at the core of their strategies for survival.

At our third key field site, Fukushima, we anticipated that the magnitude of the environmental damage caused by the 2011 Fukushima Nuclear Plant Accident may have been too large to test our hypothesis of the importance of food diversity, social networks and TEK. Contrary to our expectation, however, our interviews of farmers in Fukushima revealed the critical importance of TEK and local networks for maintaining residents' identity and pride.

Key Comparative Studies: For comparative studies, two other types of small-scale communities and groups on both sides of the North Pacific Rim we reexamined: indigenous small-scale communities, including

Native American tribes in California, and alternative food producers, including organic farmers and practitioners of agroecology. Our research indicates the importance of TEK and social networks in maintaining resilient socioeconomic systems within local landscapes/seascapes. Our studies also revealed critical historical differences between Japan and North America, particularly in that Japanese contemporary small-scale food production systems tend to be rooted in rural communities that have never fully accepted large-scale operations, while small-scale food production movements in North America have emerged either as a resurgence of indigenous movements, or in response to currently dominant large-scale operations.

III. Implementation, Outreach and Policy Proposal Group

Main Focus: Hei River Area: Informed by the results of Group II's research, a team of project members developed academic and public outreach programs for instigating and promoting the importance of food/subsistence diversity, TEK and local identity. A series of workshops for the local residents were held in summer 2016 in the upper, middle and lower reaches of the Hei River. Archaeological knowledge about the use of wild food, as well as signatures of human actions on material culture and landscapes, was also incorporated into these workshops. These workshops were planned in consultation with resident researchers and the City Board of Education.

Other Main Outcomes: Other notable outcomes of this research group include a Kyoto 2016 Agroecology Declaration, University classes on agroecology at the Univ. of California and Seika Univ., a WAC (World Archaeological Congress) Resolution about resource overexploitation, and transdisciplinary research with Native American tribes. These research activities are being conducted in consultations with members of IHOPE(Integrated History and Futures of People on Earth), and our project is featured as an IHOPE regional case study.

○Project Members

◎ HABU, Junko (Research Institute for Humanity and Nature,Professor,Project Leader)

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《Contemporary Society Group》

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《Implementation, Outreach and Policy Proposal Group》

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TOMII, Noriko	(Research Institute for Humanity and Nature,Project Research Associate)

○ Future Themes

●Achievements

○Books

【Chapters/Sections】

- Fitzhugh, Ben 2016,09 Origins and Development of Arctic Maritime Adaptations in the Western Subarctic. Friesen, M. and Mason, O. (ed.) Oxford Handbook on Arctic Archaeology. Oxford University Press, Oxford, UK. .
- Hosoya, Leo Aoi 2016,05 Traditional Raised-Floor Granary and Rice Production Cycle in Bali: Past, Present, and Future of Balinese Agriculture. Petr Konvalina (ed.) Agricultural and Biological Sciences, Alternative Crops and Cropping Systems. InTech, Rijeka, Croatia, pp.47-69.
- Wilson, Douglas C., Kenneth M. Ames, and Cameron M. Smith 2016 Contextualizing the Chinook at Contact: the Middle Village. Christine Beaule (ed.) In Frontiers of Colonialism. University of Florida Press, Gainesville, FL.

○Editing

【Editing / Co-editing】

- Ikeya, Kazunobu and Robert K. Hitchcock (ed.) 2016,12 Hunter-Gatherers and their Neighbors in Asia, Africa, and South America. National Museum of Ethnology, Suita-City, Osaka, 298pp.

○Papers

【Original Articles】

- Altieri, Miguel, Clara Nicholls and Rene Montalba 2017,02 Technological Approaches to Sustainable Agriculture at a Crossroads: An Agroecological Perspective. Sustainability 9(3). DOI:10.3390/su9030349.
- Crema, E., Habu, J., Kobayashi, K., Madella, M. 2016,04 Summed Probability Distribution of 14C Dates Suggests Regional Divergences in the Population Dynamics of the Jomon Period in Eastern Japan. PLOS One . DOI:http://dx.doi.org/10.1371/journal.pone.0154809 .(reviewed).
- Habu, Junko 2016,09 Food Diversity and Climate Change: Lessons from the Early and Middle Jomon Periods, Japan. Quarterly of Archaeological Studies 63(2). (in Japanese) (reviewed).
- Habu, Junko 2017,01 Jomon Food Diversity and Environmental Change. Kagaku 87(2). (in Japanese)
- Heron, Carl, Junko Habu, Mio K. Owens, Yumiko Ito, Yvette Eley, Alexandre Lucquoin, Anita Randini, Hayley Saul, Cynthianne D. Spitteri and Oliver Craig 2016,08 Molecular and Isotopic Investigations of Pottery and 'Charred Remains' from Sannai Maruyama and Sannai Maruyama No.9, Aomori Prefecture, Japan. Japanese Journal of Archaeology 4(1) :29-52.(reviewed).
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・Sasaki, Tsuyoshi 2016,06 Analysis of Dialog Processes at a Development Meeting for an Environmental Education Program to Emphasize the Forest-River-Ocean Relationship in Tsunami Disaster Areas. Journal of the Japanese Society for Environmental Education 26(1) :15-25. (in Japanese)

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○Research Presentations

【Oral Presentation】

・Altieri, Miguel A Agroecology: Research Directions on Rural and Urban Environments. The 128th RIHN Seminar, 2016,05,13, RIHN, Kyoto.

・Altieri, Miguel A Agroecology and Food Sovereignty: Experiences from Latin America. The 130th RIHN, Seminar, 2016,05,30, RIHN, Kyoto.

・Crema, Enrico, Marco Madella, Junko Habu and Oki Nakamura A Chronological Reassessment of Demographic Change and Anthropogenic Forests in Northern Japan between Early and Late Jomon Periods. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.

・Cuthrell, Rob The Amah Mutsun Land Trust and Place-based Stewardship. The Bay Area Open Space Conference, 2016,05,19, Richmond, California, USA.

・Dolan, Patrick, Colin Grier, Markussen Christine and Katie Simon Magnetic Gradient Survey of a Hunter-Gatherer Plank House Village at the Dionisio Point Site, Northwest Coast of North America. Society for American Archaeology 81st Annual Meeting, 2016,04,08, Orlando, Florida.

・Goto, Nobuyo ″3.11 Fukushima″ to Shiminshakai: Shakaikiki to Kagakuteki Shimin no Seitan (“3.11 Fukushima” and Civil Society: Social Crisis and Birth of Citizen Science). The 39th Annual Meeting of Institute For Fundamental Political Economy , 2016,09,17-2016,09,18, Komazawa University. (in Japanese)

・Grier, Colin Long-term Resource Management Practices in the Coast Salish Region of the Northwest Coast of North America: Lessons from the Archaeological Record. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.

・Grier, Colin Terraforming, Monumentality and Long Term Practice in the Coast Salish World. Society for American Archaeology 81st Annual Meeting, 2016,04,08, Orlando, Florida.

・Habu, Junko Food Diversity, Demography and Climate Change: Lessons from the Prehistoric Jomon Period, Japan. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.

- Habu, Junko, Barbara Rose Johnston and Rika Shinkai Indigenouse rights, cultural heritage, landscapes, and dam construction: the case from Nibutani in Hokkaido, Japan. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Hattori, T., Sawada, J., Masuda, R. and Sato, T. Ohotsuku Bunka Shudan ni Okeru Buta no Shiiku Riyo (Breeding and Use of Pigs by Okhotsk People). The 70th Annual Meeting of the Anthropological Society of Nippon, 2016,10,08-2016,10,10, Niigata NSG Gakusei-Sogo-Plaza STEP, Niigata. (in Japanese)
- Hosoya, Leo Aoi Processing, Storage and Symbolism of Wild Nuts in the Past and Present: Comparative Ethnoarchaeobotanical Studies of East Asia and USA. 7th Worldwide Conference of the Society for East Asian Archaeology, 2016,06,08-2016,06,12, Harvard University and Boston University, Boston, USA.
- Hosoya, Leo Aoi Processing, Storage and Symbolism of Wild Nuts in the Past and Present: Comparative Ethnoarchaeobotanical Studies of Japan and California, USA. 17th Conference of International Working Group for Palaeoethnobotany, 2016,07,04-2016,07,09, le Muséum national d'histoire naturelle, Paris, France.
- Hosoya, Leo Aoi Wild Nuts in the Past and Present: Comparative Ethnoarchaeobotanical Studies of East Asia and USA. World Archaeological Congress 8, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Ito, Yumiko and Junko Habu Dietary Importance of Chestnuts (Castanea) and Horse Chestnuts (Aesculus) among Complex Hunter-Gatherers in the Temperate Zone: A Case Study from the Early and Middle Jomon Periods on the Aomori Plain, Northern Japan. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Johnston, Barbara R. After the good, the bad and the ugly: Considering Chixoy Dam development, extractive industry and archaeological research in Guatemala. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Johnston, Barbara. R Environment, Health and Human Rights: Current Challenges and Adaptive Responses in the Marshall Islands. Small-scale Economies Project Workshop: Nuclear Disaster, Systematic Resilience, and the Power of Traditional Ecological Knowledge - Comparative Studies and Emerging Experiences in Fukushima and the Marshall Islands, 2016,08,31, RIHN, Kyoto.
- Johnston, Barbara, R. and Junko Habu Doing Archaeology and Cultural Heritage Work in Nuclear Disaster Zones: Environmental Health Risks and Worker Concerns. World Archaeoloigcal Congress 8, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
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- Kaner, Simon Metastability, Communication and Change: Observations from the Shinano-Chikuma River. The 137 RIHN Seminar, 2017,01,06, RIHN, Kyoto.
- Kawahata, H., Hatta, Y., Ota, Y., Yoshida, A. and Habu, J. Quantitative Reconstruction of Temperature in Northern Japan for the Last 2000 Years and the Influential Factors to Determine Climatic Fluctuation. European Geosciences Union-General Assembly 2016, 2016,04,17-2016,04,22, Austria Center Vienna, Austria.
- Kawahata, H., Hatta, Y., Habu, J. and Yoshida, A. Kitanihon ni okeru Kako 6,700 nenkan no Ondo Henka to Jinrui Katsudo (Temperature Variation and Human Activity For the Last 6,700 Years in Northern Japan). Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba. (in Japanese)
- Matzen, Sarick Plant-based Remediation of Arsenic-contaminated Soil: Successes and Challenges. The Small-scale Economies Project Seminar "Plant-based Remediation of Arsenic-contaminated Soil: Successes and Challenges", 2016,07,01, RIHN, Kyoto.
- Matzen, Sarick and Arnold, Joshua Can Training Help Urban Farmers Deal with Soil Contamination? . Sustainable Agriculture Educators Association, 2016,07,29-2016,07,31, University of California, Santa Cruz, California.
- Nakahara, Satoe Making New Home and Rejecting Inherited Home: The Rongelap People Reconstruct Their Life with Food. Small-scale Economies Project Workshop: Nuclear Disaster, Systematic Resilience, and the Power of Traditional Ecological Knowledge - Comparative Studies and Emerging Experiences in Fukushima and the Marshall Islands, 2016,08,31, RIHN, Kyoto.

・Sasaki, Tsuyoshi What is Food Intrinsic Value: FIV for Sustainable Society? . International Self Determination Theory Conference, 2016,06,01-2016,06,06, Victoria, Canada.

・Sasaki, Tsuyoshi Cherry Salmon Studying Project in Tsunami Area Enhancing Local Community Resilience. 2016 Annual Conference - National Marine Educators Association, 2016,06,24-2016,06,30, Orland, FL, USA.

・Savelle, James Subsistence Resiliency and Climate Change: The Development and Cllapse of Canadian Arctic Thule Whaling Societies. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.

・Schneider, Tsim Seeing Native Communities in Postmission Marin County, California. Critical Conversations in Critical Cultural Heritage, 2016,04,14, University of California, Santa Cruz, CA, USA.

・Thornton, T. F. and S. Hamada Herring as Gifts and Trade Items in Southeast Alaska and Northern Japan. Society for Applied Anthropology Annual Meeting, 2016,03,28-2016,04,01, Vancouver, BC, Canada.

・Thornton, T. F. and S. Hamada Growth, Degrowth, and De-Refit in the Lineage of Sustainability Values Among Alaska Natives. 115th American Anthropological Association Annual Meeting, 2016,11,16-2016,11,20, Minneapolis, MN, USA.

・Yamaguchi, Tomiko Sangyoka shita Yukinogyo no Taikojiku no Shoso: Kariforunia no Shokibo Yukiinoka no Torikumi o toshite (Aspects of Industrialized Organic Agriculture: Case Study on the Small-scale Organic Farmers in California). The Japan Sociological Society 89th Meeting, 2016,10,08-2016,10,09, Kyushu University. (in Japanese)

・Yamaguchi, Tomiko and Junko Habu Institutional Expertise and Lay Responses to Soil Contamination: The Experience of Farmers in Fukushima. The Third ISA Forum of Sociology, 2016,07,10-2016,07,13, Vienna, Austria.

・Yamamoto, Naoto Wooden Circles in the Final Jomon period of Japan. Wetland Archaeology Research Project 30th Anniversary Meeting, 2016,06,28-2016,07,02, University of Bradford, UK.

・Yamamoto, Naoto The Wetland Sites of the Late and Final Jomon: A Look at the Tedori River Alluvial Fan in Central Japan. World Archaeological Congress 8, 2016,08,28-2016,09,02, Doshisha University, Kyoto.

・Yoneda, Minoru Shoku no Tayoseika to Shakai Fukuzatsuka (Food Diversity and Complex Society). Research Institute of Prehistoric Culture of Japan Symposium, Meiji University, 2016,08,27, The University of Tokyo, Tokyo. (in Japanese)

・Yoneda, Minoru Hone kara Kataru Kako no Shokuseitai (Ecology of Eating in the Past Reconstructed from Bones). The 70th Symposium of the Anthropological Society of Nippon “History Reconstructed from Bones”, 2016,10,09, Niigata Citizens Plaza. Niigata. (in Japanese)

・Yoneda, Minoru, H. Takayama, J.Sawada, and T. Nara Maritime adaption of Jomon populations in northern Japan (Hokkaido and Tohoku). World Archaeological Congress 8, 2016,08,28-2016,09,02, Doushisha University, Kyoto.

・Yoshida, A., Kawahata, H. and Habu, J. Cooling Climate of the Middle Holocene Reconstructed from the Pollen Analysis Data of the Sediment Core of Uchiura Bay, Hokkaido.. Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba. (in Japanese)

【Poster Presentation】

・Matzen, Sarick Effects of Soil Texture and Soil Fertilization on Arsenic Phytoextraction. Goldschmidt Conference, 2016,06,26-2016,07,01, Yokohama Pacifico Convention Center, Yokohama.

【Invited Lecture / Honorary Lecture / Panelist】

・Altieri, Miguel A Agroecology and Food Sovereignty: Experiences from Latin America. ICU SSRI Open Lecture, 2016,05,16, International Christian University, Tokyo.

・Altieri, Miguel A Science and Politics of Agroecology. 2nd KU-WU International Graduate Workshop on Food, Farm and Rural Development, 2016,05,25.

・Goto, Nobuyo Fukushima kara no Koe: 21seiki o Ikiru Yorokobi Hataraku Yorokobi e (Voices from Fukushima: From Joy of Living in the 21st Century to Joy of Working). The Commemorative Lecture of the 62nd Niigata Mothers Assembly, 2016,07,31, Niigata. (in Japanese)

・Goto, Nobuyo Nuclear Disaster and Social Movement in Fukushima Civil Society in Asia. , 2017,02,02-2017,02,03, Center for Japanese Studies, Melbourne University.

・Goto, Yasuo 6nenme o Mukaeru Fukushima no Genjitsu to Tachiagaru Shakaiundo (The Situation of Fukushima in its 6th Year since the Great East Japan Earthquake and Emerging Social Movements). NPO Researh Organization for Asian Environments and Energy, 2nd General Meeting, Keynote Lecture, 2016,05,08, Rikkyo University, Tokyo. (in Japanese)

・Habu, Junko Key Note Speech: Food Diversity and Climate Change: Case Studies from the Early to Middle Jomon Period. Society of Archaeological Studies, 62nd General Meeting, 2016,04,16-2016,04,17. (in Japanese)

・Habu, Junko Food Diversity, Climate Change and the Resilience Human-Environmental Interaction: A Case Study from the Jomon Period. Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba City, Chiba. (in Japanese)

Stage: Full Research

Project Name: Societal Adaptation to Climate Change in Japan: Integrating Palaeoclimatological Data and Archaeological Evidence

Abbreviated Title:

Project Leader: NAKATSUKA Takeshi

Program 1: Societal Transformation under Environmental Change

URL:

Key Words:

○ Research Subject and Objectives

a) Research objectives and background

What should we do when we confront rapid environmental and/or climatic changes? The most important task in global environmental studies is to find methods for adapting to change, not just mitigating it. This project intends to identify such methods through precise paleoclimatological, historical, and archaeological reconstructions of the many examples of abrupt climate change and the diverse societal responses those engendered over the long course of Japanese history. By categorizing historical society-climate relations and synthesizing findings from many case studies, this project also seeks to identify general social characteristics or modes associated with tolerance or vulnerability to abrupt changes.

To date,many paleoclimatologists and historians have noted apparent coincidences between historical events and climate change, speculating that the former might have been caused by the latter. In particular, recent paleoclimatological studies using tree ring and speleothem records have revealed a close relationship between multi-decadal climate variability and regional social collapse throughout the world. Climatic variations in the past, of course, are not the same thing as contemporary anthropogenic environmental changes. However, we believe that past societal responses to climate change, especially to multi-decadal climatic variation, nonetheless have relevance to global environmental change. Human societies often rely excessively on particular resources or technologies such as petroleum or nuclear power (this is known as overadaptation). Therefore, when these resources or technologies become unavailable for one reason or another, society is faced with a problem. Similarly, human societies that have optimized their agricultural strategies for particular climate conditions over a period of decades cannot easily adapt to drastic climate change. We believe that common patterns of overadaptation and resulting failure to adapt to new conditions can be found in both today's global environmental challenges and in historical examples of the relationship between climate and society.

b) Research methods and organization

This project consists of three research stages. (1) Reconstruction and understanding of past climate variations during the last several millennia throughout Japan at high temporal and spatial resolutions. (2) Categorization of society-climate relations through detailed chronological comparisons between climate and societal events. (3) Identification of common characteristics underlying resilience and vulnerability of human societies vis-a-vis climate change regardless of time or place.

Recent progress in studies of tree-ring width and cellulose oxygen isotope ratios allows accurate reconstruction of past climate variations at an annual resolution in East Asia, including Japan. In this project, high-resolution paleoclimatological data based on tree rings, documents, sediments, coral rings, and speleothems are integrated to ensure the accuracy of climate reconstructions in and around Japan. The reconstructed past climate data have been evaluated together with modern climate analysts and modellers to understand modes and mechanisms of climate variations in the past.

Comparisons of the high-resolution paleoclimate data sets with the vast amount of paleographic and archaeological data in Japan may not only enable us to elucidate cause-and-effect relationships when climate apparently influenced society, but may also allow us to find cases when society was apparently not affected by climate change. So far, we have not found any cases where any apparent impacts of large climate variations could not be identified either in paleographic or archaeological evidence. There have been always distinct relationships between summer climate variations and societal responses especially at multi-decadal time scales in Japanese history after introduction of rice paddy cultivation around 3000 years ago, although the response mode of societies were different among many cases.

In general, abrupt cooling after multi-decadal warmth usually caused serious famines, while frequent floods after multi-decadal dryness often resulted in societal disturbances even without famines probably because, in contrast to coldness, floods often brought spatially heterogeneous damages to a region, inducing people's disparity and conflict around the damaged areas. However, the most important lesson from the societal responses to multi-decadal variations is that the same type of climate variation does not always result in the same type of societal responses. Frequent floods usually caused societal disturbance, but it could result either in successful social transformation or tragic social disintegration after the difficult climate period at last. From the many historical cases, we can learn clues to overcome contemporary global environmental problems, including the occurrence of large societal disparity and refugee.

Hereafter, we will compile many cases of societal adaptations to climate changes in Japanese long history and investigate what kind of social characteristics or modes are responsible to adaptability of societies to climate change by statistical analyses using a cause-and-effect model, which will be revised to incorporate the spatial heterogeneity of climatic damages and narrative approaches using ordinary archaeological and historical methods with comparison of many cases beyond time and place.

○ Progress and Results in 2016

During FR periods, paleoclimatological and climatological members in this project have progressively extended the temporal and spatial coverage of high resolution past climate reconstructions in Japan and East Asian countries over last several thousand years, mainly focusing on summer temperature and precipitation which influence agricultural productivity, especially rice paddy cultivation. Historical and climatological members in this project have been carrying out many case studies on relationship between human societies and climate change in detail at various historical periods, in collaboration with paleoclimatological and climatological members.

By direct comparison between climate variations and societal responses, we have found that multi-decadal large temperature variation usually caused serious famines throughout Japanese history, probably reflecting people's cycle of over adaptation and failure of adaptation to the changing climate. However, there were difference in the magnitude of societal response like change in regional population among many cases, so that we will evaluate influence of climate quantitatively and compare them beyond time and place to identify factors controlling the size of societal reaction against the climate variation.

In contrast to temperature, precipitation variation seemed to have somewhat different impacts on human society. While multi-decadal large precipitation variation did not always result in serious famines, it often caused societal disturbance and sometimes resulted in societal regime shifts, such as the abrupt collapse of Kamakura Shogunate (warrior's government) in 1333 AD. By detailed chronological investigation on yearly numbers of societal conflict and disaster documents, we can find that increases in flood numbers are always followed by increase in societal conflicts, suggesting that spatially heterogeneous impacts of water disasters induces social disparity and occurrence of refugees in pre-modern societies of Japan.

The apparent coincidences between multi-decadal large precipitation variations and societal regime shifts can be found universally in the long history of East Asia, including Japan and China, possibly

reflecting the common influence of the variation in East Asia summer monsoon to agricultural productivity in Japan and China. In prehistorical period of Japan,we can find remarkable increases in numbers of archaeological remains relating to human villages and warfare and the evidence of active people's migration during the periods when multi-decadal precipitation variation increased. During historical period in Japan and China, there are always good coincidences between the increase in multi-decadal precipitation variation and the number of reports on societal conflict and warfare. The most important point there is that the common large climate variation resulted in completely different societal regime shifts among many cases in the history of Japan and China. In some cases, it resulted in successful social transformation, but in other cases, tragicsocial disintegration occurred after the difficult climate period at last. We will investigate how and why the social transformations were successful or not by comparison of many cases in the historical climate adaptation in East Asia.

○Project Members

◎ NAKATSUKA, Takeshi (Research Institute for Humanity and Nature,Professor,Project Leader)
○ SANO, Masaki (Research Institute for Humanity and Nature,Senior Project Researcher,Project Sub-leader)

Paleoclimatology Group

○ YASUE, Koh (Shinshu University,Associate Professor,Dendroclimatological and wood anatomical analyses in Japan and Asia)
○ ABE, Osamu (Graduate School of Environmental Studies, Nagoya University,Assistant Professor,Coral analyses in Southwest Japan)
MITSUTANI, Takumi (Nara National Research Institute for Cultural Properties,Visiting Researcher,Age determination of cultural properties in Japan using tree ring width)
SAKAMOTO, Minoru (National Museum of Japanese History,Professor,Age determination of paleoclimate proxy materials using radiocarbon)
KAGAWA, Akira (Forest and Forest Products Research Institute,Researcher,Development of analytical methods for isotopic ratios of tree-ring samples)
FUJITA, Koji (Graduate School of Environmental Studies, Nagoya University,Associate Professor,Analysis of ice cores in Central Asia)
XU, Chenxi (Institute of Geology and Geophysics Chinese Academy of Sciences,Associate Professor,Dendroclimatological and dendroarchaeological analyses using isotopes in Japan and Southeast Asia)
MORIMOTO, Maki (Faculty of Education, Gifu University,Associate Professorer,Coral analyses in Southwest Japan)
KIMURA, Katsuhiko (Faculty of Symbiosis Systems Science, Fukushima University,Professor,Dating of excavated wooden samples during Jomon, Yayoi, and Kofun Eras)
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TADA, Ryuji (Graduate School of Science, University of Tokyo,Professor,Analysis of varve sediments from Lake Suigetsu, central Japan)
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HIRANO, Jumpei (Teikyo University,Lecturer,Analysis of climate change in Japan using old documentary records)
TAIRA, Hideaki (Tateyamasugi Research Institute,Director,Analysis of human-forest relationship during last two millennia in mountainous areas)
SHO, Kenjiro (Social Engineering, Nagoya Institute of Technology,Assistant Professor,Assessment of hydrological impacts of past climate change)
LI, Zhen (Research Institute for Humanity and Nature,Research Associate,Reconstruction of past hydroclimate in Japan using tree-ring oxygen isotope ratios)

HAKOZAKI, Masataka	(National Museum of Japanese History,Specially Appointed Assistant Professor,Reconstruction of past climate in Japan using tree-ring width, density and oxygen isotope ratios)
LI, Qiang	(Institute of Earth Environment, Chinese Academy of Science,Associate Professor,Reconstruction of past climate in China using tree-ring width, density and oxygen isotope ratios)
KAWAHATA, Hodaka	(Atmosphere and Ocean Research Institute, University of Tokyo,Professor,Reconstruction of past climate in Japan using inland sediment cores)
SAKASHITA, Wataru	(Graduate School of Science, University of Tokyo,Graduate Student,Reconstruction of past climate in Japan using tree-ring oxygen isotope ratios)
HISAMOCHI, Ryo	(Graduate School of Science, Kyoto University,Graduate Student,Reconstruction of past climate in Japan using stalactite carbon and oxygen isotope ratios)
TSUSHIMA, Akane	(Research Institute for Humanity and Nature,Project Researcher,Reconstruction of past climate in Japan using tree-ring oxygen isotope ratios and Analysis of ice cores in Central Asia)
SHIGEOKA, Yuki	(Graduate School of Environmental Studies, Nagoya University,Graduate Student,Reconstruction of past climate in Japan using tree-ring width, density and oxygen isotope ratios)

Climatology Group

○ YOSHIMURA, Kei	(Institute of Industrial Science, The University of Tokyo,Associate Professor,Evaluation of proxy isotope data using general circulation models with isotope dynamics)
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UEMURA, Ryu	(Faculty of Science, Ryukyu University,Associate Professor,Observation of spatial and temporal variability of precipitation isotope ratios)
WATANABE, Masahiro	(Atmosphere and Ocean Research Institute, University of Tokyo,Professor,Climatological evaluation of past climate variations based on proxy records)
ICHINO, Mika	(Meiji University,Part-time Lecturer,Database construction and utilization of old diary weather records)
OKAZAKI, Atsushi	(RIKEN Advanced Institute for Computational Science,Researcher,Evaluation of proxy isotope data using general circulation models with isotope dynamics)
TORIDE, Kinya	(University of California, Davis,Graduate Student,General circulation modeling with assimilation of weather records in old diaries)
PANDUKA, Neluwala	(School of Engineering, The University of Tokyo,Graduate Student)

Prehistory/Ancient History Group

○ WAKABAYASHI, Kunihiko	(History Museum, Doshisha University,Associate Professor,Analysis of social adaptations to climate changes during Yayoi Era)
○ HIGAMI, Noboru	(Aichi Prefectural Center for Archaeological Operations,Investigator,Analysis of excavated wooden properties during Yayoi and Kofun Eras)
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MATSUGI, Takehiko	(National Museum of Japanese History,Professor,Analysis of social responses to climate changes during Yayoi and Kofun Eras, focusing on human population dynamics)
AKATSUKA, Jiro	(Ancient Niwanosato Cultural Heritage Network,President,Analysis of social adaptations to climate changes during Yayoi Era)
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FUJIO, Shin-ichiro	(National Museum of Japanese History,Professor,Analysis of social responses to climate changes during Jomon and Yayoi Eras)
YAMADA, Masahisa	(Graduate School of Humanity, Tokyo Metropolitan University,Professor,Analysis of excavated wooden properties during Jomon, Yayoi, and Kofun Eras)
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ONBE, Shin	(Kumakogen Town Board of Education,Curator,Analysis of archaeological remains in the Seto Inland Sea during Jomon Era)
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Medieval History Group

○ TAMURA, Noriyoshi	(Faculty of Humanities, Beppu University,Professor,Analysis of social responses to severe events of flood and drought during Muromachi and Warring States periods)
○ MIZUNO, Shoji	(School of Human Culture, The University of Shiga Prefecture,Professor,Analysis of social adaptation to hydroclimate variability during Kamakura and Muromachi periods)
ITO, Keisuke	(Research Institute for Humanity and Nature,Project Researcher,Relationship between economy and climate during the medieval period)
SHIMIZU, Katsuyuki	(School of Commerce, Meiji University,Professor,Analysis of social response to climate changes from the Muromachi to Warring States periods)
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ITO, Toshikazu	(Faculty of Human Studies, Meijo University,Professor,Analysis of societal responses to climate variation in Japan during the medieval period)
SASO, Mamoru	(Faculty of Shinto Studies, Kokugakuin University,Professor,Relationship between climate variations and spatio-temporal distribution of archaeological remains)
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Early Modern History Group

○ SATO, Daisuke	(International Research Institute of Disaster Science, Tohoku University,Associate Professor,Historical Analysis of social responses to natural disasters)
○ WATANABE, Koichi	(National Institute of Japanese Literature,Professor,Urban adaptation to heavy flood events in Edo during the early modern period)
KAMATANI, Kaoru	(Research Institute for Humanity and Nature,Project Researcher,Changes in livelihood pattern compared with climate change, focusing on fisheries around lake Biwa during the early modern period)
KIKUCHI, Isao	(Miyagi Gakuin Women's University,Professor,Social responses to great famines in Northeast Japan during the early modern period)
NAKAYAMA, Tomihiro	(Graduate School of Letters, Hiroshima University,Professor,Changes in livelihood pattern during the early modern period in Southwest Japan)
HIRANO, Tetsuya	(Tokiwa University,Associate Professor,Societal responses to climate change during the early modern period in local villages in East Japan)
SATO, Hiroyuki	(Faculty of Education, Kagoshima University,Associate Professor,Societal responses to climate change during the early modern period in Southernmost Japan)
OGI, Shinichiro	(Faculty of Humanities, Kochi University,Professor,Societal responses to climate change during the early modern period in Southern Japan)
TAKEI, Koichi	(Faculty of Law and Letters, University of the Ryukyus,Associate Professor,Societal responses to climate change during the early modern period in Northern Japan)
TAKAHASHI, Miyuki	(Faculty of Economics, Rissho University,Associate Professor,Analysis of population dynamics in northeast Japan during the early modern period)
YAMADA, Kosei	(Okinawa International University,Part-time Lecturer,Societal responses to climate change during the early modern period in southwest islands of Japan)
TAKATSUKI, Yasuo	(Research Institute for Economics and Business Administration, Kobe University,Associate Professor,Analysis of market pricing in early modern Japan)

MURA, Kazuaki	(Mitsui Bunko,Chief Researcher,Analysis of market pricing in early modern Japan)
BROWN, Philip C.	(College of Arts & Sciences, Department of History, The Ohio State University,Professor,Analysis of landownership in Japan during early modern period)
ENDO, Takahiro	(Osaka Prefecture University,Associate Professor,Societal responses to climate change during the early modern period in central Japan)
KORIYAMA, Shiho	(Kasai City Board of Education,Part-time Researcher,Estimate of climate impacts in early modern feudal domains)

○ Future Themes

Because there remain only two years (FR4 and 5) and we must publish research results as thoroughly as possible by the end of project, hereafter we will concentrate ourselves mainly on preparation of synthesis books on research results as well as individual papers both in Japanese and English. We will finalize the contents of each synthesis book soon.

In FR4, we will also analyse paleoclimatological, historical and archaeological data and samples obtained until FR3 as effectively as possible using many innovative methods developed in FR3 to make the project output maximum.

As for the tree-ring cellulose oxygen isotope ratio, the summer precipitation proxy and the dating tool in this project, there were three big problems solved during FR3. First, we had not reconstructed long-term (more than century scale) variation because tree-ring oxygen isotope ratios in some tree individuals have long-term age effects which had been removed together with long-term climate information. However, we have developed an innovative method to reconstruct past long-term variation in summer precipitation by combination of oxygen and hydrogen isotope ratios in tree ring according to the fact that the two isotope ratios show opposite age effects but have same climate signal. We are now recompiling hydrogen isotope data ever analysed together with oxygen isotope ratios to infer every frequency domain of past summer precipitation variability. Second, we had not utilized tree-ring oxygen isotope ratios in northern Japan for climate reconstruction because there are too many factors affecting the isotope ratio to extract simple climate signal from it. In FR3, we found that the sliding correlation of tree ring oxygen isotope ratios among distant sites in north Japan corresponds well with long-term regional temperature variation and become a novel precise proxy for climate field although the isotope ratio at individual site does not indicate any clear climate condition. We are now synthesizing many time-series of tree-ring oxygen isotope ratios over Japan including northern area. Third, we could not apply the tree-ring oxygen isotope ratios to date most of excavated archaeological woods although it has proved to be a promising index of dendrochronological dating irrespective of tree species. It is because most of excavated wood are too degraded to be treated for cellulose extraction. In FR3, we developed a new method to extract cellulose safely even from highly degraded wood, which should be applied to annual resolution of dating for human-climate interaction especially in prehistorical ages.

As for the paleography studies in this project, we have achieved two type of essential innovations in FR3. One is the keyword-based counting of specific documents using digitalized paleography database such as “Kamakura-Ibun (1185-1333AD)” to demonstrate quantitative relationship between climate variations and societal responses. The other is progress in the study of tax invoice during early modern era. Because inter-annual variations in the tax rate per unit area of rice paddy in East Japan corresponds well with temperature, we can conclude that there is a sophisticated system to share the

influence of climate variation within different social classes and it is possible to estimate past potential of agricultural productivity using paleoclimate data.

●Achievements

○Editing

【Editing / Co-editing】

・David Wittner・Philip C. Brown (ed.) 2016,04 . Routledge Studies in the Modern History of Asia. Routledge, UK, 290pp.

○Papers

【Original Articles】

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・Yoshikane, T., K. Yoshimura, E.-C. Chang, A. Saya, and T. Oki 2016,11 Long-distance transport of radioactive plume by nocturnal local winds. Scientific Reports 6. DOI:10.1038/srep36584.Article number: 36584.

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○Research Presentations

【Oral Presentation】

・Koichi Watanabe Metropolitan responses toward a series of disasters in 1780s Edo “Cities and disasters: urban adaptability and resilience in history. Responses to disasters in early modern capital, 2016,11,04, London UK, Institute of Historical Research.

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・M. Hakozaki, T. Nakamura, M. Ohyama, J. Kimura, M. Sano, K. Kimura, T. Nakatsuka Verification for the absolute age of an oxygen isotopic tree-ring chronology in the northern Japan based on 774-775 carbon-14 spike. WAC-8, 2016,08,30, Doshisha Univ. Kyoto.

・Yumiko MURAKAMI, Kunihiko WAKABAYASHI, Noboru HIGAMI, Chenxi XU, Masaki SANO and Takeshi NAKATSUKA Stone Axes to Iron Axes in Chubu District, Japan. WAC-8, 2016,08,30, Doshisha Univ. Kyoto.

・Shin-ichiro Fujio The interaction between hunter-gatherers and farmers, interactions between prehistoric hunter-gatherers and neighbors in Asia. WAC-8, 2016,08,29, Doshisha Univ. Kyoto.

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・Philip C. Brown Writing for an International Audience: Strategies. Workshop: Towards Mutual Understanding: Issues Related to Publishing for an International Audience, 2016,08,08, RIHN, Kyoto.

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・Ryu Uemura Isotope records of fluid inclusions from stalagmites in Okinawa. Utokyo AORI international workshop: Recent Advances in Paleoclimates Studies, 2016,06,24-2016,06,25, Chiba, Japan.

・Ryuji Asami, Ryu Uemura, Haruyoshi Miyata, Chen Jin-Ping, Chung-Che Wu, Chuan-Chou Shen Hydroclimate reconstruction from subtropical northwest Pacific stalagmites in Okinawa-jima, Japan. Taiwan Geoscience Assembly, 2016,05,24, Taipei, Taiwan ROC.

・Philip C. Brown Water, Power, and Control in Greater Eurasian History: A Geographical Overview. Water History Workshop: Water, Culture, and Society in Global Historical Perspective, 2016,05,13, The Ohio State University, Ohio, USA.

【Poster Presentation】

・Zhen Li, Masaki Sano, Takeshi Nakatsuka The optimized techniques of cellulose extraction for the isotope dendroarcheological study using wood samples from archaeological sites. The Eight Word Archaeological Congress, 2016,08,28-2016,09,02, Kyoto.

・Ryu Uemura, Satoru Mishima, Kanako Ohmine, Ryuji Asami, Chen Jin-Ping, Chuan-Chou Shen Coupled Oxygen Isotope Records of Inclusion Water and Carbonate from a Stalagmite in Hoshino Cave, Okinawa. Goldschmidt conference 2016, 2016,07,01, Kanagawa, Japan.

・Ryuji Asami, Ryu Uemura, Haruyoshi Miyata, Chen Jin-Ping, Chung-Che Wu, Chuan-Chou Shen Stalagmite based climate variability reconstruction of the subtropical northwest Pacific region from Gyokusen cave in Okinawa-jima, The Ryukyu islands, Japan. Goldschmidt conference 2016, 2016,07,01, Yokohama, Japan.

・Chen, A. C-C. Shen, M. Tan, T.-Y. Li, R. Uemura, R. Asami Precise measurements of helium isotopes and noble gas abundance in cave dripping water in three selected caves in East Asia. Goldschmidt conference 2016, 2016,07,01, Yokohama, Japan.

・Ryoto FURUKAWA, Sumito MATOBA, Ryu UEMURA, Yoshinori IIZUKA Temperature and accumulation rate reconstruction from the ice core in south-east dome, Greenland. Goldschmidt conference 2016, 2016,06,30, Yokohama, Japan.

・F. Parrenin, S. Fujita, A. Abe-Ouchi, K. Kawamura, V. Masson-Delmotte, H. Motoyama, F. Saito, M. Severi, B. Stenni, R. Uemura, E. Wolff Climate dependent contrast in surface mass balance in East Antarctica over the past 216 kyr. JpGU2016, 2016,05,22-2016,05,26, Chiba, Japan.

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Stage: Full Research

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

Abbreviated Title: ILEK project

Project Leader: SATO Tetsu

Program 2: Fair Use and management of diverse resources

URL: http://ilekcrp.org/

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. This project focuses on the formation and circulation of a novel concept of local knowledge (Integrated Local Environmental Knowledge, ILEK) blending scientific and local daily-life knowledge productions. Diverse ecosystem services should be managed on the basis of collective knowledge base such as ILEK. We examine mechanisms to facilitate production and circulation of ILEK to understand ILEK-based adaptive governance mechanisms for creation and sustainable governance of such commons. This initiative-based project conducts meta-analysis and integrates a wide range of results of RIHN projects and locally accumulated knowledge through daily practices of stakeholders in various areas of the world, to understand formation mechanisms of ILEK and drivers of adaptive governance using ILEK as a knowledge base. Residential researchers living in local communities play important roles to produce ILEK essential for adaptive governance. Bilateral translators of knowledge promote circulation of ILEK among different stakeholders. The project invites these important actors in local communities to provide viewpoints of ‘knowledge users’ to elucidate production and circulation mechanisms of ILEK for sustainable adaptive governance of local commons. Analyses of circulation of knowledge across multiple scales by cross-level knowledge translators clarify cross-scale governance for solutions of global environment problems.

Background of research:

Bottom-up approaches driven by divers 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. These results will

contribute to formation of future visions of “science in/with society” and “society making full use of science” to support bottom-up solutions of diverse global environmental problems.

○ Progress and Results in 2016

Research plan:

This project effectively inherits research outcomes of cognitive sciences from previous RIHN projects and integrates them with various cases of issue-driven and solution-oriented science approaches from the world, which involve collaborative interactions between scientists and stakeholders to produce and utilize ILEK for creation and sustainable management of local commons. The project aims to elucidate pathways to promote science in/with society as well as to design social systems to make full use of science for solutions of diverse global environmental problems. 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 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. In 2014, we aimed to elaborate these theoretical frames from meta-analysis of case studies and modeling to produce verifiable hypothesis for designing action-based verification processes. We also conducted analysis of roles and functions of bilateral knowledge translators in the contexts of cross-scale collaboration mediated by knowledge flow across multiple scale levels from local to global. Through the previous research, we recognized that local communities are almost always interacting with external actors and institutions including global and regional ones. Cross-scale translators are an important component of stakeholder networks in each local community. This observation led us to incorporate cross-scale analysis into each case study, and to avoid analyzing cross-scale governance independently in a separate research group. Action-based verification processes have started from FR3 in selected case study sites to incorporate cross-scale elements as much as possible. With the approaches integrating empirical studies, Action-based verification processes and theoretical analysis, the project aims to elucidate the way forwards toward solution of global environmental problems.

Research methods:

This initiative based project employs a unique transdisciplinary approach incorporating feedback loops connecting local empirical analyses and abstract theoretical levels. At the local empirical level, we identified 61 case study sites based on the presence of dedicated residential researchers or translators among project members closely collaborating with diverse stakeholders in each case study site. Fifteen sites of action-based verification have been extracted among the case study sites. Organizations and people working as a bilateral translator connecting multiple scales from global to local levels are reviewed for their knowledge production and translation, and cases of such cross-level knowledge translators are identified for cross-scale analysis. Project member scientists conduct co-design, co-production and co-delivery processes of transdisciplinary research through daily interactions with local leaders, decision makers, cross-level translators and other stakeholders. These localized research results are integrated by meta-analysis using semi-structured interviews, text analysis, GIS-based cluster analysis and conceptual as well as mathematical modeling to identify important drivers of adaptive governance. The scientists and stakeholders at the local level researches will be involved at the meta-level theoretical analysis through the deliberative stakeholder workshops planned in FR3 and 4. The workshop is designed to critically review and discuss the outcomes of theoretical meta-analysis to give feedback from the local perspectives to both theoreticians and empirical researches. These feedback at the workshop will be immediately brought back to local level research and actions by participating scientists and stakeholders deeply embedded to each case study sites. This two-tier structure of transdisciplinary approaches will enable the scientists and stakeholders to achieve close collaboration and mutual learning throughout the entire research processes to produce acceptable and applicable way forwards for designing sustainable societies at local as well as global scale levels.

Research organizations:

The research organization has been composed of Case Study, Social Experiment, Multi-scale Analysis, Theory and Modeling, and Managing groups together with thematic task forces (TFs) cross-cutting the research groups. The Case Study group with three working teams (East Asia: EU & North America: Developing Countries) conducts field research of diverse knowledge systems produced by RIHN projects and other researches in different localities of the world. We design and conduct action-based verification of hypothesis focusing on ILEK-based adaptive governance mechanisms to clarify drivers of adaptive societal changes. A part of Case Study group has been re-organized into Action-based Verification group in FR3. We also make a quest of mechanisms to facilitate cross-scale actions for global environment problems, by analyzing roles of bilateral translators across global, regional and local scales. Multi-scale Analysis group consisted of Top Down and Bottom Up teams was merged into Action-based Verification group to work together with other groups to elucidate dynamic translation and circulation of knowledge across different scale levels to facilitate cross-scale adaptive governance. Theory and Modeling group works together with other groups to conduct meta-analysis of the case studies to establish and elaborate parameters for modeling. The results are fed back to other groups to refine research strategies. In order to facilitate interactions among diverse project members with different academic background, the cross-cutting Task Forces (TFs) are organized at different levels of analyses, including Ethics of Design-oriented Science, ILEK Simulator, Environmental Governance, Transdisciplinarity, Residential Research, Sato-umi Fisheries Resource Management, Biosphare Reserves, and Resource Management Certification TFs. The Managing group coordinate diverse research activities of these groups and TFs, develop and improve basic concepts and strategies, and integrate research results for design of sustainable societies. Comprehensive understanding of adaptive governance mechanisms of commons is expected to be achieved with this integrative research design.

Research outcomes of the year 2014:

a) ILEK Triangle model

While collaborative research and actions were continued in each case study sites, preliminary analysis were conducted regarding knowledge production, circulation and utilization for local decision making and actions in 11 cases of RIHN research project to construct a conceptual model of ILEK-based local adaptive governance for meta-analysis and integration of case studies and cross-scale analysis. The model, named “ILEK Triangle”, is composed of interactive system of three important elements of ILEK-based adaptive governance (knowledge production, decision making and action at individual or small group level, and formal/informal institutional changes), driven by knowledge producers, knowledge users and translators. In this ILEK Triangle, ILEK productions were hypothesized to lead to dynamic changes of institutions toward sustainability through two different pathways: first, through changes of individual decision makings and actions resulting in adaptive changes of social systems, and second, through direct effects upon formal and informal institutions and collective knowledge systems in the community. In order to identify important drivers to mobilize this system, detailed analyses of interview records of RIHN project leaders were conducted. A set of hypothetical drivers were identified by these analyses, which were classified into five categories (below).

1. create and visualize values

Produced knowledge creates or visualizes new shareable values in local communities to mobilize collaborative actions.

2. create new linkages (local and cross-scale)

Produced knowledge creates new linkages among actors within and outside the community, including actors addressing broader issues.

3. provide options and opportunities

Produced knowledge expand options and opportunities for sustainable actions among stakeholders and mediates changes in environmental perception.

4. create collective actions

Produced knowledge creates collective actions, transforming existing local institutions or creating new ones.

5. appropriate translation

Knowledge translators (individual or organizational) mediate changes in individual actions or formal and informal social systems by appropriate selection, modification and reconstruction of knowledge.

b) Preliminary results of discourse analysis

We developed detailed interview protocol based on ILEK Triangle in March 2013 to extract perceptions of scientists and stakeholders collaborating in ILEK productions and community actions in case study sites with regard to important drivers of ILEK-based adaptive governance. More concise and user friendly self-evaluation questionnaire was also developed in 2013 by improving the interview protocol. Interview Specialists Group (ISG) was established and has accumulated interview records, including translators, knowledge producers, and 8 knowledge users. The interviewees commonly shared importance of opportunities to expand human networks by collaborative actions supported by ILEK, which were largely dependent on attributions of knowledge producers and translators, as well as knowledge itself. The analysis of participatory observations by Case Study and Action-based Verification group clarified that new values were created and visualized through the collaborative interactions, and options and opportunities also expanded as a result of collaboration. Various types of actions created by knowledge production and circulation effectively mobilized local institutions, thereby promoting decision making and actions. Translators played significant roles in collaborative networking by bridging gaps in knowledge hierarchy and providing legitimacy for different stakeholders to collaborate. This hypothetical drivers of knowledge-based adaptive governance should be verified in the remaining project periods by both empirical studies and theoretical modeling.

c) Progress in text analysis and theoretical modeling

Methods of computer-assisted text analysis based on the ILEK database launched have been developed to conduct quantitative and qualitative analyses of discourses of scientists, translators and stakeholders accumulated in the project research. Semantic network analysis methodologies have been developed to extract major concepts delivered in the narratives of various actors, and the changes of message structures according to time axes. We aim to improve this technique to provide data sets for mathematical modeling of dynamic changes of knowledge circulation networks in the adaptive governance processes.

Approaches of mathematical modeling of ILEK-based adaptive governance have been improved in the process of intensive interactions between theoreticians, empirical scientists and stakeholders. Particularly promising approaches include communication dynamics models analogous to evolutionary dynamics of knowledge as a meme, complex network models including asymmetric simple exclusion processes (ASEP) focusing on functions of bilateral translators in knowledge circulation networks (≈social network), and game theoretic models of exclusion mechanisms of free-riders in adaptive governance processes.

d) Academic and societal outputs

The basic concepts of the project including ILEK, residential researchers and bilateral knowledge translators, as well as methodological framework of the project were summarized and published in a book chapter in English (Sato, T, 2014, ″Integrated Local Environmental Knowledge Supporting Adaptive Governance of Local Communities”, Alvares, C. ed, Multicultural Knowledge and the University, Multiversity India, Mapusa, India, pp.268-273.). We organized the first ILEK project international symposium in September 2014 entitled ″Knowledge Translation:Bridging Gaps between Science and Society″, and an international symposium co-organized by University of Saskatchewan and Kyoto Model Forest Association titled ″International Symposium on Community-based Management of Forest Resources: Perspectives on culture, learning and adaptation in Canada and Japan″ in March 2015. The Resource Management Certification TF organised a symposium on ″Producing Intangible Values of Agriculture and Fisheries Products: Local certification and trust formation mechanisms″ in February 2015. In order to share general research outcomes of the project with various stakeholders to receive their input to the research processes, we had a deliberative workshop inviting 45 local stakeholders including residential as well as visiting researchers in January 2015.

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○ Future Themes

a) Meta-analysis and modeling

The improved version of self-evaluation questionnaire will be applied to case studies and social experiments to accumulate data to extract perceptions on ILEK-based adaptive governance among scientists and stakeholders collaborating in ILEK productions and community actions. A new project researcher in charge of case studies in developing countries will play a key role in meta analysis of case studies outside Japan, especially in developing countries. Text data of naturally spoken narratives and writings of important actors in case study and action-based verification sites will also be accumulated to provide resources for discourse analysis.

In FR4, we will improve analysis of these interview records and narrative data using conventional and computer-assisted discourse analysis to elaborate hypotheses on important drivers and processes of

ILEK-based adaptive governance. Computer-assisted analysis techniques including semantic network analysis will be further improved in close collaboration among modelers, database specialists and empirical scientists. Outcomes of these analyses will be successively delivered to the Theory and Modeling group to test various modeling approaches, and to the Action-based Verification group to promote verification of hypothesis in FR4. Research results are also applied to the design of ILEK Simulator scheduled to be launched toward the end of the project.

b) Case studies and Action-based Verification

FR4 will be a critical stage of the project to implement action-based verification processes at selected sites to verify focused hypotheses on drivers and processes of ILEK-based adaptive governance. The designs of verification processes on the bases of ILEK Triangle model has been completed at 15 sites to address questions related to characterization of drivers of knowledge-based adaptive governance. Each verification process is composed of attempted or ongoing actions delivered by knowledge producers or translators and expected societal changes observable within the project period. We will organize the Action-based Verification Group with project members committed to each sites to improve the design and implementation and to integrate results. Societal changes resulted from experimental actions can be measured by dynamism of stakeholder networks, changes in perceptions among stakeholders and scientists, and emergence of collaborative actions. Methodologies of qualitative and quantitative evaluation of social dynamism will be established and improved in FR4.

c) Stakeholder workshop at meta-analysis level

Stakeholder workshops will be an important component of two-tier transdisciplinary approach in the project. We completed the first deliberative workshop in September 2014 (within Japan), and are designing a series of localized workshops in the verification sites outside Japan in 2015. The WS will mainly invite scientists and stakeholders deeply embedded to each case study sites. The protocol basically follows those utilized in World Wide Views on Biodiversity project. The output of the WS have been analysed collaboratively by scientists and stakeholders to provide feedback to both academic and stakeholder communities at local and cross-scale levels.

d) ILEK Simulator as a societal output of the project

In its initial design, we assumed that the final societal output of ILEK project would be societal changes in each case study site directly delivered by project members deeply embedded in each community. However, as we found collaboration among diverse actors within and outside the community could be an important driver of adaptive governance, a mechanism to promote mutual learning and interaction among diverse case study sites over the world was desperately needed. Based on the Web GIS system and semantic network analysis protocols, we started designing a web-based ILEK Simulator as the societal output of the project. ILEK Simulator provides plausible options and tips of ILEK-based adaptive governance fitted to particular local settings, together with real-life examples of local collaborative activities in other sites sharing common characteristics. ILEK Simulator will open a new pathway to connect local communities in the world for collaboration in adaptive governance processes.

Stage: Full Research

Project Name: Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus

Abbreviated Title: WEF Nexus Project

Project Leader: Aiko Endo

Program 2: Fair Use and management of diverse resources

URL: http://www.chikyu.ac.jp/wefn/index.html

Key Words: Water-Energy-Food Nexus

○ Research Subject and Objectives

Climate change and social change, including accelerating development, urbanization, and globalization are increasing pressure on water, energy and food resources, increasing the number of tradeoffs and potential conflicts among these resources that have their complex interactions.
The Global Risks Interconnections Map published by the World Economic Forum in early 2016 highlights the global risk posed by linked food and water crises and energy price shocks.
In order to address these issues, the objectives of the project are to understand the complexity of the water-energy-food (WEF) nexus system and to create policy options to reduce trade-offs among resources and to alleviate conflicts of resource users using scientific evidence and under assumptions of uncertainty to maximize human-environmental security.
The project also contributes solutions to local and global environmental problems by contributing to global research networks associated with the Future Earth platform and the U.N. Sustainable Development Goals.

The project involves 60 researchers from different disciplines and five countries, including Indonesia, the Philippines, Canada, Japan and the USA.

Five research groups carry out the following tasks:

1) the Water-Energy Nexus Group conducts biophysical measurement and analysis using space satellites, geothermic, and hydrogeological techniques;

2) the Water-Food Nexus Group conducts biophysical measurements and analyses using geochemical, coastal oceanographic, geophysical, hydrologic, and ecological methods, including isotopic tracers;

3) the Stakeholder Analysis Group conducts stakeholder and social network analyses, community surveys, and scenario planning based on sociology, economics, and behavioral science approaches;

4) the Socio-culture of Resource Usage Group develops the science-policy interface based on its examination of the socio-cultural history of groundwater use; and

5) the Interdisciplinary Group conducts the research with a mission to: i) identify research problems; and ii) determine the methods and/or create new discipline-free methods based on synthesizing and harmonizing team-based production, collected from individual scientists in different disciplines from each team in order to assess human environmental security.

In addition, the team further developed these approaches to incorporate non-scientific/- disciplinary views on the analyses; and iii) design a nexus system.

○ Progress and Results in 2016

In order to analyze the water-energy nexus we are collecting groundwater samples from observation wells by depth for monitoring the groundwater level in Otsuchi.
We also calculated the potential of using groundwater as a source of thermal energy in Obama.
In Beppu, the subsurface environment, including flow of groundwater and hot springs, have been clarified by gravity measurement.
The Water-Food Nexus Group identified the location of submarine groundwater discharge at Obama and Beppu bays, and estimated the supply of nutrients conveyed from land to ocean by groundwater.
Stakeholder analysis of hot spring resources also clarified key issues related to future scenarios and social change.

The Interdisciplinary Group will continue to develop integrated methods, including models of Beppu and Otsuchi, Japan, Pajaro Valley, California, and British Columbia, Canada.
This group is also designing a nexus system at the local scale to understand the complexity of the nexus system and establish a clear definition of the nexus concept.
For collaborative scientific activities with society, we designed lectures open to local citizens, also conducted a participatory survey on hot springs with local residences and stakeholders in Beppu.
We developed a web page, “spring map”, in order to share the results of our groundwater survey.
Such activities with local governments and private sector raised awareness of nexus issues.
Future research will improve scientific understanding of the complexity of the water-energy-food nexus, and attempt to ease social conflicts by promoting dialogue and cooperation with stakeholders.
Finally, we will contribute to policy by suggesting ways to reduce trade-offs among the three nexus resources.

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○ Future Themes

1. To define the academic nexus concept.
2. To understand the complexity of the water-food-energy nexus system, and create visualizations of the linkages between events using ontology-based systems; to identify trade-offs and efficient resource uses; to define the academic concept of nexus, contribute to scenario planning, and design a nexus system.
3. Preparation of policy-relevant future nexus-issue scenarios through collaboration with stakeholders.

4. Development of localized studies that can be up-scaled and produce policy-relevant results; improvement of networking with stakeholders and researchers addressing nexus issue nationally and internationally.

●Achievements

○Books

【Authored/Co-authored】

・Hidayat Pawitan dan Gadis Sri Haryani 2016 Pendekatan Ekohidrologi dalam Pengelolaan Sumber Daya Air dan restorasi ekosistem di Indonesia. Best Practices of Sustainable Water Resources Management Based on Ecohydrology Approach. Asia-Pacific Center for Ecohydrology (Other) (In Press).

○Papers

【Original Articles】

・Gurdak, J.J. 2017,02 Groundwater: Climate-induced pumping. Nature Geoscience 10 :71. DOI:10.1038/ngeo2885.(reviewed).

・Naufal Rospriandana, Masahiko Fujii 2017,01 Assessment of small hydropower potential in the Ciwidey subwatershed, Indonesia: a GIS and hydrological modeling approach. Hydrological Research Letters 11(1) :6-11. DOI:10.3178/hrl.11.6.(reviewed).

・Ryo Sugimoto, Katsuhiro Kitagawa, Saori Nishi, Hisami Honda, Makoto Yamada, Shiho Kobayashi, Jun Shoji, Shinji Ohsawa, Makoto Taniguchi, Osamu Tominaga 2017,01 Phytoplankton primary productivity around submarine groundwater discharge in nearshore coasts. Marine Ecology Progress Series 563 : 25-33. DOI:10.3354/meps11980.(reviewed).

・Ioka, S., Muraoka, H., Matsuyama, K., and Tomita, K. 2016,12 In situ redox potential measurements as a monitoring technique of hot spring water quality. Sustainable Water Resources Management 2(4) : 353-358.

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・Masuhara, N., Baba, K. and Tokai, A. 2016,10 Clarifying relationships between participatory approaches, issues, processes, and results, through crosscutting case analysis in Japan's environmental, energy, and food policy areas. Environment Systems and Decisions 36(4) :421-437. DOI: 10.1007/s10669-016-9613-6.

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・Wada, C., Burnett, K., and Gurdak, J.J. 2016,08 Sustainable agriculture irrigation management: the Water-Energy-Food Nexus in Pajaro Valley, California. Sustainable Agriculture Research 5(3) :76-83. DOI:10.5539/sar.v5n3p76.(reviewed).

・Kimberly Burnett, Christopher Wada, Aiko Endo, Makoto Taniguchi 2016,08 Cost-benefit analysis of disaster mitigation infrastructure: The case of seawalls in Otsuchi, Japan. Journal of Finance and Economics Volume 4 (No. 3) :1-11. DOI:10.12735/jfe.v4n3p01.(reviewed).

・Notte, C. Allen, D.M., Gehman, J., Alessi, D.S., and Goss, G.G. 2016,07 Comparative analysis of hydraulic fracturing wastewater practices in unconventional shale developments: Regulatory regimes. Canadian Water Resources Journal . DOI:10.1080/07011784.2016.1218795.

・Ioka, S., Muraoka, H. and Suzuki, Y. 2016,06 Redox potential of shallow groundwater by 1-month continuous in situ potentiometric measurements. Applied Water Science :1-7. DOI:10.1007/s13201-016-0436-x.

・Masaki Hata, Ryo Sugimoto, Masakazu Hori, Takeshi Tomiyama, Jun Shoji 2016,05 Occurrence, distribution and prey items of juvenile marbled sole Pseudopleuronectes yokohamae around a submarine groundwater seepage on a tidal flat in southwestern Japan. Journal of Sea Research 111 :47-53. DOI: 10.1016/j.seares.2016.01.009.

・Terukazu Kumazawa, Keishiro Hara, Aiko Endo, Makoto Taniguchi 2016,04 Supporting collaboration in interdisciplinary research of water-energy-food nexus by means of ontology engineering. Journal of Hydrology: Regional Studies (Elsevier) . DOI:10.1016/j.ejrh.2015.11.021.(reviewed).

○Research Presentations

【Oral Presentation】

・Gurdak, J.J. The Water-Energy-Food Nexus: Sustainable Water and Food Systems in Coastal California. Dept. of Environmental Studies, 2017,01,31, University of California, Santa Cruz.

・J. Nishijima, K. Naritomi and S. Ohsawa Reservoir monitoring using repeat precise gravity measurements in Beppu hot spring area. annual meeting of Society of Environmental Science, 2017, Oita prefecture, Japan.

・Makoto Yamada, Ryo Sugimoto and Hisami Honda Impact of submarine groundwater discharge heat-flux on the coastal area. American Geophysical Union Fall Meeting, 2016,12,15, San Francisco.

・Taniguchi, M. Water-energy-food nexus for adopting sustainable development goals in Asia. American Geophysical Union, 2016,12,14, San Fransisco, USA.

・Tomohiro Oh Reading Groundwaterscape: Historical Change of Well Use in Obama, Japan. France-Japan Joint Symposium "Landscape in the Anthropocene", 2016,12,05-2016,12,08, Fondation France-Japon de l'EHESS, 190 Avenue de France, Paris.

・Hamamoto, H. Urban Subsurface Heat Islands in Asian Megacities. Seminar in Karlsruhe institute of technology, 2016,12,01, Karlsruhe.

・Hidayat Pawitan WATER AND FOOD NEXUS: the challenge of competing water uses in Indonesia. Int'l Conference: Asia Pacific Policy Dialogue on Water, Energy and Food Security for Poverty Alleviation in Dryland Regions, 2016,11,23-2016,11,25, Rawalpindi, Pakistan.

・Jun SHOJI, Masaki HATA, Koji FUJITA, Takeshi TOMIYAMA Effects of submarine groundwater on feeding and growth of juvenile marbled flounder Pseudopleuronectes yokohamae in the Seto Inland Sea, Japan. The North Pacific Marine Science Organization (PICES) 25th Annual Meeting, 2016,11,02-2016,11,13, OMNI Hotel, San Diego, CA, USA.

・Fernando P. Siringan Direct groundwater seepage across the lake floor (DGSL) of Laguna de Bay in the Los Banos-Calama=ba area, Philippines. 4th Project Meeting on RIHN Research Project on Human-Environmental Security In Asia Pacific Ring of Fire: Water-Energy-Food Nexus, 2016,10,31-2016,11,02, Sanriku Hana Hotel Hamagiku, Namiita Kaigan, Kamihei-gun, Otsuchi-cho, Iwate Prefecture, Japan.

・Karen Ann B. Jago-on Social Acceptability of Micro Hydropower in Laguna, Philippines. 4th Project Meeting on RIHN Research Project on Human-Environmental Security In Asia Pacific Ring of Fire: Water-Energy-Food Nexus, 2016,10,31-2016,11,02, Sanriku Hana Hotel Hamagiku, Namiita Kaigan, Kamihei-gun, Otsuchi-cho, Iwate Prefecture, Japan.

・Deny Hidayati, Intan Adhi Perdana Putri, Syarifah Aini Dalimunthe, and Aliyansyah Abdurrahim Socio-Economic Benefits To The Community. Associated With Jatiluhur Reservoir. the International Meeting on Water Energy Food Nexus in Otsuchi, 2016,10,31-2016,11,02, Iwate, Japan.

・K. Naritomi, J. Nishijima, S. Ohsawa and Y. Fujimitsu Three-dimensional fluid flow modeling in Beppu. annual meeting of Geothermal Research Society of Japan, 2016,10,20, 郡山市中央公民館.

・Fujii, M. Assessment of the potential for developing base load renewable energy and the possible conflicts with water and food. 4th International Conference on Sustainable Built Environment, 2016,10,13, Yogyakarta, Indonesia.

・Taniguchi, M. Groundwater-energy-food nexus: Conflicts between groundwater use for energy and fishery production. 43rd International Association of Hydrogeologists, 2016,09,28, Montpellier, France.

- Jun SHOJI Water-Food NEXUS in coastal ecosystems: elevation of fish species diversity and productivity by freshwater supply with emphasis on submarine groundwater. Sustainability Initiative in the Marginal Seas of South and East Asia (SIMSEA) Regional Symposium 2016 'Designing a holistic socioecological research program on the marginal seas for sustainability in Asia', 2016,09,27, Microtel by Wyndham, Diliman, Quezon City, Philippines.
- Masuhara, N., Oh, T. and Baba, K. Procedure and implications of stakeholder analysis: A case study of Otsuchi Town, coastal and groundwater-rich area in Japan. SIMSEA Regional Symposium 2016, 2016,09,27, Diliman, Quezon City, Philippines.
- Tomohiro Oh Revisiting Japan's Experience of Resource Governance: Lessons from a Historical and Holistic Perspective. SIMSEA Regional Symposium 2016, 2016,09,26-2016,09,28, Diliman, Quezon City, Philippines.
- Endo,A. "Developing explicit linkages between terrestrial and marine systems from the perspective of water-energy-food nexus". SIMSEA Regional Symposium 2016, 2016,09,26-2016,09,28, Manila, the Philippines.
- Rachmat Fajar Lubis Water - Food Nexus, Assessment of Submarine Groundwater Discharge (SGD) as a Source of Nutrient to Jakarta Bay. 2016 SIMSEA Regional Symposium, Sustainability Initiative in the Marginal Seas of South and East Asia, 2016,09,26-2016,09,28, Manila.
- Robert M. Delinom The Role of Water Quality for Securing Water Food Nexus in Jatiluhur Reservoir. 2016 SIMSEA Regional Symposium, Sustainability Initiative in the Marginal Seas of South and East Asia, 2016,09,26-2016,09,28, Manila.
- Jun SHOJI, Ryo SUGIMOTO, Osamu TOMINAGA, Hisami HONDA, Shiho KOBAYASHI Spatial variability in fish community and productivity around submarine groundwater seepages in coastal area. 56th ECSA (Estuarine, Coastal and Shelf Science Association) Conference: From a 'natural' to an anthropogenically-modified state, 2016,09,07, Maritim Hotel & Congress Centrum, Bremen, Germany.
- Hidayat Pawitan and Hadi Susilo Afifin Ecotechnology measures for sustainable urban water system in the Greater Jakarta basin. Australia-Indonesia Research Summit on Urban Water Stream Session: "Engineering solutions in leapfrogging to water sensitive cities", 2016,08,23, Surabaya.
- Hamamoto, H., M. Yamano, S. Goto, A. Miyakoshi Reconstruction of the Thermal Environment Evolution from Subsurface Temperature Distribution in and around Bangkok and Tokyo. Asia Oceania Geosciences Society (AOGS) 2016, 13th Annual meeting, SE16-A005, 2016,08,03, Beijing.
- Jun SHOJI, Masaki Hata Submarine groundwater seepage as possible nutrition source for flatfish juveniles. 40th Annual Larval Fish Conference, 2016,06,21, Chesapeake Biological Laboratory, University of Maryland, Solomons, MD, USA.
- Endo,A. Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus. SCIENTIFIC FORUM " UNDERSTANDING THE WEF NEXUS AND ITS IMPLICATIONS FOR GOVERNANCE", 2016,06,15-2016,06,16, Osnabruck, Germany.
- Taniguchi, M. Impact of groundwater use as heat energy on coastal ecosystem and fisheries. EGU, 2016,04,22, Vienna, Austria.
- Baba, K. Participatory Approaches for Co-design and Co-production on Water-energy-food Nexus Issues; Case study in Beppu. The 3rd Future Earth Water-Energy-Food Nexus Workshop: "Governance Transformation and Integrated Information for W-E-F NEXUS", 2016,04,05, RIHN, Kyoto, Japan.
- Endo,A., Oh, T., Yamada, M., Honda, H., Masuhara, N., Okamoto, T., Teramoto, S. "Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus". THE 3rd FUTURE EARTH WATER-ENERGY-FOOD NEXUS WORKSHOP: Governance transformation and integrated information for the W-E-F Nexus, 2016,04,04-2016,04,06, RIHN.
- Pedcris Orencio Water-Food Nexus: Evaluating Human-Environmental Security in Los Banos and Calamba, Laguna, Philippines. The 3rd Future Earth Water-Energy-Food Nexus Workshop "Governance Transformation and Integrated Information for W-E-F NEXUS", 2016,04,04-2016,04,06, Research Institute for Humanity and Nature (RIHN), Kyoto, Japan.
- Osamu Tominaga Water-Food Nexus from the Perspective of Fisheries, Livestock and Water. The 3rd Future Earth Water-Energy-Food Nexus Workshop "Governance Transformation and Integrated Information for W-E-F NEXUS", 2016,04,04-2016,04,06, Research Institute for Humanity and Nature (RIHN), Kyoto, Japan.

・Jun SHOJI Possible effects of the global warming on Water-Food NEXUS in coastal ecosystems: fish species diversity and production around submarine groundwater seepage. FUTURE EARTH WATER-ENERGY-FOOD NEXUS WORKSHOP: “Governance transformation and integrated information for the W-E-F Nexus”, 2016,04,04, Research Institute for Humanity and Nature (RIHN), Kyoto, Japan.

・Fujii, M. Energy-water nexus. Future Earth Workshop on the Water-Energy-Food Nexus, 2016,04,04, Kyoto.

【Poster Presentation】

・Makoto Yamada, Ryo Sugimoto and Hisami Honda Impact of submarine groundwater discharge heat-flux on the coastal area. AGU 2016 Fall Meeting, 2016,12,12-2016,12,16, San francisco.

・Fernando Siringan, Ronald Lloren, Erwin Racasa, Danica Mancenido, Karen Jago-on, Ma. Ines Rosana Tarriela, Makoto Taniguchi Lake Ecosystem Assessment in the Philippines: A Science and Policy Forum for a Sustainable Laguna Lake Management. Direct groundwater discharge across the lake floor of Laguna de Bay and the possible impact of hot spring resort development in Calamba-Los Banos, 2016,11,22-2016,11,23, Summit Ridge Hotel, Tagaytay City.

【Invited Lecture / Honorary Lecture / Panelist】

・Allen, D.M. Assessing risk to aquifers in BC. IAH-UBC Fall Hydrogeology Symposium, 2016,11,04, University of British Columbia, Vancouver.

・Taniguchi, M. Water-energy-food security in Asia-Pacific region. OECD Symposium on Water Footprints, 2016,09,14-2016,09,16, Lincoln, Nebraska, USA.

・Endo, A. Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus. International Workshop on Food-Energy-Water Nexus, 2016,09,05-2016,09,06, Taipei.

・Endo, A. Methods of the Water-Energy-Food Nexus. 2016 International conference on Water Resource and Environment (WRE 2016), 2016,07,23-2016,07,26, Shanghai.

・Allen, D.M. and Kirste, D SFU Regional groundwater studies. Northeast BC Groundwater Knowledge Workshop, 2016,06,02, Victoria, BC.

・Endo, A. Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus. PCWS and Smart Villages Workshop on Energy and Water Nexus in SE Asia, 2016,06,01-2016,06,03, Ilocos Norte, Philippines.

・Taniguchi, M. Introduction of Future Earth and Nexus. The 3rd Future Earth Water-Energy-Food Nexus workshop, 2016,04,04, RIHN, Kyoto.

Stage: Full Research

Project Name: Biodiversity-driven Nutrient Cycling and Human Well-being in Social-Ecological Systems

Abbreviated Title: Ecological Recycling Project (e-REC Project)

Project Leader: OKUDA Noboru

Program 2: Fair Use and management of diverse resources

URL:

Key Words: Biodiversity, Ecosystem service, Human well-being, Nutrient balance, Watershed governance

○ Research Subject and Objectives

Technological innovation in energy and food production resulted in population growth, increase in life expectancy and economic prosperity. However, over exploitation of the resources leads to disturbance of natural biogeochemical cycles of many elements, and in particular the carbon cycle and those of macro nutrients, such as nitrogen and phosphorus (Sutton et al. 2013). Such nutrient imbalances have caused serious environmental problems, contributing to global warming due to increased CO2 and water pollution due to increased nitrogen and phosphorus loadings. These anthropogenic disturbances in the carbon and nutrient cycling are also the main driver of biodiversity loss on a global scale. At present, it has been recognized that nutrient loadings and biodiversity loss are so common and prevalent throughout the planet, posing a risk to sustainable human development (Rockström et al. 2009).

When considering the nutrient balance, phosphorus plays a key role in controlling terrestrial ecosystem processes, presenting a “too much too little” problem in the environmental and social contexts (Elser & Bennett 2011). Because of its scarcity relative to other macro nutrients, on one hand, phosphorus determines ecosystem functioning and thus the quality and quantity of ecosystem services. On the other hand, over exploitation of phosphorus resources threatens our sustainability because phosphorus resources are consumed many orders of magnitude faster than they are replenished (Vaccari 2009). To solve these nutrient imbalance-associated issues and ultimately construct sustainable social-ecological systems, we have to enhance nutrient recycling on watershed scales.

Under such a background, we aim to facilitate cross-linkage of the multi-level governance, in which governments and researchers with systemic view tend to manage nutrient loadings and sustainable use on the regional and global scales, while most of citizens want to solve social and environmental issues in the context of their life and livelihood. For such watershed governance to be successful, local and scientific knowledge must be shared and integrated by a variety of stakeholders to reconcile conflicting issues on different scales.Here we will develop a framework of the adaptive watershed governance, in which social involvement in community activities for biodiversity conservation enhances human well-being through accumulation of social capitals, which in turn enhances nutrient recycling through an increase in the biodiversity-dependent ecosystem functions. Through social evaluation of scientific knowledge on how the biodiversity provides public values, the community activities will be fed back to the well-being for the community member through a shift from bonding to bridging social capitals. Following transdisciplinary science (Brunner 2005, Mauser et al. 2013), our governance approach is improved in the adaptive way to increase all of the biodiversity, nutrient recycling and well-being based on the PDCA cycle.

○ Progress and Results in 2016

We launched action researches in three of four local communities from the upstream,middle-stream, downstream and the coastal area of Yasu River sub-watershed, the largest tributary of Lake Biwa. Our field and experimental researches demonstrated that some of local knowledge-based activities are likely to be useful in enhancement of biodiversity and nutrient recycling. We also started to evaluate human well-being through questionnaire and inquiry surveys,associating with social and natural capitals.

We also started the basic research on biodiversity, nutrient and human dimension in Silang-Santa Rosa sub-watershed of Laguna de Bay, the Philippines, to compare the watershed governance between two contrasting watershed societies (i.e., infrastructure-oriented vs.high-loading societies). In this sub-watershed, river waters were overwhelmingly rich in phosphate because of drastic population increase under the recent economic development and incomplete sewage treatment systems, resulting in the extreme nutrient imbalance and biodiversity loss. Local communities used to utilize communal springs as commons

decades ago. After establishment of tap water systems, however, most of them were degraded due to lack of social norms and morality. The drinking waters are derived from the shallow groundwater, so that the groundwater pollution is the recent concern of matter. Our preliminary inquiry surveys revealed that environmental consciousness of local communities has been distant from the nature of springs and streams under the economic development.

○Project Members

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【Analytical Research Working Group】

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○ Future Themes

With the reduced budget, it is not realistic to practice and compare our watershed governance across all of our study watersheds. Thus we will not conduct intensive field researches in three domestic watersheds (Hachiro Lagoon, Inba Marsh and Lake Shinji) other than Lake Biwa. Based on archives and documents, however, we will examine how governmental politics on development and environmental conservation have affected these four domestic watershed systems and how their social-ecological status have varied among these watersheds through interactions with each other, according to Advocacy Coalition Framework (ACF) as well as to Institutional Analysis and Developmental (IAD) Framework. We expect to find what is a turning point for the watershed governance to drive into the good relationship between humanity and nature through our comparison. If time and budget permit us, we may also use Social-Ecological System (SES) Framework to analyse cross-scale linkages of the natural resource governances within and between watershed systems.

●Achievements

○Books

【Chapters/Sections】

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○Papers

【Original Articles】

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【Oral Presentation】

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・Triño, E. M. C., I. B. B De Jesus, E. M. Peralta, H. J. A. Guerrero, C. G. S. M. Arce, J. J. A. Domingo, M. A. Maute, M. D. S. San Miguel, J. C. A. Briones, F. S. Magbanua, A. C. Santos-Borja, R. D. S. Papa & N. Okuda Biodiversity Assessment of Littoral Macrozoobenthos in Laguna de Bay, Philippines. The 16th World Lake Conference, 2016,11,07-2016,11,11, Bali.

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・Asano S., K. Wakita, I. Saizen & N. Okuda Can the spawn of the Japanese brown frog (Rana japonica, Ranidae) be a local environmental index to evaluate environmentally friendly rice paddies?, 2016,10,17-2016,10,21, Colombo.

・Peralta, E., Batucan L. S. Jr., Briones, J. C. A, F. S. Magbanua, R. D. S. Papa, Magbanua F. S. & N. Okuda Benthic macroinvertebrates assemblages and biological metrics in relation to land cover and environmental factors in Silang-Santa Rosa subwatershed, Philippines. 48th Annual National Convention of the Federation of Institutions for Marine and Freshwater Sciences, 2016,09,21-2016,09,23, University of Eastern Philippines, Catarman.

・De Jesus, IBB, JCB Briones, O Privaldos, Y Uehara, T Ishida, A Borja, F Magbanua, RDS Papa, T Iwata, N Okuda A pioneer in tropical streams: determination of phosphorus and nitrogen uptake in Silang-Santa Rosa Subwatershed, Philippines. 48thAnnual National Convention of the Federation of Institutions for Marine and Freshwater Sciences (FIMFS), 2016,09,21-2016,09,23, University of Eastern Philippines, Catarman.

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・Deborde, DDD, MBM Hernandez, FS Magbanua Benthic macroinvertebrate community as indicator of stream health: how land use affects stream benthic macroinvertebrates. 1st Philippine Symposium on Freshwater Biodiversity and Ecosystems, 2016,06,07-2016,06,09, University of Santo Tomas, Manila, Philippines.

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・Encina, L, TCG Bermejo, RM Madrelejos, KML Viray, EM Triño, IBB De Jesus, HJ Guerrero, EM Peralta, JC Briones, RDS Papa Spatial variability of the trophic structure of littoral zones in Laguna de Bay in association with water physicochemical parameters and nutrient levels. 1st Philippine Symposium on Freshwater Biodiversity and Ecosystems, 2016,06,07-2016,06,09, University of Santo Tomas, Manila, Philippines.

・Magbanua, FS, KA Ortizo Benthic macroinvertebrate communities and water physico-chemistry along two major rivers of Maasim, Sarangani. 1st Philippine Symposium on Freshwater Biodiversity and Ecosystems, 06,07-2016,06,10, University of Santo Tomas, Philippines. 2016,06,07-2016,06,10, University of Santo Tomas, Manila, Philippines.

・Magbanua, FS, LS Batucan Jr. PQ Palomares, ARR Flandez, MBM Hernandez Stream macroinvertebrate community responses to contrasting land use and reduced discharge 1st Philippine Symposium on Freshwater Biodiversity and Ecosystems,. , 2016,06,07-2016,06,10, University of Santo Tomas, Manila, Philippines.

・Hernandez, MBM, KCV Buenafe, JGJ Antonio, JEC Balagtas, JL Gan, ITG Santos, NCA Tamayo, JSH Villa-Abrille, JPM Vilvestre, S Letana, FS Magbanua 1st Philippine Symposium on Freshwater Biodiversity and Ecosystems, Manila, Philippines. , 2016,06,07-2016,06,10, University of Santo Tomas,Philippine.

・Kudo, S., N. Okuda, S. Ohba Male egg-caring is sexually selected in giant water bugs.. ISBE2016 Conference, 28th, 2016,06,03, University of Exeter.

・Saitoh, Y., T. Nakano, K.-C. Shin, K. Yamashita, H. Amakawa, C. Yoshimizu, J. Matsubayashi, Y. Kato, H. Togashi, Y. Amano, Y. Kurita, N. Okuda & I. Tayasu Spatial variation of neodymium and strontium isotope ratios of shellfish soft bodies in the coastal sea of eastern Tohoku District. JpGU Meeting 2016, 2016,05,22-3016,05,26, Makuhari Messe.

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・Ide, J, M Ohashi, K Köster, F Berninger, I Miura, N Makita, K Yamase, J Pumpanen Changes in the quality of dissolved organic matter in soil water with time since last fire in a boreal forest. EGU General Assembly , April 2016, Vienna, Austria.

【Invited Lecture / Honorary Lecture / Panelist】

・Papa, RDS. Science Publicity: Using the Web, mainstream and Social Media. Seminar-Workshop on Technology-enhanced Teaching and Learning, 2016,11,04, College of Science, UST.

・Papa, RDS.Antonio Luna as a student of the University of Santo Tomas. Lecture delivered during the General Antonio Luna 150th Birth Anniversary. Antonio Luna Parade Grounds (Sunken Garden), 2016,10,29, University of the Philippines Diliman. Papa, RDS.Antonio Luna as a student of the University of Santo Tomas. Lecture delivered during the General Antonio Luna 150th Birth Anniversary. 2016,10,29, Antonio Luna Parade Grounds (Sunken Garden), University of the Philippines Diliman.

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- Briones, JCA. EM Peralta. The parasite checklist of Philippine fishes in comparison to mathematically-modelled host/parasite checklists from fish FISHPEST: how many parasites are there really?. 48thAnnual National Convention of the Federation of Institutions for Marine and Freshwater Sciences (FIMFS), 2016,09,21-2016,09,23, University of Eastern Philippines, Catarman, Samar, Philippines.
- Papa, RDS. Lake Taal: Sustaining native biodiversity in the face of aquaculture, climate change, and non-native species. 2016 TVPL Research Summit, 2016,08,04-2016,08,05, NDN Grand Hotel, Santo Tomas, Batangas.
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- Briones, JCA. Fish parasite research in the Philippines: history current state, and recommendations for future directions. The 1st Philippine Symposium in Freshwater Biodiversity and Ecosystems, 2016,06,07-2016,06,10, University of Santo Tomas, Manila,Philippines.

Stage: Full Research

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

Abbreviated Title: Desertification in Afro-Eurasia

Project Leader: TANAKA Ueru

Program 3: Designing Lifeworlds of Sustainability and Wellbeing

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 set as follows: 1) to deepen understanding of the cultural, social and ecological characteristics of targeted areas in Semi-Arid Afro-Eurasia as a premise to study on desertification; 2) to design and verify some practical techniques/approaches effective for desertification control,ecosystems conservation/restoration and improvement of livelihood in the context of rural development support, with paying special attention to vulnerable people and areas left behind in the trend of economic development and globalization; 3) to disseminate the knowledge, experiences and techniques/approaches for desertification control and rural development to local people, local government and aid-organizations.

Background

Desertification is one of the globally concerned problems/issues with complex phenomena related to land degradation and poverty in sub-humid, semiarid and arid areas of Afro-Eurasia. In ratifying the United Nations Convention to Combat Desertification (UNCCD) in 1994, the international community, including Japan,signed its commitment to solve the problems. More than twenty years has past,so far, there have been many efforts made by international organization, local government and NGO. The problems, however, still remain unsolved and become more serious year by year (UNDP, 2003; Easterly, 2006; Tollefson and Gilbert,2012).

Difficulties:Why desertification control have not been successfully achieved and even became worse? It may be explained from the complexity in its causes, social and ecological condition, and diverse livelihoods of local people closely linking with poverty (Mainguet, 1994). As defined in UNCCD (1994), the causes of desertification are both climatic factors and human activities (Geist, 2005;Zdruli et al., 2010). Apart from the climatic factors, such as short and uneven distribution of rainfall, excess and fluctuating rain, and wind (Geist, 2005;Boken et al. 2005), primary 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 (Geist, 2005, O'Brien et al.,2010; Jana and Majumder, 2010). Difficulty of desertification control, it is to be carried out while maintaining the causes, i.e. daily livelihood activities.

Focus:Pillar actions of the implementation for desertification control in the documents of UNCCD (1994) are summarized into 'policy making', 'financial support', 'scientific and technical knowledge', 'capacity building (for officials)', 'education and training (for local people)' and 'extension of technology'. Among them, the most critical action should be 'scientific and technical knowledge', since it is directly reflected to the contents of 'capacity building', 'education and training' and 'extension of technology'. Unfortunately, inadequate understanding and confusion about the concept of desertification (Kadomura et al., 1993) and techniques for desertification control is still remained among researchers. The framework of actions and implementation measures were already established at international and government level. Those at regions and community level are, however, still weak, especially in semi-arid Africa. The project, therefore, puts major focus on the research to create realistic and practical 'scientific and technical knowledge' leading the actions at community level.

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 2016

【General aspects of the project activities】

Project sites

Semi-Arid Afro-Eurasia contains front-lines of desertification in the world (Middletonand Thomas, 1997). This project set the study areas in the Sahel of West Africa(mainly Burkina Faso, Niger and Senegal), Southern Africa (Namibia and Zambia),East Africa (Tanzania), Northeast Africa (Sudan), North Africa (Algeria), South Asia (India) and East Asia (Mongolia and China) where socio-ecological conditions and land resources are deteriorated due to demographic pressure and inappropriate use.

Specific activities at each area

1. West Africa and Northeast Africa(so-called 'Sahel zone' of Africa)

1-a. Extension of some verified techniques of desertification control (Andropogon grass-band system, fallow-band system, extension method incorporated with social-network survey) collaborating with local NGO (Niger)

1-b. Monitoring of soil fertility maintenance and degradation process under different cultivation practices in semi-arid condition (Niger)

1-c. Cross-border migration, social and ecological adaptation and process of community formation (Niger, Burkina Faso and Togo)

1-d. Mechanisms and process of innovation by local people (Burkina Faso)

1-e. Influences of "Islam" in daily livelihood of urban and rural communities (Burkina Faso)

1-f. Background and conditions around street children as a vulnerable existence (Burkina Faso)

1-g. Advisory for aid organizations to make implementation project(Burkina Faso, Senegal)

1-h. Preliminary survey to identify possible area(s)/site(s) for the transfer of some verified techniques (Senegal, Sudan)

2. Southern Africa

2-a. Impact of transformation in local animal husbandry on peoples' livelihoods, communities, vegetation and land resources (Namibia)

2-b. Monitoring of soil fertility maintenance and degradation process under different cultivation practices in semi-arid condition (Namibia)

2-c. Changes of local livelihood activities and land use systems after compulsory trans-migration (Zambia)

2-d. Local rules in utilizing land resources and ecosystems (Zambia)

3. South Asia

3-a. Data-base of indigenous tools, its manufacturing processes, and literature of traditional farming systems to seeking appropriate techniques useful for rural development assistance in semi-arid Asia and Africa (India)

3-b. Co-existence of local livelihoods between the pastoralists and cultivators in highly populated area, Rajasthan and Tamil Nadu (India)

3-c. Seasonal movement of pastoralists and its contribution of soil fertility maintenance (India)

3-d. Preliminary survey to seek possibility technology transfer between India and Africa (India, Senegal)

4. East Asia

4-a. Requisites of resilience mechanisms in the pastoralists' livelihood to reduce vulnerability against natural disaster (Mongolia)

4-b. Indigenous knowledge/techniques of land resource management by pastoralists (Mongolia)

4-c. Preparation of a field experiment for re-appraisal of dry farming techniques described in antique books (China)

5. Inter regional sites

We make comparative studies on 1) Adaptation strategies in agro-pastoral systems between high/low population areas, tropical/temperate climate regions, and cultivation/pastoral system" and 2) Possibility of technology transfer, e.g. land use systems,restoration of degraded land, farming tools and soil management practices in Africa and Asia.

Project activities and the framework of UNCCD

UNCCD has already set the framework for action to address desertification. We focus on 'scientific knowledge' and 'techniques' which may be associated with some shortcomings in the framework. Many techniques employed to control desertification to date, however scientifically sound and rational they may be,unfortunately are often not matched to the needs and situations of local people if, for example, they are too expensive or require too much time or labor. Some techniques are highly dependent on materials and machinery that may not be locally available. Our project modifies such shortcomings and adds more knowledge and techniques through the activities in Semi-arid Africa and Asia. In West Africa the major focus of project work is on collaborating with local people in the innovation of practical desertification control techniques and extension methods, especially related to the livelihoods of vulnerable people. In Southern Africa, basic studies are being developed to describe agro-ecosystems,local livelihood systems, and adaptation strategies under demographic pressure and environmental fluctuation. In South Asia, we have inventoried local knowledge (e.g. indigenous knowledge, techniques and tools), in order to identify pastoral peoples' adaptation strategies in high population areas experiencing fluctuating social and agro-climatic conditions. In East Asia, we re-appraise indigenous knowledge in the traditional upland farming systems. Comparative studies within Africa and between Africa and Asia are also underway in order to evaluate the possibility of horizontal technology transfer.

【Progress】

1. To deepen the understanding of targeted areas in semi-arid Afro-Eurasia

Researches in Africa: Basic information related to social, cultural and ecological characteristics of the targeted areas are were collected. The causes and background of desertification were also identified. We paid special focus on resilience or adaptation strategies of local people against extreme weather(e.g. drought and flooding) and social changes (e.g. influx of refugees and intervention through rural development activities by local government and aid-organizations). We documented the livelihood systems, social relations and coping behaviours during the year of crisis in pastoralists' community in Burkina Faso(Katakura Motoko Award, Association of Arid Land Studies, Y. Ishimoto, 2014), in agro-pastoralists community in Niger (Young Scientist Award, Society of Agricultural Systems, Y. Sasaki, 2013; Best Presentation Award, Society of Agricultural Systems, Y. Komura et al., 2012), and in Namibia (Best Poster Award, Association for Arid Land Studies, K. Teshirogi, 2012). Soil fertility mechanism and its management practices were identified in sandy soils under semi-arid condition in the Sahel(Best Poster Award, 20th World Congress of Soil Science, H. Shinjoet al., 2014). Situation of education and social support for children, including street children, in urban area of Burkina Faso were reported and pointed out that the realities were far different from our general understanding (Superior Presentation Award, African Educational Research Forum, T. Shimizu, 2013). The fact that a time-lag occured in behaviours and decision-making of local people when received external technique, identified in the case of Burkina Faso, was useful information to design rural development approach (Best presentation Award, Society of Agricultural Systems, Y. Machi et al., 2014). We identified some requisites of resilience against extreme weather (flooding) in rural communities of semi-arid Zambia(Poster award, World Water Week 2012, Umetsu et al., 2012). Use of mobile-phones was helpful to the recovery of household economy after flooding(Best Poster Award, Association for Arid Land Studies, Y. Ishimoto et al.,2013).

Researches in Asia: Indigenous knowledge and techniques, which give insights to identify the requisites of social and ecological adaptation of livelihood systems in semi-arid condition, were collected in India. The situation of traditional animal-driven water well, which is almost disappearing, was recorded (Best Poster Award, Association for Arid Land Studies, H. Endo et al,2014). The background of

agrarian changes and livelihood diversification in Tamil Nadu state was explained by recent demographic movement due to overseas and inter-regional transmigration (Best Poster Award, EMASS-2014, M. Jegadeesan et al., 2014). Factors to decide resilience in pastoralists' livelihood found after natural disaster in cool arid environment were identified in the field research in Mongolia (Best Poster Award, Society for International Development Studies, H. Nakamura, 2014).

2. To design and verify some practical techniques/approaches

Basically using local resources and indigenous knowledge, we innovated practical techniques concurrently enabling livelihood improvement and desertification control. Some of them include a bold idea of introducing Indian traditional knowledge to semi-arid Africa, which can be a model example ofso-called 'south-to-south technology transfer' on innovation. As an attempt of 'co-designing' and 'co-working', we involved local people to the process of innovation, demonstration,monitoring and dissemination, and confirmed its validity. Due to the novelty and achievement, the studies were highly evaluated and given many academic awards, e.g. 2012 SSPN Award, K. Ikazaki et al., 2012; Best Poster Award,Society of International Development, U. Tanaka and K. Ikazaki, 2013; Best Poster Award, Society for International Development Studies, Y. Sasaki, 2013; Best Presentation Award, 20th World Congress of Soil Science, K. Ikazaki et al., 2014;Young Scientist Award, Society of Soil Science and Plant Nutrition, K. Ikazaki,2014; Achievement Award for Young Scientists, Foundation of Agricultural Science of Japan, K. Ikazaki, 2014; /Environment Ministers' Award by Hitachi Foundation, Tanaka et al,, 2014; Nikkei Award for Global Environmental Techniques, Tanakaet al., 2015.

Innovated practical techniques: Soil erosion by wind (wind erosion) is one of the causes of desertification/land degradation in semi-arid Africa. In Niger, we made an apparatus to measure wind erosion, revealed its processes,and innovated a prototype technique 'fallow-band system' to control wind erosion and concurrently to improve crop yield. Soil erosion by water (water erosion) is also serious and damage land resources. We devised a practical technique, called 'contour-line of Andropogon', which concurrently enables reduction of soil erosion by water, encouragement of water-harvesting to soil, and increase of household income. The technique is basically a revival one based on some indigenous practices in Burkina Faso, such as Zai (planting pit) and Kukokse (line of grass). Combination of traditional tools from India and cow pea cultivation in pastoral area is useful to conserve soil moisture, convert degraded grassland into productive land, generate household income and, thus, stabilize the livelihood of pastoralists. We modified the method of tree planting under semi-arid environment. Tree planting was one of the standard measures against desertification so far, however, not necessarily effective. Using an indigenous technique 'Zai', the survival rate of planted tree seedlings were drastically improved. Not only innovating practical techniques, we devised an improved agricultural extension method incorporating some steps of 'social network survey' and demonstrated its applicability in Niger.

3. To disseminate the knowledge, experiences and techniques/approaches

The technique 'fallow-band system' was implemented in Niger through JICA Grassroots Project in 2010 through 2013 (http://www.jica.go.jp/partner/kusanone/partner/niger_01.html). Using our research results, Ministry of Environment of Japan published a technical brochure 'Lifestyle and Measures against Desertification' in 2013 (http://www.env.go.jp/en/nature/desert/download/against%20desertification_eng.pdf). One of our technique (fallow-band system) was introduced in the high school textbook published by Geography Teachers' Association of Victoria (GTAV), Australia,in 2016. We made many presentations in Africa, India, Europe, China and Japan.

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○ Future Themes

Since our project is entering its final year, we are accelerating the dissemination of our research results through publications, and international and domestic workshops. For social implementation, we are providing some of the practical techniques developed in the project to the 'Great Green Wall for the Sahara and the Sahel Initiative', an international desertification project initiated by the African Union and other entities. We are also preparing proposals which should be helpful in linking our academic results to specific future social implementations.

●Achievements

○Books

【Chapters/Sections】

- Ikazaki, Kenta 2017,03 Control of Wind Erosion, Loss of Soils, and Organic Matter Using the "Fallow Band System" in Semiarid Sandy Soils of the Sahel. FUNAKAWA, Shinya (ed.) Soils, Ecosystem Processes, and Agricultural Development -Tropical Asia and Sub-Saharan Africa-. Springer, Berlin, Germany.(in press)
- MIYAZAKI H., ISHIMOTO Y., YAMASHITA M., TANAKA U. and UMETSU C 2016 Coping Behaviors with Extremely Heavy Rainfall in Southern Zambia- Comparison between 2007/08 and 2009/10. VASANTHA KUMAR J., RATHAKRISHNAN T., PHILIP H., MURUGAN P.P. and JAGADEESAN M. (ed.) Extension Management Strategies For Sustainable Agriculture Opportunities & Challenges. New India Publishing Agency, New Delhi, India, pp.413-427.
- JEGADEESAN M. and MIYAZAKI H 2016 Deterioration of Tank Irrigation System in Tamil Nadu, India: Socio Economic Factors and Necessary Remedies. VASANTHA KUMAR J., RATHAKRISHNAN T., PHILIP H., MURUGAN P.P. and JAGADEESAN M. (ed.) Extension Management Strategies For Sustainable Agriculture Opportunities & Challenges. New India Publishing Agency, New Delhi, India, pp.255-281.

○Papers

【Original Articles】

・Bakary Sanou, Kimseyinga Savadogo, and Takeshi Sakurai 2017,03 Determinants of Adoption and Continuous Use of Improved Maize Seeds in Burkina Faso. Japanese Journal of Agricultural Economics 19.(reviewed).(Forthcoming).

・TESHIROGI, Koki, YAMASHINA, Chisato, FUJIOKA, Yuichiro 2017,03 Variations in Mopane Vegetation and its Use by Local People: Comparison of Four Sites in Northern Namibia. African Study Monographs 38(1) :5-25. DOI:http://repository.kulib.kyoto-u.ac.jp/dspace/handle/2433/218898.(reviewed).

・Hiroshi Nakamura, Rinchindorj Dorjjadamba, Delgerjargal Sodnomdarjaa 2017,01 The Impact of a Disaster on Asset Dynamics in the Gobi Region of Mongolia: An Analysis of Livestock Changes. The Journal of Development Studies .(reviewed).(in printing).

○Research Presentations

【Oral Presentation】

・Ueru TANAKA Practical agro-ecosystems management with fragile environments in semi-arid Africa under desertification. Japanese - Swiss Ecohealth Colloquium, 2017,01,11-2017,01,12, Basel, Switzerland.

・MIYAZAKI H., K. P. SINGH, UCHIYAMA Y., ENDO H., ISHIMOTO Y. and TANAKA U Pastoralism in Northwestern -Focus on Relationship between Pastoralist and Agriculturist. France-Japan Joint Symposium “Landscape in the Anthropocene″, 2016,12,05-2016,12,08, Fondation France-Japon de l’EHESS, Paris, France.

・Ueru TANAKA Practical soil management techniques for ecosystems conservation and livelihood improvement under fragile environment in semi-arid Tropic. France- Japan Joint Symposium “Landscape in the Anthropocene”, 2016,12,05-2016,12,08, Fondation France-Japon de l’EHESS, Paris, France.

・Oyama, S. Mitigation of Land Scarcity and Resource Conflict between Farmers and Herders in the Sahel region of West Africa. “Land, the State and Decolonising the Agrarian Structure in Africa: A colloquium in Honour of Professor Sam Moyo”, 2016,11,28, University of Cape Town, South Africa.

・MIYAZAKI H., K. P. SINGH, UCHIYAMA Y., ENDO H., ISHIMOTO Y. and TANAKA U Livelihoods of Pastoral community in North West India. International Seminar on “Traditional Knowledge and Heritage of South Asia″, 2016,11,15-2016,11,16, Haryana, India.

・Ueru TANAKA Possibility and significance of the transfer of indigenous farming techniques from India to Africa. International Seminar on “Traditional Knowledge and Heritage of South Asia”, 2016,11,15-2016,11,16, All India Jat Heroes’ Memorial College, Rohtak, Haryana, India.

・Ueru TANAKA and Takao SHIMIZU Practical Techniques for Desertification Control and Livelihood Improvement in the Sahel, West Africa. 12th International Conference on Development of Drylands “Sustainable Development of Drylands in the Post 2015 World”, 2016,08,21-2016,08,24, Alexandria, Egypt.

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・Akinori Kitsuki and Takeshi Sakurai Seasonal Hunger: Heterogenous Impacts of Seasonal Price Changes and Credit Constraints on Seasonal Consumption Patterns in Rural Zambia. Agricultural and Applied Economics Association Annual Meeting, 2016, 2016,07,31-2016,08,02, Boston, MA, USA.

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・UMETSU C., SAKURAI T., YAMAUCHI T., MIYAZAKI H. and MWALE M Climate Change, Agricultural Production and Nutrition: Towards Integrated Policy Design for Food Security. Japan Geoscience Union Meeting 2016, session ″Implementing Geoscience Research for the Earth’s Future, 2016,05,22-2016,05,26, Makuhari, Chiba, Japan.

【Poster Presentation】

・Hidetoshi MIYAZAKI, Yudai ISHIMOTO, Shinichi SETO and Ueru TANAKA Toward effective soil fertility management in the West African Sahel. DesertlandII The 2015 Conference on Desertification and Land Degradation, 2015,06,16-2016,06,17, Ghent, Belgium.

Stage: Full Research

Project Name: Coastal Area-capability Enhancement in Southeast Asia

Abbreviated Title:

Project Leader: ISHIKAWA Satoshi

Program 3: Designing Lifeworlds of Sustainability and Wellbeing

URL: http://www.chikyu.ac.jp/CAPABILITY/

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

○ Research Subject and Objectives

In recent years, there is a growing concern about the deterioration of marine ecosystems and resources. Especially, coastal area ecosystems have rapidly been worsening and destroyed, as they are affected from global environmental changes and intensive human activities in both land and sea areas. Many of those coastal areas holding high biological production supported by high biodiversity are located in tropical zones in developing countries, such as Southeast Asia. In Southeast Asia, coastal ecosystem services have fostered high cultural diversity. Hence, coastal areas are characterized by the close linkage between ecosystem and local people. The coastal area serves are bases of the livelihood of local people, and human intervention is deeply embedded in ecosystem. This linkage enhances the complexity and affects the vulnerability of the ecosystem in the region (Fig.1). However,conservation and management activities originated in temperate zone usually focus particular ecologies and commercial resources with little consideration of how multiple ecologies and livelihood strategies overlap in culturally diverse contexts, and so they cannot be easily applied to tropical coastal areas and there are no alternative theory and method to harmonize ecosystem conservation and rural livelihoods based on their complex intervention importance.

In this project, we are going to investigate the linkage between livelihoods and ecosystem health in coastal areas through holistic field surveys, in order to clarify the environmental problems and its causes based on chemical, biological, ecological, social and human science viewpoints. Then, we conduct several collaborative action researches with local community to solve the environmental problems based on our data and research result. Impact assessments and feedback practices to improve our action researches are performed through town seminars and discussion among researchers and local community.

Although community based participatory research and management actions have been highlighted as alternative trials of top-down management and rural development tool in developing countries, these activities are usually evaluated performance improvement, e.g., income generation, productivity, and cost efficiency. We try to identify key potential factors which enable the performance improvements through details of information and changes of livelihoods, behaviours and minds of collaborating community members and other stakeholders.

We call an integral of the potential factors as “Area-capability” that will be a new concept of evaluation and target for rural development. And our activities can provide how to conduct and evaluate “Area-capability” in research and participatory actions as new approach. Spreading the use and understanding of “Area-capability” may lead us to good relationship between humanity and nature.

Project Framework

To establish Area-capability concept and guideline, we treat three aspects; 1) Ecosystem production mechanisms and dynamics, 2) Development process of local community and environmental governance, and 3) Adaptive Technology and managements (Fig. 2). In order to elucidate these three aspects, we conduct the **holistic field researches** on the southeast Asian coastal areas in order to grasp the linkage between nature and human, and we also conduct **participatory action researches** in collaboration with local communities to verify the feasibility and acceptability of new concept and approach to local societies in Rayong(Thailand), Panay Is. (Philippines) and Ishigaki Is., (Japan)(Fig. 3). We also conduct reference surveys in Bandon bay (Thailand), Hue (Viet Nam), Mikawa bay(Japan)(Fig. 3). All data, information and progresses of the action researches are compiled into the database and reports for subsequent discussions. New concept and approach might be denied from existing academic disciplines as illogical and/or unscientific, however, without new concept that can be recognized by ordinal people

based on their ordinal sensuous and those can change human behaviours toward good interactions between human and nature, global environmental problems would be never solved.

The holistic researches comprise of five components; 1) Environmental survey, 2) Biodiversity survey, 3) Coastal resources survey, 4) Utilization of resources survey and 5) Social survey (Fig.4). Ecosystem production mechanisms and dynamics with identification of the biological and ecological important areas and species for local ecosystem are examined based on the results of Environmental, Biological and Coastal resource surveys using statistical, chemical, stable isotope, and molecular analyses in collaboration with taxonomic study and acoustic survey. Development process of local community, environmental governance and importance of the coastal resources for the local people are examined based on the results of utilization and social surveys carried out through interview/questionnaire surveys and anthropologic surveys. In the social survey, we treat economic condition, time allocation, food supply, education, health condition, participation to the community activities, indigenous knowledge, religious importance, and information gathering situation. Three participatory action researches are conducted; 1) Community-based set-net fishery installation in Rayong (Fig. 5), 2)Community-based re-stocking program in Batan bay in Panay Is. (Fig. 6), 3)Collaboration action among fishery, ecotourism and education in Ishigaki Is.and Mikawa Bay (Fig. 7). In these areas, there are local people's groups which already collaborated with some of our members and several researches on natural resources and livelihood have been conducted. All data and results of analyses were shared among members and localgroups through workshops, seminar and meetings and database in internet.

72 researchers from 17 universities and research institute (12 in Japan, 2 in Thailand, 2 in Philippines, one regional research center "Southeast Asian Fisheries Development Center: SEAFDEC") are participating in this project. They have different expertise and academic backgrounds of oceanography, biology, social science, agricultural sciences, civil engineering, economy, policy study, anthropology and area study.

The concept of "Area-capability" will be concretized and the guideline of its approach will be compiled based on the all experiences and achievements. And the guidelines will be informed and disseminated through ASEAN-SEAFDEC mechanisms and International Symposiums.

Future tasks

FR3:

In the third year of full research, we continue the interdisciplinary field surveys and collaborative action researches and analyses for collecting data and information of the linkage between human and nature.

Around Rayong beach in Thailand, we evaluate the negative impacts of oil spill accident on environment and livelihoods of local people. To do this, material flows and nutrient concentration along the Rayong beach will be conducted. We collect water, soil and biological samples from the beach and analyse them in RIHN. Biodiversity and food web survey will be performed based on the stable isotope and genetic analyses using the biological samples. Livelihoods and fishery activity survey including trading and marketing will be also conducted through interview and observation surveys of Set-net fishermen group and other villagers using the questionnaire and GPS. Statistic data and information, aerial photographs will be collected in recent 10 years for understanding the land use and demographic changes. All data and information including the analytical results are compared with former data that we had obtained in FR1 and 2. Besides, behaviour and minds changes of Set-net fishery group members will be examined to identify the effects from community based activity on social capitals, interests of environment, livelihoods, and management of natural resources.

Around Batan bay in Philippines, we investigate the extent of damage from super typhoon on ecosystem, buildings, infrastructure, health and minds, sense of values, community and businesses.

We will collect water, soil, mangrove, and aquatic organisms' samples around Batan Bay for nutrients and pollution evaluation. We will conduct chemical and stable isotope analyses of them in RIHN. We will record the extent of damages on mangrove forests, paddy fields, buildings, infrastructure, fishing gears, aquaculture ponds around Batan Bayand we will evaluate the relationships between geographical situation and damages concerning with the typhoon path. And we conduct interview with local people to get some information of evacuation actions and assistance each other and from governments. We will conduct stock evaluation of shrimp in the bay and conduct stock enhancement through community based

intermediate aquaculture with local community. We record the attitude, comments and behaviour the participants to the stock enhancement in order to identify the key factors of their collaborative activity.

In Ishigaki Island, Japan, we will make underwater map and material flow analyses of the island using stable isotope analysis. And we evaluate the food web and population structure of fish around the island to evaluate the linkage of materials between land and sea. These results will be informed to local people through town seminar and other workshops,to facilitate the conservation activity and future develop planning of the town.

We will elucidate the population structure of fishery important fish in South China Sea using genetic analysis to identify the management units of them, and grasp biodiversity of this area. In addition, we try to improve acoustic survey system which can be used in shallow sea area and to disseminate this system for ASEAN countries through workshops and publication of manuals.

○ Progress and Results in 2016

Achievements of holistic surveys

1) Environmental survey:

To grasp environmental conditions, we measured temperature, Dissolved Oxygen, pH, chlorophyll a Particulate organic matter (POM), Sedimentary organic matter(SOM), and nutrients (NO3, NH4), Acid volatile sulphide (AVS), ignition loss, Phytoplankton and mangrove biomasses at Rayong and Bandon in Thailand, Batan in Philippines, Mikawa in Japan during both rainy and dry seasons. Land use changes we reexamined by satellite image analyses have been conducted at Batan in Philippines and Bandon in Thailand. Concentration of 52 micro elements of water and soil samples collected from Batan and Rayong, were measured by Inductively Coupled Plasma Mass Spectrometry (ICP-MS), 7500cx (Agilent Technologies Inc.)in RIHN. All results were put on the GIS to identify biological ecological important areas. Food webs and material cycles were evaluated using stable-isotope analyses at Rayong, Batan and Bandon

2) Biodiversity survey:

In Southeast Asia, biodiversity including the taxonomic knowledge of fishery species are still unclear. So, we conducted taxonomic study through specimen collection making and genetic studies. We collected fish specimen of 1811 individuals from Philippines, 538 individuals from Thailand, 268 individuals from Malaysia.These specimens were recorded and donated into University of Philippine Visayas Museum and Thailand National Science Museum. For standardization of specimen collection, we published “Fish Collection Building and Procedures Manual,English edition” and “Fishes of Northern Gulf of Thailand”.

Using collected fish specimen, we analysed genetic diversity and differences of 7 fishery important species based on the mt DNA COI sequences analyses, and we identified the plural reproducible populations of Atule mate,Megalaspis cordyla, Rastrelliger kanagurta, Gerresfilamentosus in Southeast Asian Sea. For the more detailed genetic population identification, micro satellite DNA markers which can be used for various fish species were established using Next generation DNA analysing machine. Besides, species identification system based on the morphological features using photographs is now under construction. It can be easily identify the fish species using photographs by ordinal persons and this system will cultivate the interesting of biodiversity for ordinal persons.

3) Coastal resources survey:

To stock assessment of coastal fishery resources, new acoustic survey equipment and system were developed. Using this new system, fish stock assessments in Rayong we recarried out. Then, these data were used for the training course at Kasetsart University in Thailand for undergraduate students in collaboration with Southeast Fisheries Development Center.

The new buoyance control system of underwater robot was developed. And portable under water monitoring robot was made. This underwater robot was used for underwater ruins surveys and educational workshops for high school students in Ishigaki Is. in collaboration with Ishigaki city.

4) Utilization of resources survey

To understand the linkage between natural resources and livelihoods of coastal area, we conducted interview and observation survey using GPS system to collect data about fishing gear, fishing areas and operation, and target species, cost and benefit of 13 households in Rayong, 24 households in Batan. We

also collected weather conditions, and are analysing the impact of weather conditions on local fishermen's lives and their adaptations.

5) Social survey

In order to clarify the relationship among social situation, cultural regulation, job opportunity, social capital, and management of natural resources, we conducted household interview survey to collect information of jobs, time allocation, communication, compliance, health condition, educational background, community bonds etc. of 117 households in Rayong and 467 households in Batan. Besides, economic systems including funding, transportation, price making systems and market access were evaluated in both areas.

Achievement of action researches

1) Community-Based Set-Net Fishery in Rayong,Thailand:

Community-based Japanese-type Set-net fishery has been installed in Rayong. The community conduct management and maintenance of fishing gears and their own fish shops. All data of operation, fish catch and incomes have been recorded. Our project member input several technical supports for the management and operations. The transformations of fish catch, price,markets, and behaviours of community members and non-members who are living in Rayong were recorded.

2) Cooporative Stock Enhancement in Batan Bay,Philippines

Community-based stock enhancement of shrimpis conducting in Batan Bay. Intermediate shrimp aquaculture and surveillance have been conducted local community. Project member provide technical supports for aquaculture and monitoring environments.

3) Collaboration between Eco-tourisim and Fisheriesdevelopment in Ishigaki-Mikawa , Japan

Town seminar was held in collaboration with Junior Chamber International Japan, Yaeyama branch. We discussed how to harmonize conservation of coastal area and tourism development. And educational workshops for high school students in Ishigaki Is. was held in collaboration with Ishigaki city.

Generalization and concept development

To facilitate interdisciplinary discussions and activities, data sharing system through internet was established and the international seminar was held at Philippines in 2012 and at Thailand in 2013.To identify the key factors of "Area-capability", workshops were held in Japan,and five axes for evaluation of potentials of Area-capability, 1) Ecosystem health supported by biodiversity and biomasses, 2) Knowledge and interests of peoples on ecosystems, 3) Governance situation, 4) Strength of People's network and community, 5) Contacts between human and nature, were identified,tentatively.

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○ Future Themes

FR4:

Regarding the community based set-net fishery impacts on environment and social development, we will compiles the case study results as an installation manual books with good example of Rayong. We will publish the evaluation manual of stock enhancements for harmonising between environments and rural development based on the case study of Hamana Lake in Japan. And the technical guide book of the shrimp stock enhancement will be also published in English.

We will record the processes and changes of the environment and social aspect around Batan Bay in Philippines based on the field survey. And shrimp stock enhancement will be continued with the measurement of stock status and livelihoods changes.

Key factors identification of potentials for good practices in which people care the environment and their livelihood improvements, will be discussed on the workshops based on the data and information

FR5:

Regarding the impacts of community based stock enhancement on environment and social development, we will compiles the case study results as an installation manual books with good example of Batan Bay. Key factors of high resilience against natural disaster will be identified based on the records and data from Batan Bay area and the results will be published as a guide books for rural development. And all data, information and results, we try to clarify the "Area-Capablity" and publish a book of What is Area-capability, the concept and practices. And we will hold an international seminar of Area-capability as a new concept for evaluation of rural development with harmonizing conservation of environment to disseminate this new concept and approach.

Stage: Full Research

Project Name: Lifeworlds of Sustainable Food Consumption and Production: Agrifood Systems in Transition

Abbreviated Title: FEAST Project

Project Leader: Steven R. McGreevy

Program 3: Designing Lifeworlds of Sustainability and Wellbeing

URL: http://feastproject.org/

Key Words: agrifood transition, sustainable food consumption and production, foodshed mapping, participatory backcasting, Asian food ethics, social change, social practice

○ Research Subject and Objectives

Research Objectives and Background

Agrifood systems in Asia face a myriad of sustainability challenges related to declining environmental health (GHG, resource overuse, pollution, soil fertility), loss of diversity (biological, cultural, knowledge), and the deterioration of small-scale farming due to globalizing market forces (Wegner & Zwart 2011, McIntyre et al. 2009). On the consumption side, over-reliance on globalized food flows limit consumer agency and decrease food security and sovereignty, while diets composed of more processed food create public health impacts (rise in diabetes, obesity) (Carolan 2011, Ezzati et al. 2005, ICN2 2014) . The ways in which food is provided, consumed and governed need urgent change, but we lack real understanding of how agrifood transitions emerge and take root (e.g. Bui et al 2016), and the role of existing and alternative institutions and policy (e.g. Meadowcroft 2011), social practices (e.g. Horlings 2015, Shove et al. 2012, Spaargaren 2011), and economic arrangements in advancing sustainable transitions (D'Alisa et al. 2014, Infante & Gonzalez de Molina 2013).

In setting out to address these research gaps, the FEAST project takes a transdisciplinary approach to explore the realities and potential for sustainable agrifood transition at sites in Japan, Thailand, Bhutan, and China with significance for the entire region. We analyze patterns of food consumption, food-related social practices and their socio-cultural meanings, consumer-based agency to change deeply held-cultural notions and regional food systems, and food system mapping specific to national, regional, and local production, distribution, and consumption contexts. Building upon that work, we partner with stakeholders to vision plausible futures and to initiate food citizenship-oriented experiments and actions. FEAST co-designs and co-produces socially-robust knowledge and mechanisms that challenge mainstream economic thinking on consumption and growth, work to redefine the notion of long-term food security, and engage society in a public debate on our relationship with food and nature that questions shared beliefs and values to reacclimatize consumers as citizens and co-producers in the foodscapes around them.

Through these processes, FEAST will contribute to a growing body of research that merges the literatures of sustainable food consumption (iPES-Food 2015, Lykke Syse & Lee Muller 2015, Reisch et. al 2013) and social transformation/transitions (Grin et al. 2010, Spaargaren et al. 2012).

Research Methods and Organization

FEAST will produce four types of knowledge relevant to catalyzing agrifood transitions: 1) contextual knowledge of contemporary global, national/regional, and local food systems (production, distribution, and consumption); 2) co-produced visions of alternative food consumption and production practices and municipal transition plans identifying research, education, and policy needs; 3) modeling and scenario-based knowledge to inform coinciding deliberation and planning processes; 4) and knowledge related to three intervention strategies: collaborative, bottom-up consensus building networks for ethical local food policy, and market transparency-oriented information-providing tools that are codesigned at the local (eco-label) and national levels (food impact data and smartphone app). A significant portion of the research is transdisciplinary in nature and many final outputs are geared for public use, enabling the project to have real-world impact beyond the five-year research period.

The project is arranged into five "working groups" (WG), each with its own "work package" to carry out over the five year period.

Working groups

1) Food System Mapping & Modeling - produces statistical and spatial information on context contemporary food systems and food consumption, how food production, distribution, and consumption impact the environment and society, and provides insight into how we might eat in the future for all of the research sites.

2) Collaborative Approaches for Food Ethics, Citizenship, and Behavioral Change - investigates sustainable agrifood transitions through participatory approaches and future visioning toward new local food governance (civic food networks, food policy councils) and food ethics in Japan, and by analyzing contemporary and alternative social practices for sustainable food consumption in Japan (Kyoto, Nagano, Akita), Thailand (Bangkok), China (Beijing), and Bhutan (Thimpu).

3) Agroecological Production Strategies in Policy and Practice - explores the emerging paradigm of agroecological production as a plausible future for Japan and Bhutan through the lenses of national and regional agricultural policy and expansions of/shifts in producer strategies and practices.

4) Co-designing Agri-food Eco-branding Tools for Supporting Sustainable Regions - co-designs tools - food labeling, corporate-social responsibility, and carbon valuation- for integrating ecologically sound production practices with unique market support structures to revitalize rural communities in Kyoto, Japan and Shanghai, China.

5) Food Chain Transparency - works with key stakeholders in the food industry to compile and develop data on the environmental, social, and health impacts of food products, develop an interactive smartphone app that provides access to these "backstories," and gauge the response of consumers and industry.

Each WG employs a host of interdisciplinary methodologies that are well-established -geographical information systems (GIS), life-cycle assessment (LCA), social statistics, ethnography- and also further develops new and innovative methods practice-oriented participatory backcasting (Davies et al. 2014), participatory gaming and visioning (e.g. Vervoort et al. 2010), and the creation of new sustainability assessment tools (holistic local food security) and indices.

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○ Progress and Results in 2016

Each project working group (WG) made progress during the FR1 period.

WG1: Food System Mapping & Modeling

The research question driving WG1's FR1 research was "What are the major drivers of, and environmental impacts from, the gaps between "observed food flow" (ie. current food systems) and "potential foodshed" (ie. potential food system)? Work began to answer this question in four sites, Kyoto and Kameoka Cities (Kyoto Prefecture), Noshiro City (Akita Prefecture), Nagano City (Nagano Prefecture, and Chiang Mai (Thailand), with the majority of the effort placed on Kyoto. Two general food system "types" were identified: 1) long chain food flow systems comprised of producer, wholesaler, processor, retailer, and consumer actors; and 2) short chain food flow systems emphasizing direct linkages between producers and consumers, and non-conventional agricultures. Evidence on the evolution of the food distribution in Japan indicated that long chain food flow systems can be further divided into a traditional wholesale market segment and a "modern" segment comprised of large-scale buyers (sogo shosha) and retailers. Data sets detailing the linkages between producers and wholesale markets, as well as between firms and international agents within the "modern" segment are being compiled and analyzed, with firmer results to come in 2017. To supplement this data, a limited set of actors linked to the wholesale markets in Kyoto (traders, retailers, and government officials) were interviewed to better understand their economic and social contexts, and motivations. Further analysis is needed into the diversification and increasing complexity of long chain food flows in Japan and their linkages throughout Asia, in particular the relationship between large buyers and the traditional wholesale market. GIS and satellite imagery is used to map informal urban food production, such as vegetable plots and gardens, as well as changes in urban agricultural land in Kyoto City. This analysis showed a decrease of 14.7% agricultural land by area, which affects the potential for urban food production. A survey of the potential of rooftop agriculture in Kyoto is also in the process of being designed.

WG2: Collaborative Approaches for Food Ethics, Citizenship, and Behavioral Change

WG2 is interested in three themes: 1) the development of civic food networks and policy organizations; 2) how these private networks become legitimized in the public sphere as policy-making bodies; and 3) transitions in food practices in everyday life, now and in the future. Themes 1) and 2) are mainly focusing on the Japanese context, while 3) will be investigated in Japan, Thailand, China, and Bhutan. WG2 takes a transdisciplinary approach in investigating these themes and also catalyzing activity with societal actors. Fieldwork was conducted at sites in North America (Toronto, Canada and Knoxville, USA) to profile and analyze one form of civic food network (CFN) -food policy councils (FPC)- to better understand the preconditions, possibilities, and restrictions for the emergence and success of CFN. Tachikawa et al. reviewed these cases in a paper "Food Policy Councils in North America: Their Trend and Implications" and pointed out potential barriers for FPC establishment in Japan, including the lack of a galvanizing food issue with broad consensus to motivate citizen-consumers (2017). Review of domestic initiatives organized around food policy issues, the history of these initiatives' development, and hints for successful implementation is currently underway. Initiating one component of

a series of planned transdisciplinary interventions, members of WG2 collaborated with local government and local food system actors in Noshiro City, Akita Prefecture for three closed workshops and one public forum. The workshops used forecasting and backcasting exercises to imagine possible and ideal futures related to the local food environment and are meant to serve as a platform to catalyze CFN development in Noshiro - dialogue, interview, and various forms of "homework" data are being analyzed to measure how attitudes and perspectives changed for workshops participants and allow for research on how private networks become legitimized in the public sphere as governing or decision making bodies. Further workshops are scheduled for next year in Noshiro, Kyoto/Kameoka, and for Nagano in 2018.

WG3: Agroecological Production Strategies in Policy and Practice

WG3 is concerned with the future of food production and is exploring elements of agrifood transitions toward agroecological production at various sites in Asia. Specifically, WG3 looks at the ways in which 1) transition is fostered or hindered through agricultural policy (at global, national, and regional scales) and 2) how agroecological production practices change or resist change in the midst of agrifood transition. A variety of different entry points into these two themes are used to critically examine the range and breadth of issues relevant to agroecology in Asia. A comprehensive review and comparison of national and regional policy support structures to encourage young farmer success in Kyoto and Kentucky, USA, was conducted following fieldwork - the existence of direct payments and contributions to creating communities of interest were determined to play a major role in the success of beginning farmers. Further analysis of agricultural policy to promote agroecological production is scheduled for 2017 - this includes a critical look into Globally Important Agricultural Heritage Systems (GIAHS) in Japan. Exploratory fieldwork at three GIAHS sites in Japan (Wakayama, Gifu, Miyazaki) also set the stage for a deeper exploration of the changing practices of food producers and how these practices are being conserved. Similarly, the practice of seed saving in Japan is being investigated to better understand the relationship between crops, skills, knowledge, and culture, and how and why various groups are keeping the practice alive.

WG4: Co-designing Agrifood Eco-Branding Tools for Supporting Sustainable Regions

WG4's research is concerned with conducting innovative experiments for supporting the sustainable development of small-scale farming and farmer livelihoods via carbon offsetting techniques and co-designed marketing schemes. Studies on the 1) economic and 2) ecological feasibility of carbon offsetting production practices with an accompanying branding scheme (COOL VEGE®) were initiated in Kameoka City, Kyoto to prepare for co-designing workshops to take place in 2017-2018. Confirming what has been found in the literature, a random survey (n=756, 37.8% response rate) of citizens living in Kameoka revealed that motivations for purchasing COOL VEGE® products were because they was locally-sourced and looked fresh - the fact that the products were environmentally-friendly scored much lower. These findings, as well as findings from an international review of existing food sustainability branding and labels, will be used in citizen workshops to assist with the co-design of localized sustainable agriculture indices. Further analysis of other forms of agricultural carbon sequestration and availability of local biomass for biochar production will also compliment these workshops. Preparatory work was conducted to initiate field trials of biochar amended vegetables in Shanghai, as well as a survey to gauge receptivity of Chinese consumers to accept ecofriendly products versus products that are assured to have a high food safety standard.

WG5: Food Chain Transparency

WG5 strives to 1) measure the environmental and social impacts of food products (especially those with global linkages) and 2) disseminate this information to the public through a smartphone app to improve food chain transparency for the Japanese food market. Through eight broadly attended meetings, four teams were created (seafood, agriculture & meat, processed food, and app design/consumer behavior). Each team is composed of experts from academia and the food industry to collaborate on data architecture and organization. LCA data on the top 10 most popular seafood species, 54 fruits and vegetables, and 8 sources of animal protein are in the process of being calculated in the first year. A review of existing food transparency smartphone apps and the practice of mobile-assisted shopping was also conducted.

General Achievements

For the most part, the research progressed to the extent that was expected. In conjunction with research progress, other achievements include 1) the completion of comprehensive work package research plans to guide the research and provide common understanding among diverse project members; 2) the arrangement of four agreements with both municipal governments and research institutions to be completed in short order. We expected more time for collaborative writing amongst project members, but this proved difficult as transdisciplinary research requires significant time for communication, coordination, and management with societal partners.

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○Project Members

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○ Future Themes

Plans for next year

This section is used to highlight only a small portion of the planned work for next year.

Ecological footprint of regional and municipal food systems and food consumption– linking demographic trends and precariousness

The ecological footprint for the food system in Kyoto City as well as per capita ecological footprint of food consumption as a function of diet is currently being analyzed (results in 2017). To expand this work, household expenditure data will be used to gain further insights into the breakdown, distribution, and scale of ecological footprint amongst various social groups (gender, age, income bracket) to appreciate the degree to which demographic factors and footprints are related to socio-economic precariousness.

Mapping personal foodsheds: Who feeds me?

Food means different things to different people and embodies relationships with others, society at large, and cultural norms. Building on a large-scale (n=1300) questionnaire and spatial survey of consumer eating habits in Kyoto, Noshiro, and Nagano, semi-structured interviews and participant GIS mapping will be used with individuals and households to explore the spatial, social, and psychological dimensions of their personal foodsheds and food lifeworlds.

Sustainable food consumption: Transitions in practice and everyday life, now and in the future

Along with overseas partners at Mahidol University, Renmin University, Royal University of Bhutan, and Wageningen University, WG2 has co-developed a research plan on contemporary experiments and possible futures for sustainable food consumption practices and provisioning in Japan, Thailand, China, and Bhutan. Phase 1 of 4 is scheduled to begin next year in Thailand and Japan, with China and Bhutan to follow in 2018. The first phase involves a series of focus group interviews and brainstorming activities to elicit plausible visions of three food practices 30 years in the future– food purchasing, cooking at home, and eating out. Phases 2 through 4 involve the creation and evaluation of future practice scenarios, and backcasting frameworks for education, research, and policy needs to reach them.

Exploring innovative urban food security practices through co-designed serious games

Utilizing interactive games, or serious games, in participatory settings has the potential for robust mutual learning and empathy-building, as well as the co-creation of innovative re-configurations of existing structures and practices in society. A series of serious games are in development and food system stakeholders from Kyoto will use the co-designed game interface to collect, explore and combine innovative urban food security practices in a way that creates insight and value for participants.

Evolving agroecological practices, farmer livelihoods, and traditional knowledge

In order to understand how production practices are changing under conditions of agroecological rural development in a developing world context, fieldwork and ethnographic research of shifting production practices will begin in earnest next year in Bhutan. Bhutan is unique in that organic agriculture is being promoted heavily at the national level- but what does this mean for farmer livelihoods, practices, and knowledge (as well as impacts on the Bhutanese food market and consumers). At the same time, similar work will begin at Globally Important Agricultural Heritage (GIAHS) sites in Japan, with particular emphasis on the Wakayama GIAHS site known for plum and charcoal production.

Contributions to academic societies

-FEAST has organized five sessions on "Food system transitions" with contributions from over 25 scholars at the Association of American Geographers Conference (April 2017, Boston). An edited volume is planned.

-A FEAST-organized symposium at American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America Annual Meeting (October 2017, Tampa) is now being planned.

-FEAST members will attend a National Socio-Environmental Synthesis Center (SESNYC) funded workshop near Washington D.C. for the development of the Research and Engagement Plan for the Systems of Sustainable Consumption and Production Knowledge Action Network under Future Earth. FEAST contributed to the application of SESNYC funding and was pleased to receive it.

●Achievements

○Books

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○Research Presentations

【Oral Presentation】

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・Kobayashi, Mai Bhutan's Gentle Transition:Organic Agriculture, the Changing Face of Seed Procurement & Food Security. The Second International Conference of the Sustainable Consumption Resaerch and Action Initiative (SCORAI), , 2016,06,15-2016,06,17, University of Maine, Maine, USA.

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・Taniguchi, Yoshimitsu Noshiro no Shokuno Miraizou wo Egaku: Transition Workshop no Houkoku (Envisioning food for the future of Noshiro: Report on Transition Workshop). 17th RIHN Regional Collaboration Seminar , 2016,12,05, Plaza Miyako, Noshiro City, Akita. (in Japanese)

・Tolentino, Lutgarda L. Where are we Up to in Understanding Food Systems in Asia?. International Seminar: Political Ecology of Sustainable Food Consumption and Production: Emerging Perspectives in Asian Countries, 2016,09,19, Hasanuddin University, Makassar, Indonesia.

・Tsuchiya, K., Hara, Y., McGreevy, S. Who feeds us? Building GIS integrated analytical toolkits for food systems localization (Hara). The Second International Conference of the Sustainable Consumption Research and Action Initiative, 2016,06,15-2016,06,17, University of Maine, Maine, USA.

【Invited Lecture / Honorary Lecture / Panelist】

・Rupprecht, C. D. D. Toshi to Shizen no Kankei: Shoku kara Miru Ikimono no Kizuna (The relationship between city and nature: bonds between living beings seen from food). Class Lecture for “Introduction to Environmental System Studies,″ Doshisha University, 2016,05,27, Doshisha University, Kyoto. (in Japanese)

Stage: Pre-Research

Project Name: Toward the Regeneration of Tropical Peatland Societies: Transformability of Environmentally Vulnerable Societies and Establishment of an International Research Network.

Abbreviated Title: Tropical Peatland Societies

Project Leader: MIZUNO, Kosuke

Program 1: Societal Transformation under Environmental Change

URL:

Key Words: Peatland, Tropical peatland societies, Rehabilitation, Environmental vulnerability, Transformability

○ Research Subject and Objectives

a) Research objectives and background,

The destruction of tropical peat swamp forests is a major contributor to global greenhouse gases and an urgent international health crisis in Southeast Asia. It is estimated that about 20 percent of global soil carbon (89Pg) is accumulated in tropical peat swamp forests (Page et al. 2011), which are primarily found in Southeast Asia (76 percent of the world's total). Carbon dioxide (CO2) emissions from fires in Indonesia during July to November 2016 exceeded CO2 emissions from fossil fuel use in Japan during the whole of 2013 (http://www.globalfiredata.org/updates.html).

Due to their physical characteristics, tropical peat swamp forests have been difficult to utilize, and therefore spared from development for a long time. However, drainage associated with plantation development of fast-growing and oil palm trees has led to a decrease in groundwater table levels and the drying of peat swamp forests. This in turn has resulted in an increase in (CO2) emissions by peat decomposition, and frequent fires (Hirano et al. 2009, 2012, 2014). In Indonesia alone an estimated 2.1 million hectares of forests, most of them peatlands, were burned in 2015. The resultant haze caused incalculable damage to the economy and has impacted the health of not only local people but also those as far away as Malaysia and Singapore. In 2015, 0.5 million people in the region were diagnosed with upper respiratory infections, and child asthma rates continue to rise. Haze has become a trans-boundary environmental, economic, and political issue.

In Indonesia most peatland is classified as state land. State appropriation of forests that originated centuries ago has created contested, overlapping, and insecure forest tenure conditions (RRI 2008, RRI 2012, Sunderlin, Hatcher, and Liddle 2008, White and Martine 2002). Companies that were given concessions in peatland areas developed plantations, roads, and canals under weak state regulations, attracting people to move in. As plantations were established, the peat swamp dried up, became degraded, and the fires began.

How can society develop institutions to control and manage these fires and mitigate degradation? Our research project will conduct transdisciplinary research of the social ecological systems in tropical peatlands to understand and address their vulnerabilities. Through collaboration with local stakeholders, the research will integrate scientific findings with local practices to establish mitigation and adaptation strategies in order to achieve sustainable (low carbon) use and conservation of peatlands. Ultimately the project intends to elucidate the transformability of environmentally vulnerable societies.

b) Research methods and organization,

This project treats peatland degradation as a global environmental problem that needs to be understood in its social and ecological contexts. Therefore our project will conduct transdisciplinary research based on the considerations and realities of peatlands societies.

1) The Social, Corporate, and Governance Group will conduct field research on the socioeconomic aspects and historical background of peatland societies. Study will focus on livelihood

strategies, land tenure, and resource use to identify factors that cause peat degradation, and work with local institutions and organizations at the village level to establish mitigation and adaptation practices such as paludiculture (Sustainable peatland livelihood activities). National, subnational, and local governance structures, private company initiatives, and environmental finance mechanisms such as REDD+ and PES will be reviewed for efficacy.

2) The Material Cycling and Ecosystem Group will conduct intensive multi-disciplinary research, particularly on water and material cycling, in several representative peatlands in Southeast Asia for the integration of natural and social scientific mapping to better understand peatland ecosytems. The group will create a "Tropical peatland characteristics map" based on hydrological, geophysical, and social information of peatlands for integrated management.

3) The International Research and Implementation Hub Group will establish an international research and implementation collaboration hub for coordinating research and integrating experiences on sustainable peatland management. This group is comprised of Asian and European universities, and international and local organizations. Coordinating partners include Riau University and Bogor Agricultural University in Indonesia, the University of Malaysia, Sarawak, the Research Institute of the Peruvian Amazon (IIAP), UNDP, CIFOR, Walhi, AMAN, and Sawit Watch.

c) Evidence of the feasibility of Full Research.

In January 2016 the Indonesian Government established the Peatland Restoration Agency to restore degraded peatland, and set the target of restoring two million hectares of peatland by 2019. Collaborating with the Indonesian Peatland Restoration Agency is one of the most important and effective ways to contribute to peatland restoration in Indonesia, because the agency is the focal institution to promote restoration efforts among domestic and international organizations. Our project has therefore strengthened relations with the agency through issuing a joint statement of collaboration, conducting international seminars, national seminars, and Focal Group discussions.

We have started the research for the peatland restoration at Meranti District, Riau Province, Indonesia based on the MOU mentioned above. Besides these activities, we have continued research activities on a variety of topics in Bengkalis and Siak districts, Riau Province and also in South Kalimantan, using various methodologies. We have already published one book that has been reviewed by many media, including leading international academic journals.

○ Progress and Results in 2016

We introduced the practice of rewetting and forestation in peatland areas in 2010 in Bengkalis District, Riau Province. This experiment site attracted significant attention, especially in 2015 when fires and haze became very serious. Through this experiment site, international seminars, and publishing a book, we have informed the public about the potential of rewetting and forestation as a solution to regenerate peatland.

Due to outrage about the peatland fires in 2015, the government responded to the disaster by mobilizing the army, punishing fire starters, and halting any new peatland development permits. These measures were urgently needed, but provided only short-term relief. The public has demanded more long-term and sustainable measures. Rewetting and reforestation is one such measure.

In January 2016 the Indonesian Government established the Peatland Restoration Agency to restore degraded peatland, and set the target of restoring two million hectares of peatland by 2019. On April 25, 2016, the Peatland Restoration Agency issued a joint statement with RIHN and Kyoto University to collaborate for the restoration of Indonesian degraded peatland. On August 10, 2016, the Peatland Restoration Agency, RIHN, Kyoto University, and Hokkaido University signed an MOU to conduct action research to restore degraded peatland. On December 15, 2016 RIHN and Kyoto University witnessed the signing of a joint statement between the Indonesian Peatland Restoration Agency and JICA to conduct peatland restoration programs. We have conducted international seminars, national seminars, and focal group discussions in collaboration with the Indonesian Peatland Restoration Agency.

We started research on peatland restoration in Meranti District, Riau Province based on an MOU signed among RIHN, Kyoto University, and the Indonesian Restoration Agency. We will conduct a 100-hectare restoration project at this site, and establish a model demonstration site in collaboration with JICA.

We started a field survey to research livelihoods and ecological resource use in the local communities of Meranti. We found from the pilot survey that in peatland forests owned by local people, residents had several methods of conserving the peatland and preventing fires. We found apparent differences in peatland conservation among various areas. We have also found that in areas where acacia plantations dominate have badly degraded peatlands that experience frequent fire. The plantation companies have kept the water during the dry season, so the peatland around the area is dried out.On the other hand, the watersheds of the forest kept by people without acacia plantations is protected, keeping the peatland well wet and preventing fire. These findings will inform the next steps in identifying practical solutions.

Beside these activities, we have continued to conduct research in Bengkalis and Siak districts in Riau Province and also in Central Kalimantan, using various methodologies and covering various topics. We published one book, titled Catastrophe and Regeneration in Indonesia's Peatlands: Ecology, Economy and Society (Kyoto-CSEAS Series on Asian Studies 15, Singapore: National University of Singapore Press;Kyoto:Kyoto University Press).(1) The book has been reviewed by many media, including leading international academic journals.

We conducted frequent fieldwork to investigate current environmental conditions in peat swamps in Indonesia, comparing intact peat swamp forest, drained peat forest, and burnt peat areas after frequent peat fires in Central Kalimantan and Riau province. Our findings showed that the sequence of deforestation, drainage, and peat fire can dramatically change the carbon cycling. They also suggest that once the forest is lost, it is almost impossible to recover the forest environment unless countermeasures are taken. We also conducted a peat burning experiment in the laboratory to clarify the character of air pollutants that peat fires produce. The publication of the results of this experiment in a notable international journal was the first such report about Southeast Asian peat.

Our method of rewetting and paludi culture, especially the planting of wet peatland indigenous trees, was created through fieldwork and intensive discussions with local people. Many people have both abandoned peatland plots and plots for cultivation; we proposed planting indigenous wet peatland trees on the abandoned land. We collaborated with local people to rewet the abandoned peatland and today the planted trees are growing well. People are able to maintain their livelihood by cultivating the land while at the same time doing non-agriculture work, and therefore will grow trees without receiving subsidies. According to our findings, although both state and non-state lands have been burned, non-state land owned by local people is better managed, partly due to the weak land rights of those managing state lands.We found a direct correlation between stronger land rights and better land management. Livelihoods and land rights are the key social issues for the trial of peatland restoration. We will therefore continue to study the nexus of these issues.

○Project Members

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OSAKI, Mitsuru (Hokkaido University,Professor)
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○ Future Themes

We continue to study peatland degradation and restoration. Based on these studies, we explore the overarching concepts that are relevant to global environmental science. Two such concepts are those of environmental vulnerability and transformability. Peatland is vulnerable both environmentally and socially. Damage to peatland is ecologically irreversible: once it is made use of, subsistence begins, and it can not be restored if the land is rewetted. Drying peatland for cultivation leads to frequent fire. Historically peatland areas were not settled, as they are not suitable for agriculture. Most peatland is state land that is not well managed and where the government has granted large scale concessions. Compared with areas that have a history of rural settlements and established communities, peatland society has accumulated less social capital. These conditions have led to the social vulnerability of peatland society. Such kinds of environmentally and socially vulnerable societies are found globally in environmental border areas, like those between the desert and nondesert, high altitude mountainous area, and highly dried area. Restoration of peatland is regarded as one form of the transformation of a vulnerable society. We investigate this transformability from the viewpoints of material, water, and air cycle studies, and livelihood,

community, company, and governance studies. By using the concept of the transformation of a vulnerable society to integrate our studies, we will to contribute global environmental studies.

●Achievements

○Editing

【Editing / Co-editing】

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【Oral Presentation】

・SHIODERA, S. Species composition and environmental factors of grasslands developing on the burnt peatlands in Sumatra. 15th International Peat Congress 2016, 2106,08,15-2016,08,19, Pullman Hotel, Kuching, Sarawak, Malaysia.

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・KOZAN, O. "Transboundary Air Pollution issue and Tropical Peatland Management in Indonesia". e-asia Bio-energy Workshoip -Green and Renewable Energy Technology for Sustainable Environment-, 2016,10,31-November 2016, Family Boutique Hotel, Vientiane Capital, Lao P.D.R.

・MIZUNO, K. Tantangan dalam pengembangan komoditas dari tanaman ramah gambut untuk peningkatan kesejahteraan masyarakat di wilayah gambut. Kick-Off Seminar 'Pengembangan Nilai Tambah Komoditi RamahGambut dan Kesejahteraan Masyarakat Lokal', 2016,10,13, Bogor, Indonesia.

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Stage: Pre-Research

Project Name: The Sanitation Value Chain: Designing Sanitation Systems as Eco-Community-Value System

Abbreviated Title: Sanitation

Project Leader: Naoyuki FUNAMIZU

Program 3: Designing Lifeworlds of Sustainability and Wellbeing

URL: http://www.chikyu.ac.jp/sanitation_value_chain/

Key Words: resources oriented sanitation; value chain

○ Research Subject and Objectives

Global environmental problem discussed in the project:

In the project, the word "Sanitation" is used for showing the provision of facilities and services for safe disposal and resources recovery of human urine, faeces and wastewater. Sanitation is essential for promoting health, preventing environment pollution, conserving ecosystem, and recovering and recycling resources. Therefore, it can be said that sanitation is closely related to such current global issues as poverty, urban slum, conservation of ecosystem, and resources management. In developing world, population is growing rapidly especially in urban slums and they have still high under 5 mortality and poverty issues. It also reported that 2.4 billion people are still using unimproved sanitation facilities, including 946 million people who are still practicing open defecation in 2015 (UN, 2015). On the other hand, depopulation and aging are progressing especially in rural area of developed world, and the financial capability of municipality which is a management agency of sanitation system is becoming weaker and weaker.

Key question in the project:

Namely, the question, "How can we handle the waste from 10 billion people in future" and "how can we achieve water and sanitation target in SDGs?" are a global environmental problem to be solved.

Working hypothesis of the research:

Hypothesis-1: Current sanitation issues are caused by the dissociation between the value which is provided by the sanitation system and the values of the individual people and/or the community of the people.

Hypothesis-2: Sanitation technologies can't work well without support system. The mismatch between prerequisites of technologies and local characteristics makes sanitation issues more complicated.

Key concept - Sanitation Value chain:

The project is proposing Sanitation Value Chain, which has the following basic policies: 1) Put values of people and community in the center of discussion, and prepare sanitation system to drive this value chain; 2) Design the sanitation system by focusing on direct incentive for individual users and community; 3) Recognize a sanitation system as an integrated system with social and technical units; 4) Design the sanitation system by making a good matching between social characteristics and prerequisites of technologies.

Why Value Chain? :

We are strongly thinking that 1) Planning and installation of infrastructures such as sanitation system is nothing but planning and installing value chain; and 2) Because of weakening of municipalities, the prerequisites of current management model for water and sanitation system will be no longer satisfied in future.

Goal of the project:

Accordingly, the goals of this research project are to: 1) propose the concept of Sanitation Value Chain as relevant to both developing and developed countries; 2) design several pilot studies demonstrating the significance of societal, academic, and professional involvement in the co-creation of this value chain; and 3) contribute to the establishment of a new interdisciplinary academic foundation regarding sanitation. The examples of the sanitation value chain will be demonstrated and co-created at pilot study sites.

Three research topics to achieve the goal :

In Topic -1(Life and Sanitation),field and literature surveys are performed 1)for analyzing values and Happiness of people;2)for understanding norm to human excreta of current situation as well as historical change; 3)for re-evaluating the value of sanitation system; 4)for analyzing the mismatch between prerequisites of sanitation technologies and regional specific characteristics of human and community by gathering failed cases; 5)for understanding historical change of sanitation system in target areas; and 6)for matching the values of people, community and value provided by sanitation system. In Topic -2(Technology), four research activities are planned: 1)summarizing prerequisites of sanitation technologies; 2)re-evaluating the value of sanitation system; 3) analysing the mismatch between prerequisites of sanitation technologies and regional specific characteristics of human and community by gathering failed cases; 4) developing required technologies. In Topic-3 (Co-creation of sanitation value chain), the following three steps will be adapted: 1) Identifying stake holders and understanding the structure of values of people and community by field survey; 2)Analyzing hierarchy and structure of stakeholders' value chain and evaluating their mutual affinity; 3)Developing the co-creation process.

Pilot sites:

The project performs the field study at 1) the rural area in Ishikari River Basin; 2) the rural area in Burkina Faso; 3) the urban slum in Indonesia; 4) the rural area in Indonesia; and 5) the urban slum in Zambia. FS+PR study has already shown the tentative plans of sanitation value chains for Ishikari ; for Burkina Faso; and Indonesia.

○ Progress and Results in 2016

In 2016 fiscal year, we performed FS study(from April to July) and PR study (from August). We have performed field surveys at Lusaka (Zambia), Bandung (Indonesia) and Furano (Ishikari, Japan);international symposium in Indonesia with LIPI; researcher meetings at Hokkaido University; the joint seminar with RIHN.

Achievement-1:Preparation for FR study

Lusaka(Zambia) (1)Field survey(August - October, 2016): We evaluated the slums of the Lusaka region from the perspective of regional centers, schools and health centers, and selected the following three candidate sites for field survey: Chawama, Garden, Kanyama. Field surveys in Kanyama clarified the current situation of sanitation. One third of households in this area don't have toilet.And Cholera outbreak occurs every year. We made interviews to about 320 people in these areas. Results of the survey are: 1)Although the government asks people to install a toilet, most of houses don't have a toilet (the toilet construction cost is about 3,000 Kwacha; 2) the hospital has a division for handling regional hygiene and health, free hand washing soap and chlorine for water disinfection are distributed. (2) Formulation of on-site research team: In Zambia team, Dr. Zulu, Dept. of Public Health& Education has become a local supervisor. Also, facilitators that summarize the three districts and youth facilitators are selected for each district.

Bandung(Indonesia) (1) Field surveys (8/28~ 9/30, 11/16 ~ 11/26): We made surveys with the help of the neighborhood association in Sukapura district 02, Chiara Chon-dong. The questionnaire surveys, focus group discussions, and interviews were conducted, and we analysed housing, economic, hygiene circumstances; concerning social circumstances; values and judgments of people. 31 married women at first survey, about 200 residents at second survey cooperated. Results of the survey are:1) "Food expenses" is the first expenditure from expenditure information, but the second place is dispersed as "medical expenses""educational expenses" "utility expenses"; 2) Neighborhood association is functional; 3) There are two types of toilets, shared and private owned toilet. There are also toilet with "only holes" and"only scaffolds"; 4) Wastewater is discharged to buried pipe, side groove, river without treatment; 5) Residents' decision making structure of toilet replacement was estimated by questionnaire.

(2) Establishment of on-site research team: We established a cooperative relationship with the president of the town, the executives of the neighborhood association,women's group PKK, principals and teachers of Babakan · Sienar elementary school in Chiara Chon-dong, In addition, a cooperative relationship with the regional community organization of the bio-gas project and the tofu manufacturing organization, which is a major industry in the local area, was newly established for rural areas (Gurjaja village of Smedan province). At the symposium on value chain held in Indonesia, we were able to establish a network with local toilet related NGOs, health researchers and LIPI researchers.

(3)Technical Aspects: We summarized the verification points of technologies (compost toilets, transport system, and agricultural use) for reusing compost at rural area.

Ishikari(Japan) (1) Relationships with actors on water and sanitation: We have made cooperative relationships with Furano City, Minami-Furano Town, NPO "Doronko" Outdoor School, Hokkaido Government Water Supply Department, and Companies on technologies.

(2)Material and value flows analysis of actors:We interviewed a couple of the neighborhood association chiefs and the farmers in Minami Furano Town and Furano City, and tried to visualize the person - value - material flows in the area. (3) Summary of agricultural reuse of sludge from wastewater treatment in Iwamizawa: We tried to visualize the cooperative structure practicing between sanitation side and agricultural group.

Achievement -2 : Video materials for Sanitation Education Program

We are strongly recognizing the importance of the visual image for expressing our research outputs to several actors. We have released the video material on the You-tube for Sanitation Education Program by using the resources of Hokkaido University on sanitation (https://www.youtube.com/channel/UCcDLZXSBauZWQSGE29x7lYg). This lecture series give the discussions on the resources oriented sanitation from the several point of views such as social aspect, technical aspects, agricultural aspects. We have also organized the TD visualization Group as new sub-group.

Achievement - 3: International symposium and joint seminar

We organized "The first International Symposium on Green Technology for Value Chains 2016" (Indonesia, 3rd-5th October, 2016).RIHN and Hokkaido University joint seminar was conducted twice. Title of the first seminar in June was "Value Chain in Regional System". The title of the second seminar in October was "Learning the future of the community and the environment from Innovative Farmer".

Achievement - 4: Collaboration with projects at RIHN

As well as the joint seminar, we have established collaboration with the "Knowledge Bridge" project in RIHN on the Ishikari area. In order to promote the institutional collaboration on visualization of research outputs, we have built collaborative relationships with members of the Core program in RIHN.

Achievement - 5: The external fund

We have succeeded to obtain the external fund(Title: Transition to regional autonomous next-generation type water infrastructure management system. Source:The Cabinet Office "Strategic Innovation Creation Program (SIP)""Infrastructure Maintenance / Update / Management Technology" (JST Management, Period: from September, 2016 to March, 2019)

Achievement- 6: Reinforcement of social science side in the project

Responding to PEC comments, researchers on social science are invited to the project, and topics on social side are added.

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○ Future Themes

Project management: During the FS + PR study,the project whole research plan has become clearer. It is necessary to clarify the research tasks of individual researchers further.

Research on urban areas: Regarding the sanitation value chain in the area of urban area with population growth and slum formation, 1) it is necessary to consider the value of the community in addition to the individual value chain. This is due to the diversity of slum populations. 2) We also need to consider how to consider the significance and value of public health and environmental conservation.

Prerequisites of sanitation technologies: We recognize that the prerequisite conditions of sanitation systems should be assessed not only from technical said but from social side.

Field survey: We did not conduct any concrete activities this fiscal year in Burkina Faso, taking into account the security situation.Therefore, the establishment of the research system is delayed. Also, We

got the prospect of adding the Latin America region this fiscal year, but We need to set up specific research goals and establish a research system for this area.

●Achievements

○Books

【Authored/Co-authored】

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○Papers

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○Research Presentations

【Oral Presentation】

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・Shimizu T, Nakao S, Ito M, Kobayashi H BARTHOUX, Samuel Past and Present in Japanese African Studies: A case of chronical transformation of Kassena's mud houses and families. Séminaire CRAA-ETRE, 2016,12,08, Centre Inde Salle.

・Hayashi K Landscape of the African rainforest for the Baka hunter-gatherers in the eastern Cameroon. France- Japan Joint Symposium “Landscape in the Anthropocene” Fondation France-Japon de l'EHESS, 2016,12,07, Paris.

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- Ikemi, M. Sanitation and income improvement by local community as sustainable participatory development. International symposium on Green Technology for Value Chains 2016, 2016,10,04, Banten, Indonesia.
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・Shimizu T Local Knowledge of Water Measures in Semi-Arid Region and Proper Technology: Cases from West Africa. Global Environmental Studies · JSPS Nairobi Research Contact Center "And the Asia-Africa collaboration to deal with desertification and regional development approach", June 2016, Kenya, Nairobi. (in Japanese)

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・Tanaka U, Shimizu T Idea box to improve desertification and lifestyle improvement in West African semi arid region. System Agriculture Society, June 2016, Fukuoka. (in Japanese)

・Shimizu T Surprise, Learning and Encouraging: From the Relationship between Researchers and Survey Targets in Desertification Studies in the Sahel Region. Earth and Planetary Science Association, May 2016, Makuhari. (in Japanese)

・Shimizu T Islamic Education System - From the Case of Burkina Faso. The 17th Africa Educational Research Forum, April 2016, Nagoya. (in Japanese)

【Invited Lecture / Honorary Lecture / Panelist】

・Hidenori Harada Fecal exposure and pathogenic Escherichia coli in developing contexts: cases from a Vietnamese village and a Bangladeshi slum. Life Science Talk, Life Science Discipline, 2017,01,08, Khulna University.

・Hidenori Harada Pathotyping of Escherichia coli isolated from community toilet excreta and stored drinking water in a slum in Bangladesh. Sandec Seminar, 2016,10,18.

・Funamizu N The sanitation value chain: Its concept and new research collaboration project. International Symposium on Green Technology for Value Chains 2016, 2016,10,04, Banten, Indonesia.

Stage: Feasibility Study

Project Name: Proposal and verification of the validity of isotope environmental traceability method in environmental studies

Abbreviated Title:

Project Leader: Ichiro Tayasu

Core Program

URL:

Key Words:

○ Research Subject and Objectives

We consider that water security, food security and environmental security are fundamental to the sustainability of human society in a changing world. In this project, we hypothesize that environmental traceability is a key concept in solving environmental issues for various stakeholders. For example, one certainly refuses to drink well water if it is obvious that the water comes from polluted drainage. Environmental traceability is an extension of the metaphor. However, it is usual that cause-and-effect relationships or even correlations are unclear. Stable isotope ratios of elements, together with the concentrations of elements, can trace a matter flow, the environmental condition of sites, ecosystem structure and food products. Spatio-temporal variation of multiple isotope ratios can be used for studying the earth systems from local to global point of view. The information may serve as a key for local people to consider water security, food security and environmental security, which are fundamental for the sustainability of human society, in terms of global viewpoint. Multi-isotope approach has successfully been applied to many previous projects in RIHN. Furthermore, the fact that RIHN is equipped with advanced isotope ratio mass spectrometers and elemental analysis systems confirms the advantage of adopting the approach and developing a new type of application of isotope tools for transdisciplinary approach.

How to use the environmental traceability concept is a methodology that we seek to establish in this study. However, how to use the methodology in the transdisciplinary point of view is not well studied so far, and we hypothesize the process should be different among the stakeholders, especially “who” considered the approach is applicable to the environmental issue. “Multi-Isoscapes” (use of multiple elements and multiple isotope ratios, and GIS based mapping technique), interview, workshop and questionnaire are methods for adopting environmental traceability in a given environmental issue.

In this project, we test if the environmental traceability concept is valid in environmental studies, I) Effectiveness of the environmental traceability concept, and II) Comparison with food traceability. For the research I), we test if there are any differences among three types of initiatives, (1) decision makers (2) citizens, and (3) researchers, in transdisciplinary research process by using environmental traceability methodology. For the research II), we test if to what extent are the two types of “traceability concept” different between food traceability and environmental traceability.

○ Progress and Results in 2016

We visited all of the research sites together with the researchers, collaborators and citizens, depending on the specificity of sites. We reviewed the current situations of the potential research sites and extracted the main focus on the concept,which is environmental traceability. Then, we hypothesized the existence of three different types, depending on the initiatives of either decision makers,citizens, or researchers. We call this research as Research I. For this purpose, we collaborate with mainly with the Nutrient-Cycling project (PI:Prof. Okuda) and the Nexus project (PI: Prof. Endo). We also started collaborations with citizens in Chikusa river watershed in FY2015. Some of the members are belong to Future Earth community. We presented the research results of FY2015, and made co-design workshop for 2016 on 19 June 2016. The participants showed further interest and made collaborative study, which was done on 7 August 2016.

We conducted a sampling campaign in Ono area at the end of July. Profs. More and Tayasu attended the water cycle and a spring water culture recovery propulsion liaison council on 22 November 2016. We made a stakeholder workshop about water quality in Toyooka City on 27 October 2016 in collaboration with Prof. Kikuchi in the ILEK project led by Prof. Sato. We measured δ34S of vertebralsection and

87Sr/86Sr ratios of otoliths in an anadromous salmon species, Oncorhynchus masou, in collaboration with Prof. Sasaki in the Small-scale economics project led by Prof. Habu (Matsubayashi et al.,submitted). We discussed how to apply the "Multi-Isoscapes" in environmental science with Prof. Bowen, University of Utah at ISOECOL2016 conference in Tokyo in April 2016.

In the fiscal year 2016, some other possibilities of collaboration were proposed and we categorized the proposals into three according to the research I typology. Oshino Village in Yamanashi asked us to study water path to the famous eight ponds called "Oshino Hakkai", which was categorized as type 1. A high school teacher would like to study groundwater in Fushimi area in Kyoto City, which was categorized as type 2. A small symposium was held to study Noto peninsula using "Multi-Isoscapes" with the members of Institute of Nature and Environmental Technology, Kanazawa University on 3-4 November 2016, which was categorized as type 3.

We also discussed the concept of environmental traceability with Prof. McGreevy, who is leading the FEAST project. The project considers a sustainable agrifood system, focusing on the mutual understanding of food consumption and production. The project applies co-design and co-production process by multi-stakeholders. In the discussion with the project members, we noticed the similarity and difference of the two types of "traceability concept" between food traceability and environmental traceability. We hypothesized the environmental traceability would bridge the producers and consumers by the conceptual framework of elemental cycles. We call this research as Research II.

○Project Members

◎ TAYASU, Ichiro	(Research Institute for Humanity and Nature,Professor,Developing environmental traceability methodology)
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SHIN, Ki-Cheol	(Research Institute for Humanity and Nature,Assistant Professor,Developing environmental traceability methodology)
KONDO, Yasuhisa	(Research Institute for Humanity and Nature,Associate Professor,Developing GIS platform for environmental traceability methodology)

○ Future Themes

The Core project is designed to work collaboratively with research project members in RIHN, outside of RIHN, and various stakeholders. Thus, the Core project is not an independent project. During the FS, we have developed collaborative relationships with the research teams about feasibility of the methodology. The most important point of the project is strong connection with local researchers and various stakeholders, including local government, local students, citizens, NPOs, and so on. The researchers and stakeholders in the research sites already have a potential interest in collaborations, therefore, it is considered the Core project FR is ready to start in FY2017.

Stage: Feasibility Study

Project Name: Visualizing and filling gaps of knowledge information between actors in the research to solve social issues

Abbreviated Title: Knowledge Bridging

Project Leader: Yasuhisa Kondo

Core Program

URL: https://www.slideshare.net/yaskondo/

Key Words: Open science, transdisciplinary research, bridging agents, actors

○ Research Subject and Objectives

1. The contents of the theory and methodology which the Core Project seeks to establish

This Core Project develops a methodology for the effective combination of computation tools and workshop techniques to visualise and overcome knowledge information gaps between societal actors involved in solving a socio-environmental issue through participatory action research. To this end, this Core Project analyses the reasons for the occurrence of such gaps obstructed collaboration, and tests the Knowledge Bridging Model, in which the concept of Open Science (OECD 2015) to widely open the scientific knowledge systems to society is integrated into the transdisciplinary (TD) approach comprising co-design of research agenda, co-production of knowledge, and co-dissemination of outcomes with societal stakeholders (Mauser et al. 2013). This research model divides societal actors into external experts and on-site parties including both active and inactive stakeholders (see the figure). Both parties open and share data and knowledge information, intermediated by bridging agents, who facilitate exchange of not only formal knowledge that is explicitly verbalized but also accompanying implicit knowledge (Nonaka and Takeuchi 1995) to enhance mutual understanding for the acquisition of new perspectives and decision-making for solving the socio-environmental issue.

2. Necessity, utility, and the background of the theory and methodology to solve global environmental issues

It is important for a collaborative solution to contemporary socio-environmental issues to foster mutual trust through mutual learning and understanding through equal dialogue between diverse societal actors, including researchers joined who possess the knowledge system of science and humanities, decision makers (such as governmental agents and leaders) bringing the knowledge system of governance, and industries, non-profit organisations (NPOs), and residents who carry the local knowledge system. It is also noted that pro bono workers, or skilled volunteers with technical knowledge such as programming and social design, have increasingly participated in this process. They, along with the wide acceptance of the concepts of open data and open source, which allow free secondary processing and redistribution of information resources.

In reality, however, mutual understanding may be hindered by the gaps between different actors in the recognition of issues, interests, values, and available knowledge information resources. Particularly, the knowledge information gap between the external experts (outgroup) who leave when a collaborative project terminates, and the on-site parties (ingroup) who must continue to commit the issue even after then, could be the most serious. The multi-layered ingroup-outgroup relationship, between researchers in the humanities, social sciences, and natural sciences, or between active stakeholders with strong interest to the issue and uninterested silent majority for instance, may make gaps more complicated. To unravel this wicked complex of gaps and facilitate issue-driven research, it is an urgent issue to establish a methodology that effectively shed light on the cause of knowledge information gaps and to effectively combine tools for information visualisation and dialogue according to the nature of the relationship between actors.

When actors based on different knowledge information backgrounds collaborate to solve socio-environmental issues, it is necessary to set common upper-level goals even if the gap is not resolved. To establish dialogue for target setting, bridging agents who facilitates the exchange of different knowledge information are demanded. Such a bridging agent may belong to external experts as science

communicators and data librarians, or on-site parties as researchers in residence. It is necessary to understand diverse roles and functions of bridging agents.

○ Progress and Results in 2016

1. Research Organization

This Core Project was a joint proposal from the Information Resources Division of the RIHN Center, with integrating the former three Core Project FSes in FY 2015--the Open Science Core FS proposed by Kondo, the Knowledge Informatics Core FS proposed by Sekino, and the Ontology Core FS proposed by Kumazawa.

The FS focused on investigating trends and developing the research organisation to build a fundamental theory on how and why knowledge information gaps between actors occur and how we can overcome them. At the Core Project/Program meetings on 4 October and 7 November 2016, the above-mentioned questions were examined from the viewpoints of philosophy (Abe), social psychology (Nakashima), NPO and scientists (Wang), and science communication (Kano). In addition, Kondo interviewed researchers specialised in workshop design and political science, as well as companies and NPOs interested in socio-environmental-issue-driven enterprise. An international collaboration with a project team of the Stockholm Resilience Center (Tengö et al. 2014) was established through an intensive discussions with Eduardo Brondizino, an Invited Scholar of the RIHN.

Regarding the theoretical and practical linkage between Open Science and TD, a RIHN-NII joint unconference-style meeting was held on 3-4 September 2016 with the attendance of Kitamoto, Kazuhiro Hayashi and researchers of the RIHN Center, and obtained the results described in the next section. The predictions will be validated by the Japan Open Research Data Survey of the NISTEP, conducted by Ikeuchi and Hayashi, followed up by the NISTEP-RIHN-NII joint unconference held on 27-28 January 2017.

Regarding the relationship to existing research projects, we undertook intensive collaborations with the Climate Adaptation History Project, the Nutrition Cycling Project, and the Sanitation Project in the fields described in the Section 2. This Core Project inherits the outcomes of completed projects through interviews with the project leaders and researchers, which revealed the presence of bridging agents in each project, exemplified by researchers in residence (identified by the Integrated Local Environmental Knowledge Project), practical farmers (identified by the Desertification Project), and drivers of the Area Capability Cycle (identified by the Area Capability Project).

2. Results

The review of literature and the dialogue with researchers from the above-mentioned researchers resulted in obtaining the following notes and predictions:

1) Both researchers and pro bono workers fall under the category of external experts.

2) It is particularly important to overcome the gap identified between external experts and on-site parties.

3) It is important to identify the role of bridging agents and tools as these agents are always present at socio-environmental issue-driven projects.

4) Bridging agents can be a team. They can also be an ‘evangelist’ (in the sense of information technology industry) to promote the new research model through directing projects with budget and personnel discretion.

5) The concepts of TD can contribute to a better development of the Open Science.

6) Researchers’ uneasiness in disclosing their data is a major obstruction to the promotion of Open Science.

7) As in the case of the TD, bridging agents are also demanded to bridge between data producers and users in the context of Open Science.

3. Feasibility toward Full Research

This Core Project focuses on the flow of knowledge information resources between societal actors facilitated by bridging agents and the application of the concept of Open Science to the knowledge exchange between external experts and on-site parties. The review of existing research on the cause of knowledge information gaps and the identification of the roles of bridging agents have progressed, while analysis of the multi-layered structure of on-site parties and knowledge information gaps in-

between them remains limited. However, as the collaboration with RIHN's research projects and researchers have been established and is concrete, we self-evaluate that this Core Project is ready for FR.

○Project Members

◎	KONDO, Yasuhisa	(RIHN,Associate Professor,Project managemet; theory development; dialogue tools; data visualization)

Theory Group

	ABE, Hiroshi	(Kyoto University,Professor,Theory development)
	HAYASHI, Kazuhiro	(National Institute of Science and Technology Policy,Senior Research Fellow,Open science)
	IKEUCHI, Ui	(University of Tsukuba,PhD student,Open science)
	KANO, Kei	(Shiga University,Associate Professor,Theory development)
	KITAMOTO, Asanobu	(National Institute of Infirmatics,Associate Professor,Open science)
○	KUMAZAWA, Terukazu	(RIHN,Associate Professor,Dialogue tools; data visualization)
	MURAYAMA, Yasuhiro	(National Institute of Information and Communications Technology,Director,Open science)
	NAKASHIMA, Ken'ichiro	(Hiroshima University,Associate Professor,Theory development)
	OSAWA, Tsuyoshi	(Institute for Agro-Environmental Sciences,Senior Researcher,Open science)
	SATO, Kenichi	(Kyoto Sangyo University,Professor,Dialogue tools)
○	SEKINO, Tasuki	(RIHN,Professor,Data visualization)

Practice Group

	ASANO, Satoshi	(RIHN,Project Researcher,Liaison to the Nutrient Cycling Project)
	FUNAMIZU, Naoyuki	(Hokkaido University/RIHN,Professor,Liaison to the Sanitation Project)
	HAYASHI, Koji	(RIHN,Project Researcher,Liaison to the Sanitation Project)
	KAMATANI, Kaoru	(RIHN,Project Researcher,Liaison to the Climate Adaptation History Project)
	NAKATSUKA, Takeshi	(RIHN,Professor,Liaison to the Climate Adaptation History Project)
	OKUDA, Noboru	(RIHN,Associate Professor,Liaison to the Nutrient Cycling Project)
	USHIJIMA, Ken	(Northern Regional Building Research Institute,Researcher,Liaison to the Sanitation Project)
	TAYASU, Ichiro	(RIHN,Professor,Liaison to the Environmental Traceability Project)

○ Future Themes

1. Research Question

The Feasibility Study (FS) verified the need to identify the functions and roles of bridging agents and tools to visualise and overcome knowledge information gaps for solving socio-environmental issues, as described in the Section 5. Therefore, the Full Research (FR) focuses on this issue through cooperation with RIHN's research projects, and systemises the methodology for selecting appropriate tools according to the type of gap. In the course of FR, the validity of the Knowledge Bridging Model is tested.

2. Research Method

a) Understand the cause of the knowledge information gap between actors, and build a fundamental theory on the strategy to overcome the gap through a general review of philosophy, social psychology, and science theory.

b) Formulate the theory to integrate open science and TD based on the international trends.

c) Develop techniques to promote dialogue for mutual understanding and trust between actors.

d) Develop tools for visualising knowledge information gaps between actors.

e) Apply the Knowledge Bridging Model to specific issues of RIHN's research projects. The progress of the research is documented by means of participatory observation and interviews to identify bridging

agents and their roles and to evaluate the effectivity of the selected tools. The projects are classified into the following four types by the mode of transformation towards balanced participatory action research in which the co-leadership of external experts and on-site parties is established to enable the co-design of research agenda.

1) Transformation from intradisciplinary to interdisciplinary research;

2) Transformation from interdisciplinary to participatory action research;

3) Transformation from external-expert-led participatory research to balanced participatory action research; and

4) Transformation from on-site-parties-led action research to balanced participatory action research.

3. Research Organization

The research organisation of this Core Project consists of a Theoretical Study Group and a Practical Study Group.

A. The Theoretical Study Group is organised based on collaboration with external researchers and RIHN Center, and is subdivided into the following groups:

A-1. Theory for knowledge information gaps. The knowledge information gaps between societal actors are studied from the viewpoint of philosophy by Hiroshi Abe (Kyoto University), social psychology by Kenichiro Nakashima (Hiroshima Univ.), and the theory for science and technology for society by Ge Wang (Japan Science and Technology Agency) and Kei Kano (Shiga University).

A-2. Theory for Open Science. Asanobu Kitamoto (National Institute of Informatics; NII) develops the practical theory, whereas Yasuhiro Murayama (National Institute of Information and Communications Technology) reviews international trends. Kazuhiro Hayashi (National Institute of Science and Technology Policy; NISTEP) reviews trends in national policy, and Ui Ikeuchi (Tsukuba University) surveys the situation in Japan.

A-3. Techniques for dialogue. Kondo and Kumazawa develop the technique of unconference, or a meeting in which themes of group talk are decided by attendees of the day. Kenichi Sato (Kyoto Sangyo University) develops the technique hatenathon (questioning workshop). These techniques are developed through the general review of other techniques of stakeholder workshops such the Future Design (Saijo 2015) and innovation workshops such as ideathon and hackathon.

A-4. Tools for Information visualisation. Tatsuki Sekino (RIHN) develops the object-activity diagram to visualise a chain of causes and results of socio-environmental issues. Terukazu Kumazawa (RIHN) develops a technique to visualise a common understanding of the issue based on the ontology engineering. Yasuhisa Kondo develops the technique of the participatory GIS to visualise the spatio-temporal patterns of socio-environmental phenomena with societal actors. These tools are designed to facilitate the dialogue between actors.

B. The Practical Study Group is organised based on the collaboration with RIHN's research projects to verify the effectiveness of the Knowledge Bridging Model, with applying the above-mentioned tools and techniques according to the mode of transformation towards balanced participatory action research (the detail will be explained in the presentation). Kondo, Kumazawa, and Kaoru Kamatani (RIHN) documents and review the practical process through participatory observation and interviews.

B-1. Transformation from intradisciplinary to interdisciplinary research is tested by the Climate Adaptation History Project (Takeshi Nakatsuka) to visualise and overcome the gap between climatologists, and Japanese archaeologists and historians. The effectiveness of the model is verified by the case studies of the deployment of open data and data papers from ecology (Tsuyoshi Osawa, the Institute for Agro-Environmental Sciences) and archaeology (Kondo) to related fields of research such as mathematical biology.

B-2. Transformation from interdisciplinary to transdisciplinary research is also tested by the Climate Adaptation History Project to enhance public awareness and interests to the long-term climate change, mega-hazards, and human reactions to them.

B-3. Transformation from external-experts-led to balanced participatory action research is tested by the collaboration with the Sanitation Project (Naoyuki Funamizu and Koji Hayashi) in cooperation with the Hokkaido Research Organization (Ken Ishijima) and local actors (to be identified) to shift the

local water supply system into a small-scale and sustainable system in the Ishikari River Basin, Hokkaido, Northern Japan.

B-4. Transformation from on-site-parties-led to balanced participatory action research is tested by the collaboration with the Nutrient Cycling Project (Noboru Okuda and Satoshi Asano) to promote the reuse of the waterweed removed of Lake Biwa, east of Kyoto, as compost in collaboration with the Shiga Prefectural Office, pro bono workers, and local community members, with promoting the engagement of 'silent majority' residents and volunteers to form a wider community for sustainable use of removed waterweed as a regional environmental resource. A collaboration with the Isotope Core Project (Ichiro Tayasu and Takanori Nakano) also contributes to developing a community of sustainable monitoring of underground water by local residents and NPOs, aided by participatory mapping of multi-isoscapes (or multi-element isotope landscape) in Ohno City (Fukui Prefecture), Sayo Town (Hyogo Prefecture), and other places in Japan.

3. Research Schedule

FR1 (FY 2017)

a) Hold the kick-off meeting (at RIHN in April/May 2017) attended by all project members to share the goals and plan of this Core Project.

b) Employ a project researcher no later than July 2017. This researcher will be in charge of coordinating research with the associated projects and document the process of research in collaboration with the core members.

c) Commence the collaborative works described in Section 2.

FR2 (FY 2018)

d) Continue the collaborative works.

e) Hold the mid-term meeting (at Hiroshima University in the summer of 2018) to review the progress of the project.

f) Prepare drafts for the theory and methodology for overcoming knowledge information gaps between actors in socio-environmental-issue-driven research.

FR3 (FY 2019)

g) Finalize the collaborative works.

h) Hold the final meeting (at RIHN in late 2019) to summarise the results of the project.

i) Edit and publish the above-mentioned textbook.

j) Plan the passing on of the Knowledge Bridging Model to the RIHN Center, projects, and community of RIHN and beyond.

●Achievements

○Papers

【Original Articles】

・Yasuhisa Kondo, Takehiro Miki, Taichi Kuronuma, Yuichi S. Hayakawa, Kyoko Kataoka, Takashi Oguchi 2016,08 Concurrent and sustainable development of a local-scale digital heritage inventory through action research at Bat, Oman. Journal of Cultural Heritage Management and Sustainable Development 6(2) :195-212. DOI:10.1108/JCHMSD-01-2016-0005.(reviewed).

・Hiroshi Abe 2016 A 'cosmopolis' as the foundation for understanding cultural differences. Neuroscience and Biomedical Engineering 4(3) :169-173. DOI:10.2174/2213385204666161102153357. (reviewed).

○Research Presentations

【Oral Presentation】

・Yasuhisa Kondo, Atsushi Noguchi Best practices and challenges in promoting open science in archaeology: two narratives from Japan. 45th Annual Conference on Computer Applications and Quantitative Methods in Archaeology (CAA), 2017,03,14-2017,03,16, Georgia State University, Atlanta, USA.

・Yasuhisa Kondo Grand design of the PaleoAsia DB, a holistic site database of the PaleoAsia project. The 1st Conference on Cultural History of PaleoAsia, 2016,11,05-2016,11,06, Koshiba Hall, The University of Tokyo, Bunkyo-ku, Tokyo, Japan. (in Japanese)

・Yasuhisa Kondo Joint ecological niche- & cost surface model to backcast the adaptation of early modern humans to the palaeoenvironment. Future Earth Cluster Workshop “Modeling Challenges for Sustainability”, 2016,09,28-2016,09,30, Reserarch Institute for Humanity and Nature, Kyoto, Japan.

・Yasuhisa Kondo, Yuichiro Nishimura Renaissance of the “TOMOBIKI Night!!” social streaming program for geospatial information science and technology. Japan Geoscience Union Annual Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba, Japan. (in Japanese)

【Invited Lecture / Honorary Lecture / Panelist】

・Makoto Taniguchi, Hein Malle, Yuko Onishi, Takeshi Nishimura, Kuniyoshi Ebina, Masayuki Itoh, Hiroki Tsuruta, Yasuhisa Kondo, Tetsuzo Yasunari Japan strategic research agenda and research design for Future Earth. Japan Geoscience Union Annual Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba, Japan. (in Japanese)

Incubation Studies

Development of Interactive System between Cities and Rural Communities and Creation of Human Well-being

MORI Koichiro (Shiga University)

The purpose of this research is to alleviate a variety of global environmental problems through the control of the interdependent systems between urban and rural areas, and to create and enhance human well-being in both urban and rural areas within global environmental limits. The central notion of a hypothetical theoretical framework in this research is incomplete division of labor between urban and rural areas. This means that a number of people work in both urban and rural areas to a sufficiently large extent. Knowledge that urban areas have is introduced into rural areas due to the incomplete division of labor, and rural areas are able to enhance economic added values which they produce. This economic incentive makes people in urban areas move to rural areas, which mitigates excessive population concentration in urban areas. People who move from urban areas to rural areas and who work in both urban and rural areas promote the understanding of the significance of environmentally-friendly agriculture as an example. Thus strong purchasing power in urban areas would be shifted from the payment for waste disposal and excess consumption in mass production and distribution system to the payment for the value-added environmentally-friendly agricultural products. Three outcomes are expected:

① Social experiments and accumulation of their experiences in target sites,

② Development and dissemination of interactive system between urban and agricultural areas, and

③ Development of a theory of incomplete division of labor between urban and rural areas.

Reconstructing Life under Radioactive Contamination: fostering mutual understanding

NAKAHARA Satoe (Institute of Social Sciences, Chukyo University)

The purpose of this project is to assist the reconstruction and revitalization of communities and people who were/are affected by the contamination of ionizing radiation. The ionizing radiation influences various aspects of life such as environments, health, community, food culture and the mental condition. The uncertainty of radiation influence leads to friction among people who are forced to live in a condition affected by ionizing radiation. This project examines the current conditions and values specific to these individuals and communities, and wishes to propose an alternative idea to rebuild lives of these individuals. They are dealing with friction and disagreement over the reconstruction of their lives due to lack of information and uncertainties. By establishing a network among various communities and experts, we hope to promote local and global mutual understandings of the contamination of ionizing radiation. I had discussions individually with an anthropologist, a sociologist, a radiologist, a medical doctor, and leaders at NPO. I established a network by taking a part in the symposium, meeting, and workshop of other FR projects of the RIHN. I also organized a study group of this project which consists of both domestic and foreign project members. I have also started contacting NPOs in the Marshall Islands and the Russia whose aims are raising awareness of radiation exposure.

Nexus of Agriculture-Nutrition-Health to Build Sustainable Society

MATSUDA Hirotaka (Graduate School of Frontier Sciences, the University of Tokyo)

The purpose of this study is to discuss possible methodology and the way of social implementation including collaboration with stakeholders for building sustainable society based on the linkage of food between urban and rural area through considering appropriate food demand based on connection between agriculture, nutrition and health, and

alternative agricultural production by combination of modern agriculture with traditional agriculture in developing countries. This purpose has been achieved through workshops held at Research Institute for Humanity and Nature (RIHN) and the University of Tokyo. In addition, a session of this study was organized in the 5th GPSS-GLI international symposium and contributed to achieve this purpose. Results of those discussions are summarized as the concept paper of this project. Furthermore, it has been attained selection of case study areas for research and social implementation and establishment of a network for cooperation with relevant organizations.

Re-evaluation of hybrid livelihood based on multi-species cultivation

TOYODA Yukio (College of Tourism, Rikkyo University)

It has been believed that the monoculture, the way of growing a single crop on a large scale, is an efficient way of getting a large amount of product, and that it is necessary for developing countries to achieve economic development. Recent researches in Papua New Guinea, however, indicate that 'hybrid livelihood', which is based on multi-species cultivation and combines garden production, informal markets and small business, is more profitable for local people than the wage labor of private sector and plantation, resulted from monoculture, if considered opportunity cost analysis. The current study tries to verify this hypothesis by conducting more extensive research, including quantitative one, by the team of field workers of anthropologists and geographers. It also tries to propose the possibility of successive development in these areas, based on the hybrid livelihood. We have established a research team of field workers of Papua New Guinea and have agreed that the hypothesis is generally acceptable. We invited an economist and agronomist to give a presentation for our seminars and we compared the case of Papua New Guinea with the other areas, and also examined theoretical aspects of this study.

Development of socio-ecological network for international resource sharing with geographical indications and transformation of traditional knowledge

KOHSAKA Ryo (Graduate School of Environmental Studies, Tohoku University)

The ABS (Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization) has been contested issues as global environmental issues for developed and developing countries over three decades. In this research, we focused on the local varieties of vegetables as local genetic resource. The applicability of intellectual property regime such as Geographic Indications (GI) was critically evaluated with transdisciplinary approach, integrating historic and cultural elements. The goal was to propose ABS scheme for provider and user countries at both and local level capacity building, ethical standardization, transdisciplinary resource evaluation and governance.

We worked on the following four categories; (1) Applicability of GIs to the ABS at community level; (2) Establishment of traditional products with historical elements based on Koziruien [古事類苑]; (3) Analysis of how knowledge is transmitted to local environment with cases of pollination; (4) Identification of genetic originality and diversity. Using example of radish, the applicability of the new generation genome analysis was conducted. It was possible to identify the time scale ad genetic originality of the products.

RIHN Center

The RIHN Center provides foundations and platforms for RIHN's research activities and promotes engagement in interactive collaborations with academic and societal stakeholders. The Center also promotes capacity building activities related to global environmental studies.

The RIHN Center consists of four divisions. The Laboratory and Analysis Division develops and maintains the laboratory facilities necessary for research and fieldwork. The Information Resources Division maintains RIHN research databases and archive. The Collaboration Division facilitates internal and external research networking as well as RIHN engagement with the international Future Earth initiative and manages activities of Future Earth in Asia. The Communication Division develops a variety of communication strategies linking RIHN research to academic, public and user-specific communities.

Division Name: Laboratory and Analysis Division
Head of Division: TAYASU Ichiro

○ **Subject and Objectives**

The Laboratory and Analysis Division organizes three types of collaborative study in the Phase III Medium-Term Plan.

(1) Research collaboration with research projects: The division manages eighteen basement laboratories dedicated to various analytical needs. The division is responsible for maintaining state-of-the-art facilities, especially stable isotope mass spectrometers, and collaborates with research projects.

(2) Research collaboration with core projects: A core project FS entitled "Proposal and verification of the validity of isotope environmental traceability methodology in environmental studies" seeks to establish a methodology for how to use the concept of environmental traceability using multiple isotope ratios. The division collaborates with the project in an analytical viewpoint.

(3) Research collaboration with universities via "Environmental Isotope Study": The division provides "Joint Research Grant for the Environmental Isotope Study" for universities and affiliated institutions throughout Japan, allowing them to use the facilities and exchanging research information. From FY2016, the division started the two types of collaborations, "Collaborative research with the Division" or "General collaborative research".

○ **Progress and Results in 2016**

The division upgraded or maintained various analytical instruments in the laboratories.

The division accepted 21 proposals of "Collaborative research with the Division" and 45 proposals of "General collaborative research" in FY2016 of "Joint Research Grant for the Environmental Isotope Study".

The division organized a session in JpGU2016 entitled "H-TT21: Development and applications of environmental traceability methods" on 24 May 2016. 18 oral and 16 poster papers were presented in the session.

The division organized a short course of Environmental Isotope Study: Course 1 for light elements (31 August-2 September) and Course 2 for heavy elements (6-8 September). 15 researchers attended the course.

The division organized the sixth annual symposium of Environmental Isotope Study on 22 December. 119 researchers and students attended the symposium.

○ **Members**

TAYASU, Ichiro, SHIN, Ki-Cheol, TAKESHIMA, Hirohiko, YABUSAKI, Shiho, OHTA, Tamihisa, KATO, Yoshikazu, SAITO, Yu, YOSHIMIZU, Chikage, OSADA, Yutaka, MATSUBAYASHI, Jun, MATSUMOTO, Takuya (RIHN)

Appointed researchers of "Environmental Isotope Study" in FY2016

OKUSHI, Kenichi (Graduate school of HUMAN Development and Environment Kobe University)

HORIKAWA, Keiji (University of TOYAMA)

AMMA, Ryo (Faculty of Life and Environmental Sciences University of Tsukuba)

SOMEDA, Hidetoshi (National Defense Medical College)
YAMASHITA, Katsuyuki (Graduate School of Natural science and Technology Okayama University)
URAKAWA, Rieko (Asia Center for Air Pollution Research, Japan Environmental Sanitation Center)
KOSHIKAWA, Masami (Center for Regional Environmental Research, National Institute for Environmental Studies)
SORIN, Yoshiki (Institute for Chemical Research Kyoto University)
KASHIWAYA, Koki (Graduate School of Engineering)
NONOSE, Naoko (National Metrology Institue of Japan National Insutitute of Advanced Industrial Science and Technology)
SASE, Hiroyuki (Asia Center for Air Pollution Research, Japan Environmental Sanitation Center)
TAKEUCHI, Nozomu (Graduate School of Science Chiba University)
KAMAUCHI, Hiromitsu (Institute of Nature and Environmental Technology Kanazawa University)
SEKI, Yuji (Department of social Research National Museum of Ethnology)
KATSUTA, Nagayoshi (Faculty of Education Gifu University)
CHO, Kei (University of Toyama)
CHIBA, Hitoshi (Graduate School of Natural science and Technology Okayama University)
MATSUKI, Atsushi (Institute of Nature and Environmental Technology Kanazawa University)
NAKAGIRI, Takao (Graduate School of Life and Environmental Sciences Osaka Prefecture University)
KUSAKA, Soichiro (Museum of Natural and Environmental History, Shizuoka)
ASAHARA, Yoshihiro (Graduate School of Environmental Studies Nagoya University)
KUME, Atsushi (Kyushu University)
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OKADA, Naoki (Graduate school of Global Environmental Studies Kyoto University)
HANBA, Yuko T (Kyoto Institute of Technology)
TAKANO, Shotaro (Institute for Chemical Research Kyoto University)
AZUMA, Kumiko (Division for Research and Education National Insutitue of Polar Research)
YOKOO, Yoriko (Faculty of Science and Engineering Doshisha University)
KATSUMI, Naoya (Faculty of Science and Engineering, Waseda University)
KATO, Kenji (Shizuoka University)
GOTOU Yunosuke, II Yuusuke (Food and Agricultural Materials Inspection Center)
OTAKE, Tsubasa (Graduate School if Engineering Hokkaido University)
ITO, Masayuki (Center for Southeast Asian Studies Kyoto University)
MIZUNO, Kazuharu (Graduate School of Letters Kyoto University)

○ **Future Themes**

The division considers that “Environmental Isotope Study” is one of the most important function of RIHN as an Inter-University Research Institute Corporation. The division continuously develops analytical techniques to collect various environmental information in order to solve environmental issues.

●Achievements

○Papers

[Original Articles]

- Takano, S.; Tanimizu, M.; Hirata, T.; Shin, K.-C.; Fukami, Y.; Suzuki, K.; Sohrin, Y. 2017,03 A simple and rapid method for isotopic analysis of nickel, copper, and zinc in seawater using chelating extraction and anion exchange. Analytica Chimica Acta 967 :1-11. DOI:10.1016/j.aca.2017.03.010.(reviewed).
- Neoh, K.-B., Bong, L.- J., Muhammad, A., Itoh, M., Kozan, O., Takematsu, Y., Yoshimura, T. 2017,03 The effect of remnant forest on insect successional response in tropical fire-impacted peatland: A bi-taxa comparison. PLOS ONE 12(3) :e0174388. DOI:10.1371/journal.pone.0174388.(reviewed).
- Budisulistiorini, S. H., Riva, M., Williams, M., Chen, J., Itoh, M., Surratt, J. D., Kuwata, M. 2017,03 Light-absorbing brown carbon aerosol constituents from combustion of Indonesian peat and biomass. Environmental Science & Technology 51(8) :4415-4423. DOI:10.1021/acs.est.7b00397.(reviewed).
- Satomi Shiodera 2017 Tropical peatlands and their environmental issues in Southeast Asia: Indonesian Cases. Proceedings of "Exploring Academic Frontiers for a Sustainable Future: Challenges for Japan-ASEAN Research Collaboration" :221-236.
- Kiriyama, K., Kusaka, S. 2016,12 Prehistoric diet and mortuary practices in the Jomon period: Isotopic evidence from human skeletal remains from the Yoshigo shell mound. Journal of Archaeological Science: Reports 11 :200-210. DOI:10.1016/j.jasrep.2016.11.048.(reviewed).
- Kaori Takemura, Hiroyuki Kamachi, Atsushi Kume, Tomomichi Fujita, Ichirou Karahara, Yuko T. Hanba 2016,11 A hypergravity environment increases chloroplast size, photosynthesis, and plant growth in the moss Physcomitrella patens. Journal of Plant Research 130(1) :181-192. DOI:10.1007/s10265-016-0879-z.(reviewed).
- Nagatsuka, N., Takeuchi, N., Uetake, J., Shimada, R., Onuma, Y., Tanaka, S. and Nakano, T. 2016,11 Variations in Sr and Nd Isotopic Ratios of Mineral Particles in Cryoconite in Western Greenland. Front. Earth Sci 4 :93. DOI:10.3389/feart.2016.00093.(reviewed).
- Neoh, K.-B., Bong, L.- J., Muhammad, A., Itoh, M., Kozan, O., Takematsu, Y., Yoshimura, T. 2016,08 The impact of tropical peat fire on termite assemblage in Sumatra, Indonesia: reduced complexity of community structure and survival strategies. Environ. Entomology 45(5) :1170-1177. DOI:10.1093/ee/nvw116.(reviewed).
- Satomi Shiodera, Kazuo Yabe, Masayuki Ito, Osamu Kozan, Tika Dewi Atikah and Joeni Setijo Rahajoe 2016,08 Species composition and environmental factors of grasslands developing on the burnt peatlands in Sumatra, Indonesia. Proceedings of "International Peat Congress 2016" .
- Hisaaki Hiraoka,Sakie Morita,Atsunobu Izawa,Keisuke Aoyama,Ki-Cheol Shin,and Takanori Nakano 2016,07 Tracing the Geographical Origin of Onions by Strontium Isotope Ratio and Strontium Content. Analytical Sciences 32(7) :781-788. DOI:10.2116/analsci.32.781.(reviewed).
- Yuichi Kagotani, Keisuke Nishida, Takashi Kiyomizu, Keisuke Sasaki, Atsushi Kume and Yuko T. Hanba 2016,06 Photosynthetic responses to soil water stress in summer in two Japanese urban landscape tree species (Ginkgo biloba and Prunus yedoensis) - effects of pruning mulch and irrigation management-. Trees 30(3) :697-708. DOI:10.1007/s00468-015-1312-2.(reviewed).

○Research Presentations

[Oral Presentation]

- Kazuhiro Uzawa, Mai Takigami and Yuji Seki Beginning of Camelid breeding during the Formative period at the Pacopampa site, Peru. Society of American Archaeology 82nd Annual Meeting, 2017,03,31, Vancouver (Canada).
- S. Takano, M. Tanimizu, T. Hirata, K. Shin, Y. Fukami, K. Suzuki, and Y. Sohrin Nickel, copper and zinc isotopes in the pacific ocean. ASLO 2017 AQUATIC SCIENCES MEETING, 2017,02,26-2017,03,03, Hawaii, USA.
- S. Takano A new method for determination of nickel, copper and zinc isotope ratios in seawater, phytoplankton, and

marine sediments. East Asia GEOTRACES Workshop, 2017,01,16-2017,01,18, Hokkaido, Japan.

- Naoya Sakaguchi, Kaori Takemura, Ryuji Kameishi, Rina Watanabe, Atsushi Kume, Ichirou Karahara, Tomomichi Fujita, Hiroyuki Kamachi, Yuko T. Hanba Response to hypergravity of model plant, Physcomitrella patens, and that of mechanism ~ from results of long-term hypergravity experiments ~. The 31st Space Utilization Symposium, 2017,01,16-2017,01,17, Institute of Space and Astronautical Science (Sagamihara). Space Utilization Research 2016: Proceedings of the 31st Space Utilization Symposium. https://repository.exst.jaxa.jp/dspace/bitstream/a-is/590479/3/SA6000061000.pdf
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- Akihisa Mori, Hiroyuki Kamachi, Ichirou Karahara, Atsushi Kume, Yuko T. Hanba, Kaori Takemura, Tomomichi Fujita Effects of Vibration on Plant Growth in a Hypergravity Plant Cultivation System. The 31st Space Utilization Symposium, 2017,01,16-2017,01,17, Institute of Space and Astronautical Science (Sagamihara). Space Utilization Research 2016: Proceedings of The 31st Space Utilization Symposium. https://repository.exst.jaxa.jp/dspace/bitstream/a-is/590479/3/SA6000061000.pdf
- A. ITO, T. OTAKE, K. SHIN, K. S. GRIFFIN, F. Y. YEOH, T. SATO Geochemical and isotopic signatures of heavy mineral processing in contaminated are near Ipoh city. Malaysia. 5th International Doctoral Symposium-Sustainable Management of Resources and Environment in the 21st Century, 2016,11,10, Faculty of Engineering, Hokkaido University.
- Tomomichi Fujita, Atsushi Kume, Hiroyuki Kamachi, Yuko Hanba, Ichirou Karahara Towards Microgravity Experiments in Moss: Emerging Model Land Plant, Physcomitrella Patens for Experiments on International Space Station. AMS2016, 2016,10,28, Hokkaido University (Sapporo).
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- Asahara, Y Radiogenic and stable isotopes as tracers: Application to paleoceanography and environmental analysis, using marine sediments in Pacific, Okhotsk Sea, Bering Sea and Arctic Sea. Iran-Japan International Workshop on Isotope Geology, 2016,10,01-2016,10,03, University of Kurdistan (Sanandaj, Iran).
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- S. Takano, W. Uehara, K. Shin, T. Hirata, M. Tanimizu and Y. Sohrin Distributions of nickel, copper and zinc isotopes in the North Pacific Ocean. Goldschmidt Conference, 2016,06,26-2016,07,01, Kanagawa, Japan.
- Q-M. Pham, D. Ishiyama, Y. Ogawa and M. Fukuyama Evaluation of the relationship between chemical form and the distribution of elements in river water of Shibukuro-Tama-Omono River System in Akita Prefecture. The Society of Resorce Geology 2016 annual meeting, 2016,06,22-2016,06,24, Tokyo University.O-28.
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- Lee W.C., L. Yang, S. H. Budisulistiorini, J. Chen, M. Itoh, S. Shiodera, Haris Gunawan, and M. Kuwata Examining water soluble materials from laboratory biomass burning experiments. 2016 Taiwan Geosciences Assembly, 2016,05,16-2016,05,20, Taipei, Taiwan.
- Tomomitsu Kinoshita, Yuko T.Hanba, Keisuke Nishida, Takashi Kiyomizu Seasonal variation in carbon isotope discrimination and photosynthesis of a roadside tree Ginkgo biloba. 7th EAFES, 2016,04,19, Daegu (South Korea).
- Kenji Kato, Ayumi Sugiyama, Kazuyo Nagaosa, and Maki Tsujimura Chase the direct impact of rainfall into groundwater in Mt. Fuji from multiple analyses including microbial DNA. EGU General Assembly 2016, 2016,04,17-2016,04,21, Vienna, Austria. Geophysical Research Abstracts Vol. 18, EGU2016-5200.

[Poster Presentation]

- M. Tanimizu, R. Nakai, N. Sugimoto, and Y. Mori Geochemical characteristics of hydrothermal fluids observed along Median Tectonic Line in Mie-Prefecture, Japan. European Winter Conference on Plasma Spectrochemistry 2017, 2017,02,19-2017,02,24, Sankt Anton Am Arverg Austraria.
- Naoya Sakaguchi, Ryuji Kameishi, Rina Watanabe, Hiroyuki Kamachi, Ichirou Karahara, Atsushi Kume, Tomomichi Fujita, Yuko T. Hanba Photosynthetic Capacity and Morphological Change of Physcomitrella Patens to Hypergravity. AMS2016, 2016,10,26, Hokkaido University (Sapporo).
- Maki Yokoi, Tomomichi Fujita, Atsushi Kume, Hiroyuki Kamachi, Yuko Hanba, Ichirou Karahara Emerging Model Plant, the Moss Physcomitrella Patens for Experiments on International Space Station: Response to Gravity or Space Radiation. AMS2016, 2016,10,26, Hokkaido University (Sapporo).
- Kaori Takemura, Hiroyuki Kamachi, Atsushi Kume, Tomomichi Fujita, Ichirou Karahara, Yuko T. Hanba Hypergravity Environment Changes Plant Growth, Anatomy, Chloroplast Sizes and Photosynthesis of a Moss Physcomitrella Patens. AMS2016, 2016,10,26, Hokkaido University (Sapporo).
- Kamauchi, H., Akasaka, M., Sakimoto, M., Suzuki, S., Ohta, T. and Tayasu, I. Sea-fog and coastal forest in eastern Hokkaido, Japan. 7th International Conference on Fog, Fog Collection and Dew, 2016,07,24-2016,07,29, Universytet Wroclawski, Wroclaw, Poland.
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- Makoto Tsujisaka, Shotaro Takano, Takafumi Hirata and Yoshiki Sohrin Determination of the stable isotope ratio of molybdenum and tungsten in marine sediments. Goldschmidt, 2016,06,26-2016,07,01, Yokohama.p313.
- Ken'ichi Shinozuka, Masaaki Chiwa, Ichiro Tayasu, Chikage Yoshimizu, Atsushi Kume Topographic impacts on downstream NO3- reduction with high levels of NO3- leaching from upland forests. Japan Geoscience Union Meeting 2016, 2016,05,24, Chiba. http://www2.jpgu.org/meeting/2016/session/PDF/H-TT21/HTT21-P13_e.pdf

[Invited Lecture / Honorary Lecture / Panelist]

- Satomi Shiodera Human-induced disturbance in tropical peat swamp forests and effects. The 64th Annual Meeting of Ecological Society of Japan, 2017,03,14-2017,03,18, Waseda Univercity, Tokyo, Japan.Invited oral presentation for planning symposium on "current state and efforts for conservation of huge carbon pool in tropical eat forests' huge carbon pool".
- Satomi Shiodera The current issues and future directions of peat swamp forests in Indonesia -Possibility and mechanism of peatland recovery. Tropical Peatlands, Past and Future: Ecosystem Processes & Environmental Change, 2016,08,06-2016,08,11, Asian School of the Environment Nanyang Technological University, Singapore.
- Yuko T. Hanba Analysis of plant photosynthetic functions using stable carbon isotope ratio. German-Japanese symposium: Plant trait workshop, 2016,05,09, Technische Universität Dresden (Germany).

Division Name: Information Resources Division
Head of Division: SEKINO Tatsuki

○ **Subject and Objectives**

The information resources division attempts to construct an information hub which progress collection, accumulation and application of information about global environment such as data and documents, and expects that the information hub promotes RIHN's activities. The information hub mainly consists of "RIHN archives" to store various kinds of information resources about RIHN's activities, an institutional repository to release publications and application systems to use the resources. Additionally, the division promotes research and development of new information technologies for global environmental studies, and provides the products to universities and research institutes in the world as well as RIHN's projects.

○ **Progress and Results in 2016**

(1) Collection and accumulation of resources, and promoting usage of them

- Institutional repository on JAIRO Cloud was opened in May 2016. 713 resources had been registered into the repository until March 2017.
- 476 resources had been registered into the RIHN archives in 2016 FY.
- Work flows and system operation to use the accumulated resources for IR were reviewed.

(2) Research and development of new information technology to promote global environmental studies

- Research and development were conducted about ontology technology and time information science. Some new products were released.
- GIS lecture was held on 24-25 August 2016 with 17 participants (including lecturer).
- A special session corroborating with Center for Environmental Remote Sensing, Chiba University entitled "Collaboration between scientists and stakeholders at the scene of environmental issues" is held in Japan Geoscience Union Meeting 2016.

(3) Development of applications to use the accumulated information resources

・ Preparations to construct the applications (data portal and functions of data concierge) were conducted (data design and improvements of existing systems).

○ **Future Themes**

Improvements of data access and operation are required to promote usage of resources accumulated in the RIHN archives and the institutional repository.

○ **Achievements**

【Papers】

・ Yasuhisa Kondo, Takehiro Miki, Taichi Kuronuma, Yuichi S. Hayakawa, Kyoko Kataoka, Takashi Oguchi 2016,08 Concurrent and sustainable development of a local-scale digital heritage inventory through action research at Bat, Oman. Journal of Cultural Heritage Management and Sustainable Development 6(2) :195-212. DOI:10.1108/JCHMSD-01-2016-0005. (reviewed).

・ Terukazu Kumazawa･Keishiro Hara･Aiko Endo･Makoto Taniguchi 2016,04 Supporting collaboration in interdisciplinary research of water–energy–food nexus by means of ontology engineering. Journal of Hydrology: Regional Studies . DOI:10.1016/j.ejrh.2015.11.021. (reviewed).

・ Sekino, T. 2016,12 Time Information System Web HuTime: Comparison with Existing Web Applications. Journal of Asian Network for GIS-based Historical Studies 4 :62-69. (reviewed).

【Research Presentations】

・ Yasuhisa Kondo, Atsushi Noguchi Best practices and challenges in promoting open science in archaeology: two narratives from Japan. 45th Annual Conference on Computer Applications and Quantitative Methods in Archaeology (CAA), 2017,03,14-2017,03,16, Georgia State University, Atlanta, USA. http://caaconference.org/

・ Yasuhisa Kondo How open scientific research data transform transdisciplinary research: a theoretical debate. Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe (Chiba). DOI:10.13140/RG.2.1.2665.8163.

・ Sekino, T. Temporal Information System HuTime. Workshop Schedule of Activities Updates on The Community Data Base System Healthy Communities Strengthening Section, Thai Health Promotion Foundation, 2016,11,21-2016,11,23, AETAS Lumpini, Bangkok.

・ Sekino, T. Academic asset of environmental science and related interdisciplinary studies. Workshop on the Academic Asset Preservations and Sharing in Southeast Asia, 2016,11,20-2016,11,20, Pullman Bangkok Grande Sukhumvit, Bangkok.

・ Sekino, Tatsuki Linked Data of Temporal Information. PNC 2016 Annual Conference and Joint Meetings, 2016,08,16-2016,08,18, The Getty Center, Los Angeles.

・ Sekino, Tatsuki Time Information System on the Web. PNC 2016 Annual Conference and Joint Meetings, 2016,08,16-2016,08,18, The Getty Center, Los Angeles.

Division Name: Collaboration Division
Head of Division: Hein MALLEE

○ **Subject and Objectives**

1) Information input
2) Management/Coordination on Future Earth
3) Engagement
4) Taking Opportunity/Conjugate
5) Outreach

○ **Progress and Results in 2016**

1) Information input

Mapping on Future Earth core projects and related projects

2) Management/Coordination on Future Earth

◇Future Earth Regional Centre for Asia

・ The 2nd Regional Advisory Committee for Future Earth in Asia meeting organized (4/25-4/27 Soul)
・ SCJ Issue-Centered Committee on promoting Future Earth meeting participated (7/22, 10/13)
・ Monsoon Asia Integrated Research for Sustainability Science Committee meeting organized (11/18-19 RIHN)
・ International Symposium on Global Sustainability Challenges: Kyoto Initiative in "Future Earth" co-organized (12/21 Kyoto University)
・ The 5th International Workshop on Future Earth in Asia organized (1/23-1/24 RIHN)
・ The 3rd Regional Advisory Committee for Future Earth in Asia meeting organized (1/25 RIHN)

◇ Building Knowledge-Action Networks

・ Workshop on Systems of Sustainable and Production organized (3/15-3/16 RIHN)

◇ Future Earth; Research and study on selection of globally prioritized themes for Japan to be engaged in and on R&D designs for such themes

・ Workshop on Ranking for investigating priority to Japan Strategic Research Agenda (JSRA) organized (6/6-6/24 RIHN)

3) Engagement

◇ MOU

Overseas: 3 new contract (The People's Government of Changzhou City of the People's Republic of China, The Agency of Peatland Restoration (Badan Restorasi Gambut), Republic of Indonesia, Research Center for Environmental Changes, Academia Sinica)

2 renewal (Peking University, East China Normal University)

Domestic: Institute of Nature and Environmental Technology, Kanazawa University, Hokkaido University

4) Taking Opportunity/Conjugate

◇RIHN Initiative for Chinese Environmental Issues Contemporary Chinese Area Studies

・ 47th The RIHN-China Seminar (6/8 RIHN)
・ Joint Lecture of RIHN-China and College of Environmental Science and Engering, Peking University (3/21 Pekin, 3/23 Shanghai)
・ The RIHN-China Newsletter "Ten-Chi-Jin (Tian-Di-Ren)" No. 28-30

◇ New Developments in Ecohealth Research in Asia (Director Hein Mallee)

・ Meeting: (5/25 Tokyo Metropolitan University)
・ Seminar: (11/2 RHIN)
・ 1st Workshop on Health and History: (2/1 RIHN)

・ International Workshop: (11/3-11/4 RIHN)
・ Workshop: (1/30 RIHN)

5) Outreach

◇ Future Earth Regional Centre in Asia
・ 16th Conference of the Science Council of Asia (5/29-6/2 Colombo)
・ 23rd Pacific Science Congress (6/13-6/17 Taipei)
・ Web cite http://www.futureearth.org/asiacentre/ja

◇ RIHN Seminar No.126–No.141
・ No.126 (2016/4/14 16:00–17:30) Lecturer: Joshua Newell (Assistant Professor, University of Michigan/ RIHN Visiting Research Scholar) , Title: The Energy and Justice Footprint of Water Supply for Southern California
・ No. 127 (2016/4/28 16:00–17:00) Lecturer: Benjamin Houlton (University of California, Davi) , Title: Nutrient limitation and global climate change
・ No. 128 (2016/5/13 15:00-16:00) Lecturer: Miguel Altieri (Professor, University of California, Berkeley / RIHN Invited Scholar) , Title: Agroecology: Research Directions on Rural and Urban Environments
・ No. 129 (2016/5/20 15:00-17:00) Lecturer: A. John Sinclair (University of Manitoba), Patricia Fitzpatrick (The University of Winnipeg), Title: Considering individual transformative learning outcomes through natural resource and environmental management
・ No. 130 (2016/5/30 15:00-16:00) Lecturer: Miguel Altieri (Professor, University of California, Berkeley / RIHN Invited Scholar) , Title: Agroecology and food sovereignty: experiences from Latin America
・ No. 131-1 (2016/6/2 13:30-15:00) Lecturer: Eduardo Brondizio (Professor, Department of Anthropology, Director, Center for the Analysis of Social-Ecological Landscapes (CASEL), Faculty Associate The Ostrom Workshop in Political Theory and Policy, Analysis Indiana University Bloomington) , Title: A Cultural Ecology of the Anthropocene: An anthropological perspective to the history of Human-Environment Interaction research
・ No. 131-2 (2016/6/6 13:30-15:00) Lecturer: Eduardo Brondizio (Professor, Department of Anthropology, Director, Center for the Analysis of Social-Ecological Landscapes (CASEL), Faculty Associate, The Ostrom Workshop in Political Theory and Policy, Analysis Indiana University Bloomington) , Title: A microcosm of global change: Reflections on Scale and Complexity in the Amazon
・ No. 131-3 (2016/6/9 13:30-15:00) Lecturer: Eduardo Brondizio (Professor, Department of Anthropology, Director, Center for the Analysis of Social-Ecological Landscapes (CASEL), Faculty Associate, The Ostrom Workshop in Political Theory and Policy, Analysis Indiana University Bloomington) , Title: Bridging knowledge systems: A problem-oriented conceptual framework to social-ecological system analysis
・ No. 132 (2016/6/7 14:30-17:00) Lecturer: Masahiro Terada, Gita A Keeni Masayuki Onishi, Tetsuzo Yasunari, Toshiki Osada, Title: India-Japanese dialogue in search of new Asian narrative of environment from view point of language and literature
・ No. 133 (2016/7/1 14:00-17:00) Lecturer: Mansee Bal Bhargava (Environmental Design Consultants) , Title: Opportunities and Challenges for (Japanese) Scholars to Engage in Environmental Governance in India
・ No. 134 (2016/9/6 14:00-16:00) Lecturer: Tara Beuzen-Waller (Université de *Paris*) , Friederike Stock (Universität zu Köln) , Title: New Directions in Geoarchaeolog
・ No. 135-1 (2016/10/13 15:00-17:00) Lecturer: Sander van der Leeuw (Arizona State University/Invited Scholar RIHN) , Title: A shrinking society: The case of Epirus, Greece
・ No. 135-2 (2016/10/20 15:00-17:00) Lecturer: Sander van der Leeuw (Arizona State University/Invited Scholar RIHN) , Title: Exploring historical tipping points: The Rhône Valley
・ No. 135-3 (2016/11/9 15:00-17:00) Lecturer: Sander van der Leeuw (Arizona State University/Invited Scholar RIHN) , Title: Social-ecological degradation: The Argolid Region, Greece
・ No. 135-4 (2016/12/8 15:00-17:00) Lecturer: Sander van der Leeuw (Arizona State University/Invited Scholar

RIHN) , Title: Improving our studies?

- No. 136 (2016/11/18 13:00-15:00) Lecturer: Stephane Grumbach (Senior Scientist at INRIA, Director of IXXI, Rhône-Alpes Complex Systems Institute) , Title: The Datasphere, in control of ecosystems
- No. 137 (2016/1/6 15:00-17:00) Lecturer: Simon Kaner (Sainsbury Institute for the Study of Japanese Arts and Cultures) , Title: Metastability, communication and change: observations from the Shinano-Chikuma River
- No. 138 (2017/1/10 9:30-17:30) Lecturer: Frederic Joulian, Yann-Philippe, Tastevin, Yoann Moreau, Shoichiro Takezawa, Mikaeal Le Meur, Title: FIXING THE WORLD – Excess, leftovers and innovation
- No. 139 (2017/2/14 15:00-16:00) Lecturer: Sanghyun Lee (Texas A&M University / Visiting Research Fellow RIHN), Title: Development of Water-Energy-Food Nexus platform for assessing impacts of food policy, trade, and land use on national resource security
- No. 140 (2017/2/21 13:30-15:30) Lecturer: Isaac Rodrigues dos Santos (Southern Cross University) , Title: The water-climate nexus
- No. 141 (2017/3/3 15:00-16:00) Lecturer: Thomas Elmqvist (STOCKHOLM RESILIENCE CENTRE, Stockholm University) , Title: On Urban Sustainability and Resilience – common misconceptions and confusion

◇ Special Lecture at Kyoto University Graduate School of Global Emvironmental Studies (7/7)

- Lecturer: Riichiro Ishii, Title: Current perspective of global environmental issues (from an Asian ecologist's pont of view)

◇ Exhibition at Japan Geoscience Union Meeting 2016 (5/22-5/26 Chiba)

○ **Achievements**

【Research Presentations】

- Hein Mallee "Ecohealth, Transdisciplinarity and Participation". JSPS Japanese-Swiss Ecohealth Colloquium, 2017,01,11-2017,01,12, Swiss Tropical and Public Health Institute.
- Hein Mallee "Regional Advisory Committee: Research Agenda or Strategic Directions for Future Earth in Asia?" 2016.11.07, RHIN
- Hein Mallee "When is A Co-Design Approach Needed? Insights from the Literature on Transdisciplinarity". The 23rd Pacific Science Congres, 2016,06,13-2016,06,17, Academia Sinica, Taipei..
- Hein Mallee "Regional Development of Future Earth in Asia". 16th Conference of the Science Council of Asia, 2016,05,30-2016,06,01, Colombo, Sri Lanka..
- Hein Mallee "The Regional Center for Future Earth in Asia". 25th KAST International Symposium, Future Earth & Sustainable Development Goals in Asia, 2016,04,25, Seoul, Korea..
- Hein Mallee "Future Earth and Human Health: Possible Contributions from Japan". XXIst Conference of the Society for Human Ecology, 2016,04,15, Santa Ana, California

Division Name: Communication Division
Leader: ABE Ken-ichi

○ **Objective and Role**

Our basis of activities is "knowledge networking", which means that we reedit isolated/spread knowledge or information and provide them as a new knowledge/concept. There are three pillars of our activities and objectives (see Table 1).

Table 1. Main activities and objectives in our division

	What	Why	How
1	Review new ways of transmitting research achievements	Construct the platform promoting interactive information/knowledge network	Method development, such as utilizing images, in the transdisciplinary area
2	Carry out environmental education	Implement RIHN original environmental education and build up educational materials	Collecting/integrating RIHN project research achievements
3	Create renewed wisdoms and values	Build new values and methods	Rearrange RIHN activities and achievements and connect gained knowledge and information in a higher level

○ **Plan and Results (The 2016 academic year)**

1. Status of Achievement

1) Plan and Results

①To review new ways of transmitting research achievements and develop method

We are aiming to co-create environment knowledge according to building public relations/ communications of the results mediums using iTunes U as the base.

We have cooperated with Sanitation Project and just started TD VISUALIZATION seminar <Plan 1: Establishment of research systems and host a seminar>. During "the knowledge co-creative seminar" which is described later, we had a discussion about visual materials as well. As a result, our research exchange is deepened between Hokkaido University Institute for the Advancement of Higher Education, Kyoto University Museum, other researchers and organizations <Plan 2 : Cooperation and surveillance with the relevant organizations>.

The number of distribution in the 2016 academic year has been reached 215 items (255 in total on April 7th 2017) and 13,221 as an online traffic. The establishment of operational environment for iTunes U and content production have been making good progress <Plan 3: The establishment of operational environment for iTunes U and content production>. As a content which is not transmitted from iTunes U, we cooperated with NHK EDUCATIONAL and prepared the video production the subject of which is taken from five towns and villages in the northern part of Miyazaki prefecture. We are having a surveillance on seminars with respect to JMOOC operational environment, but it has not advanced much because of lack of resources in RIHN at the moment <Plan 4: JMOOC operational environment and surveillance>.

②To carry out RIHN original environmental education and build up educational materials

Selected "environment and culture" as a theme, some researchers from Osaka University and Mongolia and us have conducted field research in Inner Mongolia on August 2016, and in Shiso city(Hyogo prefecture), Nu-island(Hyogo prefecture) and Obihiro city(Hokkaido prefecture) on November <Plan 1: Establishment of Research Systems>. As

for the cooperation with organizations related to environmental education <Plan 2: the cooperation with organizations>, an education agreement was concluded with Rakuhoku high school and Hokuryo high school on September 1st 2016. While we engage in environmental education in the both schools above, questionnaire survey has been continued towards teaching aids development and we rethinks how education should be done utilizing RIHN comparative advantages <Plan 3 and 4: Questionnaire survey for teaching aids development and consideration of environmental education>. Related to KLaSiCA (Knowledge, Learning and Societal Change An International Research and Action Alliance) activities, organizing a sub-committee in the Science Council of Japan, and we participated in the First International Case Studies Symposium in Taiwan.

③To create renewed wisdoms and values based on knowledge/information network

We held "the knowledge co-creative seminars" in RIHN showed as below (see Table 2) <Plan 1: Organization of "the knowledge co-creative seminars" >. The Forth seminar in particular was jointly organized by our division and Sanitation project members, based on project surveillance results <Plan 2: Cooperation with RIHN project members>. In reference to the cooperation with RIHN project, we followed up with Area-capability project members for RIHN area seminar in Amakusa.

Table 2. The knowledge co-creative seminars

	Date	Lecturer (specialty or affiliation)	Topic
1st	May 16th, 2016	Prof. Jyunzo KAWADA (anthropologist)	Anthropology with Sensibility: Environmentology with Sympathy
2nd	July 7th, 2016	Mr. Hiroshi HATTORI (NHK EDUCATIONAL, Lead producer)	Information Transmission towards Co-creating with Society: Possibilities for RIHN
3rd	November 18th, 2016	Prof. Togo TSUKAHARA (Kobe University)	Facing with Advanced Technology
4th	March 13th, 2017	Mr. Shin-ichi WADE (Special technical staff, RIHN)	Basics and Practice of Design
		Prof. Mari TOHYAMA (Specially appointed associate professor, RIHN)	Science Communication: Form the Concept
		Prof. Takayuki SHIOSE (Associate professor, Kyoto University Museum)	Facilitating and Restraining Action: Thinking in Terms of Inclusive Design

2) Other Results

①To review new ways of transmitting research achievements and develop method

- We held a movie screening, Gilles Clément documentary film, « Le jardin en mouvement » at Institut Français Kansai, Kyoto on September 16th and 17th. (We used to invite Mr. Gilles Clément in RIHN before.)

②To carry out RIHN original environmental education and build up educational materials

- The exchange event for students from Doshisha elementary school(Kyoto) and primary school attached to Taito University (Taiwan) was organized with the both schools as mentioned before and RIHN on November 29th.
- The Japanese booklet "Cultivating Sensitive Intelligence toward the Earth: Learning through Creative Appreciation" (vol.2) was published on March 2017.

③To create renewed wisdoms and values based on knowledge/information network

- We and RIHN project members were in charge of a deciding task for agriculture future plans in five towns and villages in Miyazaki prefecture, as a delegated research of The GIAHS Region Takachiho・Shiibayama Local Revitalization Promotion Council.
- We jointly planed the symposium and research colloquium on the themes from Augustin Berque's "Histoire de l'habitat idéal" on March 15th and 16th 2017.

○ **Members**

◎ABE Ken-ichi (Professor)
○NILES Daniel (Associate professor)
○MIMURA Yutaka(Research associate)
○SHIMADA Nahoko (Research associate)
○KISHIMOTO Sayaka (Research associate)

○ **Forthcoming challenges**

- It is necessary to further strengthen cooperation among RIHN projects and including new members in order to plan and conduct partnership programs.
- To strengthen collaboration between local society, we would like to enter into a MOU with relative organizations.

Outreach Programs and Events

1. RIHN International Symposium

In order to diffuse the findings of FR projects, the RIHN 11th International Symposium "Asia's Transformations to Sustainability: Past, Present and Future of the Anthropocene" was held on 10-11 March 2017 at the RIHN Lecture Hall. The details of the symposium are as follows.

RIHN 11th International Symposium

<Friday, March 10>

Plenary Session

Chair: KUBOTA Jumpei (Deputy Director-General, RIHN)

Welcome and Introduction to Plenary Session: KUBOTA Jumpei (Deputy Director-General, RIHN)

Opening Remarks: YASUNARI Tetsuzo (Director-General, RIHN)

Keynote Address 1 : Anthropocene and Transhumanism – or the ecumene as an anthroposcene –
Augustin BERQUE (École des hautes études en sciences sociales (EHESS), France)

Keynote Address 2 : Does Chinese History Suggest a Sustainable Growth Trajectory?
Kenneth POMERANZ (University of Chicago, USA)

Session 1: Impact of Climate Change, Water and Energy on Long-term Socio-economic Changes

Chair: NISHI Makoto (RIHN)

Introduction to Session 1
SUGIHARA Kaoru (RIHN)

Impact of Climate Change on Social Transformations in Japan and Beyond
NAKATSUKA Takeshi (RIHN)

On Climate, Demography and Social Change in the Japanese Archipelago
SAITO Osamu (Hitotsubashi University)

Monsoon Asia, Industrialization and Urbanization: The Making and Unmaking of the Regional Nexus
SUGIHARA Kaoru (RIHN)

Carbon Forests and Rivers of Conflict: Writing South Asian Environmental History in the Epoch of the Anthropocene
Rohan D'SOUZA (Kyoto University)

Land Tenure and Degradation of Peatlands in Sumatra, Indonesia
MIZUNO Kosuke (RIHN and Kyoto University)

Roundtable Discussion
The above speakers, Mark METZLER (University of Texas at Austin, USA), SATO Takahiro (Kyoto University), WAKIMURA Kohei (Osaka City University), and Roy Bin WONG (University of California, Los Angeles, USA)

<Saturday, March 11>

Session 2: Wise Governance of Diverse Resources

Chair: NAKASHIZUKA Tohru (RIHN and Tohoku University)

Introduction to Session 2
NAKASHIZUKA Tohru

Concept of Wise Governance of Resources and Ecosystem Services in Asian context
NAKASHIZUKA Tohru

Participatory Approaches for Co-design and Co-production on Water-Energy-Food Nexus Issues
BABA Kenshi (Tokyo City University)

Considering Ecosystem Service Tradeoffs including Biodiversity and Culture in the Water-Energy-Food Nexus
Kimberly BURNETT (University of Hawaii, USA)
The Adaptive Watershed Governance: Biodiversity, Nutrient Cycling and Human Well-being
OKUDA Noboru (RIHN)
Valuing Forest Ecosystem Services and Disservices - Case Study of a Protected Area in India
Karachepone N. NINAN (Centre for Economics, Environment and Society, India)
Roundtable Discussion
The above speakers

Session 3: Building Lifeworlds of Sustainability and Wellbeing
Chair: KOBAYASHI Mai (RIHN)
Introduction to Session 3
SAIJO Tatsuyoshi (RIHN and Kochi University of Technology)
Future Design
SAIJO Tatsuyoshi
Seeking Sustainability and Well-being through Asian Cultures and Values
Rakesh KAPOOR (Alternative Futures, India)
Lifeworlds as Pedagogy for Socio-cultural Change: Sensuous Food Futures, Practices, and Meaning in Everyday Experience
Steven R. MCGREEVY (RIHN)
Sanitation Value Chain: Its Concept and Element Technologies
FUNAMIZU Naoyuki (RIHN and Hokkaido University)
Roundtable Discussion
The above speakers, TANAKA Ueru (RIHN) and ISHIKAWA Satoshi (RIHN)

General Discussion: Beyond Stakeholder Engagement: Reflection and proposals
Chair: TANIGUCHI Makoto (Deputy Director-General, RIHN)
Sessions Summaries and Discussion across All Sessions
Closing Remarks
TANIGUCHI Makoto

2. Symposium of Environmental Isotope Study

Joint research grant for Environmental Isotope Study has conducted multidisciplinary joint researches using various isotope analysis facilities RIHN has maintained. To exchange research information and promote the Environmental Isotope Study network, “Symposium of Environmental Isotope Study” has been held once a year since 2011.

The 6th Annual Symposium of Environmental Isotope Study
Date: 22 December, 2016
Venue: RIHN

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 2016 at the RIHN lecture hall and several sites in Kyoto.

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

The 68th Public Seminar 28 November, 2016
An Environmental History Perspective of Modern Asia: From the Growth Paradigm to the Sustainability Paradigm
SUGIHARA Kaoru (RIHN)
KAMATANI Kaoru (RIHN)

The 69th Public Seminar 24 January, 2017
Mainstreaming of Biological diversity
MAKASHIZUKA Tohru (RIHN)
OH Tomohiro (RIHN)

The 70th Public Seminar 9 February, 2017
Trying to Think about "Environment" with High School Students
Students at Kyoto Prefectural Rakuhoku High School

The 71st Public Seminar 24 March, 2017
Science Contributing Solutions of Global Environmental Problems:
The quest for transdisciplinary research learning together with diverse societal actors
SATO Tetsu (RIHN)
KUBOTA Jumpei (RIHN)

4. RIHN Kids Seminar

In order to enhance community relations, RIHN has held public lectures for children in neighboring elementary schools since 2010. In the fiscal year 2016, seminar was held for elementary and junior high school students in Kyoto as below.

The 7th Kids Seminar

(Summer) "Stable Isotope Ratio links Environment and ourselves"
Date: 25 July, 2016
Venue: RIHN
Lecturer: TAYASU Ichiro (RIHN)

(Fall and Winter) Hands-on Learning for Junior High School Students "Make Fertilizer from Urine!?"
Date: 14 January, 2017
Venue: RIHN
Lecturer: FUNAMIZU Naoyuki (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 2016.

Date: 5 August, 2016
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. The fiscal year 2016, two seminars were held as below.

The 17th RIHN Area Seminar Noshiro
"Let's think about tomorrow's food for the future of Noshiro in 30 years! The possibility of food transition in Noshiro"
Date: 5 December, 2016
Venue: Plaza Miyako (Noshiro city, Akita)

The 18th RIHN Area Seminar Takachiho
"Globally important agricultural heritage system: Change for the better"
Date: 21 January, 2017
Venue: Takachiho-cho Natural Resting Village Management Center (Miyazaki)

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 2016 as below.

7th Tokyo Seminar
"Imagination for the Earth: Learning in the Anthropocene"
Date: 26 January, 2017
Venue: Fukutake Hall, University of Tokyo

8. The Earth Forum Kyoto; 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 symposium was held in fiscal year 2016 as below.

The Earth Forum Kyoto; International Symposium
Date: 11 February, 2017
Venue: Kyoto International Conference Center

9. 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 2016 recipients of the Earth Hall of Fame Kyoto Award:

Dr. Augustin BERQUE (Professor at the School for Advanced Studies in the Social Sciences [EHESS: École des hautes études en sciences sociales])

José Alberto MUJICA Cordano (Former President of Uruguay)

NAKAMURA Tetsu (Medical Doctor, Executive Director of PMS (Peace Japan Medical Services)/ Representative of Peshawar-kai in Pakistan and Afghanistan)

10. 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.

126th	14 April, 2016 at RIHN Seminar Room 3 & 4 The Energy and Justice Footprint of Water Supply for Southern California Dr. Joshua NEWELL (Assistant Professor, University of Michigan/ RIHN Visiting Research Scholar)
127th	28 April, 2016 at RIHN Seminar Room 3 & 4 Nutrient limitation and global climate change Benjamin HOULTON (Associate Professor and Chancellor's Fellow, Director: UC Davis John Muir Institute of the Environment)
128th	13 May, 2016 at RIHN Lecture Hall Agroecology: Research Directions on Rural and Urban Environments Professor Miguel ALTIERI (Professor, University of California, Berkeley / RIHN Invited Scholar)
129th	20 May, 2016 at RIHN Seminar Room 3 & 4 Considering individual transformative learning outcomes through natural resource and environmental management Session 1: Individual learning through strategic environmental assessment in Kenya A. John SINCLAIR, Heidi WALKER and Harry SPALING (Natural Resources Institute, University of Manitoba, Winnipeg, Manitoba Canada) Session 2: Fostering learning and resilience through adaptive management in EA follow-up: The case of three Canadian assessments Patricia FITZPATRICK and Alan P. DIDUCK (Department of Geography, University of Winnipeg, Winnipeg, Manitoba Canada)
130th	30 May, 2016 at RIHN Lecture Hall Agroecology and food sovereignty: experiences from Latin America Professor Miguel ALTIERI (Professor, University of California, Berkeley / RIHN Invited Scholar)
131st	Seminar Series 131-1: 2 June, 2016 at RIHN Seminar Room 3 & 4 A Cultural Ecology of the Anthropocene: An anthropological perspective to the history of Human-

Environment Interaction research
131-2: 6 June, 2016 at RIHN Lecture Hall
A microcosm of global change: Reflections on Scale and Complexity in the Amazon
131-3: 9 June, 2016 at RIHN Seminar Room 3 & 4
Bridging knowledge systems: A problem-oriented conceptual framework to social-ecological system analysis
Eduardo BRONDIZIO (Professor, Department of Anthropology, Director, Center for the Analysis of Social-Ecological Landscapes (CASEL), Faculty Associate, The Ostrom Workshop in Political Theory and Policy, Analysis Indiana University Bloomington)

132nd 7 June, 2016 at RIHN Seminar room 3&4
India-Japanese dialogue in search of new Asian narrative of environment from view point of language and literature
TERADA Masahiro (Visiting Associate Professor, RIHN)

133rd 1 July, 2016 at RIHN Seminar room 1&2
Opportunities and Challenges for (Japanese) Scholars to Engage in Environmental Governance in India
Dr. Mansee Bal BHARGAVA

134th 6 September, 2016 at RIHN Seminar room 3&4
New Directions in Geoarchaeology
Session 1: Reconstructing past human-environment interactions in arid margins: the case study of the Adam region, Sultanate of Oman
Tara BEUZEN-WALLER (Paris-Sorbonne University, France)
Session 2: Reading the geo-bioarchives of Ephesos: Human-environment interactions in Western Turkey during the last eight millennia
Friederike STOCK (University of Cologne, Germany)

135th Seminar Series “From fieldwork to systems thinking in contemporary environmental studies”
135-1: 13 October, 2016 at RIHN Lecture Hall
A shrinking society: The case of Epirus, Greece
135-2: 20 October, 2016 at RIHN Seminar Room 3 & 4
Exploring historical tipping points: The Rhône Valley
135-3: 9 November, 2016 at RIHN Lecture Hall
Social-ecological degradation: The Argolid Region, Greece
135-4: 19 December, 2016 at RIHN Lecture Hall
Improving our studies?
Dr. Sander van der LEEUW (Arizona State University/Invited Scholar RIHN)

136th 18 November, 2016 at RIHN Seminar room 1&2
The Datasphere, in control of ecosystems
Dr. Stephane GRUMBACH (Senior Scientist at INRIA, Director of IXXI, Rhône-Alpes Complex Systems Institute)

137th 6 January, 2017 at RIHN Lecture Hall
Metastability, communication and change: observations from the Shinano-Chikuma River
Professor Simon Charles KANER (Visiting Research Fellow)

138th 10 January, 2017 at RIHN Lecture Hall
FIXING THE WORLD - Excess, leftovers and innovation
Frederic JOULIAN (École des Hautes Études en Sciences Sociales,Marseille)

Yann-Philippe TASTEVIN (Centre National de la Recherche Scientifique, Paris)
Yoann MOREAU (École des Mines, Paris)
TAKEZAWA Shoichiro (National Museum of Ethnology)
Mikaeal Le MEUR (Université Libre de Bruxelles)

139th 14 February, 2017 at RIHN Incubation room
Development of Water-Energy-Food Nexus platform for assessing impacts of food policy, trade, and land use on national resource security
Sanghyun LEE (RIHN Visiting Research Fellow)

140th 21 February, 2017 at RIHN Seminar Rooms 1 & 2
The water-climate nexus
Prof. Isaac Rodrigues dos SANTOS (RIHN Visiting Research Fellow)

141st 3 March, at RIHN Lecture Hall
On Urban Sustainability and Resilience – common misconceptions and confusion
Prof. Isaac Rodrigues dos SANTOS (RIHN Visiting Research Fellow)

11. 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.

269th 19 April, 2016
Evidence for sulfur air pollution in forest ecosystems
ISHIDA Takuya (Project Researcher)

270th 14 June, 2016
What did we want to eat? What do we want to eat? What are we going to eat?
OHTA Kazuhiko (Project Researcher)

271st 21 June, 2016
Environmental Education and International Earth Understanding
KISHIMOTO Sayaka (Center Research Associates)

272nd 5 July, 2016
Informal green space: past, present, and future
Christoph RUPPRECHT (Project Researcher)

273rd 19 July, 2016
Changing Landscape of Food Production in Western Bhutan - Adaptation of Peasant Farmers in an Era of Organic Agriculture
KOBAYASHI Mai (Project Researcher)

274th 2 August, 2016
Conserve a little wetland: ecosystem management through small-scale experiments in Mizorogaike Pond
KATO Yoshikazu (Center Researcher)

275th 23 August, 2016
Fitting wildlife range expansion using Markov chain Monte Carlo with particle filters
OSADA Yutaka (Center Research Associates)

276th 30 August, 2016
Sustainable use of fishery resource and the limit of ecolabelling - agrifoodsystem as an issue of human-

ity and nature
TAMURA Norie (Senior Project Researcher)

277th 6 September, 2016
Fieldwork in mountain glacier
TSUSHIMA Akane (Project Researcher)

278th 20 September, 2016
Agro-Pastoral Coexistence in Semi-Arid India
MIYAZAKI Hidetoshi (Project Researcher)

279th 4 October, 2016
The Culture of Glutinous Rice Food in Annual Festivals: Focus on changes in people's living environment in regions south of the Yangtze River
GAN Jingchao (Researcher, RIHN Initiative for Chinese Environmental Issues)

280th 18 October, 2016
What was the Amore Chikyuken?
Panelists: KONDO Yasuhisa (Associate Professor), ISHII Reiichiro (Associate Professor), TSUJIMURA Hanako (Administrative Staff), NAKAOHJI Yu (Administrative Staff)
Moderator: KUMAZAWA Terukazu (Associate Professor)

281st 1 November, 2016
Past and future of the hunter-gatherers through their subsistence activities: Case of the Baka pygmies living at African rainforest
HAYASHI Koji (Project Researcher)

282nd 21 February, 2017
Fish&Chips: the past and the future
MIKI Hiroshi (Project Researcher), FUKUSHIMA Atsuko (Center Research Associates), KITAMURA Kenji (Project Researcher)

12. RIHN Annual Open Meeting

RIHN researcher, office staffs, 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 324 attendees in its three-day duration, the annual meeting generated dialogue among RIHN researchers and improved general awareness of RIHN's progress and evolution within the larger fields of environmental research.

Date: 30 November - 2 December, 2016
Venue: Co-op inn Kyoto

13. Press Conferences

RIHN 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. In fiscal 2016, press conference was held in January 2017.

Date: 19 January, 2017
Venue: Kyoto Karasuma Convention Hall, Meeting room1

14. Publications

14-1 RIHN Science Series

"History of the Ideal Habitat. From the East to the West"
Written by Augustin BERQUE, Translated into Japanese by TORIUMI Motoki

"Natural Regeneration from notion of 'having a stake': from the site storks return to"
Written by KIKUCHI Naoki (in Japanese)

14-2 Others

"Megacity 1: Megacity and Sustainability"
Edited by MURAMATSU Shin, KATO Hironori, MORI Kohichiro

"Megacity 2: Evolution and Diversity of megacities"
Edited by MURAMATSU Shin, FUKAMI Naoko, YAMADA Wakita, UCHIYAMA Yuta

"Megacity 3: Megacities Engraved in History"
Edited by MURAMATSU Shin, SHIMADA Ryuto, KAGOTANI Naoto

"Megacity 4: Emerging Economic Development and Megacity"
Edited by MURAMATSU Shin, KATO Hironori, MORI Kohichiro

"Our Future Earth: Strategic Research Theme for Sustainable Earth's Society"
Written and edited by ONISHI Yuko, NISHIMURA Takeshi, HAYASHI Kengo, YAMASHITA Hitomi

"Commercial and bycatch market fishes of Panay Island, Republic of the Philippines"
Edited by MOTOMURA, H., U. B. ALAMA, N. MUTO, R. BABARAN, and S. ISHIKAWA

"Market fishes of Panay Island, Republic of the Philippines (poster)"
Edited by MOTOMURA, H., U. B. AKAMA, N. MUTO, R. BABARAN, and S. ISHIKAWA

"Laboratory Manual on Fundamental Ichthyology"
Edited by KISHIMOTO Hirokazu, SUZUKI Nobuhiro and AKAGAWA Izumi

"GUIDE TO OPERATION OF ACOUSTIC DATA COLLECTION SYSTEM (AQFI-1301) FOR SHALLOW WATERS"
Edited by MIYAMOTO, Y., UCHIDA, K., THEPAROONRAT, Y., ANONGPONYOSKUN, M., THONGSILA, K., MINLEE, Y., SASAKURA, T. and HASEGAWA, K.

"Field Guidebook on Philippine Fishing Gears - Fishing Gears in Estuaries"
Edited by Harold MONTECLARO, Kazuhiko ANRAKU and Satoshi ISHIKAWA

"Wind, Soil, and People in the Fields" (Essay)
Edited by TANAKA Ueru

"Living Landscape in the Fields" (Photo essay)
Edited by TANAKA Ueru

"Japan Strategic Research Agenda (JSRA)"
Published by Research Institute for Humanity and Nature

"Past and Present in Higashihazu"
Edited by Yinji LI

14-3 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 60-65 were published in fiscal year 2016.

Individual Achievements

A	ABE Ken-ichi	Professor
	ADACHI Kaori	Project Researcher
	ALTIERI, Miguel Angel	Visiting Research Fellow
	ASANO Satoshi	Project Researcher
B	BRONDIZIO, Eduardo Sonnewend	Visiting Research Fellow
C	CHAN, Sarah	Visiting Researcher
E	ENDO Aiko	Associate Professor
F	FU, Zhenzi	Visiting Researcher
	FUKUSHIMA Atsuko	Project Research Associate
	FUNAMIZU Naoyuki	Professor
G	GAN, Jingchao	Research Fellow NIHU Center for Area Studies
H	HABU Junko	Professor
	HANDOH Itsuki C.	Visiting Associate Professor
	HARA Yuta	Visiting Researcher
	HAYASHI Kengo	Center Research Associate
	HAYASHI Koji	Project Researcher
	HAZARD, Benoit Sylvain	Visiting Researcher
	HIYAMA Tetsuya	Visiting Professor
	HOMMA Kosuke	Visiting Associate Professor
	HONDA Hisami	Project Research Associate
	HONMA Saki	Project Research Associate
I	ICHIE Tomoaki	Visiting Associate Professor
	IKEYA Tohru	Project Researcher
	ISHIDA Takuya	Project Researcher
	ISHII Reiichiro	Associate Professor
	ISHIKAWA Satoshi	Professor
	ISHIYAMA Shun	Project Researcher
	ISOKAWA Aki	Project Research Associate
	ITO Keisuke	Project Researcher
J	JIANG, Hong-wei	Research Fellow NIHU Center for Area Studies
K	KAKIKOKA Ryo	Project Research Associate
	KAMATANI Kaoru	Project Researcher
	KANEKO Shinji	Visiting Professor
	KANER, Simon Charles	Visiting Research Fellow
	KANIE Norichika	Visiting Professor
	KASUGA Fumiko	Visiting Professor
	KATAOKA Megumi	Project Research Associate
	KATO Yoshikazu	Center Researcher
	KIHIRA Tomoe	Project Research Associate
	KIKUCHI Naoki	Associate Professor
	KISHIMOTO Sayaka	Center Research Associate
	KITAMURA Kenji	Project Researcher
	KITOLELEI, Jokim Veu	Project Research Associate
	KOBAYASHI Mai	Project Researcher
	KOBAYASHI Yuko	Project Research Associate
	KOMAKI Takuhei	Visiting Researcher
	KONDO Yasuhisa	Associate Professor
	KUBOTA Jumpei	Professor
	KUMAZAWA Terukazu	Associate Professor
	KUSAGOU Takayoshi	Visiting Professor

L	LEE, Sanghyun	Visiting Research Fellow
	LI, Zhen	Project Research Associate
M	MALLEE, Henricus Paulus	Professor
	MASUHARA Naoki	Project Researcher
	MATSUBAYASHI Jun	Center Research Associate
	MATSUI Takeshi	Visiting Professor
	MATSUMOTO Takuya	Visiting Researcher
	MATSUOKA Yuko	Project Research Associate
	MCGREEVY, Steven Robert	Associate Professor
	MEUTIA, Ami Aminah	Visiting Researcher
	MIKI Hiroshi	Project Researcher
	MIMURA Yutaka	Center Research Associate
	MIYAZAKI Hidetoshi	Project Researcher
	MIZUNO Kosuke	Professor
	MURAMATSU Shin	Visiting Professor
	MURAYAMA Satoshi	Visiting Professor
N	NAITO Daisuke	Project Researcher
	NAKAGAMI Ken'ichi	Visiting Professor
	NAKAMURA Ryo	Visiting Researcher
	NAKASHIZUKA Tohru	Specially Appointed Professor
	NAKATSUKA Takeshi	Professor
	NAWATA Hiroshi	Visiting Professor
	NEWELL, Joshua Peter	Visiting Research Fellow
	NILES, Daniel Ely	Associate Professor
	NISHI Makoto	Senior Program Researcher
	NISHIMURA Takeshi	Center Researcher
O	OH Tomohiro	Project Researcher
	OHTA Kazuhiko	Project Researcher
	OHTA Tamihisa	Center Research Associate
	OJIKA Yukari	Project Research Associate
	OKA Masami	Center Research Associate
	OKAMOTO Takako	Project Research Associate
	OKUDA Noboru	Associate Professor
	OMOTO Reiko	Project Researcher
	ONISHI Wataru	Visiting Researcher
	ONISHI Yuko	Assistant Professor
	OSADA Yutaka	Center Research Associate
R	RAMPISELA, Dorotea	Visiting Professor
	RUPPRECHT, Christoph David Dietfried	Project Researcher
S	SAIJO Tatuyoshi	Visiting Professor
	SAITO Yu	Center Researcher
	SAKAKIBARA Masayuki	Visiting Professor
	SANO Masaki	Senior Project Researcher
	SATO Tetsu	Professor
	SEKINO Tatsuki	Professor
	SHIBATA Akira	Visiting Professor
	SHIMADA Nahoko	Center Research Associate
	SHIN, Kicheol	Assistant Professor
	SHINKAI Rika	Project Researcher
	SHIRAIWA Takayuki	Visiting Associate Professor

	SUGIHARA Kaoru	Specially Appointed Professor
T	TAKAGI Akira	Visiting Associate Professor
	TAKEHARA Mari	Project Research Associate
	TAKEMURA Shion	Project Researcher
	TAKESHIMA Hirohiko	Specially Appointed Assistant Professor
	TAMURA Norie	Senior Project Researcher
	TANAKA Ueru	Professor
	TANIGUCHI Makoto	Professor
	TAYASU Ichiro	Professor
	TERADA Masahiro	Visiting Associate Professor
	TERAMOTO Shun	Project Research Associate
	TESHIMA Mika	Project Research Associate
	TESHIROGI Kouki	Project Researcher
	TOMII Noriko	Project Research Associate
	TOYAMA Mari	Specially Appointed Associate Professor
	TSUSHIMA Akane	Project Researcher
U	UCHIYAMA Junzo	Visiting Professor
	UDMALE, Parmeshwar Digamber	Project Researcher
	UEHARA Yoshitoshi	Project Research Associate
	UWASU Michinori	Visiting Associate Professor
V	VAN DER LEEUW, Sander Ernst	Visiting Research Fellow
W	WATANABE Kazuo	Senior Project Researcher
	WATANABE Kirie	Project Research Associate
Y	YABUSAKI Shiho	Center Research Associate
	YAMADA Makoto	Project Researcher
	YAMAMOTO Aya	Program Research Associate
	YAMAMOTO Mami	Project Research Associate
	YASUNARI Tetsuzo	Director-General
	YASUTOMI Natsuko	Visiting Associate Professor
	YONEMOTO Shohei	Visiting Professor
	YOSHIDA Takehito	Visiting Associate Professor
	YOSHIMIZU Chikage	Center Researcher

※Job titles listed above are as of 31 March, 2017.
(For those who retired in the middle of fiscal 2016, the job titles of that time are listed.)

FUNAMIZU Naoyuki

Professor

Born in 1953.

[Academic Career]

Department of Sanitary Engineering, Hokkaido University (1976)
Graduate School of Engineering, Department of Sanitary Engineering, Hokkaido University, Master Course (1978)

[Professional Career]

Assistant Professor, Department of Sanitary Engineering, Hokkaido University (1978)
Associate Professor, Department of Sanitary Engineering, Hokkaido University (1989)
Visiting Fellow, Department of Civil and Environment Engineering, University of California, Davis (1995)
Associate Professor, Graduate School of Engineering, Hokkaido University (1997)
Professor, Graduate School of Engineering, Hokkaido University (2004)
Specially Appointed Professor, Graduate School of Global Food Resources, Hokkaido University (2017)

[Higher Degrees]

Doctor of Engineering (Hokkaido University, 1986)

[Fields of Specialization]

Sanitary Engineering

[Academic Society Memberships]

International Water Association
Japan Society of Civil Engineers
Japan Society on Water Environment
Japan Swage Works Association
Japan Water Works Association
The Engineering Academy of Japan

[Awards]

WRRS2005 The best poster award: "Toxicity assessment of the hydrophilic organic matter in the activated sludge decay process" (2005)
The second Manufacturing award (Excellence Award)"Development of Bio-Toilet" (2007)
Japan Society on Water Environment Best Paper Award: "Transformation and characterisation of dissolved organic matter during the thermophilic aerobic biodegradation of feces" (2008)
International Water Association Fellow (2010)
Japan Water Forum Toilet Award to change the world (2014)
Japan Society on Water Environment Achievement award (2014)
Best Presentation Award 9th IWA International Symposium on Waste Management Problems in Agro-Industries: "Effect of burned shell dosage on crystal species in synthetic cow urine (S. Kaneko, R. Ito, N. Funamizu" (2014)
Best Poster Award IWA Specialist conference on Nutrient Removal and Recovery "Water and Inorganic Nitrogen Components Movement in the Soil Column of Grain Sorghum" (Abukmeil Reem, Funamizu N.) (2015)
Japan Society on Water Environment Academic Award "Development of Wastewater Differentiable Onsite Treatment System" (2015)

—Achievements—

[Papers]

[Original Articles]

・Funamizu N, Harada T, Watabe Y, Wachi E, Yoshida T 2016,09 Activity report of the Ishikari River basin area water and sanitation system Part 3. Suido Koron (9) :46-51. (in Japanese)

・Funamizu N 2016 Compost toilet for developing countries. Research on plumbing equipment 33(3) :17-20. (in Japanese)

・Sossou SK, Sou/Dakoure M, Hijikata N, Maiga AM, Funamizu N 2016 Inactivation kinetics of indicator microorganisms during urea treatment for sanitizing compost from composting toilet. Journal of Water, Sanitation and Hygiene for Development 76(13) :3838-3850. DOI:10.2166/washdev.2016.090. (reviewed).

・Hijikata N, Tezuka R, Kazama S, Otaki M, Ushijima K, Ito R, Okabe S, Sano D, Funamizu N 2016 Bactericidal and virucidal mechanisms in the alkaline disinfection of compost using calcium lime and ash. Journal of Environmental Management 181 :721-727. DOI:10.1016/j.jenvman.2016.08.026.(reviewed).

・Bradai, M , Han, J, El Omri, A,Funamizu N, Sayadi, S ,Isoda, H 2016 Effect of linear alkylbenzene sulfonate (LAS) on human intestinal Caco-2 cells at non cytotoxic concentrations. Cytotechnology 68(4) :1267-1275. DOI:10.1007/s10616-015-9887-4.(reviewed).

・Sossou SK, Gbedenudk, Konate Y, Sawadogo B, Ameyapih Y, Maiga AH, Funamizu N 2016 Damage mechanisms of pathogenic bacteria in drinking water during chlorine and solar disinfection. Int. J. Biol. Chem. Sci. 10(2) :519-532.(reviewed).

・Miguel Ángel López Zavala, Blanca Nelly Flores Arriaga, Naoyuki Funamizu 2016 Simultaneous Determination of Four Estrogens in Compost Based on Ultrasonic Solvent Extraction, Solid-Phase Extraction Clean-Up and Analysis by UHPLC-MS/MS. American Journal of Analytical Chemistry, 7 : 434-445.(reviewed).

・Sossou SK, Sou/Dakoure M, Hijikata N, Maiga AM, Funamizu N 2016 Inactivation kinetics of indicator microorganisms during solar heat treatment for sanitizing compost from composting toilet. Journal of Water and Environment Technology 14(2) :37-46. DOI:10.2965/jwet.14-066.(reviewed).

・Kabore S, Ito R, Funamizu N 2016 Effect of Formaldehyde/Urea ratio on production rate of Methylene Urea from Human urine. Journal of Water and Environment Technology 14(2) :47-56. DOI:10.2965/jwet.15-016.(reviewed).

・Kabore S, Ito R, Funamizu N 2016 Reaction kinetics for the production of methylene urea from synthetic human urine. Journal of Environmental Chemical Engineering 4(2) :2510-2517. DOI:10.1016/j.jece.2016.04.028.(reviewed).

・Ito R, Fujioka M, Funamizu N 2016 Phosphorous recovery from urine based wastewater of cowshed. Journal of Japan Society of Civil Engineers, Ser. G (Environmental Research), 72. (in Japanese) (reviewed).

・Ito R, Funamizu N 2016 Phosphate Recovery from synthetic Urine with shell of Mizuhopecten Yessoensis. Journal of Water and Environment Technology 14(6) :437-446.(reviewed).

[Research Presentations]

[Oral Presentation]

・Funamizu N Sanitation value chain: its concept and element technologies. RIHN 11th International Symposium Asia's Transformations to Sustainability:Past, Present and Future of the Anthropocene, 2017,03,10-2017,03,11, Kyoto.

・Yamauchi T, Ushijima K, Sintawardani N, Funamizu N Future Sanitation Based on the Insight and Participation of Children: A Collaboration between Schoolchildren in Indonesia and Japan. The 1st International Symposium on Green Technology for Value Chain 2016, 2016,10,03-2016,10,05, BSD, Indonesia.

・K Ushijima, H Kobayashi, D Nilawati, J T Astuti, N Sitawardani, N Funamizu Visualization of Urban Metabolism for Designing Value Chain Improving Living Conditions in Urban Slum of Bandung City. 1st International Symposium on Green Technology for Value Chains 2016 , 2016,10,03-2016,10,05, Banten, Indonesia.

・B.C.W. Nikiema, R. Ito, G. Mokhtar, N. Funamizu Hydrolysed urine concentration by forward osmosis: numerical modelling of water flux and nutrient concentration. the 13th IWA Specialized Conference on Small Water and Wastewater Systems (SWWS) & the 5th IWA Specialized Conference on Resources-Oriented Sanitation (ROS), 2016,09,14-2016,09,16, Athene, Greece.

・T. Maeda, B. Nikiema, C. Wind-Yam, G. Mokhtar, R. Ito, N. Funamizu Urine concentration by forward osmosis process. the 13th IWA Specialized Conference on Small Water and Wastewater Systems (SWWS) & the 5th IWA Specialized Conference on Resources-Oriented Sanitation (ROS), 2016,09,14-2016,09,16, Athene, Greece.

・R. Ito, M. Tanie, K. Ushijima, D. Nilawati, J. Triastuti, N. Sintawardani N. Funamizu Evaluation of a composting toilet prototype for people in slum area in Indonesia. he 13th IWA Specialized Conference on Small Water and Wastewater Systems (SWWS) & the 5th IWA Specialized Conference on Resources-Oriented Sanitation (ROS), 2016,09,14-2016,09,16, Athene, Greece.

・B.C.W. Nikiema, R. Ito, G. Mokhtar, N. Funamizu Prediction of water recovery during urine concentration by Forward Osmosis. the 13th IWA Leading Edge Conference on water and wastewater technologies, 2016,06,13-2016,06,16.

・Kabore Wendkouni John Steve, Ito R, Funamizu N Reaction Kinetics for the Production of Methylene-Urea from Human Urine. 13th IWA leading edge conference on water and wastewater technologies, 2016,06,13-2016,06,16, Jerez de la Frontera, Spain.

・Guizani M, Funamizu N Use of Electro-adsorptive membranes to remove LPS endotoxin from reclaimed wastewater. 13th IWA leading edge conference on water and wastewater technologies, 2016,06,13-2016,06,16, Jerez de la Frontera.

・R Ito, S. Kaneko, N Funamizu Recovery of phosphate from human urine by shell particles of Mizuhopecten yessoensis. the 13th IWA Leading Edge Conference on water and wastewater technologies, 2016,06,13-2016,06,16, Jerez de la Frontera, Spain.

[Invited Lecture / Honorary Lecture / Panelist]

・Funamizu N Resources oriented sanitation: its concept and element technologies. Special Lecture at De La Salle University, Japanese Professors Dispatch Program 2016, ASEAN University Network / Southeast Asia Engineering Education Development Network, 2017,02,20, Manila.

・Funamizu N The sanitation value chain: Its concept and new research collaboration project. International Symposium on Green Technology for Value Chains 2016, 2016,10,04, Indonesian Convention Exhibition, Banten, Indonesia.

HABU Junko

Professor

Born in 1959.

[Professional Career]

Visiting Professor, Research Institute for Humanity and Nature, Kyoto, Japan (2016)
Professor, Research Institute for Humanity and Nature, Kyoto, Japan (2014)
Professor, Department of Anthropology, University of California, Berkeley (2010)
Associate Professor, Department of Anthropology, University of California, Berkeley (2002)
Assistant Professor, Department of Anthropology, University of California, Berkeley (1996)
Faculty Lecturer, Department of Anthropology, McGill University(1994)
Full-time Research Associate (joshu), Faculty of Science, The University of Tokyo (1984)

[Higher Degrees]

Ph.D. (Archaeology, Department of Anthropology, McGill University, 1996)

M.A. (Archaeology, Division of History, Keio University, 1984)

B.A. (Archaeology, Department of Ethnology and Archaeology, Division of History, Keio University, 1982)

[Academic Society Memberships]

American Anthropological Association

Society for American Archaeology

Sigma Xi

American Geophysical Union

Indo-Pacific Prehistory Association

Society for East Asian Archaeology

Japanese Archaeological Association

Society of Archaeological Studies of Japan

The Anthropological Society of Nippon

Japan Association for Quaternary Research

Japanese Society for Scientific Studies on Cultural Property

Kagoshima Archaeological Association

Association for Edo Period Archaeology

—Achievements—

[Papers]

[Original Articles]

- Crema, E., Habu, J., Kobayashi, K., Madella, M. 2016,04 Summed Probability Distribution of 14C Dates Suggests Regional Divergences in the Population Dynamics of the Jomon Period in Eastern Japan. PLOS One . DOI:http://dx.doi.org/10.1371/journal.pone.0154809 .(reviewed).
- Habu, Junko 2016,09 Food Diversity and Climate Change: Lessons from the Early and Middle Jomon Periods, Japan. Quarterly of Archaeological Studies 63(2). (in Japanese) (reviewed).
- Habu, Junko 2017,01 Jomon Food Diversity and Environmental Change. Kagaku 87(2). (in Japanese)
- Heron, Carl, Junko Habu, Mio K. Owens, Yumiko Ito, Yvette Eley, Alexandre Lucquoin, Anita Randini, Hayley Saul, Cynthianne D. Spitteri and Oliver Craig 2016,08 Molecular and isotopic investigations of pottery and 'charred remains' from Sannai Maruyama and Sannai Maruyama No.9, Aomori Prefecture, Japan. Japanese Journal of Archaeology 4(1) :29-52.

[Research Presentations]

[Oral Presentation]

- Habu, Junko Food Diversity, Demography and Climate Change: Lessons from the Prehistoric Jomon Period, Japan. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Habu, Junko, Barbara Rose Johnston and Rika Shinkai Indigenouse rights, cultural heritage, landscapes, and dam construction: the case from Nibutani in Hokkaido, Japan. World Archaeological Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Johnston, Barbara, R. and Junko Habu Doing archaeology and cultural heritage work in nuclear disaster zones: environmental health risks and worker concerns. World Archaeoloigcal Congress, 2016,08,28-2016,09,02, Doshisha University, Kyoto.
- Kawahata, H., Hatta, Y., Ota, Y., Yoshida, A. and Habu, J. Quantitative Reconstruction of Temperature in Northern Japan for the Last 2000 Years and the Influential Factors to Determine Climatic Fluctuation. European Geosciences Union-General Assembly 2016, 2016,04,17-2016,04,22, Austria Center Vienna, Austria.

・Kawahata, H., Hatta, Y., Habu, J. and Yoshida, A. Kitanihon ni okeru Kako 6,700 nenkan no Ondo Henka to Jinrui Katsudo (Temperature Variation and Human Activity For the Last 6,700 Years in Northern Japan). Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba. (in Japanese)

・Yamaguchi, Tomiko and Junko Habu Institutional Expertise and Lay Responses to Soil Contamination: The Experience of Farmers in Fukushima. The Third ISA Forum of Sociology, 2016,07,10-2016,07,13, Vienna, Austria.

・Yoshida, A., Kawahata, H. and Habu, J. Cooling Climate of the Middle Holocene Reconstructed from the Pollen Analysis Data of the Sediment Core of Uchiura Bay, Hokkaido. Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba. (in Japanese)

[Invited Lecture / Honorary Lecture / Panelist]

・Habu, Junko Key Note Speech: Food Diversity and Climate Change: Case Studies from the Early to Middle Jomon Period. Society of Archaeological Studies, 62nd General Meeting, 2016,04,16-2016,04,17. (in Japanese)

・Habu, Junko Food Diversity, Climate Change and the Resilience Human-Environmental Interaction: A Case Study from the Jomon Period. Japan Geoscience Union Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba-City, Chiba. (in Japanese)

IKEYA Tohru

Project Researcher

[Academic Career]

Graduate School of Science, The University of Tokyo(1992)

Graduate School of Environmental Sciences, University of Tsukuba(1987)

College of Biological Sciences, University of Tsukuba(1985)

[Professional Career]

JSPS-Post-doctral Fellow, Division of bioenergetics, National Institute for Basic Biology, Okazaki, Japan (1992)

Research Scientist, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Yokosuka, Japan (1994)

Research Promotion Technician, National Institute of Polar Research, Tokyo, Japan (1998)

Assistant Researcher, Department of Systems Science, The University of Tokyo, Tokyo, Japan (1999)

Research Associate, Department of Life Sciences, Graduate school of Arts and Sciences, The University of Tokyo, Tokyo, Japan (2003)

Postdoctoral Researcher, Ocean Research Institute, The University of Tokyo, Tokyo, Japan (2006)

Joint industry-university project researcher, Ocean Research Institute, The University of Tokyo, Tokyo, Japan (2007)

Project researcher, Ocean Research Institute, The University of Tokyo, Tokyo, Japan (2008)

Project researcher, Atmosphere and Ocean Research Institute The University of Tokyo, Kashiwa, Japan (2010)

Project researcher, Department of Biological Sciences, Graduate School of Science, The University of Tokyo, Tokyo, Japan (2014)

Joint industry-university project researcher, Faculty of Environment & Information Sciences Yokohama National University, Japan (2014)

[Higher Degrees]

Ph.D.(The University of Tokyo, 1992)

M.A. (University of Tsukuba, 1986)

[Fields of Specialization]
Aquatic ecology, Environmental Sciences

[Academic Society Memberships]
Botanical Society of Japan
Ecological Society of Japan
Deep ocean water Applications Society
Association for the Sciences of Limnology and Oceanography
Nature Restoration and Conservation Society, Japan
Japanese Society of Environmental Education
The Plankton Society of Japan
The Japanese Society of Limnology
Japan Geoscience Union

[Awards]
Early Career Travel Grant for the Joint Aquatic Sciences Meeting 2014 in Portland, Oregon (Association for the Science of Limnology and Oceanography)

—Achievements—

[Papers]

[Original Articles]

・K. Kawanobe, T. Ikeya 2016,08 An examination of fixatives and sample storage temperatures for marine phytoplankton preservation; comprehensive policies on quality and risk control. BULLETIN OF THE PLANKTON SOCIETY OF JAPAN 63(2) :55-65. (in Japanese) (reviewed).

[Review Articles]

・T. Ikeya 2016,10 Activities for Japanese conservation area as the UNESCO world natural heritages and biosphere reserves: Towards participatory approach by local communities: A review. Journal of Nature Restoration and Conservation 8(1) :3-22. (in Japanese) (reviewed).

KITAMURA Kenji

Project Researcher

[Higher Degrees]
Ph.D.(Simon Fraser University, 2010)
Master of Applied Science(University of New South Wales, 1999)

—Achievements—

[Research Presentations]

[Oral Presentation]

・Kitamura, Kenji. “Future Visions of Primary Industries Created by Collective Actions in the Nishibetsu Watershed in Japan”. ILEK Project International Symposium: Transformations of Social-Ecological Systems: Co-creating integrated knowledge toward sustainable futures, 2017,01,22, Kyoto.

KONDO Yasuhisa

Associate Professor

Born in 1979.

[Academic Career]

Department of Archaeology, The University of Tokyo, PhD course (2006-2009)
Department of Archaeology, The University of Tokyo, master course (2002-2005)
Department of Archaeology, The University of Tokyo, undergraduate course (1998-2002)

[Professional Career]

Associate Professor, Research Institute for Humanity and Nature (2014)
JSPS Research Fellow (PD), Tokyo Institute of Technology (2011)
Project Researcher, The University Museum, The University of Tokyo (2010)
Visiting Scholar, Center for Spatial Information Science, The University of Tokyo (2010)
JSPS Research Fellow (PD), The University of Tokyo (2009)
JSPS Research Fellow (DC2), The University of Tokyo (2008)

[Higher Degrees]

D.Litt. (The University of Tokyo, 2010)
M.A. (The University of Tokyo, 2005)

[Fields of Specialization]

Archaeology
Geographical Information Science
Open Science

[Academic Society Memberships]

International Association of Geomorphologists
Computer Applications and Quantitative Methods in Archaeology (CAA)
CIPA Heritage Documentation
European Geosciences Union (EGU)
Japan Geoscience Union (JpGU)
GIS Association of Japan (GISA)
The Association of Japanese Geographers (AJG)
Anthropological Society of Nippon
Society of Archaeological Studies
Japan Society for West Asian Archaeology (JSWAA)
Japanese Palaeolithic Research Association (JPRA)
Japan Consortium for International Cooperation in Cultural Heritage
Japan Society for Research Policy and Innovation Management (JSRPIM)

[Awards]

Kurita Water and Environmental Research Award (2016)
CSIS DAYS 2011 Presentation Award (2011)
Japanese Society for Archaeological Informatics Katata Award (2008)

—Achievements—

[Books]

[Chapters/Sections]

・Yasuhisa Kondo 2016,12 Digital documentations of Kasr al-Sleme (Tower 1148). Christopher P. Thornton, Charlotte M. Cable, Gregory L. Possehl (ed.) The Bronze Age Towers at Bat, Sultanate of Oman: Research by the Bat Archaeological Project, 2007-12. Museum Monograph, 143. University of Pennsylvania Press, Philadelphia, pp.83-122.

・Kristen Hopper, Yasuhisa Kondo 2016,12 Surface Structures at Ad-Dariz South. Christopher P. Thornton, Charlotte M. Cable, Gregory L. Possehl (ed.) The Bronze Age Towers at Bat, Sultanate of Oman: Research by the Bat Archaeological Project, 2007-12. Museum Monograph, 143. University of Pennsylvania Press, Philadelphia, pp.155-167.

[Editing]

[Editing / Co-editing]

・Yasuhisa Kondo (ed.) 2016,05 Bat Digital Heritage Inventory Project Report of the Follow-up Season December 2015-January 2016. 38pp.

[Papers]

[Original Articles]

・Yasuhisa Kondo, Takehiro Miki, Taichi Kuronuma, Yuichi S. Hayakawa, Kyoko Kataoka, Takashi Oguchi 2016,08 Concurrent and sustainable development of a local-scale digital heritage inventory through action research at Bat, Oman. Journal of Cultural Heritage Management and Sustainable Development 6(2) :195-212. DOI:10.1108/JCHMSD-01-2016-0005.(reviewed).

[Research Presentations]

[Oral Presentation]

・Yasuhisa Kondo, Atsushi Noguchi Best practices and challenges in promoting open science in archaeology: two narratives from Japan. 45th Annual Conference on Computer Applications and Quantitative Methods in Archaeology (CAA), 2017,03,14-2017,03,16, Georgia State University, Atlanta, USA.

・Yasuhisa Kondo, Akira Saito, Nozomi Mizota, Tomoko Koyama Synergistic collaboration between data visualisation experts and historians in developing a geodatabase of forced resettlement in the colonial Andes. 45th Annual Conference on Computer Applications and Quantitative Methods in Archaeology (CAA), 2017,03,14-2017,03,16, Georgia State University, Atlanta, USA.

・Yasuhisa Kondo Grand design of the PaleoAsia DB, a holistic site database of the PaleoAsia project. The 1st Conference on Cultural History of PaleoAsia, 2016,11,05-2016,11,06, Koshiba Hall, The University of Tokyo, Bunkyo-ku, Tokyo, Japan. (in Japanese)

・Yasuhisa Kondo Joint ecological niche- & cost surface model to backcast the adaptation of early modern humans to the palaeoenvironment. Future Earth Cluster Workshop “Modeling Challenges for Sustainability”, 2016,09,28-2016,09,30, Reserarch Institute for Humanity and Nature, Kyoto, Japan.

・Yasuhisa Kondo, Yuichiro Nishimura Renaissance of the “TOMOBIKI Night!!” social streaming program for geospatial information science and technology. Japan Geoscience Union Annual Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba, Japan. (in Japanese)

・Yasuhisa Kondo, Yuichiro Nishimura How open scientific research data transform transdisciplinary research: a theoretical debate. Japan Geoscience Union Annual Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba, Japan. DOI:10.13140/RG.2.1.2665.8163.

[Poster Presentation]

・Yasuhisa Kondo Understanding early modern humans in Arabia: a research plan in Oman. The 1st Conference on Cultural History of PaleoAsia, 2016,11,05-2016,11,06, Koshiba Hall, The University of Tokyo, Bunkyo-ku, Tokyo, Japan. (in Japanese)

・Yasuhisa Kondo, Terukazu Kumazawa, Tatsuki Sekino, Ichiro Tayasu, Takanori Nakano Building an ontology of isotope environmental science. Japan Geoscience Union Annual Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba, Japan. (in Japanese)

[Invited Lecture / Honorary Lecture / Panelist]

・Makoto Taniguchi, Hein Malle, Yuko Onishi, Takeshi Nishimura, Kuniyoshi Ebina, Masayuki Itoh, Hiroki Tsuruta, Yasuhisa Kondo, Tetsuzo Yasunari Japan strategic research agenda and research design for Future Earth. Japan Geoscience Union Annual Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe, Chiba, Japan. (in Japanese)

KUMAZAWA Terukazu

Associate Professor

Born in 1974.

[Higher Degrees]

Dr of Engineering

[Fields of Specialization]

Environmental planning

Regional informatics

—Achievements—

[Papers]

[Original Articles]

・Terukazu Kumazawa・Keishiro Hara・Aiko Endo・Makoto Taniguchi 2016,04 Supporting collaboration in interdisciplinary research of water-energy-food nexus by means of ontology engineering. Journal of Hydrology: Regional Studies . DOI:10.1016/j.ejrh.2015.11.021.(reviewed).

[Research Presentations]

[Poster Presentation]

・Yasuhisa Kondo, Terukazu Kumazawa, Tatsuki Sekino, Ichiro Tayasu, Takanori Nakano Building an ontology of isotope environmental science. Japan Geoscience Union MEETING2016, 2016,05,22-2016,05,26, Makuhari Messe International Conference Hall, Chiba, Japan. (in Japanese)

MALLEE, Hein

Professor

Born in 1963.

[Professional Career]

International Development Research Centre, Singapore
Senior Program Officer
Rural Poverty & Environment Program
Ecosystems Approaches to Human Health Program
2004 - 2013
++
Ford Foundation, Beijing
Program Officer
Environment and Development Program
1999 - 2004
++
China-Netherlands Poverty Alleviation Project | Huoshan, Anhui Province, China
Co-director
1997 - 1999

[Higher Degrees]

Ph.D. Leyden University 1997

[Fields of Specialization]

Social science
China Studies
Natural Resources Management
Forest Governance
Ecohealth

—Achievements—

[Research Presentations]

[Oral Presentation]

- Hein Mallee "Ecohealth, One Health, Planetary Health and the Demographic Transition". Hainann Province Lecture, 2017,02,20, Hainan Provincial Center for Disease Control, Hainan Province, China. (in Chinese)
- Hein Mallee "Ecohealth, Transdisciplinarity and Participation". JSPS Japanese-Swiss Ecohealth Colloquium, 2017,01,11-2017,01,12, Swiss Tropical and Public Health Institute.
- Hein Mallee "RIHN and Future Earth" (Researcher Talk). Inter-University Research Institute Corporations Symposium 2016, 2016,11,27, Akiba Square, Tokyo. (in Japanese)
- Hein Mallee "Ecohealth or One Health?". Sanitation Value Chain Project Workshop, 2016,07,22, RIHN.
- Hein Mallee "When Is A Co-Design Approach Needed?". 23rd Pacific Science Congress, 2016,06,13-2016,06,17, Academia Sinica, Taipei.
- Hein Mallee "Regional Development of Future Earth in Asia". 16th Conference of the Science Council of Asia, 2016,05,30-2016,06,01, Colombo, Sri Lanka.
- Hein Mallee "The Regional Center for Future Earth in Asia". KAST International Symposium on Future Earth & Sustainable Development Goals in Asia, 2016,04,25, Seoul.

[Poster Presentation]

・Hein Mallee, Moji Kazuhiko, Watanabe Chiho, Jiang Hongwei "Development of Ecohealth Thinking and Research in Japan". One Health-Ecohealth Conference, 2016,12,03-2016,12,06, Melbourne.

[Invited Lecture / Honorary Lecture / Panelist]

・Hein Mallee Panelist. The Circular Economy for Deep Sustainability, 2017,03,20, Politechnique Montréal, Canada.

・Hein Mallee "Considering Health in the Context of Sustainability" (Invited Plenary Presentation). 10th National Health Research Forum, 2016,10,27-2016,10,28, Savannakhet, Lao PDR.

・Hein Mallee Panelist. SDG Dialogue: Regional Institutions & the SDGs - Science, Policy & Capacity Building, 2016,10,13, United Nations University, Tokyo.

MASUHARA Naoki

Project Researcher

Born in 1974.

[Higher Degrees]

Doctor of Engineering(Osaka University, 2017)

Master of Political Science(Waseda University, 2000)

[Fields of Specialization]

Public Administration

Local Government Studies

Environment and Energy Policy

Citizen Participation Studies

—Achievements—

[Papers]

[Original Articles]

・Naoki Masuhara, Kenshi Baba, Akihiro Tokai 2016,11 Clarifying relationships between participatory approaches, issues, processes, and results, through crosscutting case analysis in Japan's environmental, energy, and food policy areas. Environment Systems and Decisions online(first) :1-17. DOI:10.1007/s10669-016-9613-6.(reviewed).

MCGREEVY, Steven R.

Associate Professor

Born in 1978.

[Academic Career]

Division of Natural Resource Economics, Graduate School of Agriculture, Kyoto University (2008-2012)

College of Continuing Education, University of Minnesota (2002-2004)

St. John's University- Collegeville, MN (1997-2000)

[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.LS. (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
Environmental Sociology

[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]

[Chapters/Sections]

・McGreevy, Steven R. & Akitsu, Motoki. 2016 "Steering sustainable food consumption in Japan: trust, relationships, and the ties that bind". Genus, Audley (ed.) Sustainable Consumption: Perspectives, Design and Practices. Springer, pp.101-117. DOI:10.1007/978-3-319-29665-4_7.

[Papers]

[Original Articles]

・Tachikawa, Masashi, Steven R. McGreevy, Akitsu Motoki, & Momoe Oga. 2016,12 Food Policy Councils in North America: Their Trend and Implications. Journal of Food System Research 23(3) :299-304. (in Japanese) (reviewed).

・[Newsletter] McGreevy, Steven R. 2016 Sustainable Lifestyles: Enough is as good as a feast. RIHN Humanity and Nature Newsletter 63 :15. (in Japanese)

[Research Presentations]

[Oral Presentation]

・McGreevy, Steven R. Lifeworlds as pedagogy for socio-cultural change: sensuous food futures, practices, and meaning in everyday experience. RIHN 11th International Symposium: "Asia's Transformations to Sustainability: Past, Present and Future of the Anthropocene", 2017,03,10-2017,03,11, RIHN.

・McGreevy, Steven R. Don't rock the boat? Radical change and reaching consensus in the FEAST project and Future Earth. 5th Workshop on Future Earth in Asia, 2017,01,23-2017,01,24, .

・McGreevy, Steven R. "Let's think about tomorrow's food for the future of Noshiro in 30 years". 17th RIHN Regional Collaboration Seminar, 2016,12,05, Plaza, Noshiro City, Akita Prefecture, Japan. (in Japanese)

・McGreevy, Steven R. & Atsushi Inaba A review of food LCA smartphone apps: the challenge of socially embedded information. EcoBalance 2016, 2016,10,06, Kyoto, Tersa.

・McGreevy, Steven R. & Keiko Tanaka Nurturing Future Farmers: Comparative Analysis of the Support System for Beginning Farmers between Japan and the United States. 14th World Congress for Rural Sociology, 2016,08,10-2016,08,14, Ryerson University, Toronto.

・McGreevy, Steven R. Value for what? Value for whom?: Redefining Value in Food Chains in an Age of Degrowth. RIHN Joint Seminar with University of Hokkaido, 2016,06,25, University of Hokkaido, Clark Hall.

・McGreevy, Steven R. Sustainable food consumption and agrifood system transition in Asia: Introducing the FEAST Project. Second International Conference of the Sustainable Consumption Research and Action Initiative (SCORAI), 2016,06,15-2016,06,17, Maine, USA, University of Maine.

・Tsuchiya, K., Hara, Y., & McGreevy, S.R. Who feeds us? Building GIS integrated analytical toolkits for food systems localization. Second International Conference of the Sustainable Consumption Research and Action Initiative (SCORAI), 2016,06,15-2016,06,17, University of Maine, USA.

[Poster Presentation]

・Mallee, Hein, Maurie Cohen, Magnus Bengtsson, Steven R. McGreevy, & Patrick Schroeder. Knowledge Action Network: Systems of Sustainable Consumption and Production. 5th Workshop on Future Earth in Asia, 2017,01,23-2017,01,24, RIHN.

[Invited Lecture / Honorary Lecture / Panelist]

・McGreevy, Steven R. Rural Sustainable Development in Japan: Will the seeds of transition take root?. 2nd Kyoto University/Wageningen University International Graduate Workshop on Food, Farm, and Rural Development, 2016,05,25, Kyoto University.

NAKASHIZUKA Toru

Specially Appointed Professor

Born in 1956.

—Achievements—

[Books]

[Chapters/Sections]

・Tohru Nakashizuka, Masaya Shimazaki, Takehiro Sasaki, Takahisa Tanaka, Hiroko Kurokawa, and Houki Hikosaka 2016,04 Influences of Climate Change on the Distribution and Population Dynamics of Subalpine Coniferous Forest in the Hakkoda Mountains, Northern Japan. Structure and Function of Mountain Ecosystems in Japan. Springer.

・Kouki Hikosaka, Takehiro Sasaki, Chiho Kamiyama, Masatoshi Katabuchi, Shimpei Oikawa, Masaya Shimazaki, Hiroshi Kimura, and Tohru Nakashizuka 2016,04 Trait-Based Approaches for Understanding Species Niche, Coexistence, and Functional Diversity in Subalpine Moorlands. Structure and Function of Mountain Ecosystems in Japan. Springer. pp.1-15.

[Editing]

[Editing / Co-editing]

・Jotaro Urabe · Tohru Nakashizuka (Eds) (ed.) 2016,11 Ecological Impacts of Tsunamis on Coastal Ecosystems - Lessons from the Great East Japan Earthquake.

・Shin-ichi Nakano・Tetsukazu Tahara・Tohru Nakashizuka (ed.) 2016,06 Aquatic Biodiversity Conservation and Ecosystem Services. Asia-Pacific Biodiversity Obseervation Network. Springer.

[Papers]

[Original Articles]

・Shoko Sakai a, Choy Yee Keong, Keiko Kishimoto-Yamada, Kohei T. Takano, Masahiro Ichikawa,Hiromitsu Samejima, Yumi Kato, h, Ryoji Soda, Masayuki Ushio, Izuru Saizen, Tohru Nakashizuka,Takao Itioka 2016,12 Social and ecological factors associated with the use of non-timber forest products by people in rural Borneo.. Biological Conservation 204 :340-349.

・Masahiro Aiba, Hiroko Kurokawa, Yusuke Onoda, Michio Oguro, Tohru Nakashizuka & Takashi Masaki 2016,05 Context-dependent changes in the functional composition of tree communities along successional gradients after land-use change. Journal of Ecology 104 :1347-1356.

[Research Presentations]

[Oral Presentation]

・Tohru Nakashizuka Recent Dynamics and Future Prediction of Mountain Vegetation in Northern Japan. The 7th International Conference on Water Resources and Encironment Research (ICWRER2016), 2016,05,05-2016,05,09, Kyoto.

・Tohru Nakashizuka Impacts and risks of climate change on biodiversity and ecosystem. 7th Japan-EU Workshop on Climate Change Research, 2016,04,26-2016,04,27, Tokyo.

[Invited Lecture / Honorary Lecture / Panelist]

・Tohru Nakashizuka Interactive Dialogue on Living in Harmony with Nature. The thirteenth meeting of the Conference of the Parties to the Convention on Biological Diversity(COP13), 2016,12,12, Cancún, México.

・Tohru Nakashizuka Modelling terresitial natural capital and ecosystem services in Japan. Seminar: Ecosystem Scenarios and Models From Local to National Scales -Contributions to IPBES Regional and Global Asswssments-, 2016,11,14, Tokyo.

・Tohru Nakashizuka, Reiichiro Ishii WG2: AISA-PACIFIC BIODIVERSITY OBSERVATION NETWORK(AP-BON): Session1 Moderators: Overview of regional and national BON activities. AGENDA The Ninth GEOSS Asia-Pacific Symposium: "Earth Observation Supporting the Implementation of the SDGs in the Asia Pacific Region", 2016,11,11-2016,11,13, Tokyo.

・Tohru Nakashizuka WG2: AISA-PACIFIC BIODIVERSITY OBSERVATION NETWORK(AP-BON): Discussion towards broader engagement of observation and user communities: 2)Data-Knowledge-Information chain: Japan Biodiversity Outlook 2. AGENDA The Ninth GEOSS Asia-Pacific Symposium: "Earth Observation Supporting the Implementation of the SDGs in the Asia Pacific Region", 2016,11,11-2016,11,13, Tokyo.

・Tohru Nakashizuka Effects of climate change on mountain forest. Sino-Japan forum on frontiers in forest ecology, 2016,09,29, Nanníng, China.

NAKATSUKA Takeshi

Professor

Born in 1963.

—Achievements—

[Papers]

[Original Articles]

・Naoyuki Kurita, Takeshi Nakatsuka, Keiko Ohnishi and Takumi Mitsutani 2016,10 Analysis of the interdecadal variability of summer precipitation in central Japan using a reconstructed 106-year-long oxygen isotope record from tree-ring cellulose.. Journal of Geophysical Research-Atmosphere 121(20) :12,089-12,107. DOI:10.1002/2016JD025463.(reviewed).

・Chenxi Xu, Huaizhou Zheng, Takeshi Nakatsuka, Masaki Sano, Zhen Li, Junyi Ge 2016,06 Inter- and intra-annual tree-ring cellulose oxygen isotope variability in response to precipitation in Southeast China.. Trees - Structure and Function 30 :785-794. DOI:10.1007/s00468-015-1320-2.(reviewed).

・Chenxi Xu, Junyi Ge, Takeshi Nakatsuka, Liang Yi, Huaizhou Zheng, and Masaki Sano 2016,04 Potential utility of tree ring 18O series for reconstructing precipitation records from the lower reaches of the Yangtze River, southeast China.. Journal of Geophysical Research-Atmosphere 121(8) :3954-3968. DOI:10.1002/2015JD023610.(reviewed).

[Research Presentations]

[Oral Presentation]

・Takeshi Nakatsuka and members of Historical Climate Adaptation project Climatic periodicity and societal response : Integrating paleoclimate data with historical and archaeological evidences. 8th World Archaeological Congress, 2016,08,28-2016,09,02, Kyoto Japan.

・Takeshi Nakatsuka Oxygen Isotope Dendroarchaeology-Its Background, Principle and Perspectives-. 8th World Archaeology Congress, 2016,08,28-2016,09,02, Kyoto Japan.

[Poster Presentation]

・Zhen Li, Masaki Sano, Takeshi Nakatsuka The optimized techniques of cellulose extraction for the isotope dendroarcheological study using wood samples from archaeological sites. The Eight Word Archaeological Congress, 2016,08,28-2016,09,02, Kyoto.

NILES, Daniel

Associate Professor

Born in 1971.

[Academic Career]

Ph.D.(Graduate School of Geography, Clark University, Aug 1999-May 2007)

Seminar in College Teaching(Interdisciplinary Unit, Clark University, June-July 2006)

Certificate program in Wood Technology (3 of 4 semesters completed)(Laney College (Peralta Community College District, California), Jan 1998-May 1999, Jun-July 2000)

B.A. in Community Studies (High Honors)(University of California, Santa Cruz, Aug 1989-Mar 1994)

[Professional Career]

RIHN Communications Coordinator/PASONA(October 2008-March 2009)
RIHN Contract Worker(August 2008)
MINPAKU Visiting Researcher(1 June 2008-31 March 2009)
Lecturer, Department of Geography, Clark University(August-December 2006)
Editorial Assistant, The Geographical Review (June 2005-July 2006)
Research Assistant, Prof. Turner(August-December 2000)
Research Assistant, Profs. Turner and Kasperson(August-December 1999)
ESL Teacher(March 1998-January 1999)
Research Assistant, Professor Carter Wilson(August 1996-January 1997)

[Higher Degrees]

Ph.D.(Graduate School of Geography, Clark University, Aug 1999-May 2007)
B.A. in Community Studies (High Honors)(University of California, Santa Cruz, Aug 1989-Mar 1994)

[Fields of Specialization]

Geography

[Awards]

Full Tuition Fellowship, Graduate School of Geography, Clark University, 1999-2007
Biodiversity Conservation Award, Regional Environmental Council, Worcester, MA 2005
Pruser-Holtzsauer Award, Graduate School of Geography, Clark University, 2002
Community Service Award, City of San Francisco, CA 1995
Dean's Undergraduate Award, University of California, Santa Cruz, 1994
Highest Honors, Department of Community Studies, University of California, Santa Cruz, 1994
Senior Thesis Honors, Department of Community Studies, University of California, Santa Cruz, 1994
Community Service Award, Crown College, University of California, Santa Cruz, 1994

—Achievements—

[Papers]

[Original Articles]

・NILES Daniel, ROTH Robin 2016,05 Conservation of traditional agriculture as living knowledge systems, not cultural relics. Journal of Resources and Ecology 7(3) :231-236.(reviewed).

[Review Articles]

・D.Niles, M. Terada and E. Honda 2016 Anthropocene East Asia: The concept of the Anthropocene in the East Asian context. Concept piece for HKW 2017-2019 Anthropocene Curriculum.

・Niles, Daniel 2016 Sputnik for our time.. Editorial introducing contributions to the webpage documenting the seminar "Co-evolutionary Perspectives on the Technosphere" convened for The Anthropocene Campus II: Technosphere Issue, Haus der Kulturn der Welt (HKW), Berlin, and the Max Planck Institute for the History of Science (MPIWG) .(reviewed).

[Research Presentations]

[Oral Presentation]

・Niles, Daniel Essential elements: Tracing the tangible and intangible in landscapes.. Habitscape on Terra: Towards a mesological understanding of humanity and nature; Research colloquium on the themes of A. Berque's "Histoire de l'habitat ideal", 2017,03,16, RIHN, Kyoto.

・Niles, Daniel Future Earth, Anthropocene Imaginaries, and Asia. The 5th Workshop on Future Earth in Asia, hosted by the Regional Centre for Future Earth in Asia, 2017,01,23-2017,01,24, RIHN, Kyoto.

・Niles, Daniel Anthropocene, material culture and environmental knowledge. “Long-Term Sustainability through Place-Based, Small-Scale Economies” Final Project Meeting, 2017,01,08-2017,01,09, RIHN, Kyoto.

・Niles, Daniel Conservation of living agricultural heritage: significance for the FEAST project.. FEAST Project Annual Assembly, 2017,01,07-2017,01,08, RIHN, Kyoto.

・Niles, Daniel The Anthropocene as epistemological opportunity. Landscapes of the Anthropocene; EHESS/RIHN International Colloquium, 2016,12,05-2016,12,08, Paris, France.

・Niles, Daniel Living models of environmental knowledge.. Modeling Challenges for Sustainability: Future Earth Workshop for the project “Linking earth-system and socio-economic models to predict and manage changes in land use and biodiveristy”, 2016,09,28-2016,09,30, Kyoto, Japan.Sander van der Leeuw, Organizer.

・Niles, Daniel Coevolutionary Approaches to the Technosphere: Material culture as a form of environmental knowledge. Coevolutionary Approaches to the Technosphere; seminar of Anthropocene Campus II: Technosphere Issue, Haus der Kulturn der Welt (HKW), 2016,04,16, Berlin, Germany.

・Niles, Daniel Coevolutionary Approaches to the Technosphere: Agriculture and environment. Coevolutionary Approaches to the Technosphere; seminar of Anthropocene Campus II: Technosphere Issue, Haus der Kulturn der Welt (HKW), 2016,04,15, Berlin, Germany.

[Invited Lecture / Honorary Lecture / Panelist]

・Niles, Daniel . First KLASICA International Case Studies Symposium on Collective behavior change toward sustainable futures in Asian and Pacific Island and isolated communities., 2016,11,21-2016,11,24, National Taiwan University, Taipei, Taiwan.(Invited Workshop).

・Niles, Daniel The Anthropocene Agenda-Setting Workshop. Special joint workshop of the Max Planck Institute for the History of Science (Berlin), Haus der Kulturn der Welt (Berlin), and the Institute for Advanced Sustainability Studies (Potsdam), 2016,07,05-2016,07,06, IASS, Potsdam, Germany. (Invited Workshop).

・Niles, Daniel . Assessing resilience and ecosystem goods and services of GIAHS in selected rice systems in China and the Philippines, 2016,05,16-2016,05,19, Beijing, China.(Invited Workshop).

OKUDA Noboru

Associate Professor

Born in 1969.

[Professional Career]

Lecturer, Mie University, Department of Liberal Arts (1998)
Postdoctoral fellow, Ehime University, Department of Biology and Earth Science (1998)
Research Fellow, Ehime University, Center for Marine Environmental Studies (2002)
Associate Professor, Kyoto University, Center for Ecological Research (2005)
Invited Associate Professor, Research Institute for Humanity and Nature (2013)
Associate Professor, Research Institute for Humanity and Nature (2014)

[Higher Degrees]

B.S. (Science University of Tokyo, Department of Biological Science, 1992)
M.S. (Ehime University, Department of Biology, 1994)
Ph.D. (Kyoto University, Department of Biology, 1998)

[Academic Society Memberships]

The Ichthyological Society of Japan
The Ecological Society of Japan
Japan Ethological Society

Society of Evolutionary Studies
The Japanese Society of Fisheries Science
The Japanese Society of Limnology

[Awards]

Best Poster Award for International Symposium “Long-term Variations in the Coastal Environments and Ecosystems” held in Ehime University (2004)
Young Ichthyologist Award 2005 from The Ichthyological Society of Japan (2005)
CHED REPUBLICA AWARDS(2016)
35th Association of Systematic Biologists of the Philippines-Symposium and Annual Meeting「Taxonomic Sufficiency: Implications from ecological studies on aquatic insects in Philippine watersheds」 (2017)

—Achievements—

[Papers]

[Original Articles]

- Ho, P.-C., N. Okuda, T. Miki, M. Itoh, F.-K. Shiah, C.-W. Chang, S. S.-Y. Hsiao, S.-J. Kao, M. Fujibayashi & C.-H. Hsieh 2016,08 Summer profundal hypoxia determines the coupling of methanotrophic production and the pelagic food web in a subtropical reservoir. Freshwater Biology 61 :1694-1706. DOI:10.1111/fwb.12809. .
- Kobayashi, Y., H. Kojima, M. Itoh, N. Okuda, M. Fukui, F.-K. Shiah 2016,07 Abundance of planktonic methane-oxidizing bacteria in a subtropical reservoir. Plankton & Benthos Research 11(4) :144-146. DOI:http://doi.org/10.3800/pbr.11.144.
- Okuda, N., Y. Sakai, K. Fukumori, S.-M. Yang, C. Hsieh, F.-K. Shiah 2016,06 Food web properties of the recently constructed, deep subtropical Fei-Tsui Reservoir in comparison with the ancient Lake Biwa. . Hydrobiologia in press . DOI:10.1007/s10750-017-3258-4. . DOI .
- Ohba, S., N. Okuda & S. Kudo 2016,05 Sexual selection of male parental care in giant water bugs. Royal Society open science (3). DOI:10.1098/rsos.150720. (in Japanese) Ohba, S., N. Okuda & S. Kudo (2016) . 3: 150720.
- Briones, J. C. A., R. D. S. Papa, G. A. Cauyan, N. Mendoza & N. Okuda 2016,12 Fish diversity and trophic interactions in Lake Sampaloc (Luzon Is., Philippines). Tropical Ecology 57(3) :567-581. (reviewed).

[Research Presentations]

[Oral Presentation]

- Asano S., K. Wakita, I. Saizen & N. Okuda Can the spawn of the Japanese brown frog (Rana japonica, Ranidae) be a local environmental index to evaluate environmentally friendly rice paddies?. 37th Asian Conference on Remote Sensing, 2016,10,17-2016,10,21, Colombo.
- De Jesus, I. B., O. L. A. Privaldos, A. S. Borja, F. S. Magbanua, R. D. S. Papa, T. Iwata & N. Okuda A pioneer in tropical streams: determination of phosphorous and nitrogen uptake in Silang-Santa Rosa watershed, Philippines. 48th Annual National Convention of the Federation of Institutions for Marine and Freshwater Sciences, 2016,09,21-2016,09,23, University of Eastern Philippines, Catarman .
- Peralta, E., Batucan L. S. Jr., Briones, J. C. A, F. S. Magbanua, R. D. S. Papa, Magbanua F. S. & N. Okuda Benthic macroinvertebrates assemblages and biological metrics in relation to land cover and environmental factors in Silang-Santa Rosa subwatershed, “ Philippines”. 48th Annual National Convention of the Federation of Institutions for Marine and Freshwater Sciences, 2016,09,21-2016,09,23, University of Eastern Philippines, Catarman. (in Japanese)
- Okuda, N., Y. Sakai, J. Shibata, Z. Karube, Y. Kato, T. Komiya, Y. Okuzaki, M. Hori, I. Tayasu, S. Yachi, S. Nakano & T. Nagata Spatio-temporal dynamics of food webs in the ancient Lake Biwa: Causes and consequences of changing biodiversity. The 33rd Congress of the International Society of Limnology, 2016,07,31-2016,08,05, Trino, Italy.

・Okuda, N. Methanotrophic food webs as a carbon recycling system in lakes under climate changes (Invited talk) . The 1st Philippine Symposium on Freshwater Biodiversity and Ecosystems, 2016,06,07-2016,06,10, University of Santo Tomas, Manila.

・Chishiro, S., K. Osaka, K. Fujita O. Nagafuchi & N. Okuda Evaluation of the source and bioavailability of particulate phosphorus in Yasu River by using sequential extraction methods. JpGU Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe.

・Saitoh, Y., T. Nakano, K.-C. Shin, K. Yamashita, H. Amakawa, C. Yoshimizu, J. Matsubayashi, Y. Kato, H. Togashi, Y. Amano, Y. Kurita, N. Okuda & I. Tayasu Spatial variation of neodymium and strontium isotope ratios of shellfish soft bodies in the coastal sea of eastern Tohoku District. JpGU Meeting 2016, 2016,05,22-2016,05,26, Makuhari Messe.

[Poster Presentation]

・Triño, E. M. C., I. B. B De Jesus, E. M. Peralta, H. J. A. Guerrero, C. G. S. M. Arce, J. J. A. Domingo, M. A. Maute, M. D. S. San Miguel, J. C. A. Briones, F. S. Magbanua, A. C. Santos-Borja, R. D. S. Papa & N. Okuda “Biodiversity Assessment of Littoral Macrozoobenthos in Laguna de Bay, Philippines”. The 16th World Lake Conference, 2016,11,07-2016,11,11, Bali .

ONISHI Yuko

Assistant Professor

[Academic Career]

Environmental Change Institute (ECI), Department of Geography and the Environment, University of Oxford

National Center for Development Studies, Australian National University

[Professional Career]

IPCC Chapter Scientist, National Institute for Environmental Studies

Institute for Industrial Science (IIS), University of Tokyo

Food and Agriculture Organisation of the United Nations

[Higher Degrees]

Ph.D. (University of Oxford)

[Fields of Specialization]

Climate change

Biodiversity

Conservation biology

Ecology

Biogeography

—Achievements—

[Books]

[Authored/Co-authored]

・Yuko Onishi, Takeshi Nishimura, Kengo Hayashi, Hitomi Yamashita 2016,12 Our Future Earth: Research priorities towards global sustainability. Research Institute for Humanity and Nature, 16pp. (in Japanese)

[Research Presentations]

[Oral Presentation]

- Yuko Onishi A Strategic Research Agenda for Future Earth in Japan. 5th Workshop on Future Earth in Asia, 2017,01,23-2017,01,24, Kyoto, Japan.
- Yuko Onishi Introduction to Regional Centre for Future Earth in Asia and its activities. SOLAS in Asia: A Future SOLAS Symposium, 2016,10,26-2016,10,28, Qingdao, China.
- Yuko Onishi Developing a strategic research agenda for Future Earth in Japan through transdisciplinary priority setting. The 23rd Pacific Science Congress - Science, Technology, and Innovation: Building a Sustainable Future in Asia and the Pacific, 2016,06,13-2016,06,17, Taipei, Taiwan.

RUPPRECHT, Christoph D. D.

Project Researcher

Born in 1983.

[Academic Career]

Griffith University, Environmental Futures Research Institute, PhD Urban geography, planning, ecology (2015)

Ludwig-Maximilians-University Munich, Department for Asian Studies, Magister Artium (2009)

Ludwig-Maximilians-University Munich, Faculty of Biology, EES Master Program Guest Student (2008)

Hokkaido University Short Term Exchange Program (2006)

[Professional Career]

Project Researcher, FEAST Project, Research Institute for Humanity and Nature (2016-)

Adjunct Lecturer, Graduate School of Agricultural and Life Sciences / Faculty of Agriculture, University of Tokyo (2017)

Adjunct Lecturer, Kyoto University (2017)

Adjunct Lecturer, Doshisha University (2017)

Visiting Researcher, Environmental Futures Research Institute, Griffith University (2015)

[Higher Degrees]

Ph.D. Geography, Urban Planning, Ecology (Griffith University 2015)

M.A. Japanology, Biology, Philosophy (Ludwig-Maximilians-University Munich 2009)

[Fields of Specialization]

Urban geography

Environmental planning

Food systems

Degrowth

Informal green space

[Academic Society Memberships]

Japanese Institute of Landscape Architecture

Japan Geoscience Union

American Association of Geographers

Royal Geographical Society with IGB

Society for Ecological Restoration

[Awards]

Japan Geoscience Union Meeting Student Outstanding Presentation Award (2013)

American Association of Geographers Urban Geography Specialty Group Dissertation Award (2016)

—Achievements—

[Research Presentations]

[Oral Presentation]

・Rupprecht, C. D. D. Informal greenspace as green infrastructure? Potential, challenges and future directions. American Geographers Annual Meeting, 2016, San Francisco. DOI:10.13140/RG.2.1.1470.2481/1.

・Rupprecht, C. D. D. Appreciating the non-human landscape? Urban residents' willingness to coexist with animals and plants in Australia and Japan. Japan Geoscience Union Meeting, 2016, Makuhari. DOI:10.13140/RG.2.1.1004.2488.

[Invited Lecture / Honorary Lecture / Panelist]

・Rupprecht, C. D. D. Informal green space and urban agriculture: in search of what the maps hide. Putting urban green space and agriculture to work: an international view, 2017,01,20-2017,01,20, Tokyo University, Yayoi Annex Hall. (in Japanese)

・Rupprecht, C. D. D. Depopulation in East Asia: An Opportunity to Rethink Long-Term Human-Nature Relationships. Culturally Mediated Environmental Issues: Ecological Connectedness in East Asia, 2016,07,30-2016,07,31, Nagoya University.

・Rupprecht, C. D. D. The relationship of city and nature through the lens of food: ties between living things. Introduction to food system studies, 2016,05,27, Doshisha University. (in Japanese)

SEKINO Tatsuki

Professor

Born in 1969.

[Academic Career]

Department of Zoology, Faculty of Science, Kyoto University, D. Course (1998)
Department of Biology, Faculty of Science, Shinshu University, M. Sc. (1993)
Department of Biology, Faculty of Science, Shinshu University (1991)

[Professional Career]

Professor, Center for Research Promotion, Research Institute for Humanity and Nature (2016)
Associate Professor, Research Promotion Center, Research Institute for Humanity and Nature (2002)
Researcher, Research Division, International Lake Environmental Committee Foundation (2001)
COE Scientist, Center for Ecological Research, Kyoto University (1999)

[Higher Degrees]

D. Sc. (University of Kyoto, 1998)
M. Sc. (University of Shishu, 1993)

[Fields of Specialization]

Information Science
Limnology
Ecology

[Academic Society Memberships]

Information Processing Society of Japan
Japanese Society of Limnology
Ecological Society of Japan

[Awards]

IPSJ Yamashita SIG Research Award (2015)

—Achievements—

[Papers]

[Original Articles]

- Sekino, T. 2016,12 Time Information System Web HuTime: Comparison with Existing Web Applications.. Journal of Asian Network for GIS-based Historical Studies 4 :62-69.(reviewed).
- Sekino, Tatsuki 2016,12 Web HuTime - Web platform for temporal information. IPSJ Symposium Series 2016(2) :125-132. (in Japanese) (reviewed).
- Sekino, T. 2016,07 Time Information System HuTime on the Web. IPSJ SIG Technical Reports 2016-CH-111(8) :1-4. (in Japanese)

[Research Presentations]

[Oral Presentation]

- Sekino, Tatsuki Temporal Information System HuTime. Workshop Schedule of Activities Updates on The Community Data Base System Healthy Communities Strengthening Section, Thai Health Promotion Foundation, 2016,11,21, AETAS Lumpini, Bangkok.
- Sekino, T. Academic asset of environmental science and related interdisciplinary studies. Workshop on the Academic Asset Preservations and Sharing in Southeast Asia, 2016,11,20, Pullman Bangkok Grande Sukhumvit, Bangkok.
- Sekino, Tatsuki Linked Data of Temporal Information. PNC 2016 Annual Conference and Joint Meetings, 2016,08,16-2016,08,18, The Getty Center, Los Angeles.
- Sekino, Tatsuki Time Information System on the Web. PNC 2016 Annual Conference and Joint Meetings, 2016,08,16-2016,08,16, The Getty Center, Los Angeles.

SHIN Ki-Cheol

Assistant Professor

[Higher Degrees]

PhD (University of Tsukuba, 2008)

[Fields of Specialization]

Igneous petrology

Isotope Geochemistry

[Academic Society Memberships]

The Society of Resource Geology

The Geochemical Society of Japan

Discussion Group for Plasma Spectrochemistry

[Awards]

Resource Geology The Best Article award (2010)

—Achievements—

[Papers]

[Original Articles]

・Corey Archer, Morten B. Andersen, Christophe Cloquet, Tim M. Conway, Shuofei Dong, Michael Ellwood, Rebekah Moore, Joey Nelson, Mark Rehkämper, Olivier Rouxel, Moneesha Samanta, Ki-Cheol Shin, Yoshiki Sohrin, Shotaro Takano and Laura Wasylenki. 2017,03 Inter-calibration of a proposed new primary reference standard AA-ETH Zn for zinc isotopic analysis. Journal of Analytical Atomic Spectrometry 32 :415-419. DOI:10.1039/C6JA00282J.(reviewed).

・Hisaaki Hiraoka, Sakie Morita, Atsunobu Izawa, keisuke Aoyama, Ki-cheol SHIN, and Takanori Nakanos 2016,07 Tracing the geographical origon of onions by strontium isotope ratio and strontium content. Analytical Sciences 32 :781-788.(reviewed).Hot article award.

SUGIHARA Kaoru

Specially Appointed Professor

Born in 1948.

[Academic Career]

Graduated from Faculty of Economics, Kyoto University, March 1971
Completed the Master Course (Economics), University of Tokyo, June 1973
Completed the Doctor Course (Economics), University of Tokyo, March 1976

[Professional Career]

Worked for Marubeni Corporation, Dublin Office (1976)
Lecturer in Economic History, Faculty of Economics, Osaka City University (1978)
Associate Professor of Economic History, Faculty of Economics, Osaka City University (1981)
Lecturer in the Economic History of Japan, Department of History, School of Oriental and African Studies (SOAS), University of London (1985)
Senior Lecturer in the Economic History of Japan, Department of History, SOAS, University of London (1991)
Professor of Economic History, Faculty of Economics (from 1997 Graduate School of Economics, Osaka University (1996)
Professor of The Center for Southeast Asian Studies (CSEAS), Kyoto University (2006)
Professor of Graduate School of Economics, University of Tokyo (2012)
Professor of National Graduate Institute for Policy Studies(GRIPS), Tokyo (2013)
Senior Professor of National Graduate Institute for Policy Studies (2014)
Specially Appointed Professor of Research Institute for Humanity and Nature(cross appointment with GRIPS from April to September 2016: full appointment from October 2016)
Member, Science Council of Japan (2011)

[Higher Degrees]

Doctor of Economics, University of Tokyo
MA (Economics), University of Tokyo
BA (Economics), Kyoto University

[Fields of Specialization]

Economic History
Environmental History

[Academic Society Memberships]

Socio-Economic History Society

Business History Society of Japan

The Japan Association of Asian Studies

The Japanese Association for South Asian Studies

[Awards]

*The 39th Nikkei Keizai Tosho Bunkasho [The Nikkei Book Prize for Economics], 1996

*The 18th Suntory Gakugeisho [The Suntory Book Prize for Academic Works], 1996

—Achievements—

[Books]

[Chapters/Sections]

・Sugihara, K. 2016 "Japanese Economic History: Exploring Diversity in Development". Francesco Boldizzoni and Pat Hudson (ed.) Routledge Handbook of Global Economic History. Routledge, London, pp.310-328.

・Sugihara, K., Masuda, K. and Mizuno, K. 2016 "A Socioeconomic History of the Peatland Region: From Trade to Land Development, and Then to Conservation". Kosuke Mizuno, Motoko S. Fujita and Shuichi Kawai (ed.) Catastrophe and Regeneration in Indonesia's Peatlands: Ecology, Economy and Society. NUS Press, Singapore, pp.148-184.

・Sugihara, K., Fujita, M., Mizuno,K., Kawai, S., Samejima, H., Masuda, K., Suzuki, H., Kobayashi, S., Kozan, O. and Shimamura, S. 2016 "Towards the Regeneration of Biomass Societies,". Kosuke Mizuno, Motoko S. Fujita and Shuichi Kawai (ed.) Catastrophe and Regeneration in Indonesia's Peatlands: Ecology, Economy and Society. NUS Press, Singapore, pp.423-437.

[Research Presentations]

[Invited Lecture / Honorary Lecture / Panelist]

・Sugihara, K. "Monsoon Asia, Fossil-fuel-driven Industrialization and Environmental Sustainability". Workshop on Global Economic and Environmental History, 2017,02,10, King's College, University of Cambridge, Cambridge.

・Sugihara, K. "The Rise of the Asian Regional Economy". Workshop on 'Intra-Asian Trade and the Rise of the Regional Economy in the Long 19th Century', 2016,08,03, National Graduate Institute for Policy Studies (GRIPS), Tokyo.

・Sugihara, K. "Varieties of Capitalism: An Asian Historical Perspective". International Workshop on 'Economic Change in Global History, 1500-2000', 2016,05,26, London School of Economics, London.

・Sugihara, K. "The Asian Miracle in Global History". Japan Institute of International Affairs Symposium on 'the History of Asia in the 20th Century: Origins of Prosperity and Stability', 2017,03,17, Hotel Okura, Tokyo.

・Sugihara, K. "Trade Statistics and Price Index of Colonial India". Workshop on 'Intra-Asian Trade and the Rise of Regional Economy in the Long 19th Century', 2017,03,13, Kyoto University.

・Sugihara, K. "Monsoon Asia, Industrialization and Urbanization: The Making and Unmaking of the Regional Nexus". RIHN 11th International Symposium 'Asia's Transformations to Sustainability: Past, Present and Future of the Anthropocene', 2017,03,10, Research Institute for Humanity and Nature(RIHN), Kyoto.

・Sugihara, K. "Emerging States in Global Economic History". Workshop for the Emerging State Project, 2017,01,21, National Graduate Institute for Policy Studies (GRIPS), Tokyo.

・Sugihara, K. "The Asia-Pacific Economy and the Rise of China: An Historical Overview". The Japan Foundation Center for Global Partnership/ Abe Fellowship 25th Anniversary Symposium on "Emerging Futures in a Changing World", 2016,11,15, Toranomon Hills Forum, Tokyo.

・Sugihara, K. “India’s Internal Trade in the Middle of the Nineteenth Century: A Statistical Study of Three Presidencies”. Workshop on ‘Long-term Trends in Foreign and Internal Trade and Prices in Colonial India’, 2016,08,02, National Graduate Institute for Policy Studies (GRIPS), Tokyo.
・Sugihara, K. “Intra-regional Trade and Labour-intensive Industrialization: A Regional Comparative Perspective and its Implications for the Emerging States”. Workshop on the Transition to the Emerging State, 2016,08,01, National Graduate Institute for Policy Studies (GRIPS), Tokyo.
・Sugihara, K. “Future Earth in Japan: A Humanities and Social Science Perspective”. 25th KAST (Korean Academy of Science and Technology) International Symposium on ‘Future Earth and Sustainable Development Goals in Asia’, 2016,04,25, Plaza Hotel, Seoul.

TANAKA Ueru

Professor

Born in 1960.

[Academic Career]

Faculty of Agriculture, Hirosaki University (4/1979-3/1983)
Graduate School of Agriculture, Kyoto University (Master Course, 4/1988-3/1990)
Graduate School of Agriculture, Kyoto University (Doctor Course, 4/1990-9/1990)

[Professional Career]

June/1983- April/1987: Lecturer, Department of Horticulture, Jomo Kenyatta Collage of Agriculture and Technology, Kenya (as a member of Japan Overseas Cooperation Volunteers)
Oct/1990- Sept/1999: Assistant Professor, College of Agriculture, Kyoto University
Sept/1999- March/2002: Associate Professor, College of Agriculture, Kyoto University
April/2002- Sept/2011: Associate Professor, College of Global Environmental Studies, Kyoto University
Oct/2011- March/2016: Associate Professor, Research Institute for Humanity and Nature
April/2016- Present: Professor, Research Institute for Humanity and Nature

[Higher Degrees]

Dr.Agric(Kyoto Univeristy, 1997)

[Fields of Specialization]

Environmental Agriculture, Soil Science, Terrestrial Ecosystems Management, Rural Development Studies

[Academic Society Memberships]

Japanese Society of Soil Science and Plant Nutrition, Japanese Society of International Development Studies, Japanese Society of International Rural Development Studies, Japanese Journal of Tropical Agriculture and development, Japanese Society of Pedologist, Japanese Society of African Studies, Japanese Society of Agricultural Systems

[Awards]

SSPN Young Scientist Award(2000)
ASABE Peper Award (2010, Cowin)
SSPN Award 2012 (2013, Cowin)
Japan Society for International Development, Best Poster Award (2013,Cowin)
Japan Society for International Development, Excellent Poster Award (2013,Cowin)
Japan Association for Arid Land Studies, Best Poster Award (2013, Cowin)
20th World Congress of Soil Science, Best Poster Award (2014, Cowin)
20th World Congress of Soil Science, Best Presentation Award (2014, Cowin)
EMASSA-2014 (Tamil Nadu, India), Best Poster Award (2014, Cowin)
41st Hitach Foundation Environment Award and Award by Minister of Environment (2014, Cowin)

25th Nikkei Award for Global Environmental Technology (2015, Cowin)

—Achievements—

[Research Presentations]

[Oral Presentation]

・MIYAZAKI H., K. P. SINGH, UCHIYAMA Y., ENDO H., ISHIMOTO Y. and TANAKA U. Pastoralism in Northwestern -Focus on Relationship between Pastoralist and Agriculturist . France-Japan Joint Symposium "Landscape in the Anthropocene", 2106,12,05-2016,12,08, Fondation France-Japon de l'EHESS, Paris, France.

・Ueru TANAKA Practical agro-ecosystems management with fragile environments in semi-arid Africa under desertification. Japanese - Swiss Ecohealth Colloquium, 2017,01,11-2017,01,12, Basel, Switzerland. (in Japanese)

・Ueru TANAKA Practical soil management techniques for ecosystems conservation and livelihood improvement under fragile environment in semi-arid Tropics. France- Japan Joint Symposium "Landscape in the Anthropocene", 2016,12,05-2016,12,08, Fondation France-Japon de l'EHESS, Paris, France.

・MIYAZAKI H., K. P. SINGH, UCHIYAMA Y., ENDO H., ISHIMOTO Y. and TANAKA U. Livelihoods of Pastoral community in North West India. International Seminar on "Traditional Knowledge and Heritage of South Asia", 2016,11,15-2016,11,16, Rothak, Haryana, India.

・Ueru TANAKA and Takao SHIMIZU Practical Techniques for Desertification Control and Livelihood Improvement in the Sahel, West Africa. 12th International Conference on Development of Drylands "Sustainable Development of Drylands in the Post 2015 World", 2016,08,21-2016,08,24, Alexandria, Egypt.

・Ueru TANAKA and Takao SHIMIZU Idea box of practical techniques contributing to "Great Green Wall Initiatives (GGWWI)" for desertification control and livelihood improvement in semi-arid Africa. Japan-BecA-ILRI Hub seminar, 2016,06,16, Nairobi, Kenya.

[Invited Lecture / Honorary Lecture / Panelist]

・Ueru TANAKA Possibility and significance of the transfer of indigenous farming techniques from India to Africa. International Seminar on "Traditional Knowledge and Heritage of South Asia", 2016,11,15-2016,11,16, All India Jat Heroes' Memorial College、Rohtak, Haryana, India.

・Ueru TANAKA and Takao SHIMIZU Experiences of desertification studies in West Africa and its applicability to Namibian environment. International Symposium "Livelihood and Agriculture under Variable Environment in North Central Region of Namibia, 2016,09,22, Windhoek, Namibia.

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 (2007 -)

Research Institute for Humanity and Nature, Associate Professor (2003 - 2007)

Department of Earth Sciences, Nara University of Education, Professor (2000 - 2003)
Department of Earth Sciences, Nara University of Education, Associate Professor (1993 - 2000)
Department of Earth Sciences, Nara University of Education, Research Associate (1988 - 1990)
Division of Water Resources, CSIRO, Australia, Visiting Scientist (1987 - 1988)

[Higher Degrees]

D.Sc (The University of Tsukuba,1987)
M.Sc.(The University of Tsukuba,1984)

[Fields of Specialization]

Environmental dynamic analysis
Hydrology/Weather/Oceanic physics

[Academic Society Memberships]

American Geophysical Union
International Association of Hydrological Sciences
International Association of Hydrogeology
Japanese Association of Groundwater Hydrology
Japanese Association of Hydrological Science
Japan Society of Engineering Geology
The Japan Society of Hydrology and Water Resources
The Association of Japanese Geographers
The Japanese Society of Limnology

[Awards]

Award of 7th Japanese Association of Limnology (Yoshimura Prize, 2005)
Research award from the Association of Japanese Geographers (1987)

—Achievements—

[Papers]

[Original Articles]

- Kobayashi. S., Sugimoto, R., Honda, H., Miyata, Y., Tahara, D., Tominaga, O., Shoji, J., Yamada, M., Nakada, S., Taniguchi, M. 2017,03 High-resolution mapping and time-series measurements of 222Rn and biogeochemical properties related to submarine groundwater discharge along the coast of Obama Bay, a semi-enclosed sea in Japan. Progress in Earth and Planetary Science 4(6). DOI:10.1186/s40645-017-0124-y.(reviewed).
- Sugimoto, R., Kitagawa, Nishi, S., Honda, H., Yamada, M., Kobayashi, S., Shoji, J., Ohsawa, S., Taniguchi, M., Tominaga, O. 2016,11 Phytoplankton primary productivity around submarine groundwater discharge in nearshore coasts. Marine Ecology Progress Series . DOI:10.3354/meps11980.(reviewed).
- Kumazawa, T., Hara, K., Endo, A., Taniguchi, M. 2016,04 Supporting collaboration in interdisciplinary research of water-energy-food nexus by means of ontology engineering. Journal of Hydrology: Regional Studies . DOI:10.1016/j.ejrh.2015.11.021.(reviewed).

[Research Presentations]

[Oral Presentation]

- Taniguchi M. Water-energy-food nexus in Asia Pacific. Joint workshop of RIHN and UC Berkeley, 2017,02,01, University of California Berkeley, USA.
- Taniguchi, M. Water-energy nexus in Asia-Pacific. Joint Workshop of RIHN and ASU, 2017,01,31, Arizona State University, USA.
- Taniguchi, M. Water-energy-food nexus for adopting sustainable development goals in Asia. American Geophysical Union, 2016,12,14, San Fransisco, USA.

・Taniguchi, M. Groundwater-energy-food nexus: Conflicts between groundwater use for energy and fishery production. 43rd International Association of Hydrogeologists, 2016,09,28, Montpellier, France.

・Taniguchi, M. Impact of groundwater use as heat energy on coastal ecosystem and fisheries. EGU, 2016,04,22, Vienna, Austria.

[Invited Lecture / Honorary Lecture / Panelist]

・Taniguchi, M. Water-energy-food security in Asia-Pacific region. OECD Symposium on Water Footprints, 2016,09,14-2016,09,16, Lincoln, Nebraska, USA.

・Taniguchi, M. Introduction of Future Earth and Nexus. The 3rd Future Earth Water-Energy-Food Nexus workshop, 2016,04,04, RIHN, Kyoto.

TAYASU Ichiro

Professor

Born in 1969.

[Academic Career]

Department of Zoology, Graduate School of Science, Kyoto University, Doctor Course(1997)
Department of Zoology, Graduate School of Science, Kyoto University, Master Course(1994)
Department of Zoology, Faculty of Science, Kyoto University(1992)

[Professional Career]

Professor, RIHN Center, Research Institute for Humanity and Nature (2016)
Professor, Center for Research Promotion, Research Institute for Humanity and Nature (2014)
Associate Professor, Center for Ecological Research, Kyoto University (2003)
Assistant Professor, Research Institute for Humanity and Nature (2002)
Postdoctoral Research Fellow (Research Abroad) of the Japan Society for the Promotion of Science; Laboratoire d'Ecologie des Sols Tropicaux, Institut de Recherche pour le Developpement (2000)
Postdoctoral Research fellow (PD) of the Japan Society for the Promotion of Science; Laboratory of Forest Ecology, Graduate School of Agriculture, Kyoto University, Japan (1997)

[Higher Degrees]

Ph.D (Kyoto University, 1997)
M Sc. (Kyoto University, 1994)

[Fields of Specialization]

Isotope Ecology
Animal Ecology
Freshwater Ecology
Soil Ecology
Isotope Environmental Science

[Academic Society Memberships]

Ecological Society of Japan
The Japanese Society of Limnology
The Japanese Society of Soil Zoology
The International Union for the Study of Social Insects
Japan Geoscience Union
Advancing the Science of Limnology and Oceanography

[Awards]

16th Inoue Research Award for Young Scientists (1999)

—Achievements—

[Papers]

[Original Articles]

・Matsubayashi, J., Ohta, T., Takahashi, O. and Tayasu, I. 2017,01 Reconstruction of the extinct Ezo wolf's diet. Journal of Zoology 302 :88-93. DOI:10.1111/jzo.12436.(reviewed).

・Naoe, S., Tayasu, I, Masaki, T. and Koike, S. 2016,09 Negative correlation between altitudes and oxygen isotope ratios of seeds: exploring its applicability to assess vertical seed dispersal.. Ecology and Evolution (9) :6817-6823. DOI:10.1002/ece3.2380.(reviewed).

・Kusaka, S., Ishimaru, E., Hyodo, F., Gakuhari, T., Yoneda M., Yumoto, T. and Tayasu, I. 2016,09 Homogeneous diet of contemporary Japanese inferred from stable isotope ratios of hair. Scientific Reports 6 :33122. DOI:10.1038/srep33122.(reviewed).

・Matsubayashi, J., Otsubo, K., Morimoto, J.O., Nakamura, F. and Tayasu, I. 2016,09 Feeding habits may explain the morphological uniqueness of brown bears on Etorofu Island, Southern Kuril Islands in East Asia.. Biological Journal of the Linnean Society 119 :99-105. DOI:10.1111/bij.12798.(reviewed).

・Matsubayashi, J., Tayasu, I., Morimoto, J.O. and Mano, T. 2016,07 Testing for a predicted decrease in body size in brown bears (Ursus arctos) based on a historical shift in diet. Canadian Journal of Zoology 94 :489-495. DOI:10.1139/cjz-2016-0046.(reviewed).

・Ishikawa, N.F., Togashi, H., Kato, Y., Yoshimura, M., Kohmatsu, Y., Yoshimizu, C., Ogawa, N.O., Ohte, N., Tokuchi, N., Ohkouchi, N. and Tayasu, I. 2016,05 Terrestrial-aquatic linkage on stream food webs along a forest chronosequence: multi-isotopic evidence. Ecology 97 :1146-1158. DOI: 10.1890/15-1133.1.(reviewed).

・Naoe, S., Tayasu, I, Sakai, Y., Masaki, T., Kobayashi, K., Nakajima, A., Sato, Y., Kiyokawa, H. and Koike, S. 2016,04 Mountain climbing bears save cherry species from global warming by their vertical seed dispersal. Current Biology 26 :R315-R316. DOI:10.1016/j.cub.2016.03.002.(reviewed).

TERADA Masahiro

Visiting Associate Professor

[Professional Career]

Associate Professor, Research Institute for Humanity and Nature, Kyoto, Japan(2012)
Visiting Associate Professor, Research Institute for Humanity and Nature, Kyoto, Japan (2015)
Visiting Scholar, Max-Planck-Institute for History of Science,Berlin, Germany (2016)

[Higher Degrees]

M.Lit(Osaka University,1998)

[Fields of Specialization]

History
Metahistory

—Achievements—

[Books]

[Authored/Co-authored]

・Masahiro Terada(ed.) 2016,09 Hearing the Voices, Healing the World: Towards a better Understandign of the Human Being in The Aftermath of the Catastrope [A Youg Generation's Reader]. Air Shuppan, Kyoto, 304pp. (in Japanese)

・Heather Davis, Judith Marlen Dobler, Sandra van der Hel, Johannes Lundershausen, Anna-Sophie Springer, Fabio Vladimir Sánchez-Calderón, Masahiro Terada, Alexandra Toland and Anne-Kathrin Winkler-Hanns 2016,04 “Plastic and Surrogacy”. Filtering the Anthropocene, Campus 2014 The Anthropocene Issue. Anthropocene Curriculum web site

・Olivier Hamant, Ellen Irons, Gregor Lax, Dariya Manova, Anna Lillie Svensson and Masahiro Terada 2016,04 “A Slobjects Exercise: What’s in Our Pockets?”. Slow Media, Campus 2014 The Anthropocene Issue. Anthropocene Curriculum web site

[Chapters/Sections]

・Ueru Tanaka, Benoit Hazard, and Masahiro Terada 2017,03 “The Anthropo-scenes in the Anthropocene”. Humanity & Nature. Research Institute for Humanity and Nature, Kyoto, pp.2-4. (in Japanese)

・Masahiro Terada 2016,04 No Title (Discussions on the Technosphere). Continent. (ed.) The Technosphere, Now, The special issue of continent.cc in collaboration with Haus der Kulturen der Welt Berlin. Continent. / HKW, Berlin, pp.62.

・Masahiro Terada 2016,04 “a continent. inter-view”. Nina Jäger, Paul Boshears, Bernhard Garnicnig, Jamie Allen, Lital Khaikin (ed.) continent. continent. (Web publication) , pp.53-56.

・Masahiro Terada 2016,04 ” (Maruyama(1914-1966) focuses on the term naru(なる)…)”. Flugblatt. HKW / www.continent.cc, Berlin, pp.1.

[Papers]

[Original Articles]

・Masahiro Terada 2016,11 „Floating and Anthropos: A lesson in / from Aerocene“. Anthropocene-Curriculum website. Haus der Kulturen der Welt,, Berlin, Germany.

・Masahiro Terada 2016,11 ” The Reed, Slime Mold, and Sprout: On Becoming and the Form of Time “. Anthropocene-Curriculum website. Haus der Kulturen der Welt, Berlin, Germany,

[Research Presentations]

[Oral Presentation]

・Masahiro Terada ” Narrating History, Narrating Evolution: Temporality for Humanity and Living Beings ″. Habitatscape on Terra: Towards a Mesological Understanding of Humanity and Nature, 2017,03,16, Research Institute for Humanity and Nature.

・Masahiro Terada “Anthropocene concept as a question for life-world: From a view point of energy (ε ν έ ρ γ ε ι α), becoming, and time”. Colloque international IIAC-CNRS/EHESS et RIHN-Kyoto ” Paysages dans l’anthropocene/ Landscapes in the Anthropocene”, 2016,12,05-2016,12,08, Paris, France.

・Masahiro Terada “A Passage to Shantiniketan”. 132th RIHN Seminar: Humanity and Nature in Monsoon Asia: India-Japanese dialogue in search of new Asian narrative of environment from view point of language and literature, 2016,06,07, Kyoto: Research Institute for Humanity and Nature.

・Masahiro Terada “Nature, Artificiality, and Becoming”. Seminar ″Co-evolutionary perspective on the Technosphere,″ Anthropocene Campus 2016/ Technosphere Issue, 2016,04,16, Berlin: Haus der Kulturen der Welt.

・Manfred Laubichlar, Jürgen Renn, Masahiro Terada, and Daniel Niles ″Co-evolutionary Perspectives on the Technosphere. Interview “. Anthropocene-Curriculum website, 2016,04,14, Haus der Kulturen der Welt, Berlin, Germany.

[Poster Presentation]

・Masahiro Terada ″Nature, Artificiality, and Becoming: An insight on narrative of the Anthropocene from the view point of Japanese historiography″. Colloque international IIAC-CNRS/EHESS et RIHN-Kyoto ” Paysages dans l’anthropocene/ Landscapes in the Anthropocene”, 2016,12,05-2016,12,08, Fondation France-Japon de l’EHESS, Paris, France.

UDMALE, Parmeshwar

Project Researcher

Born in 1987.

[Academic Career]

University of Yamanashi, Japan (Ph.D. Integrated River Basin Management, 2015)
University of Newcastle, Australia (Internship during Ph.D., Mar. 2014)
Asian Institute of Technology, Thailand (M.E. Water Engineering and Management, 2012)
Technische Universität Braunschweig, Germany (Research Assistant/an exchange semester during M.E., Jun.2010 - Sept.2010)
Marathwada Agricultural University, India (B.Tech. Agricultural Engineering, 2009)

[Professional Career]

Postdoctoral Researcher (Interdisciplinary Research Center for River Basin Environment (ICRE), University of Yamanashi, Japan (Oct. 2015-Jun. 2016))

[Higher Degrees]

Ph.D. (University of Yamanashi, Japan, 2015)
M.E. (Asian Institute of Technology, Thailand, 2012)

[Fields of Specialization]

Integrated River Basin Management
Agriculture, Water, and Climate Change

—Achievements—

[Papers]

[Original Articles]

- Udmale P. D., Ichikawa Y., Nakamura T., Shaowei N., Ishidaira H., and Kazama, F. 2016,07 Rural drinking water issues in India's drought-prone area: A case of Maharashtra State. Environmental Research Letters 11(074013). DOI:10.1088/1748-9326/11/7/074013.(reviewed).
- Thi Hieu Bui, Hiroshi Ishidaira, Parmeshwar Udmale 2016 Evaluation of Appropriate Precipitation Data for Streamflow Simulation in Data Sparse Catchments. Japan Society of Civil Engineers . (reviewed).Accepted for the publication..

[Review Articles]

- Udmale P.D., Ishidaira H., Thapa B.R., and Shakya N.M. 2016 The status of domestic water demand - supply deficit in Kathmandu Valley, Nepal. Water . DOI:10.3390/w8050196.(reviewed).

YASUNARI Tetsuzo

Director-General

Born in 1947.

[Professional Career]

Director-General, Research Institute for Humanity and Nature (4/2013-)
Designated Professor, Hydrospheric Atmospheric Research Center (HyARC), Nagoya University. (4/2012-3/2013)

Professor, Hydrospheric Atmospheric Research Center (HyARC), Nagoya University. (8/2002-3/2012)
Leader, Global COE program “From Earth System Science to Basic and Clinical Environmental Studies” (2009-2012)
Leader, the 21st Century COE Program "The Sun-Earth-Life Interactive System (SELIS)" (2003-2008)
Visiting Professor, Department of Earth & Planetary Science, the University of Tokyo. (4/2003-3/2006)
Professor, Climatology & Meteorology, University of Tsukuba. (4/1992-7-2002)
Associate Professor, Climatology & Meteorology, University of Tsukuba. (6/1990-3/1992)
Assistant Professor, Climatology & Meteorology, University of Tsukuba. (8/1984-8/1985)
Visiting Scientist, Department of Meteorology, Florida State University (8/1984-8/1985)
Research Associate, Center for Southeast Asian Studies, Kyoto University. (4/1977-3/1982)

[Higher Degrees]

D.Sc., Meteorology & Climatology (Kyoto University, 1981)
M.S., Meteorology (Kyoto University, 1974)

[Fields of Specialization]

Meteorology
Climatology
Climate systems studies

[Academic Society Memberships]

The Association of Japanese Geographers
Meteorological Society of Japan
Japan Society of Hydrology and Water Resources
The Japanese Society of Snow and Ice
American Geophysical Union
American Meteorological Society

[Awards]

Chichibuno-Miya Memorial award (as a group member) 1980
Yamamoto Prize, Meteorological Society of Japan 1981
Research Award (Gakkai-sho), Meteorological society of Japan 1986
Nikkei Prize for Global Environmental Study and Technology 1991
Fujiwara Prize, Meteorological Society of Japan 2002
International Award, Japanese Society of Hydrology and Water resources 2006
Meritorious Deed Award, Japan Society of Hydrology and Water Resources 2014
Japan Geoscience Union Fellow 2015

—Achievements—

[Editing]

[Editing / Co-editing]

・Yoshitsugu Hayashi, Tetsuzo Yasunari, Hiroshi Kanzawa, Hirokazu Kato, Eds. (ed.) 2016 Climate Change, Energy Use, and Sustainability: Diagnosis and Prescription after the Great East Japan Earthquake. Nagoya University. Springer, 115pp.

[Research Presentations]

[Invited Lecture / Honorary Lecture / Panelist]

・Tetsuzo Yasunari Future Earth - its importance and implication in Asia. International symposium "Decision Science for Future Earth", 2017,02,19, Inamori Hall, Ito Campus, Kyushu University (Fukuoka).

・Tetsuzo Yasunari Future Earth in Asia: its importance & implication. RACC8 / STS Forum, 2016,10,01, Kyoto International Conference Centre(Kyoto). (in Japanese)

・Tetsuzo Yasunari Future Earth in Asia: its importance and implication. 1st Asian Science and Technology Conference for Disaster Risk Reduction, 2016,08,23-2016,08,24, Bangkok, Thailand.

・Tetsuzo Yasunari Future Earth: its importance and implication in Asia. Wu Ta-You Science Camp, 2016,08,03, Hsitou, Taiwan.

・Tetsuzo Yasunari Future Earth and its importance in Asia and Pacific. 2nd JASTIP Symposium in Jakarta, 2016,06,11, The Indonesian Institute of Sciences (LIPI), Jakarta.

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					
Research Program 1 (FR3)	Long-term Sustainability through Place-Based, Small-scale Economies: Approaches from Historical Ecology	82	4	21	1	12	1	5	0	2	36
Research Program 1 (FR3)	Societal Adaptation to Climate Change: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences	77	6	29	3	18	5	7	3	2	4
Research Program 2 (FR5)	Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge	143	8	50	3	21	0	14	14	2	31
Research Program 2 (FR4)	Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus	78	8	18	7	5	0	11	3	1	25
Research Program 2 (FR2)	Biodiversity-driven Nutrient Cycling and Human Well-being in Social-Ecological Systems	96	7	31	12	16	0	17	3	2	8
Research Program 3 (FR5)	Desertification and Livelihood in Semi-Arid Afro-Eurasia	28	4	12	1	2	0	3	3	2	1
Research Program 3 (FR5)	Coastal Area capability Enhancement in Southeast Asia	142	4	49	0	25	1	12	2	6	43
Research Program 3 (FR1)	Lifeworlds of Sustainable Food Consumption and Production: Agrifood Systems in Transition	73	8	18	1	10	0	9	5	0	22
Research Program 1 (PR)	Toward the Regeneration of Tropical Peatland Societies: Transformability of Environmentally Vulnerable Societies and Establishment of an International Research Network	30	2	16	1	1	0	2	2	1	5
Research Program 3 (PR)	The Sanitation Value Chain: Designing Sanitation Systems as Eco-Community-Value System	37	2	18	0	2	0	4	0	0	11
Individual Collaboration FS (KANEKO)	Water-Energy-Nexus Technology for Marginal Settlements: Socially Optimal Size from the Perspectives of Reciprocity and Indigenous Knowledge	13	1	10	1	0	0	1	0	0	0

Institutional Collabration FS（ICHIE）	Evaluation and Use of Non-monetary Benefits from Protected Tropical Rain Forest Areas in Southeast Asia	12	0	10	0	2	0	0	0	0	0
Institutional Collabration FS（SAKAKIBARA）	Co-Creation of Regional Innovation for Reducing Risk of Environmental Pollution	20	1	14	0	1	0	0	2	0	2
Institutional Collabration FS（HOMMA）	Assessing Functional Diversity of Satoyama Paddy Landscapes in East Asia's Monsoon Region	13	0	9	0	1	0	0	0	0	3
Institutional Collabration FS（MURAYAMA）	Living Spaces: A Transdisciplinary Study on Locality, Nature and Global Interdependency	47	1	16	5	9	0	2	2	1	11
Institutional Collabration FS（YOSHIDA）	Research and Social Implementation of Ecosystem-based Disaster Risk Reduction as Climate Change Adaptation in Shrinking Societies	40	3	29	0	6	0	1	1	0	0
	Total	931	59	350	35	131	7	88	40	19	202

As of 31 March, 2017

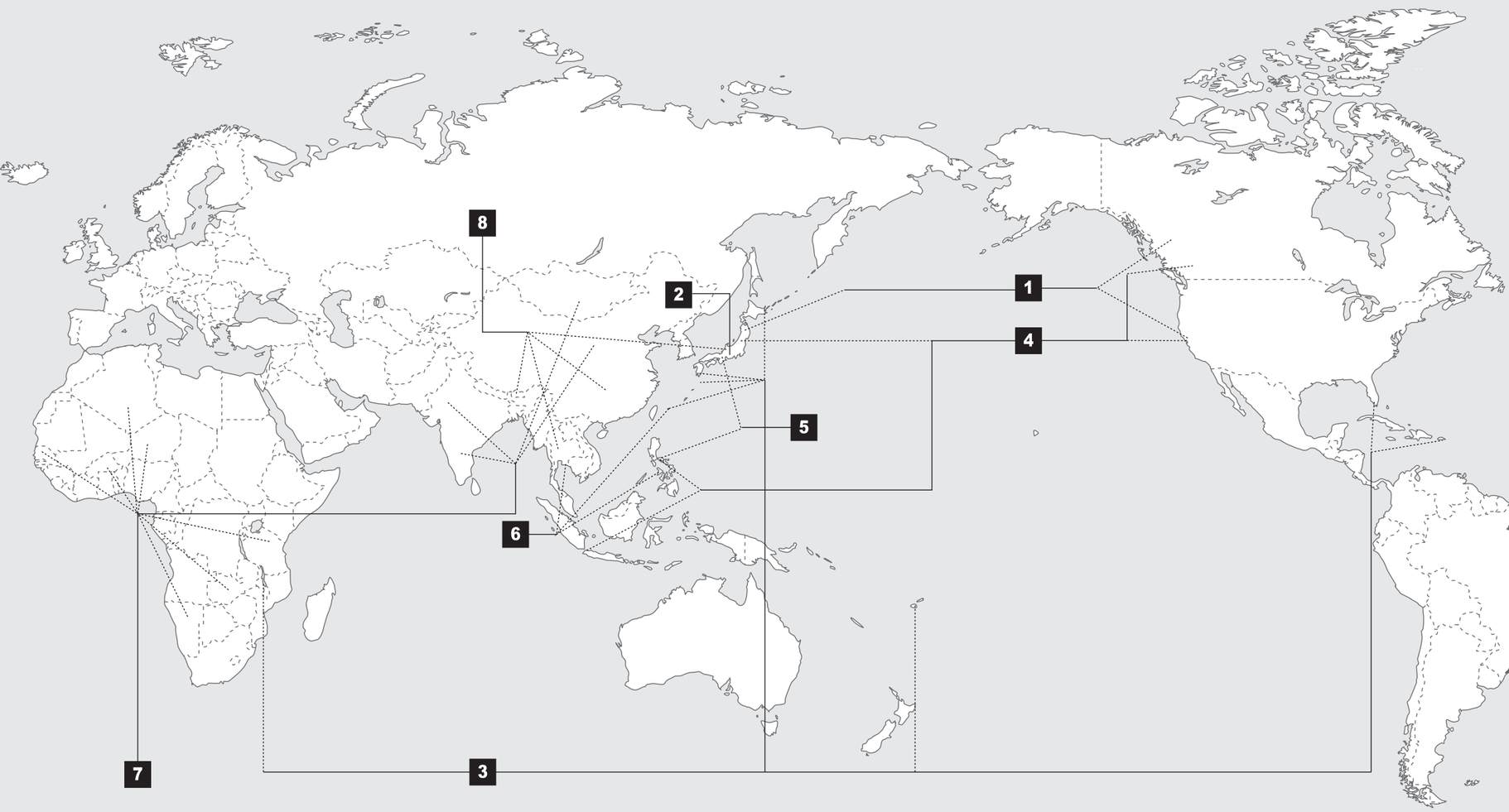
Appendix 2 Research Fields of Project Members

Project Number	Title of the Project	The Number of Projects Members				Research Background of Project Members
		Natural Sciences	Humanities	Social Sciences	Total	
Research Program 1 (FR3)	Long-term Sustainability through Place-Based, Small-scale Economies: Approaches from Historical Ecology	21	16	45	82	(Natural Sciences) Oceanography, Aquatic Marine Environmental Education Research, Global Environmental Oceanography・Paleoenvironment, Stable Isotope Ecology, Botanical Archaeology, Anthropology, Agroecology, Physical Anthropology, Environmental Archaeology, Environmental Ecology, Biological Anthropology, Biological anthropology (Human Evolution), Paleobotany, Paleoclimatology, Ecology, Isotope Analysis, Animal Archaeology, Physics, Archaeology (Humanities) Archaeology, Museology, Cultural Property, Palaeoenvironmental Studies, Archaeobotany, Osteoarchaeology, Prehisoty, Geological Archeology, Japanese Archeology, Prehistoric Archeology, Ethnic Archeology, Zooarchaeology (Social Sciences) Environmental Anthropology, Historical Ecology, Human Environmental Geography, Silviculture, Political Ecology, Archaeobotany, Zooarchaeology, Anthropology, Ethnology, Hunter-gatherers Studies, Political Economy, Sociology, Cultural Anthropology, Urban Ethnography, Integrated Policy Science, Paleoecology, East Asian Archaeology, Bioarhaeology, Archaeology, Cultural Ecology, Evolutionary Ecology, Dissemination and Enlightenment of Environmental Issues, Area Studies, Lifelong Learning, Environmental Archaeology, Food Culture, Political Ecology, Social and Cultural Anthropology, Earthquake Disaster Studies, Sociology of Science and Technology, Indigenous People Archaeology, Agriculture, Cooperative Movement, Social Movement, Archeology (West Coast of Northen America), Environmental Education
Research Program 1 (FR3)	Societal Adaptation to Climate Change: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences	37	37	3	77	(Natural Sciences) Palaeoclimatology, Dendrochronology, Historical Climatology, Wood Anatomy, Palaeoceanography, Dating Method, Plant Ecology, Isotopic Meteorology and Climatology, Climate Dynamics・Climate Modeling, Earth System Dynamics, Wood Science, Isotope GeoChemistry, Glaciology, Hydrology, Geochronology, Earth Dynamics, GeoChemistry, Forestry, Environmental Studies, Radiocarbon chronology, Climatology, Glaciology, Assimilation of old weather records (Humanities) Japanese Early Modern Age History, Archaeology, Japanese Early Modern Age Urban History・Comparative Studies of Historical Documents, Prehistorical Archaeology, Japanese Middle Age History, Japanese Archaeology, Theoretical Archaeology, Japanese History, Vegetational History, Edo-era History, Japanese Early Modern History, History of Ryukyu, Japanese Early Modern Age Emperor Studies/Economic History, Archaeology (Prehistoric-chronology), Archaeology (Yayoi-era), Prehistory, Human Informatics, Japanese Ancient History, Japanese Religious History, Japanese Middle Age History (Shoena Manor/Village/Environment), Feudal Domain History (Social Sciences) Japanese Economic History・Historical Demography, Environmental Policy, Japanese Early Modern Age Economical and Social History
Research Program 2 (FR5)	Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge	55	17	71	143	(Natural Sciences) Local Environmental Science, Landscape Ecology, Statistical Physics, Governance Theory, Science and Technology Studies, Fishery Management, Theoretical Biology, Game Theory, Satoyama Management, Complex Systems Theory, Wildlife Management, Resource Management, Protected Area Management, Ecology, Mathematical Biology, Soil Hydrology, Satoumi Governance, Coastal Management, Residential Research, Satoyama Restoration, Renewable Energy, Nature Restoration, Ecodystem Management, Agroecosystem, Knowledge Theory, Watershed Management, Natural Energy, Plant Ecology, Geology, Forest Ecology, Geography (Humanities) Science Ethics, Folklore, Governance Theory, Ecological Anthropology, Social Anthropology, Hisotry, Japanese Hisotry (modern), Knowledge Studies, Protected Area Management, Anthropology, Geography (Social Sciences) Governance Theory, Resource Management, Environmental Ethics, International Law, Environmental Economics, Fishery Resource Management, Environmental Sociology, Residential Research, Conservation Theory, Agroecosystem, Network Theory, Biodiversity Policy, Political Science, Social Psychology, Environmental Governance, Ocean Policy, Environmental NGO Theory, Coastal Management, African Area Studies, Environmental Law, Commons
Research Program 2 (FR4)	Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus	45	9	24	78	(Natural Sciences) Hydrology, Hot Spring Science, Energy Science, Thermal Energy, Aguricultural Water Utilization, Bioresource Ecology, Model of Connectivity of Hills, Humans and Oceans, Geothermal Science, Estuary Ecology, Geothermal energy, Coastal Fisheries, Bioresource Science, Marine/Coastal Geology, Geology, Water - Energy Nexus, Coastal Oceanography, Hot Spring/Ecology/Energy, Hot Spring/Groundwater, Coastal Protection, Marine Ecology, Envitonmental Science, Satoumi Resource Ecology, Fisheries, Hydroelectric Power, Fisheries Ecology, Groundwater Management, Geochemistry, Geoscience, Geothermal Energy, Geothermal Energy Policy, Biomass, Water Quality, Hydrological System Analysis, Hydrogeology, Limnology, Gravity Measurement and Geothermal Modelling, Seismology, Engineering Seismology, Geotechnical Engineering (Humanities) Environmental Governance, Local Knowledge, Graphic Design, Resource Studies, Societal Action, Psychology, Ecological Anthropology, Ethnobiology, Human Ecology (Social Sciences) Environment and development, Conservation Ecology, Environmental Planning, Global Environmental Policy, Fishery Resource, Coastal Sociology, Public Policy, Regional Studies, Environmental Policy, Policy process, International relations, Fishery Economics, Environmental Economics, Sociology, Economics, Environmental governance, Behavioral social Science, Integrated water Resources Management, Cultural Anthropology , Environment-economy Assessment, Climate Change Policy, Public Administration, Ocean Policy, Social Networking Theory, Crust Research, Physical Modelling, Environmental Conservation by Companies and Citizens, Geothermal Energy
Research Program 2 (FR2)	Biodiversity-driven Nutrient Cycling and Human Well-Being in Social-ecological Systems	76	2	18	96	(Natural Sciences) Ecological Science, Plant Ecology, Satellite Ecology, Stable Isotope Ecology, Community Ecology, Water Weed Resource Circulation, Fish Genetics and Breeding Science, Freshwater Biology, Fish Ecology, Phycology, Ecological Stoichiometry, Marine EcoSystem Engineering, Aquatic Biology, Hydrosphere Ecology, Plant Physiological Ecology, Ecology, Mathematical Biology, Evolutionary Biology, Microbial Ecology, Fungal Diversity, BiogeoChemistry, Chemical Oceanography, Applied Ecology, Molecular Ecology, Forest Ecology, Hydrology, Ecological Genetics, Aquatic Ecology, Forest Hydrology, Conservation Ecology, Fungology, Geophysics, Lake Synthetic Science, Integrated Lake Basin Management, Plankton Ecology, Analytical Chemistry, Environmental Economy, Environmental Sociology, Environmental Aguriculture, Environmental Microbiology, Environmental Conservation, Forestry and Environmental Studies, Hydrosphere Chemistry, Fisheries, Hydrological Science, Mineral Nutrient Circulation in Groundwater, Benthic Animal Diversity, Freshwater Ecology, Environmental Analytic Chemistry, Spatial Statistics, Underwater Acoustic Studies, River Basin Conservation, Biological Science, Ecosystem Ecology, Limnology (Humanities) Historical Geography, Sociology of Local Community, Social Psychology, Social Research (Social Sciences) Environmental Policy, Rural Sociology, Environmental Sociology, Industrial Ecology, Ecological Economics, Applied Economics, Quantitative Sociology, Social Psychology, Sociology, Environmental Economy, Environmental Measures, Regional Planning
Research Program 3 (FR5)	Desertification and Livelihood in Semi-Arid Afro-Eurasia	15	7	6	28	(Natural Sciences) Agronomy, Boundary Aguriculture, Remote Sensing, Soil Ecology, Soil Science, Weed Science, Meteorology, Natural Geography, Regional Architecture、Environmental Soil Science, Plant Nutrition, Zootechny, Geology, Agricultural Culture, Ethnogeography, Development Anthropology, Afro Eurasia Arid Region Area Studies (Humanities) Ethnoarchaeology, Cultural Anthropology, Ethnic Geography, African area Studies, Archaeology, Environmental Anthropology, (Social Sciences) Rural development Studies, Social development Studies, Rural Economics, Area Studies, Social Anthropology, Aguricultural culture
Research Program 3 (FR5)	Coastal Area Capability Enhancement in Southeast Asia	102	13	27	142	(Natural Sciences) Tropical forest research, Fish Ecology, Fish taxonomy, Population genetics, Genetics, Fisheries Science, Ichthyology, Costal Ecology, Molecular Ecology, Planktology, Robotics, Fishing gear, Water quality analysis, Seedling production, Genetic analysis, Marine Engineering, Telemetry, Aquaculture, Ecology, Fish behavior, Marine Ecology, Fisheries research, Biology, Environmental Studies, Water environment Studies, Environmental Science, Molecular phylogenetics, Costal Environmental research, Aquatic Ecology, Conservation Ecology, Software Engineering, Coral reef Ecology, Fishery research, Fisheries Promotion, Forest Management, Fishing Boats Operation, Set-net Fisheries (Humanities) Cultural Anthropology, International fisheries development Studies, Area Studies, Area development Studies, Ecological Anthropology, Village development, Sociology of fishing communities, Regional development Studies, Underwater Archaeology, Archaeology, Sociology, Cultural Anthropology, Anthropology, Social Anthropology (Social Sciences) Economics, Regional development, Fisheries Economics, Regional Economics, Resource Management, Traditional technique, Tourism study, Area Studies, Village development, Fish catching and Environmental linkage, Management studies
Research Program 3 (FR1)	Life-worlds of Sustainable Food Consumption: Agrifood Systems in Transition	32	10	31	73	(Natural Sciences) Soil Science, Agrifood Social Science, Rural Sociology, Farm Management, Regional Studies, Environmental Aguriculture, Food Science, Radiation Control, Modelling, Green Space Planning, Environmental Energy Science, Public Health, Social Ecological System, EcoSystem, Cultivation Management, Biodiversity Informatics, River Ecosystem, Climate Change, Japanese Traditional Vegetables, Geography, Landscape, Organic Agriculture, Life Cycle Assessment (Humanities) Environmental Sociology, Social Statistics, Regional Policy and Planning, Environmental Logic, Anthropology, Cultural Anthropology, Hisotry, Political Economy, Science and Technology Studies, Environmental Ethics, Agroforestry (Social Sciences) Environmental Sociology, Environmental Planning, Food Policy, Rural Planning, Innovation Studies, Global Aguricultural Economics, Agrifood Social Science, Agrifood System, Geology, Environmental Policy, Sociology, Food Sociology, Policy Science, Water Quality Monitoring, Food System Science, Gender Studies, Agricultural Economics, Social Policy, Agricultural Policy, Development Sociology, Rural Development Sociology, Socioeconomics, Rural Sociology, Urban / Rural Sociology
Research Program 1 (PR)	Toward the Regeneration of Tropical Peatland Societies: Transformability of Environmentally Vulnerable Societies and Establishment of an International Research Network	21	2	7	30	(Natural Sciences) Environmental Anthropology, Environmental Resource Geology, Political Ecology, Atmospheric Chemistry, Agrometeorology, Land Use and Land Resources Management, Hydrology, Biogeochemistry, Plant Ecology, Forest Ecology, Soil Science, Physical Geography, Ecology, Policy Research, Tropical Forest Resources and Environment, Air Quality Measurement (Humanities) Social Anthropology, Area Studies (Social Sciences) Area Studies(Indonesia), Economic Hisotry, Political Science, Local Wood Use, Area Studies, Environmental NGO Studies
Research Program 3 (PR)	The Sanitation Value Chain: Designing Sanitation Systems as Eco-Community-Value System	16	7	14	37	(Natural Sciences) Sanitary Engineering, Chemical Engineering, Environmental Engineering, Water Treatment Engineering, Public Health Microbiology, Environmental Resources, Regional Agricultural Technologies, Environmental and Sanitary Engineering (Humanities) Agricultural Economics, Cultural Anthropology, Global health (Social Sciences) African Political Science, Development Economics, Community Participation, International Health, Sociology, Urban and Regional Planning, Video Production, Social Medicine, Aguricultural Economics
Individual Collaboration FS（KANEKO）	Water-Energy-Nexus Technology for Marginal Settlements: Socially Optimal Size from the Perspectives of Reciprocity and Indigenous Knowledge	4	1	8	13	(Natural Sciences) Environmental Science, Sanitary Engineering, Engineering, Hydrology, Environmental Engineering, Electrical and Electronic Engineering, Electric Power Engineering, Power Conversion, Electrical Equipment, Geophysics, Geohydrology, Physical Geography (Humanities) Development Sociology, Area Studies, Development Aid Studies, Development Experience of Japan (Social Sciences) Development Economics, Environmental Economics, Labor Economics, Applied Microeconomics, Environmental Studies, Transport Economics, Environmental Policy, Applied Econometrics, Law and Economics, Environmental Impact Assessment, Economics, Applied Economics
Institutional Collaboration FS（ICHIE）	Evaluation and Use of Non-monetary Benefits from Protected Tropical Rain Forest Areas in Southeast Asia	6	1	5	12	(Natural Sciences) Natural Environmental Policy (Biodiversity/Protected areas), Forest Ecology, Forest Biology, Ecology, Entomology, Conservation Ecology (Humanities) Southeast Asian Area Studies (Social Sciences) Economies, Biocultural Diversity, Environmental Economics, Economic Sociology, Resource Strategy, Geo-restriction Strategy
Institutional Collaboration FS（SAKAKIBARA）	Co-Creation of Regional Innovation for Reducing Risk of Environmental Pollution	15	1	4	20	(Natural Sciences) Geoscience, Ecology, Environmental Petrology, Atomic Collision Physics, Inorganic Material Engineering, Environmental Economics, Epidemiolgy, Physics, Accelerator Science, Non-ferrous Metal Smelting, Resource Economics (Humanities) Business Management (Social Sciences) Rural Planning, Regional Environment Studies, Fishery Sociology, Forest Science
Institutional Collaboration FS（HOMMA）	Assessing Functional Diversity of Satoyama Paddy Landscapes in East Asia's Monsoon Region	10	0	3	13	(Natural Sciences) Life Science, Community Ecology, Environmental Science, Silviculture, Zooecology, Ecology, Agricultural Economics, Aquatic Ecology, Agricultural Engineering, Food Science, Entomology, Biodiversity, Conservation Ecology, Reintroduction Biology, Agricultural Water Utilization (Social Sciences) Comparative Cultures, Contribution to Local Society, Ecology
Institutional Collaboration FS（MURAYAMA）	Living Spaces: A Transdisciplinary Study on Locality, Nature and Global Interdependency	12	17	18	47	(Natural Sciences) Nonlinear Physics, Urban and Regional Analysis, Ecogeography, Ichthyology, Meteorology, Quantitative Analyses of Behavior, Biogeochemistry, Spatial Information Science, Multi-level Data Analysis, Physical Geography, Molecular Epidemiology, Computational Neuroscience, Regional Sanitaion, Network Science, Geoinformatics, Fisheries, Climatology, Biology, Paleoclimatology, Climate History (Humanities) Chinese Environmental History, Landscape History, Enviornmental Humanities, History of Science, History of Forest Society, History of Japan, Environmental History, Silviculture, Historical Geography, History of Philosophy, History of South Bohemia, Geography, Cultural Heritage, Rual Sociology, History of Psychiatry, History by Region, Cultural Informatics, History of Agriculture, History of Chinese Environment, Narrative approach to Environmental History, Environmental Ethics, Environmental Anthropology, Western History, History of the Family (Social Sciences) Environmental Sociology, Environmental History of Alps, Economic History, Historical Demography, Tropical Horticulture, Regional Development Studies, Economic Geography, Environmental Decision Theory, History of Agriculture, History of Political Theory, Community Building, Social Economic History, Social Dynamics, Social Movement Studies, Environmental History, Plant Physiology, History of Business Management, Tourism, Environmental History of Italian Alps
Institutional Collaboration FS（YOSHIDA）	Research and Social Implementation of Ecosystem-based Disaster Risk Reduction as Climate Change Adaptation in Shrinking Societies	33	0	7	40	(Natural Sciences) Conservation Ecology, Landscape Planning, Biodiversity Informatics, Ecology, Regional Planning, Forest Policy, Ecosystem Assessment Management, Global Environmental Studies, Spatial Informatics, Landscape Ecology and Planning, Environmental Agriculture, Landscape Architecture, Environmental Policy, Statistical Science, Urban Engineering, International Fisheries Development, Rural Planning (Social Sciences) General Insurance, Environmental Economics, Environmental Sociology, Agricultural Business Management
	Total	500	140	291	931	

As of 31 March, 2017

Research Project Sites

Appendix 3



Full-Research

Program 1 Transition to a society that can flexibly deal with environmental changes

1 Long-term Sustainability through Place-Based, Small-scale Economies: Approaches from Historical Ecology

○Japan, USA

2 Societal Adaptation to Climate Change: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences

○Japan

Program 2 Fair Use and management of diverse resources

3 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

4 Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus

○Japan, Indonesia, Philippines, Canada, USA

5 Biodiversity-driven Nutrient Cycling and Human Well-being in Social-Ecological Systems

○Philippines, Japan

Program 3 Design of wellbeing-enhancing living spaces and life styles

6 Coastal Area-Capability Enhancement in Southeast Asia

○Coastal states of Southeast Asia; Ishigakijima, Japan

7 Desertification and Livelihood in Semi-Arid Afro-Eurasia

○Senegal, Niger, Burkina Faso, Namibia, Zambia, Sudan, Tanzania, India, Mongolia, China

8 Lifeworlds of Sustainable Food Consumption and Production:Agrifood Systems in Transition (FEAST Project)

○ Japan, Thailand, Bhutan, China