NIHU
Inter-University Research Institute Corporation
National Institutes for the Humanities

Research Institute for Humanity and Nature

Prospectus 2017-2018

Contents

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 these interactions between humanity and nature ought to be. To achieve this mission, RIHN has been conducting interdisciplinary research spanning the natural sciences, humanities, and social sciences, and in recent years, has enhanced transdisciplinary research that involves collaboration with various stakeholders in society.

Since its establishment, RIHN researchers have formulated creative projects to address social needs in diverse fields of environmental interaction. Following an external review of research activities and organizational structures, in fiscal year 2015 we reformed the ways in which we conduct and promote research projects, in order to enhance coordination and integration of the projects for achieving the goals of RIHN missions. As part of this reformation, since April of 2016 (beginning of fiscal year 2016), we have launched a new set of Research Programs, a Core Program, and the RIHN Center in order to organically integrate and support the overall research activities of RIHN. With a new structure in place, we determined to pursue our mission even more vigorously through enhanced collaboration within our institute, across our diverse research community, and with society in general.

To enhance international activities of RIHN, we have been collaborating in the international research platform Future Earth, which aims to integrate global environmental change research for achieving global sustainability. As part of this international collaboration, RIHN has established the Asian Regional Center for Future Earth as one of the four formally-appointed regional centers in the world.

In fiscal year 2017 we are fully implementing these new research initiatives.

安成 哲三

YASUNARI Tetsuzo

Director-General
Research Institute for Humanity and Nature

Above: OSHIUMI Keiichi, Tranquility, Wat Phou, Laos

Below: ISHIKAWA Satoshi, A women diver's house, Toba, Mie, Japan

RIHN's Mission

For several decades, researchers from many academic disciplines have attempted to find solutions to the environmental problems that now confront human communities at all scales. Despite extensive research in individual disciplines, however, many environmental problems have remained unresolved. There is therefore need not for additional partial descriptions of discrete environmental problems, but for holistic understandings of the underlying causes of these problems, and integrated approaches to their solutions.

RIHN research is characterized by the belief that environmental problems stem from problems in human culture. RIHN research projects therefore are designed to examine not only the diverse range of cultures that currently inhabit the Earth, but also past patterns of cultural and environmental change. In addition to conducting high quality basic research, our aim is to enable discussion of diverse perspectives of nature and their potential relevance to the future.

Since the establishment of RIHN, researchers of the institute have discussed the concept of *futurability* (or sustainable future), a Japanese word that combines the ideographs "future" and "potential". This concept invites us to consider the kinds of interactions between human beings and nature—some age-old and some entirely new—that various societies and communities might seek. We hope it will continue to stimulate discussion of what should be done to address environmental problems at their roots, so that future generations will not inherit the same patterns of use and degradation that now characterize our global society.

The idea that environmental problems stem from problems in human culture inevitably leads to the conclusion that environmental research needs to consider the concept of values in various human societies and cultures. Anthropogenic environmental impact is now predominant on a global scale, and the current era of Earth history is being called the "Anthropocene". Humankind is becoming increasingly conscious of its dependence on finite and limited resources, and of the many negative consequences of continued degradation of our biosphere. Humans have also progressively come to understand that a number of critical environmental problems cannot be separated from social inequity, especially in terms of access to natural resources and their benefits. RIHN is now conducting solution-oriented environmental research projects based on new forms of transdisciplinary knowledge production.

Exposing different value systems in such contexts can lead to social conflicts, but true resolution of socio-environmental issues is a challenge shared by humanity in general. It requires forthright dialogue and exchange between peoples of the world. A sustainable future, or "*futurability*", thus also indicates our sincere aspiration to establish integrated global environmental studies as a new holistic approach to a sustainable future for human beings at local, regional to global scales of our planet Earth.

Orientation and Structure of RIHN in Phase III

In 2016 RIHN initiated its Phase III Medium-Term Plan, with the following three goals:

- Promotion of environmental studies that elucidate the interaction between humanity and nature and critically examine the future potential of human culture, based on the accumulated body of RIHN research and the results of global environmental research in Japan and abroad;
- Promotion of solution-oriented global environmental studies involving close collaborations with stakeholders, starting from the research community;
- Contribution to problem-solving by applying research results in support of, and participation in, on-site multi-stakeholder arrangements in society.

RIHN's priority issues and areas of research are the following:

- Exploration of the future potential of localities and of the Earth, centered on issues in modern society that are at the root of global environmental problems, including climate change, ecosystem degradation, rapid urbanization, changing population composition, depletion of resources, diversification of disaster risk.
- Developing research globally, but with the Asia Pacific region—a hotspot of global environmental problems—as a core focus area.

Organizational Structure

The overall structure of RIHN consists of four Programs and a Center. The programs are to guide the development of global environmental studies by organically integrating RIHN research results, while the Center provides their operational foundation, helps RIHN engage in two-way collaborations with society, and at the same time is the locus of capacity building activities.

RIHN Programs

RIHN research is organized into Programs and Projects, rather than pre-existing academic disciplines or domains. Three Research Programs and one Core Program each include multiple projects that carry out research in line with the Programs' thematic foci. The bundling and integration of Projects within the Programs is expected to facilitate the production of synthesized results at a level not possible otherwise. Programs are subject to annual review by the External Research Evaluation Committee whose members include domestic and international researchers (See RIHN Project Trajectory on page 7 & 8). RIHN endeavors to improve its research by making good use of the review results, while respecting the independence of each program.

Research Programs

Research Programs are organized around three themes identified in the Phase III Medium-Term Plan. In addressing environmental problems, technological and institutional developments are important, but RIHN recognizes that these need to build on the foundation of people's awareness, value systems and culture. The programs collaborate closely with society in developing and proposing options that contribute to the transition of society.

Program 1: Societal transformation under environmental change

This program aims at providing realistic perspectives and options to facilitate the transition to a society that can flexibly respond to environmental changes caused by human activities such as global warming and air pollution, as well as to natural disasters.

Program 2: Fair use and management of diverse resources

Taking tradeoffs into account, this program provides multifaceted options to stakeholders involved in production, distribution, and consumption of resources, in order to realize fair use, optimal management, and wise governance of diverse natural resources including energy, water and ecological resources.

Program 3: Designing lifeworlds of sustainability and wellbeing

Our "lifeworlds" are composed of the physical spaces and socio-cultural spheres of our everyday lives. They are continually reproduced, reimagined, and evolving through an interactive and reflexive relationship with society, culture, and nature. Program 3 proposes research aimed at illuminating reciprocal linkages between diverse rural and urban lifeworlds and contributing to the solution of sustainability problems by working with various societal partners such as governments, companies, and citizen groups. Special emphasis is placed on envisioning sustainable futures that improve wellbeing and gauging their feasibility.

RIHN Project Trajectory : Research Project

Incubation Studies (IS) are proposed by individual researchers to the RIHN Project Review Task Committee. If approved, the researcher is granted seed money to prepare a proposal for Feasibility Study.

Feasibility Studies (FS) allow the FS Principal Investigator a period to develop a proposal for Full Research.

In the transitional **Pre-Research (PR)** period, the project leader formally assembles the team, establishes MOUs necessary for collaboration with other institutions and makes other preparations to enable Full Research.

Full Research (FR) lasts from three to five years. It typically involves a research team at RIHN and concurrent activity with collaborators overseas, several periods of field study, workshops and presentations, and outreach or communication to relevant communities. FR projects are evaluated by the External Research Evaluation Committee at the beginning (selection) and the end (final evaluation).

Orientation and Structure of RIHN in Phase III

Core Program

Based on the mission of RIHN and in order to realize the strategies and policies formulated by the Council for Research Strategy, the Core Program undertakes research on an ongoing basis. During Phase III, the Core Program will develop concepts and methodologies to solve global environmental problems in collaboration with society.

RIHN Project Trajectory : Core Project

RIHN Center

Within the structure just described, the RIHN Center is to play the roles described below. See pages 46 for detailed description of the Center's divisions.

Collaboration with the Core Program

The Center will identify and propose Core Projects designed to make continued use of research conducted by the Programs by analyzing and enhancing its foundations (including identification and refinement of key research methods, devices, resources, and data) while also promoting collaboration within and between RIHN and its research partners.

Collaboration with the Academic Community as an Inter-University Research Institute

The Center will facilitate the role of RIHN as an Inter-University Research Institute and operate as an international research networking hub by promoting collaborative research with domestic and international institutions as well as contribute to capacity building and education.

Cooperation with Diverse Stakeholders

The Center will guide and promote transdisciplinary research processes involving domestic and international stakeholders in the entire research process, from problem identification to solution development, while also reflexively developing the methods of transdisciplinary scholarship.

Above: KISHIMOTO Sayaka, The only flower in the world, Igrem, Morocco
Bottom: FU Zhenzi, Boats are like castles on the water, Venice, Italy


CANOTTIERI MESTRE

Project Index

Full Research FR

Research Program 1: Societal Transformation under Environmental Change

Research Program 2: Fair Use and Management of Diverse Resources

Research Program 3: Designing Lifeworlds of Sustainability and Wellbeing

Core Program

Completed Research

Research Program 1

Societal Transformation under Environmental Change

This program aims at providing realistic perspectives and options to facilitate the transformation towards a society that can flexibly respond to environmental changes caused by human activities such as global warming and air pollution, as well as to natural disasters.

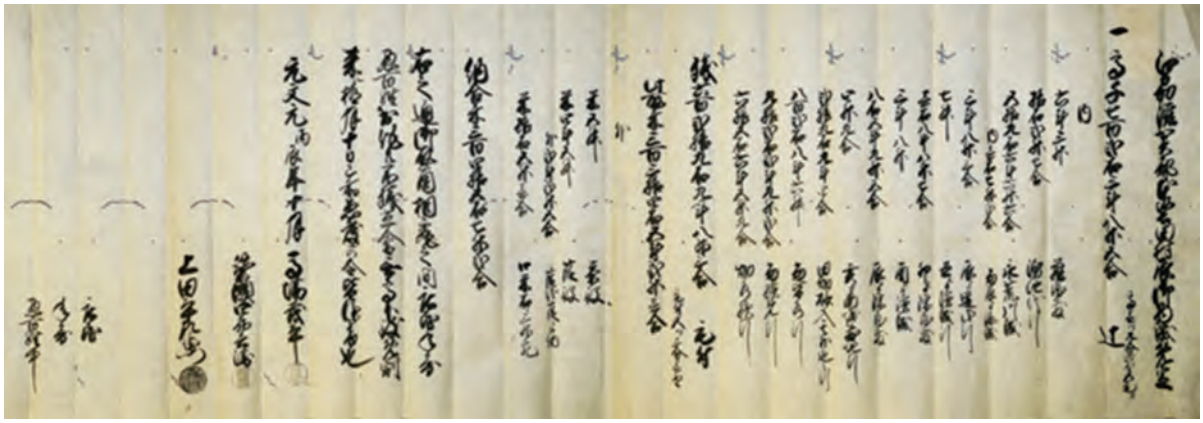
To demonstrate the fundamental significance of global environmental sustainability for human society, we need to make the links between environmental change and natural disasters, and social issues such as livelihood, inequality, social security and conflict, intellectually explicit, and reinforce them in the real world. RIHN's Societal Transformation under Environmental Change research program contributes to this task.

The Program follows two lines of inquiry. The first conducts research on Asia's long-term paths of social and economic development in relation to climate change and environmental history. Such studies offer historical understandings of the human-nature interface, and evaluate each region's political and economic conditions and cultural and social potentialities in comparative perspective. For example, postwar development of the industrial complex along Asia's Pacific coast was made possible by the combination of imported fossil fuels and utilization of rich local resources of land, water and biomass. Industrial development in the region produced both rapid economic growth and at times severe environmental pollution and degradation. It is important to recognize the causes and consequences of these historical processes in their own light, as well as for their significance to future societal change and policy deliberations.

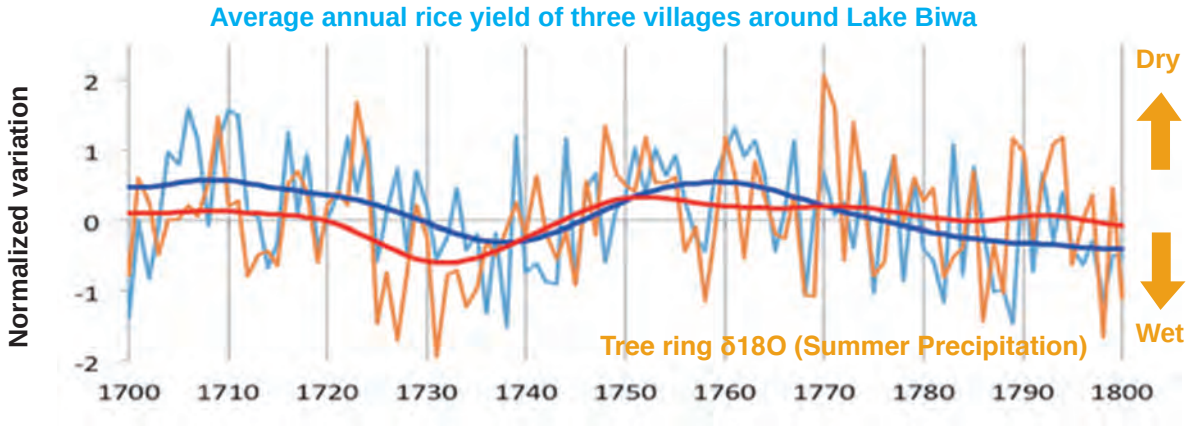
The Program's second line of inquiry examines the kinds of motivations that affect people's livelihood, by working closely with various stakeholders in local society in Asia. Our project based in Sumatra's tropical peat swamp forest, for example, has identified four principal kinds of motivations—local livelihood; profit of local farmers and agricultural and industrial enterprises; local and centrally-based governance; and conservation measures implemented by governments, NGOs and international institutions—and examines how they can best be coordinated to promote sustainability at the village level. Research also helps implement policies at local, national and international levels. This ongoing project, which cooperates with local universities, companies and officials, has already contributed to the development of regional and national policies to control peatland fires, which became a significant environmental issue in Indonesia and beyond.

This program coordinates a variety of research projects along these lines in order to develop a perspective that helps direct research and social transformation in Asia.

Recent land development activities in some parts of tropical peatlands have led to unpreceded scales of forest fire incidents, which are a serious health threat to people of local areas and neighboring countries. This photograph shows a peatland fire in Riau Province, Sumatra Island, Indonesia.



Village tax account in 1736 AD at Honkatada village, Shiga county, Ohmi state



A normalized account of estimated rice yields based on village tax accounts among three villages around Lake Biwa and tree-ring cellulose oxygen isotope ratios taken in central Japan during the 18th century. These data demonstrate that flooding was the most significant factor negatively affecting rice yields in the area at this time.

Program Director **SUGIHARA Kaoru** RIHN

Trained in Japan (Doctorate at the University of Tokyo), I have held positions at the History Department of the School of Oriental and African Studies, University of London, the Center for Southeast Asian Studies, Kyoto University, the Graduate School of Economics, University of Tokyo, and the National Graduate Institute for Policy Studies (Japan). My research concerns the history of intra-Asian trade and labor-intensive industrialization in the last two centuries. I am currently working on the economic and environmental history of Monsoon Asia in long-term perspective. I also act as Vice-Chair of the Future Earth Committee of the Science Council of Japan.

Program Researchers

MOROTA Hiroaki	Program Researcher
YAMAMOTO Aya	Program Research Associate
YANAKA Hiroko	Program Research Associate

Historical Climate Adaptation Project

Societal Adaptation to Climate Change: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences

Project Leader **NAKATSUKA Takeshi** RIHN

Professor Nakatsuka's specialties are palaeoclimatology and isotope biogeochemistry. Since his early career as a graduate student, he has been using nitrogen isotopes to study long-term variations of climate and its impacts on oceanic biogeochemical cycles. Recently, he changed his main research area from oceans to land and focused on using tree-ring oxygen isotopes to examine the relationship between climate change and human history. Investigating periodicity of climate during the last two millennia in Japan and the world, he now hypothesizes that past human societies were often damaged by multi-decadal climate variations as they were caught in a cycle of over-adaptation and subsequent failure of adaptation.

Background and objectives

If global warming causes many societal difficulties, how can we adapt to the change? Remarkable recent progress in palaeoclimatology has elucidated the fact that large climate variations often underlay epochs of human history. How did our ancestors address such change in the past? Human history must include many examples from which we can extract common lessons relevant to contemporary global environmental change. The research target of this project is Japanese history from the prehistorical Jomon era to the present. First, we reconstruct past climate variations in Japan and Asia at annual or seasonal time resolutions for the last several millennia, using up-to-date palaeoclimatological methods to identify outstanding periods of climate variation. Then we use historical and archaeological approaches to investigate how local societies reacted to climate variation in order to clarify common sociocultural characteristics of societies that are tolerant or vulnerable to changes in climate.

Research methods

In this project, past climate variations are reconstructed based on various proxies, such as tree rings (Photo 1, 3), historical weather records, lake and marine sediments, coral rings and speleothem, and compared with human responses recorded in historical documents (Photo 2) and archaeological archives. There are three reasons why we have chosen Japan as the main research area in this project. First, Japan is located at northeastern rim of the Asian summer monsoon, where small changes in monsoon dynamics might have significantly affected rice paddy cultivation on which Japanese sustenance has historically depended. Second, due to the historically high literacy rate and long-lasting family system in Japan, innumerable historical documents dating back to the 8th century are preserved in both private and governmental sectors. Third, rapid land developments during last several decades have allowed for precise archaeological excavations at numerous sites all over Japan. In addition, a palaeoclimatological tool (tree-ring cellulose oxygen isotope ratio) particularly useful in the Asian monsoon region has recently been developed to reconstruct summer precipitation on which rice paddy cultivation in Japan depends, providing archaeologists with a reliable tool for annual dating of numerous excavated woods (Fig. 1).

Remarkable results

So far, we have been using many tree-ring samples from around Japan in order to analyze tree-ring oxygen isotope ratios during the last 4300 years in annual time resolution. We have also collected many tree-ring width datasets from all over Asia in the framework of an international palaeo-climatological project (PAGES) and reconstructed inter-annual variations of averaged summer temperature in East Asia. Comparison of annual records of past climate with paleographic information such as yearly tax accounts in early modern villages and administrative documents on water control in medieval manors, as well as archaeological information on prehistorical and ancient societies excavated from farmland and habitat remains, coupled with the newest isotopic dendrochronological data allow us to investigate how variations in temperature or precipitation influenced agricultural production, human livelihoods, and water management. As a result, we can understand how historical societies could or could not overcome serious climate changes in the past. In the Edo era, summer temperature changed cyclically with

Photo 1 Sampling a tree-ring core with an increment borer

Photo 2 Collection of photo images from old written documents

Photo 3 Analysis of giant tree ring disk

http://www.chikyu.ac.jp/rihn_e/project/H-05.html
http://www.chikyu.ac.jp/nenrin/index_e.html

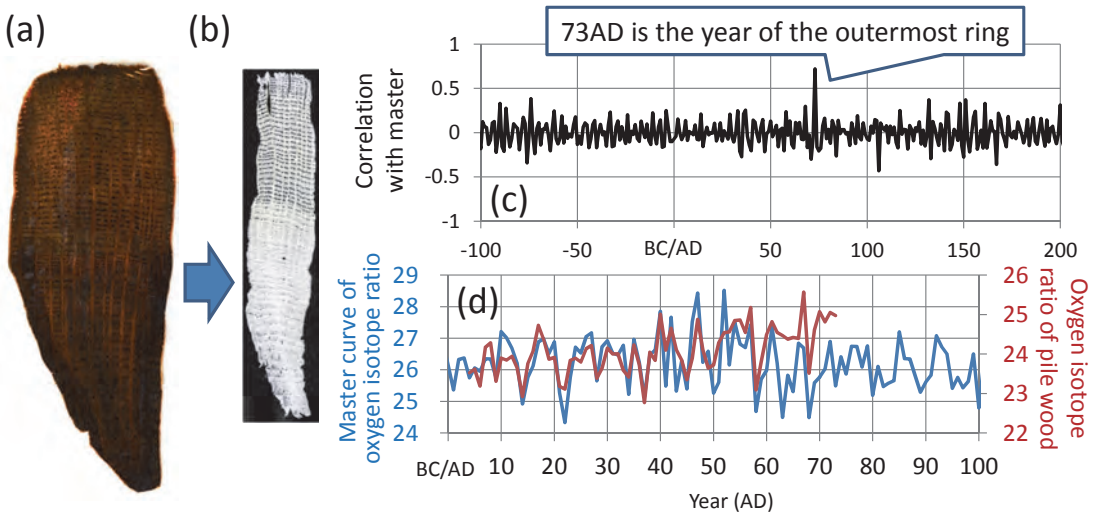


Figure 1 A thin wood plate (a) and its chemical treatment residue (cellulose) (b) from a pile wood at a rice paddy field in the Yayoi era. Variation in the tree-ring cellulose oxygen isotope ratio is compared with that in master chronology to determine the matching year (c & d).

about 40 years of periodicity and sudden temperature decreases often reduced rice yield drastically and caused serious famines in Northeast district of Japan (Fig. 2). In the medieval period, we find tight relationships between temperature and famine as well, but also that sudden increases in precipitation often caused water disasters and subsequent social conflicts and warfare (Fig. 3). Such relationships can be traced back to the early period of the Yayoi era about 2500 years ago.

Final goal

As our present concerns for global warming clearly illustrate, large climate variations in the past have always had serious impacts on our ancestors. As shown in Figs. 2 and 3, multi-decadal large climate variations had especially damaged historical societies. However, some past societies continued making efforts to overcome the influence of climate variations, while other societies collapsed. Comparative evaluation of historical climate adaptations may allow us to explain Japanese history since the Jomon era as a sequence of societal transformations designed to overcome large intermittent climate variations. The final goal of this project is to bring such historical insight into consideration of fundamental adaptation strategies in relation to contemporary global environmental problems.

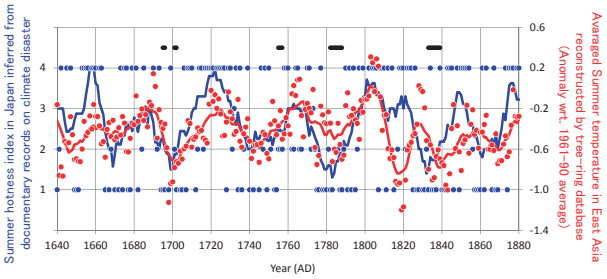


Figure 2 Variations of summer temperature in the Edo era. Two reconstructed time-series are based on Japanese historical documents of climate disasters (blue) and East Asia database of tree ring width (red), respectively. Upper black bars are corresponding to the year of giant famines in Northeast district. Dots and lines indicate yearly and 11 year running mean values, respectively.

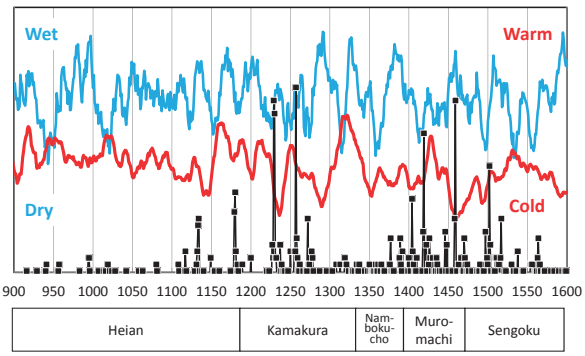


Figure 3 Variations in summer temperature (red: reconstructed from East Asia database on tree-ring width) and precipitation (blue: reversed tree-ring oxygen isotope ratio in central Japan) during 10-16th centuries, together with yearly number of famine reports (black) in Japan.

Sub Leader
KAMATANI Kaoru RIHN Senior Project Researcher

Project Researchers at RIHN
ITO Keisuke Project Researcher
TSUSHIMA Akane Project Researcher
LI Zhen Project Researcher
TESHIMA Mika Project Research Associate

Main Project Members
SANO Masaki Waseda University
WAKABAYASHI Kunihiko Doshisha University
HIGAMI Noboru Aichi Prefectural Center for Archaeological Operations
TAMURA Noriyoshi Beppu University
MIZUNO Shoji The University of Shiga Prefecture
SATO Daisuke Tohoku University
WATANABE Koichi National Institute of Japanese Literature
YASUE Koh Shinshu University
ABE Osamu Nagoya University
YOSHIMURA Kei The University of Tokyo

Tropical Peatland Society Project

Toward the Regeneration of Tropical Peatland Societies:
Building International Research Network on Paludiculture and Sustainable Peatland Management

Project Leader **MIZUNO Kosuke** RIHN/Kyoto University

Kosuke Mizuno has been studying the economic changes unfolding in rural West Java, Indonesia, since 1978, putting special attention to land, capital, and labor relationships. Following the Indonesian democratization process and particularly the restoration of the right to organize in 1998, when former President Soeharto stepped down, he analyzed institutional change, economic development, and resource management by people's organizations across Indonesia. He became the leader of an integrated natural and social science study on peatland society in Riau province in 2008, and continues to conduct action research on peatland rehabilitation while also deepening understanding of the historical and social dimensions of peatland society.

Necessity of the study

Peat swamp forests are found throughout Southeast Asia, especially Indonesia, and contain massive stores of carbon and water. Over the last two decades, these swamps have been intensively exploited for commercial acacia and oil palm plantations. As these trees cannot grow in swamps, they have been drained, creating extensive areas of dried peatlands, which are extremely vulnerable to fire.

In 2015, peatland fires burned 2.1 million hectares of forest in Indonesia, affecting 45 million people. A half million people suffered from upper respiratory tract infections, and thousands of people, especially children, were afflicted with asthma.

The government responded to this disaster by mobilizing the army, punishing people who set fires, and refusing to issue new peatland development permits. These measures were urgently needed, but provided only short-term relief. The public has demanded longer-term and sustainable measures, such as rewetting and reforestation.

The Government of Indonesia established the Peatland Restoration Agency in January 2016, and declared that two million hectares of degraded peatlands will be restored by 2019. The objective of this research project is to generate solutions to the current crisis of peat degradation and related fire and haze in tropical regions, especially Southeast Asia. It seeks to identify and implement alternative practices in collaboration with local people, as well as academia, government, NGOs, and international organizations.

The project conducts multidisciplinary research in order to clarify the entire process of peatland degradation. We focus on: A) gathering social and ecological baseline data on peatlands and measuring the impacts of fire and haze; B) implementing paludiculture projects in wetland areas as a potential mitigation strategy to peatland degradation; and C) identifying governance structures and incentives, including environmental finance mechanisms, that can support sustainable peatland management. These projects engage local people, migrants, logging and plantation companies, and local and national governments.

Achievements to date

Project researchers introduced the practice of rewetting and reforestation in peatland areas in Bengkalis District, Riau Province in 2010. This experimental site has attracted significant attention, especially since 2015 when fire and haze became very serious. Along with project-led international seminars, the site has significantly enhanced public awareness of the potential for rewetting and forestation to regenerate peatland.

On August 10, 2016, the Research Institute of Humanity and Nature, Kyoto University, and Hokkaido University signed a Memorandum of Understanding with the Peatland Restoration Agency of Indonesia to conduct action research to restore degraded peatland. Our project has created action plans based on this MOU and has accordingly begun to implement a restoration program in Meranti District, Riau Province.

Research Targets

Peatland ecosystems are vulnerable: damage from human disturbance can be irreversible. In order to achieve long-lasting solutions to peatland degradation, we must also understand the vulnerability of tropical peatland societies. Communities within peatlands often have little social capital, and land is owned by the state and not well managed. In this context our research objective is to examining alternative livelihood strategies addressing the environmental and social vulnerability of tropical frontier societies. The project supports community-initiated paludiculture as a sustainable livelihood model in rewetted peatlands, and thus explores the potential transformation of tropical peatland societies.

This research thus demonstrates the future potential of peatland-based societies the phasing out of monoculture production activity, the development of paludiculture, and the enlargement of protected peatland areas.

Publications

The edited book *Catastrophe and Regeneration in Indonesia's Peatlands: Ecology, Economy and Society* was published by the National University of Singapore Press in 2016. This volume provides inter-disciplinary field-based and historical analyses of peatland degradation through examination of the survival motives of local people, profit motives of companies, and conservation motives of Government and NGOs. The book showcases the potential solution of rewetting and reforestation of "the people's forest". The book has been reviewed in multiple media, including leading international academic journals. Our project will continue to build on this research in order to develop new insights on tropical peatland management.

Photo 1 Burned sago and peatland forest in Kepau Baru village, Meranti, Riau

Photo 2 Rewetting with local people at Tanjung Leban Village, Bukit Batu Sub-district, Bengkalis District, Riau Province

Sub Leader

KOZAN Osamu	Kyoto University

Project Researchers at RIHN

NAITO Daisuke	Project Researcher/Kyoto University	**KATSURA Tomomi**	Project Research Associate
SUZUKI Haruka	Project Researcher/Kyoto University		

Main Project Members

OKAMOTO Masaaki	Kyoto University	**PAGE, Susan**	University of Leicester, UK
ITOH Masayuki	Kyoto University	**GUNAWAN, Haris**	Peatland Restoration Agency, Indonesia
SHIMAMURA Testuya	Ehime University	**SABIHAM, Supiandi**	Bogor Agricultural University, Indonesia
SATO Yuri	Institute of Developing Economies	**DHENY TRIE WAHYU SAMPURNO, S.Si**	Indonesian Agency of Geospatial Information, Indonesia

Research Program 2

Fair Use and Management of Diverse Resources

Global environmental problems are related each other. Studies concentrating on single issue are not effective, and those consideration inter-linkage of multiple resources involving stakeholders are essential to approach the problems. Recently, nexus structure among energy, water and food became a hot issue, though we need more comprehensive understandings taking into account other issues such as ecological resources which provide ecosystem services and cultural resources to attain sustainable society. Production, circulation and consumption of resources should be discussed in wide range of special scales with involvement of various stakeholders. Sustainable use of resources require fair and wise systems and proper indices to manage these processes.

In particular, transformation from traditional socio-economic or human behaving systems to the new systems which pay more attentions on renewable natural resources which have been sometimes externalized from traditional economics is a key. Asian systems are experiencing rapid change in economics, urbanization and populations, though partly keeps traditions to manage resources in sustainable way, which associated with relatively rich humanospere and cultural background in this region. Thus, the studies on such Asian experience of resource use may give important suggestions on future sustainability in the world.

The RIHN projects up to now have accumulated information and suggestions necessary for this transformation, though there remains some parts with less information (ex. Resources such as energy, or enterprises as global stakeholders, etc.). In this program, we tries to explore wise and fair management system to cope with multiple-resource, by multiple-stakeholders, in multi-spatial scales by encouraging new projects including such new and lacking aspects with innovative ideas by young scientists. The conditions necessary for transforming values and human behavior will be discussed and we try to propose new appropriate indices and institutions for fair resource management.

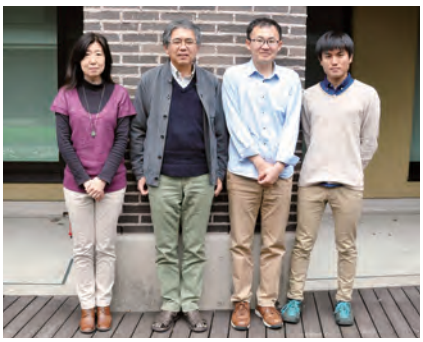
Agricultural land in India

Logging of tropical rain forest in Malaysia

Palm oil factory in Malaysia

Program Director **NAKASHIZUKA Tohru** RIHN

Tohru Nakashizuka has been studying forest ecology, biodiversity and ecosystem services at the Forestry and Forest Products Research Institute, Kyoto University, and Tohoku University. At RIHN, he is to study wise and fair use of diverse resources.



Program Researchers

KOBAYASHI Kunihiko	Program Researcher
SHIBATA Rei	Program Researcher
KARATSU Fukiko	Program Research Associate

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

Project Leader **ENDO Aiko** RIHN

Associate professor Aiko Endo studies the economics of fisheries as well as coastal and marine policy. Her interdisciplinary and multi-sectoral approaches to Integrated Coastal Management (ICM) in Japan have generated national policy proposals. Her research seeks interdisciplinary and transdisciplinary approaches to the co-design and co-production of governance structures that can solve environmental issues by linking local, national, regional, and global policy spheres.

Research objectives and background

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.

Research methods and structures

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.

Figure 1 Target research sites

http://www.chikyu.ac.jp/rihn_e/project/R-08.html
http://www.chikyu.ac.jp/wefn/index.html

Research activities and findings

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.

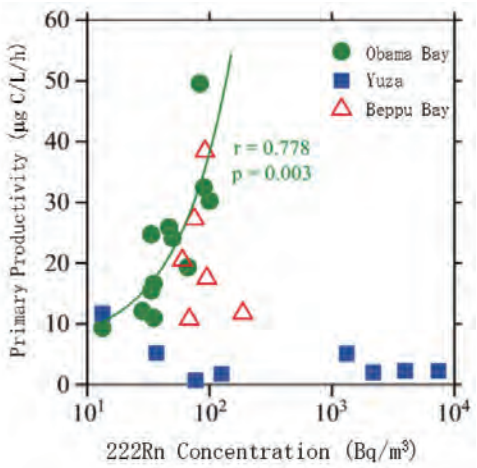


Figure 2 Relationship between submarine groundwater discharge and primary productivity (Sugimoto et al. 2017)

Photo 1 Participatory survey on hot springs in Beppu

Expected results

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.

Photo 2 The nexus project meeting in Otsuchi Town

Project Researchers at RIHN

OH Tomohiro	Project Researcher
MASUHARA Naoki	Project Researcher
OKAMOTO Takako	Project Research Associate
HONDA Hisami	Project Research Associate
TERAMOTO Shun	Project Research Associate

Main Project Members

TANIGUCHI Makoto	RIHN
FUJII Masahiko	Hokkaido University
SHOJI Jun	Hiroshima University
BABA Kenshi	Tokyo City University
OHSAWA Shinji	Kyoto University
TAHARA Daisuke	Fukui Prefectural University
KAWAMURA Tomohiko	The University of Tokyo
DELINOM, Robert M.	Indonesian Institute of Sciences, Indonesia
ALLEN, Diana M.	Simon Fraser University, Canada
SIRINGAN, Fernando P.	University of the Philippines Diliman, Philippines
GURDAK, Jason	San Francisco State University, USA

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

Project Leader **OKUDA Noboru** RIHN

My specialty is ecology, the field of study concerned with the relationships between biodiversity and ecosystem functioning. One of ecology's central questions is why humankind should conserve biodiversity. As a member of the Center for Ecological Research at Kyoto University, I have approached this question by integrating different research fields related to biodiversity from gene to ecosystem. At present, I am developing methods for adaptive watershed governance which allow new environmental knowledge to reconcile global, regional, and local ecological issues. I also should say that I love nature and humanity and how they come together very much!

Research background and objectives

Technological innovations in the use of nutrients for food production, in particular nitrogen and phosphorus, have allowed global increases in population and economic prosperity in the twentieth century. Overexploitation of nutrient resources, however, affects biogeochemical cycles and can lead to nutrient imbalances, eutrophication and loss of biodiversity. It is now recognized that nutrient imbalances and biodiversity loss are prevalent in watersheds around the world, and pose a risk to sustainable human development.

In spite of such risk, most citizens are not so interested in global environmental issues but are rather concerned about local issues related to their lives and livelihoods. Considering this dissonance in environmental consciousness, we aim to develop a framework for adaptive governance of sustainable watershed systems (Fig. 1).

Research methods

We facilitate stakeholder engagement in multi-level and multi-scale governance in order to enhance biodiversity, nutrient cycling and human well-being, according to our hypothesis that these are the three primary components for sustainability of social-ecological system and, like gears, also interdependently linked in community activities (Fig. 2). We begin with action research to empower members of each community within a watershed to conserve indigenous environmental icon, defined as indigenous nature with special significance to local life and livelihood (Process A in Fig. 2). As the value of engaging in such conservation efforts is shared among community members, community-based well-being is altered and reinforced through bonding social capitals in a positive feedback of biodiversity conservation and biodiversity-driven nutrient cycling.

If such community activities enhance nutrient cycling at the watershed scale, they can stimulate strong collective public interest in ecosystem services. In disseminating our scientific understanding of the community dimensions of nutrient cycling in watershed-based societies, our project will facilitate social involvement in conservation activities as well as "green consumption" of local products by non-community members who appreciate the public interests. Such links accumulate bridging social capital and increase economic incentives (Process B in Fig. 2). With increased public interest in conservation activities, community members may also gain institutional support from local governments. Such integration of local and scientific knowledge further enhances community-based well-being, and leads to empowerment of community activities.

To test this hypothesis, we apply our governance approach to two extreme systems in Asia: the Lake Biwa Watershed (Japan) and the Laguna de Bay Watershed (Philippines). The former is an infrastructure-oriented society and the latter a high-nutrient loading society.

Research progress

For the Lake Biwa Watershed, we practiced action research in the mid-stream community of the Yasu River sub-watershed. Based on our exercises to explore the cultural

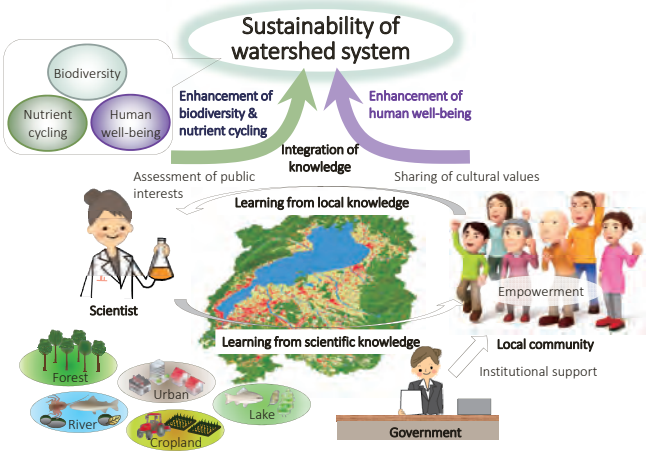


Figure 1 A conceptual schema of adaptive watershed governance

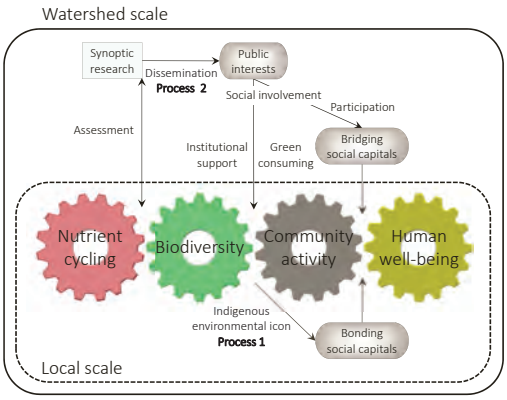


Figure 2 A working hypothesis of how biodiversity, nutrient cycling and human well-being are enhanced through multi-level and multi-scale governance

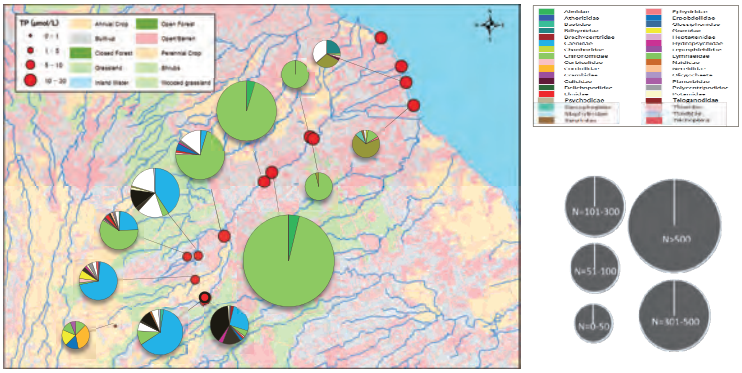


Figure 3 A map of biodiversity in the Silang-Santa Rosa sub-watershed. Circle size and color pattern indicate abundance and species richness, respectively

significance of indigenous nature, we identified a brown frog as an indigenous environmental icon and began to work to conserve its habitat. Monitoring revealed that the brown frog prefers to spawn in paddy fields with wetland biotopes (Photos 1). This observation facilitated farmer engagement in conservation activities, as they shifted from the modern to traditional paddy field irrigation system. We have been able to observe how farmer engagement in the conservation activities has altered environmental consciousness, improving their sense of how their well-being is closely linked to natural capitals. In FR3, we will conduct field experiments to demonstrate how traditional irrigation techniques are effective in reducing nutrient loadings from paddy fields.

In the Laguna de Bay Watershed, in contrast, recent economic development has led to expansion of residential areas into the mid-stream area of the Silan-Santa Rosa sub-watershed. In downstream urban areas, nutrient loadings and eutrophication have led to serious loss of biodiversity (Fig. 3). At present, people within the watershed are dependent on groundwater resources for drinking and irrigation and therefore highly concerned about groundwater overexploitation and pollution. In FR3, we will disseminate the results of our research to discuss the solution strategy for these groundwater issues with a variety of stakeholders within this watershed. We will also conduct the action research to empower the mid-stream community to conserve a communal spring as an indigenous environmental icon (Photos 2).

Perspectives

In developed societies, sewage treatment and tap water infrastructure systems have reduced eutrophication and led to greater comfort and convenience. Environmental consciousness, however, has receded from the nature of wetlands. What enhances our well-being? Is it enhanced by infrastructure? We want to seek answers to these questions together with a variety of stakeholders.

Photos 1 Social engagement in biodiversity monitoring (left) and a map of indigenous environmental icons (right) in the mid-stream community Kosaji

Photos 2 Eco-tourism in a communal spring (left) and a women's association engaged in conservation (right) in the mid-stream community Carmen

Project Researchers at RIHN

ASANO Satoshi	Project Researcher
IKEYA Tohru	Project Researcher
ISHIDA Takuya	Project Researcher
UEHARA Yoshitoshi	Project Researcher
WATANABE Kirie	Project Research Associate

Main Project Members

YACHI Shigeo	Kyoto University
IWATA Tomoya	University of Yamanashi
BAN Syuhei	The University of Shiga Prefecture
OSONO Takashi	Doshisha University
TAYASU Ichiro	RIHN
WAKITA Kenichi	Ryukoku University
SANTOS-BORJA, Adelina C.	Laguna Lake Development Authority, Philippines

Research Program 3

Designing Lifeworlds of Sustainability and Wellbeing

More than 60% of the world's population resides in Asia and the regions surrounding it. Over a third of global economic activity occurs there. Within these places lies an incredible diversity of cultures, histories, societies, economies, livelihoods, and ecologies. Asia is also affected by myriad global and local environmental issues, such as population increase, air, water, soil, and coastal pollution, increasing greenhouse gas emissions, and biodiversity loss. At the same time, growing wealth disparity, social isolation, rising levels of poverty, and the disappearance of traditional culture and knowledges are emerging.

Within these processes, the combination of migration between the countryside and cities, and rural depopulation with urban concentration is accompanied by rapid socio-cultural change, resource over-use, and the deterioration of the natural environment. Both urban and rural lifeworlds are disintegrating rapidly. Consequently, by reconstructing the lifeworld concept and highlighting the reciprocal linkages between rural and urban spaces, Program 3 designs lifeworlds of sustainability and wellbeing and co-creates concrete pathways for their realization.

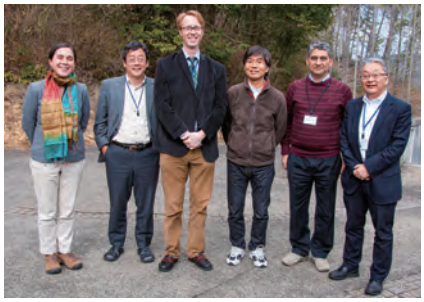
In these same places, diverse world-views and experiences of the ways in which humanity and nature can exist have accumulated. Pre-existing, yet latent, diverse socio-cultural elements, such as livelihood styles, lay knowledge, conflict resolution strategies, and the vitality of the people themselves can be called upon to address problems and help to chart a course toward possible future societies. Program 3 builds upon these experiences and knowledges of human-nature interaction to propose concrete changes needed to achieve a sustainable society.

Through the transformations and frameworks leading to sustainable urban and rural lifeworld design, the existing economic systems, markets, and political decision making systems will also require fundamental shifts in the way they are conceived. However, Program 3 will not investigate top-down approaches to system change, but will work with local residents, government officials, companies, citizen groups and other various stakeholders to propose sustainable alternatives and gauge their feasibility.

In order not to run the risk of developing proposals that are only applicable to specific regions or sites, Program 3 will aim for research results that are generalizable, but retain their diversity.

The varieties of fruits and vegetables for sale at the market in Kanchanaburi reflect Thailand's changing society

Socialization of composting type toilet in Burkina Faso. Photo by Dr. ITO Ryusei



Program Director **SAIJO Tatsuyoshi** RIHN

Tatsuyoshi Saijo (4th from left) specializes in designing social systems that promote sustainability and equity without inhibiting individual incentive. His interest is in developing the field of "Future Design", one that links the happiness and wellbeing of current generation to that of future generations.

FEAST Project

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

Project Leader **Steven R. McGREEVY** RIHN

Steven R. McGreevy is an environmental sociologist (Kyoto University Ph.D. 2012) and associate professor at RIHN. He has a background in agriculture, rural sustainable development, and environmental education. His research focuses on novel approaches to rural revitalization that utilize local natural resources, sustainable knowledge dynamics, sustainable agrifood and energy transition, and the relinking of patterns of food consumption and production in local communities.

Research Background

Agrifood systems in Asia face a myriad of sustainability challenges related to declining environmental health (GHG emissions, resource overuse, pollution, soil fertility), loss of diversity (biological, cultural, knowledge), and deterioration of small-scale farming due to globalizing market forces. At points of consumption, over-reliance on globalized food flows limits consumer agency and decreases food security and sovereignty. Diets increasingly composed of processed foods also negatively impact public health (rise in diabetes, obesity). 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, or of the role of existing and alternative institutions, social practices, and economic arrangements to advance sustainable transitions.

Research Overview and Objectives

The FEAST project takes a transdisciplinary approach to explicate the reality of, and potential for, sustainable agrifood transition in Asia. Individual field sites are located Japan, Thailand, Bhutan, and China. Taking a lifeworld perspective, we analyze patterns of food consumption, the socio-cultural significance of food-practices, and the potential of consumer-based agency to change deeply held cultural notions and regional food systems. We also develop structural description of the food system, by mapping national, regional, and local production, distribution, and consumption contexts. In combining socio-cultural and structural descriptions of the relationships between production and consumption, we are able to conduct visioning workshops with stakeholders and initiate food citizenship-oriented experiments and actions.

FEAST's process of co-design and co-production of sustainable food systems seeks to challenge mainstream economic thinking on consumption and growth. In engaging the public in structured debate of societal relationships with food and nature, our project reorients consumers to consider themselves as citizens and co-producers of the foodscapes on which they depend. FEAST seeks knowledge and mechanisms that can redefine the notion of long-term food security.

FEAST Working Groups will produce four types of knowledge relevant to catalyzing agrifood transitions (Figure 1). These are: 1) contextual knowledge of contemporary national, regional, and local food systems (production, distribution, and consumption); 2) co-produced visions of alternative food consumption and production practices and corresponding municipal-level transition plans identifying research, education, and policy needs; 3) modeling- and scenario-based knowledge supporting deliberation and planning processes; and 4) knowledge of two intervention strategies: the social learning dynamics affecting execution and effectiveness of workshop-based consensus-building for collective food action; and the significance of new methods of market transparency (e.g. eco-labels, food impact smartphone apps) in food system change.

Photo 1 **Mother and daughter harvesting *daikon* in the Phobjikha valley, central Bhutan**

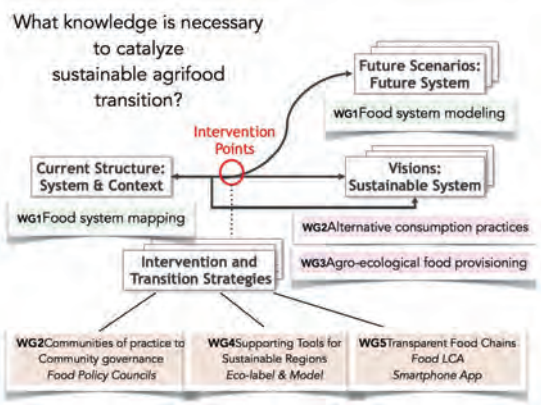


Figure **Diagram detailing how each FEAST working group is organized around the question of "What knowledge is necessary to catalyze sustainable agrifood transition?" Four kinds of knowledge are listed: 1) Current system and contextual knowledge; 2) Visions of sustainable future systems knowledge; 3) Future system scenario knowledge; and 4) Knowledge associated with intervention and transition strategies**

http://www.chikyu.ac.jp/rihn_e/project/2016-01.html
http://feastproject.org/?lang=en

Progress to Date

Investigations of the major drivers of, and environmental impacts from, the gaps between "potential foodshed" (ie. potential food systems) and "observed food flow" (ie. current food system) began at three sites in Japan (Kyoto, Akita, and Nagano). Methodologies used include extensive statistical and literature review of national and regional food distribution networks, compilation of food production data and GIS analysis of satellite imagery to determine food production potential, interviews of major food market actors and government regulators, and fieldwork in wholesale food markets.

Fieldwork was initiated at various sites in Asia examining production-led agrifood transitions toward agroecological rural development. Sites in Japan (Wakayama, Ishikawa, Gifu) and Bhutan will set the stage for further research on the viability of agroecological models such as GIAHS (Globally Important Agricultural Heritage Systems), organic farming in developing-world contexts, and the effectiveness of development policies emphasizing valorization. A comprehensive review of "support structures" aimed at encouraging new farmer entry into agriculture in Japan was accompanied by thorough fieldwork. Studies on the economic and ecological feasibility of carbon offsetting production practices with an accompanying branding scheme were initiated in Kameoka City.

Analysis also continued on the development of civic food networks (CFN) and their impact on regional food policy. Fieldwork in North America on food policy councils sought to determine the preconditions, possibilities, and restrictions for the emergence and success of such networks. Collaborating with local government and local food system actors in Noshiro, Akita Prefecture, a series of workshops to forecast and backcast possible and ideal food futures was held (Photo 2). A comparative study of consumer visions of sustainable food practices in Thailand, China, and Japan is scheduled for next year. Four teams composed of food-impact analysis experts from academia and the food industry (seafood, agriculture & meat, processed food, and app design/consumer behavior) began collaborating on data collection and structuring as initial steps toward the design of a smartphone app.

A research partnership was finalized with Kameoka City, Kyoto and partnerships with Bhutan Royal University, Chinese Academy of Sciences, and Noshiro City, Akita are expected in the near future.

Photo 2 Consumer workshops on visioning food futures, held in Noshiro City, Akita Prefecture. Drawings of an "ideal meal" 30 years in the future (inset)

Photo 3 Organic farmer and citizens workshop at the Kyoto Farmers' Market

Photo 4 FEAST Project Annual Assembly held January 7–8, 2017 at RIHN

Sub Leader

TAMURA Norie	RIHN Senior Project Researcher

Project Researchers at RIHN

KOBAYASHI Mai	Project Researcher	**SPIEGELBERG, Maximilian**	Project Researcher
RUPPRECHT, Christoph D. D.	Project Researcher	**MATSUOKA Yuko**	Project Research Associate
OTA Kazuhiko	Project Researcher		

Main Project Members

TSUCHIYA Kazuaki	The University of Tokyo	**HARA Yuji**	Wakayama University
AKITSU Motoki	Kyoto University	**TANIGUCHI Yoshimitsu**	Akita Prefectural University
TACHIKAWA Masashi	Ibaraki University	**NAKAMURA Mari**	Nagoya Bunri University
SUDO Shigeto	National Agriculture and Food Research Organization	**TANAKA Keiko**	University of Kentucky, USA
SHIBATA Akira	Ritsumeikan University	**KISHIMOTO-MO Ayaka**	National Agriculture and Food Research Organization
INABA Atsushi	Kogakuin University		

Sanitation Project

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

Project Leader **FUNAMIZU Naoyuki** RIHN/Hokkaido University

Dr. Naoyuki Funamizu is professor in the Graduate School of Global Food Resources, Hokkaido University. He was professor in the Graduate School of Engineering from April 2002 to March 2017. He has B.S. in Sanitary Engineering and an M.S. and a Ph.D. in Environmental Engineering both from the Hokkaido University. His research topics are integrated water resources management, including wastewater reclamation and reuse, and resources-oriented sanitation. He is also working on an international collaboration program on sustainability education. He is a Fellow of the International Water Association (IWA) and is a member of the Management Committee of the specialist group on Wastewater Reclamation and Reuse, and Small Water and Wastewater Systems and is a committee member of Japan Society on Water Environment.

Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal. In this proposal, the word "sanitation" is used to explore the provision of facilities and services for safe disposal and resources recovery of human urine, faeces and wastewater. The world's population is estimated to be approximately 10 billion in 2050, and this population growth will happen mostly in developing countries. UN Millennium Development Goals Report 2015 reported that 2.4 billion people are still using unimproved sanitation facilities, including 946 million people who are still practising open defecation. And the developing world has still high under 5 mortality and poverty rates. On the other hand, depopulation and aging are progressing especially in rural area of developed world, and the financial capability of local government—which is a key agent in the management of sanitation systems—is becoming weaker.

Sanitation systems are essential for promoting public health, preventing environmental pollution, conserving ecosystem functions, and recycling resources. The question of how to handle the waste of 10 billion people is therefore highly relevant to the global environment.

Working hypothesis of the research

The project has set the following hypothesises:
Hypothesis 1: Current sanitation problems 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 a social and institutional support system. The mismatch between prerequisites of technologies and local characteristics additionally complicates sanitation issues.

Key concept – Sanitation Value chain as a solution

The project proposes a new concept, the Sanitation Value Chain, which has the following dimensions:
1) Places the values of people and community in the center of discussion, and prepares the sanitation system to correspond to this value chain; 2) Designs the sanitation system by focusing on direct incentives for individual users and communities; 3) Recognizes a sanitation system as an integrated system with social and technical units; 4) Designs the sanitation system by making a good match between social characteristics and prerequisites of technologies.

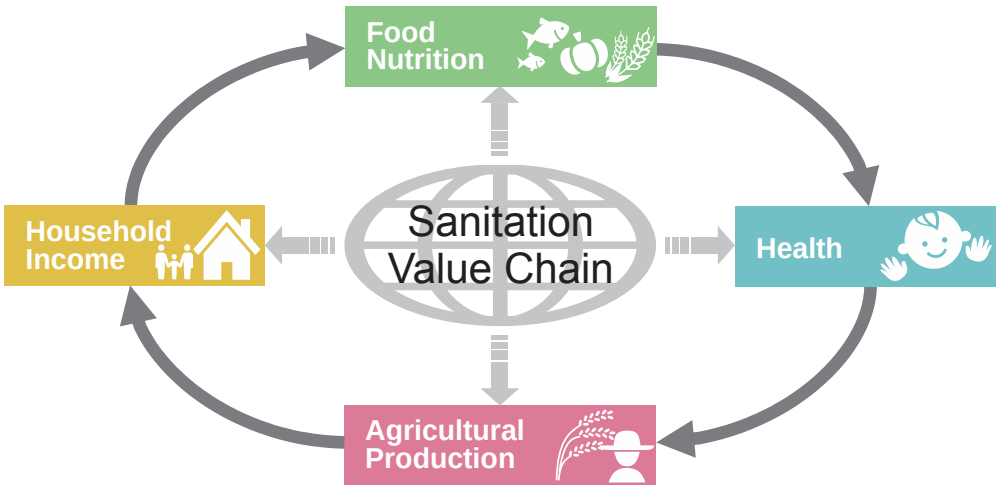


Figure The Sanitation Value Chain acts within and between other important social values

Goals of the project

The goals of this research project are to: 1) propose the concept of Sanitation Value Chain in relation 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.

Research topics for achieving the goals

Topic–1: Life and Sanitation Field survey for analyzing values and happiness of people (1-1); Field and literature surveys on current and historical norms related to human excreta (1-2); Field and literature surveys analyzing examples of the mismatch between prerequisites of sanitation technologies and regional specific characteristics of human and community (1-3); Field and literature surveys on historical change of sanitation system in target areas (1-4); Matching the values of people, community and value provided by sanitation system (1-5).

Topic–2: Technology Literature survey on prerequisites of sanitation technologies (2-1); Field and literature survey on prerequisites of sanitation technologies in particularly successful cases (2-2); Field and literature surveys to re-evaluate the value of the sanitation system (2-3).

Topic–3: Co-creation of sanitation value chain
Identifying stake holders and understanding the value structures of people and communities (3-1); Analyzing hierarchy and structure of stakeholders' value chain and evaluation of their affinities (3-2); Demonstration of co-creation of the sanitation value chain (3-3).

Research sites

The project will perform field studies at: 1) the rural area in Ishikari River Basin, Hokkaido; 2) the rural area in Burkina Faso; 3) the urban area in Indonesia; and 4) the peri-urban area in Zambia.

Achievements in FS and PR studies

Two field surveys at Lusaka (Zambia) and Bandung (Indonesia), a researcher meeting at Hokkaido University, and a joint seminar with RIHN have been conducted in FS and PR phases. Based on these activities, we have clarified the current sanitation sistuations in our field survey sites. Photo shows the situation in in Kanyama district in Lusaka City, Zambia. The surveys also showed the possible stakeholders related to sanitation and tentative ideas on how to include sanitation systems into user value chains as shown in Figure (for Burkina Faso). Tentative results on the prerequisites of sanitation technologies have also been summarized.

Photo Toilet (red mark in the Photo) and open defecation zone (blue mark) in Kanyama district in Lusaka City, Zambia (Photo by Sikopo P Nyambe)

Project Researchers at RIHN

HAYASHI Koji	Project Researcher	**KIMURA Ayako**	Project Research Associate
NAKAO Seiji	Project Researcher		

Main Project Members

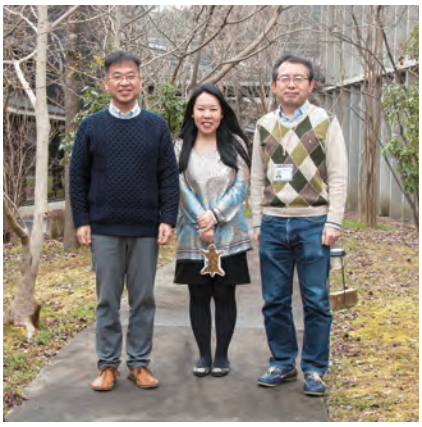
YAMAUCHI Taro	Hokkaido University	**FUJIWARA Taku**	Kochi University
ITO Ryusei	Hokkaido University	**HARADA Hidenori**	Kyoto University
USHIJIMA Ken	Hokkaido Research Organization	**INOUE Takashi**	Hokkaido University
IKEMI Mayu	Hokkaido University	**SINTAWADANI, Neni**	Indonesian Institute of Science (LIPI), Indonesia
SANO Daisuke	Tohoku University	**NYAMBE, Imasiku Anayaw**	University of Zambia, Zambia
NAKATANI Tomoaki	Hokkaido University	**LOPEZ ZAVALA, Miguel Ange**	Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico
NABESHIMA Takako	Hokkaido University		

Core Program

The Core Program develops concepts and methodologies for transdisciplinary research to solve global environmental problems in collaboration with society. Core projects develop comprehensive and systematic concepts and methodologies for transdisciplinary research, which are widely applicable to global environmental issues, and accessible to related stakeholders.

Core projects produce conceptual and methodological frameworks together with RIHN Research Projects, based on individual methods, techniques, and tools from the divisions in the RIHN Center. Core projects collaborate with Research Projects, building on the case studies developed by these projects, and develop comprehensive and systematic methodologies beyond an individual Research Program or Project. Core projects also deliver completed concepts and methodology to Research Programs and Projects, the RIHN Center, and related stakeholders.

(See additional Core Program description on page 8.)

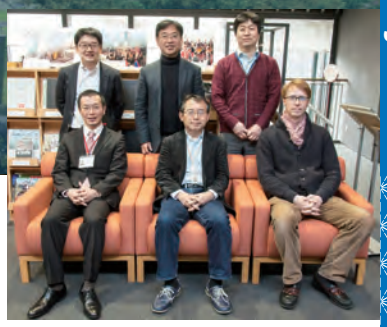


Program Director **TANIGUCHI Makoto** RIHN

Prof. Dr. Makoto Taniguchi is a hydrologist and a deputy Director-General at RIHN. He received a Ph.D. from The Tsukuba University, Japan in 1987. He is currently the vice president of the International Association of Hydrogeologists and the president of the Japanese Association of Groundwater Hydrology. He has been working on water-related projects around the world, in particular Asia, authoring or co-authoring over 170 peer reviewed articles and 8 books including "Groundwater and subsurface environment", "The Dilemma of Boundaries" and "Groundwater as a key for adaptation to the changing climate and society".

Environmental Traceability Project

Proposal and Verification of the Validity of Isotope Environmental Traceability Methodology in Environmental Studies



Project Leader **TAYASU Ichiro** RIHN

Dr. TAYASU was Assistant Professor at RIHN (2002), Associate Professor at Kyoto University (2003), and is currently a Professor at RIHN (2014). His research focuses on isotope ecology and isotope environmental science.

In this project, we hypothesize that environmental traceability is a key concept needed to solve environmental issues for various stakeholders. Stable isotope ratios of elements, together with concentrations of elements, can trace the flow of matter and chemicals through the environment, better describe ecosystem structure and conditions, and appraise food products' chemical profile. Spatio-temporal variation of multiple isotope ratios can be used for studying earth systems, ranging from local to global scales. The information may serve as a key decision-making factor for local people consider water, food and environmental security, all of which are fundamental for the sustainability of human society.

We seek to establish a methodology for how to use the concept of environmental traceability in this study. A combination of quantitative and qualitative tools, including "Multi-Isoscapes" (use of multiple elements and multiple isotope ratios, together with GIS-based mapping technique), social surveys, and workshops, are deployed to investigate the role of environmental traceability in confronting environmental issues. We hypothesize that the role and perception of traceability methods in transdisciplinary processes will differ among stakeholders and that the co-production of "Multi-Isoscapes" can act as an effective "bridging tool" for understanding and explaining variation in local environments. The ultimate objective of this research is to demonstrate the effectiveness of multi-isotopic information in solving global environmental issues.

In this project, we test (I) the effectiveness of the environmental traceability concept in environmental studies, by comparing study cases in which isotopic methods were initiated by (1) local government, (2) citizen groups, and (3) researchers; (II) to what extent the concepts of food traceability and environmental traceability are perceived to be different and how effective they are in communicating the linkages between food production and consumption to consumers?

Research will take place at sites in Ono City, Fukui; Otsuchi Town, Iwate; Saijo City, Ehime; the Chikusa river watershed, Hyogo; Lake Biwa and surrounding watershed in Shiga; and Laguna de Bay and surrounding watershed in the Philippines.

Photo 1 Hongan-Shozu pond in Ono City, Fukui, recharged by ground water

Photo 2 A meeting at Sayo, presenting results and making the next sampling design for Chikusa river watershed

Main Project Members

SHIN Ki-Cheol	RIHN
NAKANO Takanori	RIHN / Waseda University
KONDO Yasuhisa	RIHN
ENDO Aiko	RIHN
OKUDA Noboru	RIHN
MCGREEVY Steven R.	RIHN
MORI Seiichi	Gifu-Keizai University
YOKOO Yoriko	Doshisha University
KAERIYAMA Toshiaki	Ono City Office
YAMADA Yoshihiro	Kagawa University
TOKUMASU Minoru	Saijo City Office
OHKUSHI Ken'ichi	Kobe University
MITSUHASHI Hiromune	University of Hyogo / Museum of Nature and Human Activities, Hyogo
YOKOYAMA Tadashi	Hyogo prefectural Ako School for Students with Special Needs

http://www.chikyu.ac.jp/rihn_e/project/2017-03.html

Completed Research

When a project moves to Completed Research status, the contract with RIHN is concluded. Research teams disperse to university research, teaching, and other duties. Project publications and other communications and contributions may follow for several years and are assessed in the final project evaluation, conducted two years after formal project conclusion. At RIHN, however, each project forms part of the institute's heritage; project results and data are entered into the RIHN archives upon which future RIHN projects may be formulated.

Fiscal Year Completed	Leader	Research Project
2006	HAYASAKA Tadahiro	Emissions of Greenhouse Gases and Aerosols, and Human Activities in East Asia
	KANAE Shinjiro	Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives
	WATANABE Tsugihiro	Impact of Climate Changes on Agricultural Production System in the Arid Areas
	NAKAWO Masayoshi	Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes
	YACHI Shigeo	Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed
2007	FUKUSHIMA Yoshihiro	Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on Environment
	ICHIKAWA Masahiro	Sustainability and Biodiversity Assessment on Forest Utilization Options
	AKIMICHI Tomoya	A Trans-Disciplinary Study on Regional Eco-History in Tropical Monsoon Asia: 1945-2005
2008	SEKINO Tatsuki	Interaction between Environmental Quality of the Watershed and Environmental Consciousness
	TAKASO Tokushiro	Interactions between Natural Environment and Human Social Systems in Subtropical Islands
2009	SHIRAIWA Takayuki	Human Activities in Northeastern Asia and their Impact on Biological Productivity in the North Pacific Ocean
2010	TANIGUCHI Makoto	Human Impacts on Urban Subsurface Environments
	YUMOTO Takakazu	A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago
	SATO Yo-Ichiro	Agriculture and Environment Interactions in Eurasia: Past, Present and Future
2011	KAWABATA Zen'ichiro	Effects of Environmental Change on the Interactions between Pathogens and Humans
	KUBOTA Jumpei	Historical Interactions between Multi-Cultural Societies and the Natural Environment in a Semi-Arid Region in Central Eurasia
	OSADA Toshiki	Environmental Change and the Indus Civilization
	UCHIYAMA Junzo	Neolithisation and Modernisation: Landscape History on East Asian Inland Seas
	UMETSU Chieko	Vulnerability and Resilience of Social-Ecological Systems
2012	OKUMIYA Kiyohito	Human Life, Aging and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaptation in "Highland Civilizations"
	SAKAI Shoko	Collapse and Restoration of Ecosystem Networks with Human Activity
	MOJI Kazuhiko	Environmental Change and Infectious Disease in Tropical Asia
2013	HIYAMA Tetsuya	Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments
	NAWATA Hiroshi	A Study of Human Subsistence Ecosystems in Arab Societies: To Combat Livelihood Degradation for the Post-oil Era
	KADA Ryohei	Managing Environmental Risks to Food and Health Security in Asian Watersheds
2014	MURAMATSU Shin	Megacities and the Global Environment
2015	KUBOTA Jumpei D. Agnes RAMPISELA	Designing Local Frameworks for Integrated Water Resources Management
2016	HABU Junko	Long-term Sustainability through Place-Based, Small-Scale Economies: Approaches from Historical Ecology
	SATO Tetsu KIKUCHI Naoki	Creation and Sustainable Governance of New Commons through Formation of Integrated Local Environmental Knowledge
	ISHIKAWA Satoshi	Coastal Area-capability Enhancement in Southeast Asia
	TANAKA Ueru	Desertification and Livelihood in Semi-Arid Afro-Eurasia

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

Project Leader **HABU Junko** University of California, Berkeley

Objectives and theoretical background

The purpose of this project was to examine the importance of place-based, small-scale food production. Geographically, our project focused on the North Pacific Rim: northern Japan as the core area of research, and the west coast of North America as comparative sites (Figure 1). Our working hypothesis was that highly specialized subsistence (food production) strategies can support a larger community for a short period but a decrease in subsistence and food diversity increases vulnerability in the long-run. Archaeological and paleoenvironmental studies were used to test this hypothesis. Ethnographic and ecological studies allowed comparative analysis of the scale and resilience of contemporary small-scale food systems and communities.

The theoretical genesis of this project is the approach of historical ecology, which examines long- and short-term cultural change while emphasizing the impact of human activities on the environment. In particular, this project proposed that high levels of **diversity**, **networks** and **local autonomy** (or **sovereignty**), all of which are strongly correlated with the **scale** and **resilience** of the system, are the keys to achieving the **long-term sustainability** of socioeconomic systems (Figure 2).

Achievements

I. *Longue-Durée* Group

1) Primary Focus: Early-Middle Jomon (ca. 3900–2300 BC) in Northern Japan: Using archaeological indicators of food/subsistence diversity, demography, ritual, climate change and other social/environmental factors, this team tested our main hypothesis with data from northern Japan. AMS ^{14}C dating confirmed that changes in food/subsistence diversity and settlement patterns occurred at around 3000 BC, 700 years before major climate cooling (the Bond 3 event). Contrary to previous interpretations, our results therefore indicate that the Bond 3 event was not the cause of the population decrease at the end of the Middle Jomon.

2) Key Comparative Studies: Evidence from California and the Northwest Coast of North America, in contrast, indicate that wide food diversity allowed native communities in these regions to steadily increase in population through time until the European contact.

II. Contemporary Society Group

1) Primary Focus: Rural Communities in Northern Japan: Our interviews in the Hei River Area, Miyako City, indicated that food/subsistence diversity supported by traditional ecological knowledge (TEK) has played a critical role in the resilience of food systems and communities, especially in times of flooding, typhoon, and earthquakes. At Joboji, Ninohe City, our interviews indicate that multiple backup plans supported by wide subsistence diversity and TEK have historically been at the core of local survival strategies. At Fukushima City and its vicinity, where environmental damage caused by the 2011 nuclear plant accident is serious, we found that TEK and local networks are critical for maintaining farmers and residents' lifeways, identities and pride.

2) Key Comparative Studies: We examined indigenous small-scale communities and alternative food producers as two other types of small-scale communities on both sides of the North Pacific Rim. This research revealed the importance of TEK and social networks in maintaining resilient socioeconomic systems within local land- and sea-scapes.

III. Implementation, Outreach and Policy Proposal Group

This group developed public outreach programs to instigate and promote the importance of food/subsistence diversity, TEK and local identity. Workshops with local residents were held in the Hei River Area, Hokkaido and California. Other notable outcomes include the Kyoto 2016 Agroecology Declaration, university courses on agroecology at the University of California and Seika Univeristy, a Resolution by the World Archaeological Congress related to resource overexploitation, and transdisciplinary research with Native American tribes. These research activities were conducted in consultations with members of the Integrated History and Futures of People on Earth (IHOPE) program, for which our project is featured as a regional case study.

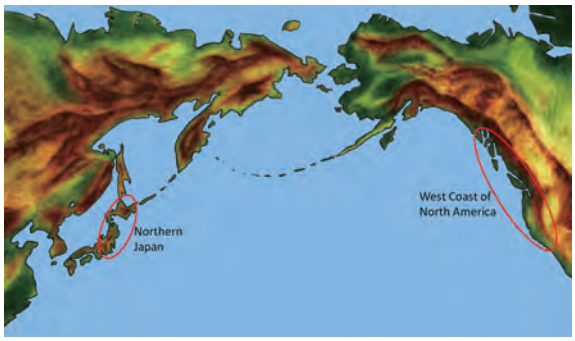


Figure 1 Main Research Areas

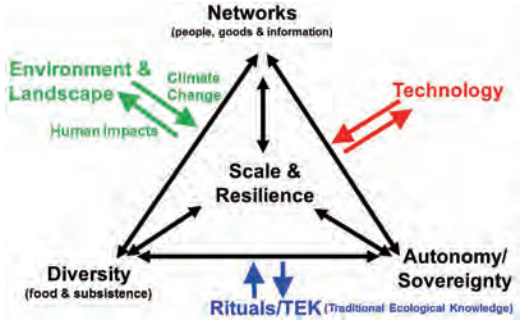


Figure 2 Key Aspects in the Discussion of System Scale and Resilience

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

Project Leader **SATO Tetsu** Ehime University
Co-Project Leader **KIKUCHI Naoki** RIHN

Local ecosystem services have deteriorated all over the world for various reasons. Ecosystem services should be managed by collaboration of various stakeholders, both within and from outside the communities. In order to achieve such collaborative management, the formation and circulation of local knowledge systems deeply embedded in real local settings is desperately needed. Integrated Local Environmental Knowledge (ILEK, Fig. 1), a novel concept of local knowledge blending scientific as well as various types of knowledge systems among stakeholders, is produced, circulated and utilized in diverse cases of local transdisciplinary research and actions to support adaptive societal transformations toward sustainability. Our project aimed to clarify mechanisms to facilitate production and circulation of ILEK and ILEK-based adaptive transformation of local communities. We also analyzed mechanisms of cross-scale linkages of knowledge co-production regarding global environment problems across global, regional and local scales. Through the transdisciplinary integration of these research results, we aimed to propose the design of "science for/with society" and "society making best use of science" for bottom-up solutions of global environmental problems.

The residential researchers embedded in local communities and bilateral knowledge translators bridging gaps between different knowledge systems across different spatial scales and governance levels were found to play important roles to facilitate collective actions among diverse stakeholders to promote adaptive transformations of local communities toward sustainability. We constructed a conceptual model of ILEK-based adaptive societal transformations focusing on functions of these important actors (ILEK Triangle, Fig. 2), and identified hypothetical categories of important enablers of ILEK-based adaptive societal transformations. Transdisciplinary research partnering with diverse local stakeholders opened a new TD research approach, resulted in identification of diversity and multiplicity of bilateral knowledge translations, both within local communities and/or crossing spatial scales and governance levels, as the important factors to create linkages across different spatial scales and governance levels from local to global.

ILEK project successfully produced a new model of transdisciplinary research based on the equal partnership with diverse local stakeholders to create collective actions in local communities and promoting their bottom up impacts to tackle with wicked problems regarding sustainability of local as well as global social-ecological systems. The actual processes of TD research in the project provided a new model of the solution-oriented global environmental research incorporating practical methodologies of transdisciplinary co-creation of knowledge to contribute to solutions of diverse global environmental problems. The project was conducted by transdisciplinary researchers working together with stakeholders of diverse local communities all over the world. These dedicated TD researchers in the project came together to co-produce the comprehensive standard textbook of issue-driven and solution-oriented TD research to tackle with global environmental problems through the bottom up processes from collective actions in local communities. The textbook titled "Transformations of Social-Ecological Systems: Studies in co-creating integrated knowledge toward sustainable futures" is at its final stage of production, which will synthesize the outcomes of the project to answer the ultimate research questions, namely what are the "science for/with society" and "society making best use of science" for bottom-up solutions of global environmental problems.

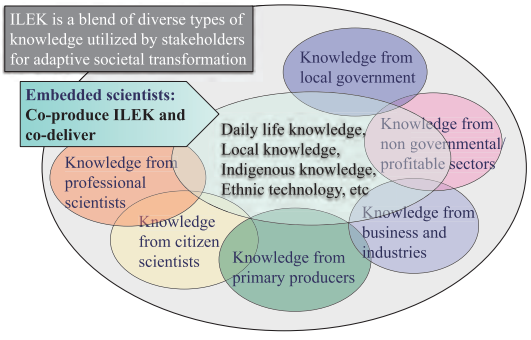


Figure 1 Structure of ILEK
Production and circulation of ILEK is not exclusively performed by professional scientists. Rather, it is usually produced and circulated by diverse actors in local communities, including skilled workers in primary industries, local government officials, local companies and NGOs, most of them being knowledge users at the same time. ILEK is formed and utilized through dynamic interactions among different actors/stakeholders in local communities, integrating scientific and local knowledge in daily livelihood and practices among stakeholders. In this process of ILEK production, scientists and experts are assuming new roles to reorganize and integrate various knowledge systems from the viewpoints of knowledge users and co-deliver ILEK to promote collaboration among diverse stakeholders for solutions of local environmental problems

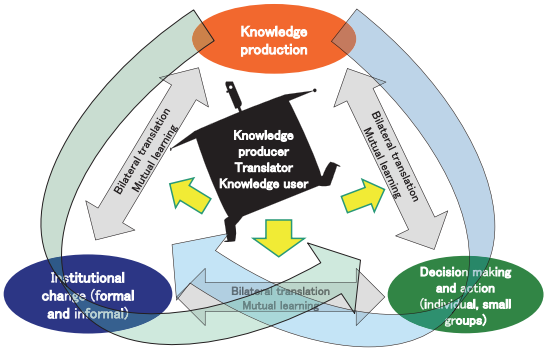


Figure 2 Conceptual model of adaptive societal transformation (ILEK Triangle)
The ILEK Triangle model is composed of an interactive system of three important elements of ILEK-based adaptive societal transformation (knowledge production, decision making and action, and formal/informal institutional change), driven by knowledge producers, knowledge users and translators. The pathways to achieve ILEK-based adaptive governance are postulated in this model with two different processes starting from knowledge production resulting in institutional changes via changes in individual decisions and actions, or directly influencing formal and informal institutions and human networks to transform individual behavior.

Coastal Area-capability Enhancement in Southeast Asia

Project Leader **ISHIKAWA Satoshi** RIHN

Coastal area ecosystem services are indispensable for rural people, but are also easily damaged by human use. Many coastal areas with high biodiversity and biological productivity are located in tropical zones of developing countries, as is the case in Southeast Asia. In such areas, ecosystem services, local livelihood and culture are closely related. Conservation and resource management strategies, however, are often derived from those of temperate regions, and usually target particular species or commercial resources with little consideration of how multiple ecologies and livelihood strategies overlap in culturally diverse contexts. In addition, in many cases, resource management and conservation activities are independently conducted by several different actors.

Ecosystem services have different significance for different peoples, depending on their interests and contexts. Although overuse and/or abuse of ecosystem services should be avoided, conservation actions should take careful account of the close relationship of local livelihoods and culture to local ecosystems, especially in rural areas lacking other livelihood opportunities. Addressing solutions to environmental problems in such contexts therefore requires linking people and policies engaged in both conservation and resource utilization.

This project attempts to examine several good ecosystem management practices based on local community participation in order to assess the conditions and functions of each actor in creating "an Area-capability cycle". We expect that an action contributing to Area-capability can link utilization and conservation and facilitate appropriate ecosystem utilizations, improve local life, cultivate ecosystem health, and foster hope for local society.

The Area-capability (AC) Cycle was proposed as one model of sequential change in the harmonization of natural resource conservation and management. The AC Cycle would be comprised of: (1) Local community use of resources unique to the region; (2) Resource users' understanding of the importance of, and care for, the environment that supports the resources used; and (3) A balance between using and caring for resources and the supporting environment, which is evaluated by outside entities.

Project research will apply the AC Cycle model to many cases in order to examine its validity and refine understanding of how to harmonize conservation and management of natural resources. We believe that the set of factors included in AC and the AC Cycle will be useful as a checklist when developing proposals for regional development and revitalization activities, assessing the balance between use and care, and clarifying the standpoint and role of each stakeholder when evaluating projects. As each AC Cycle corresponds to a resource used by a local community, we believe the number of AC Cycles can be an indicator of the abundance of local resources in a given region and, at the same time, an indicator of the potential for various types of cooperation. As such, we suggest that the number of AC Cycles could be used as an index for regional development.

Photo Group Photo at International Area-capability workshop held in December 2015, at RIHN

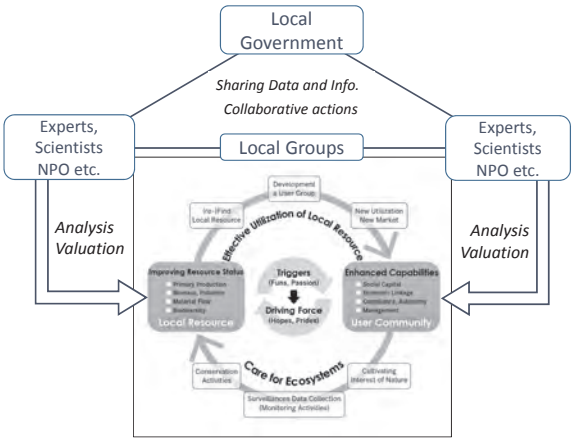


Figure Framework of AC Cycle and AC approach

Desertification and Livelihood in Semi-Arid Afro-Eurasia

Project Leader **TANAKA Ueru** RIHN

Desertification is one of the major global environmental problems. International community ratified the United Nations Convention to Combat Desertification (UNCCD) in 1994. More than 20 years have passed since, but without sufficient achievement in this field. One of the principal reasons for the lack is that the root causes of desertification are local peoples' daily livelihood and subsistence activities such as habitation, collection of fuel woods, animal husbandry and agriculture. Especially in the fragile environments of semi-arid Africa, local people have to combat desertification even as they remain reliant on the behaviors that are its cause.

In this context, we launched an interdisciplinary project focusing on desertification and livelihood as shown in Figure. The study sites were located in the semi-arid areas of West Africa, Southern Africa and South Asia, the so-called frontlines of desertification and poverty. The objectives and activities of our project were: 1) to deepen understanding of the areas experiencing desertification, examining its causes and local strategies of adaptation; 2) to innovate some practical techniques and approaches to control desertification; and 3) to disseminate project results and experiences.

Among the remarkable findings of our project was the determination that sand cover only a few centimeters thick affects the water and nutrient dynamics of sandy soils in semi-arid environments. This finding explains the rationality of the traditional 'push-hoe' widely used in the Sahel region of Africa encompassing between the Atlantic coasts of Senegal and the Red Sea of Sudan.

Together with local people and NGO members, project activity innovated some practical techniques. These include a 'fallow-band system' to prevent wind erosion and improve crop yield, use of 'Andropogon (wild perennial grass) contour-lines' to control water erosion and generate income, 'shallow tillage with indigenous animal-driven plow from India' to conserve soil moisture, 'combination of fodder-type cowpea and indigenous Indian farming tools' to convert degraded grassland into productive land, and a 'modified agricultural extension method' including some steps of a social network survey. To be practical, the techniques were designed to combine scientific knowledge and empirical local knowledge, to use local materials, and to reduce associated costs and labor. Each has the characteristic of being: 1) able to address livelihood improvement, desertification control, and ecosystem conservation/restoration concurrently; 2) easily implemented with particular consideration for the involvement of vulnerable people; and 3) disseminated directly by person-to-person communication. Our approach is therefore beyond the human vs nature dichotomy commonly found in desertification control, rural development support, and ecosystem conservation.

Our project received eighteen academic awards for its findings and innovations. These were given not only to us as researchers but also to local people who participated in the project with their empirical and indigenous knowledge. Some of our techniques have since been adopted by rural development projects in Africa. Our achievement was to develop practical innovations that also demonstrated the effectiveness of local knowledge and involvement. The end of the project is the beginning of our new challenge.

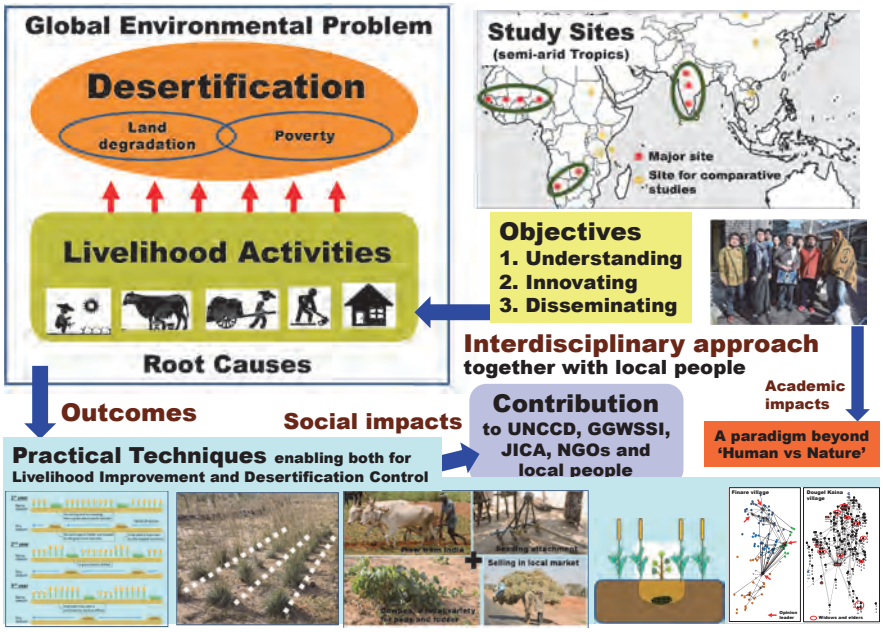


Figure Outlines of our project

http://www.chikyu.ac.jp/rihn_e/project/R-07.html

Current Feasibility Studies

Feasibility Studies are based on proposals solicited annually by RIHN from the research community at-large. If approved by the Project Review Task Committee, lead researchers are granted seed funding in order to develop their proposal for Full Research. FS status can be maintained for no longer than two years.

Above: ABE Ken-ichi, After the rain, Yunnan, China

Bottom: TANAKA Ueru, Cats are waiting to profit, Alexandria, Egypt

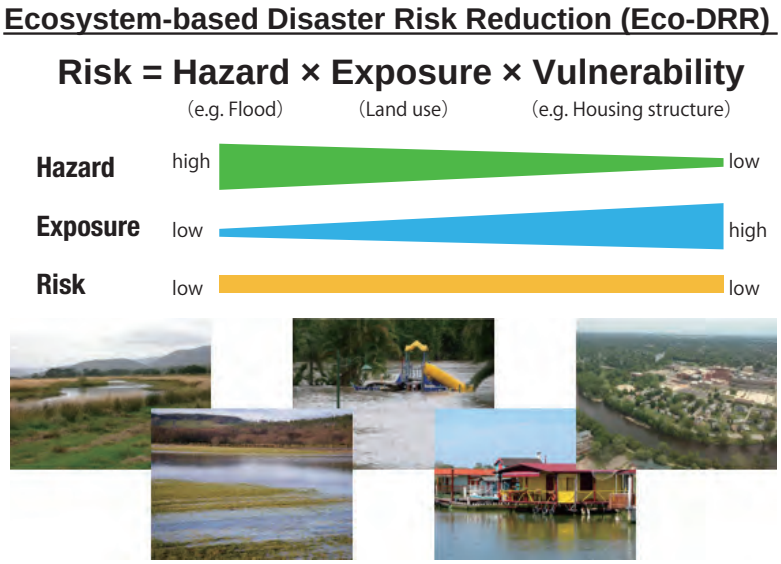
FS/PR

Research and Social Implementation of Ecosystem-based Disaster Risk Reduction as Climate Change Adaptation in Shrinking Societies

YOSHIDA Takehito, The University of Tokyo * This project will be converted to PR status (Research Program 1) in mid-2017

Area : Japan

The occurrence of natural disasters has been increasing—partly due to contemporary climate change—and adaptation to disaster risks is important for local communities. At the same time, many communities are experiencing shrinking populations. The ecosystem-based disaster risk reduction (Eco-DRR) takes advantage of the multi-functionality of ecosystems, including their capacity to mitigate disasters while providing multiple ecosystem services. Population decline provides ample opportunity for implementing Eco-DRR. Project research will develop practical solutions for implementation of Eco-DRR in local communities by visualizing natural disaster risks, evaluating multi-functionality of Eco-DRR, conducting scenario analysis, examining traditional and local knowledge of Eco-DRR, and collaborating with insurance and other sectors.



Ecosystem-based disaster risk reduction (Eco-DRR) not only lowers disaster risks but also receives benefits of ecosystem services by reducing the exposure of human activities in high-hazard locations and performing human activities in low-hazard places.

FS/PR

Assessing Functional Diversity of *Satoyama* Paddy Landscapes in East Asia's Monsoon Region

HOMMA Kosuke, Niigata University

Area : Japan, Korea, China, Laos, Thailand, Nepal

Traditional paddy rice-based landscape production systems—known as *satoyama* in Japanese—have been maintained for more than a thousand years throughout the monsoon East Asian region. Such systems are now experiencing drastic socio-economic change, however, that affects their biodiversity and ecological productivity. This study evaluates the current management systems of *satoyama* ecosystems and presents prescriptions designed to maintain the diverse functionality of *satoyama* systems within the context of contemporary social and ecological change.

A typical satoyama landscape in Yunnan Province, China.

FS

Water-Energy-Nexus Technology for Marginal Settlements: Socially Optimal Size from the Perspectives of Reciprocity and Indigenous Knowledge

KANEKO Shinji, Hiroshima University

Area : Nepal, Myanmar, Indonesia

This project attempts to identify the optimal scale of community infrastructure that can improve water and energy supplies in marginal settlements. The project is motivated by the Solar Water Pumping Systems (SWPS), which have been expanding to marginal settlements in the deep mountains of Nepal. While the capital cost of such community-scale projects can be relatively low, when scaled-up for larger social contexts, such projects increase social transaction costs of decision-making and operation, as they require comprehensive consideration of education, religion, social class, and social norms. This project investigates the tradeoffs surrounding community infrastructure works in three different types of marginal settlements: (1) high mountain villages in Nepal; (2) "floating people" of Inlay Lake, Myanmar; and (3) small remote islands in Indonesia.

Country	Nepal	Myanmar	Indonesia
Marginal Settlements	High mountain	Floating villages	Remote islands
Major religion	Hindi	Buddhism	Islam
Other features	Water carry with large elevation gap	Water transport of goods and passengers	Desalinization
	Caste	Pollution trestments	Familism
	Remittance	Donation	

Brief profile of study areas

FS

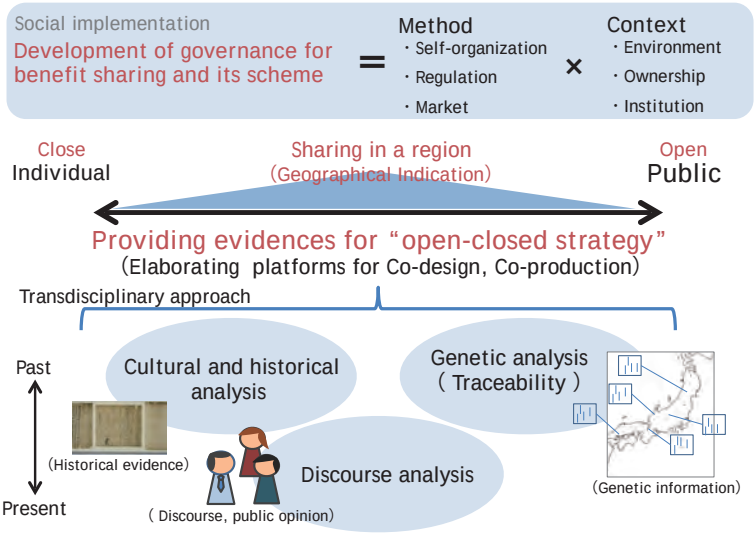
Transdisciplinary Approaches to Governance of Intellectual Properties: Genetic Resources and Traditional Knowledge in Terrestrial, Coastal and Marine Areas

KOHSAKA Ryo, Tohoku University

Area : Japan, Thailand, Philippines, Myanmar, South Korea, China, Indonesia

The discrepancy in technology between the so-called developed and developing worlds underpins the Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS). The project addresses this long-lasting global environmental problem by highlighting the role of intellectual property in fair and equitable benefiting sharing. We use an "open-closed strategy" in order to avoid loss or degradation of genetic resources and related indigenous and local knowledge.

The proposed transdisciplinary approach consists of three pillars: culture and history; genetic analysis; and discourse analysis. Based on evidence collected, the open-closed strategy is formed in relation to self-governance practices, existing regulations, and market based approaches.



Development of governance of "open-closed strategy" based on evidence from transdisciplinary research

FS

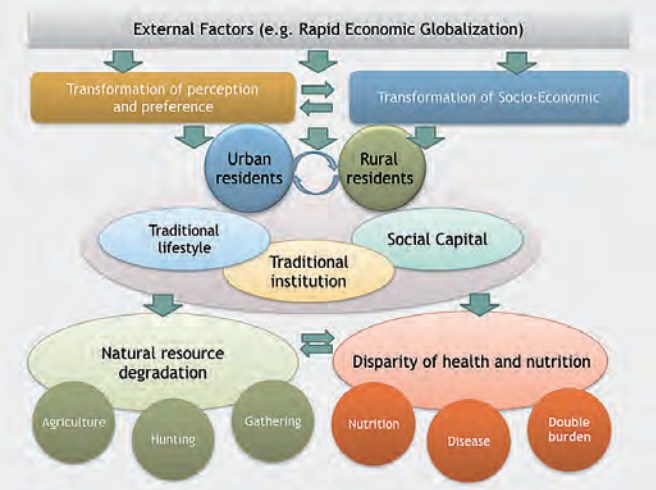
Nature Cultural Diversity and Building Sustainable Society in Asia

MATSUDA Hirotaka, The University of Tokyo

Area : South East Asia

The environmental degradations associated with modern societies have been based on culture and institutions which reflect the incentives of human beings. Naturally, culture and institution have been dynamically transformed.

The purpose of this research is to examine the East Asian historical experience of poverty, disparity of health, and utilization of natural resources, including agriculture, in order to reveal the significance of change in Asian institutions and cultural diversity and contribute to the construction of sustainable East Asian societies.



Research framework of the research

FS

Developing Interactive Rural-Urban Systems to Improve Human Well-being

MORI Koichiro, Shiga University

Area : Jakarta and Medan in Indonesia, Sabae, Saijo, Umajimura and Toyooka in Japan

The purpose of this research is to develop interactive urban-rural systems that can address global environmental problems and enhance human well-being within global environmental limits. The project investigates our hypotheses that the incomplete division of labour between urban and rural areas and virtual movement from urban to rural areas can provide strategies to abate problems related to urban overcrowding. The project will conduct social practical experiments.

FS

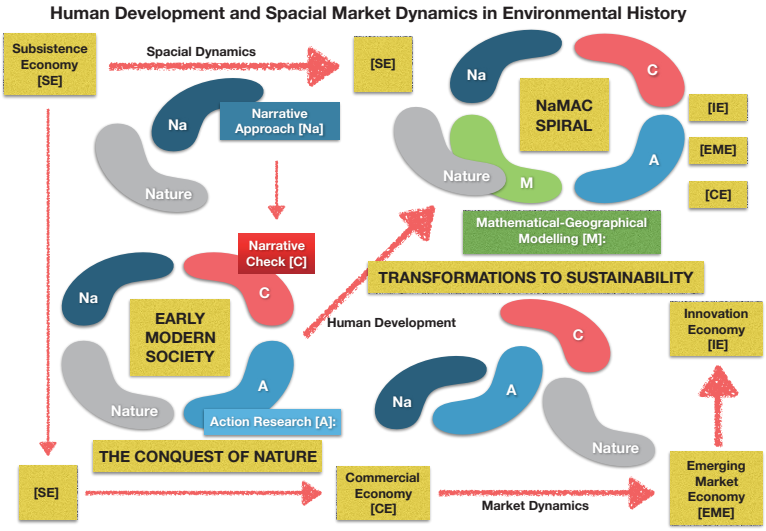
Living Spaces: A Transdisciplinary Study on Locality, Nature and Global Interdependency

MURAYAMA Satoshi, Kagawa University / ICEDS

Area : Local communities and regions in Japan, Europe, and the world

The purpose of this research is to conduct comparative environmental historical research in order to reveal the historical process by which human cultures have been separated from nature. Project research will employ mathematical-geographical modelling to identify the underlying mechanism for this separation, present a future vision of local environments, and conduct action research reflecting and reinforcing our findings.

Conceptual Chart of Living Spaces
- Where have florae, faunae, and humanity lived in the past?
- Where do they live today?
- Where will they live in the future?



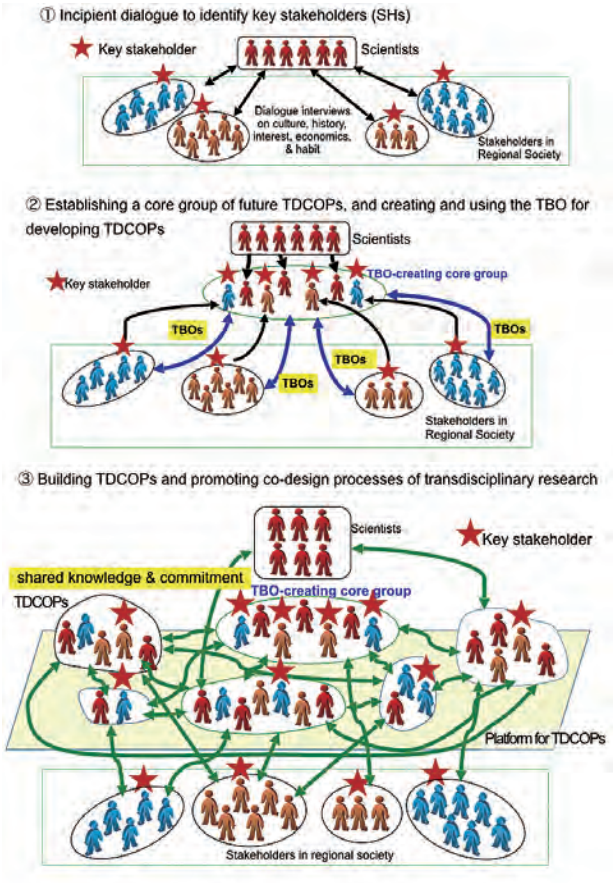
FS

Co-Creation of Regional Innovation for Reducing Risk of Environmental Pollution

SAKAKIBARA Masayuki, Ehime University

Area : Sulawesi Island, Indonesia

Developing countries frequently face the problem of intensive environmental degradation, occurring against a background of poverty. The purpose of our project is to reduce the long-term poverty and environmental risk in areas with high loads of environmental pollution in developing countries, and to create a process for constructing a sustainable society with regional innovations based on environmental and industrial innovations introduced with a transdisciplinary approach. It will include the co-creation and practical application of "transformative boundary objects" by transdisciplinary communities of practice, and will clarify the conditions that will allow a sustainable society to be established.



Co-creation of transdisciplinary communities of practice using by transformative boundary objects

Core FS

Knowledge Binding to Overcome Gaps in the Problem Perception in Collaborative Research on Socio-Environmental Interaction

KONDO Yasuhisa, RIHN

Core FS

Co-Design and Stakeholder Engagement According to Geographical Scales

ONISHI Yuko, RIHN

NISHIMURA Takeshi, Morning glow, Aso, Kumamoto, Japan

TANAKA Ueru Going to the top of a sand dune, Namibia

Above: ISHIAYAMA Shun, From behind we see her story, Zambia
Bottom: KAN Seicyou, Praying for the harvest, Yaizu, Shizuoka, Japan

Coordination

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 Communication Division develops a variety of communication strategies linking RIHN research to academic, public and user-specific communities. 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.


総合地球環境学研究所
Research Institute for Humanity and Nature (RIHN)


Imagine our world, as a giant puzzle. We all have a piece, So we can choose to leave it out or put it in place.

Science Communication

As a national research institute, RIHN is expected to conduct exemplary science. It also must communicate its research agenda and results to the public and contribute to public awareness and discussion of contemporary environmentalism. A number of public symposia, seminar series, and publications are designed to reach specialist and general audiences. Recent activities and publications include:

The Earth Forum Kyoto and the Earth Hall of Fame Kyoto Award

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 Center, and RIHN.

The 2016 recipients of the Earth Hall of Fame Kyoto Award was Professor Augustin Berque, geographer, Orientalist, philosopher and professor at the École des Hautes Études en Sciences Sociales (EHESS).

RIHN International Symposium

An annual symposium at RIHN exploring the key concepts of RIHN Research Programs.

Professor Augustin Berque, of the École des Hautes Études en Sciences Sociales (EHESS), France, giving the 2016 keynote address.

Asia's Transformations to Sustainability:
Past, Present and Future of the Anthropocene
10-11 March 2017

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

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

RIHN Area Seminars

RIHN Area Seminars take place in, and address specific environmental issues pertaining to, a particular part of Japan.

Let's think about tomorrow's food for the future of Noshiro in 30 years! - The possibility of food transition in Noshiro
5 December 2016, Plaza Miyako, Noshiro city, Akita

Globally important agricultural heritage system: Change for the better
21 January 2017, Takachiho-cho municipal center, Nishi-Usuki-gun, Miyazaki

RIHN Public Seminars

Public seminars are held throughout the year at RIHN or in the city center.

An environmental history perspective of modern Asia: From the growth paradigm to the sustainability paradigm
28 November 2016

Mainstreaming of biological diversity
24 January 2017

Trying to think about "environment" with high school students
9 February 2017

Science contributing solutions of global environmental problems: The quest for transdisciplinary research learning together with diverse societal actors
24 March 2017

RIHN Seminars

This seminar series is oriented towards researchers at RIHN, inviting a wide range of visiting scholars to present their most current research. Seminars in 2016 included:

The energy and justice footprint of water supply for Southern California
Joshua NEWELL, Assistant Professor, University of Michigan/ RIHN Invited Scholar
14 April 2016

Agroecology and food sovereignty: experiences from Latin America
Miguel ALTIERI, Professor, University of California, Berkeley / RIHN Invited Scholar
30 May 2016

An overview of the evolution of research and thinking about human-environment interaction (Lecture Series)
Eduardo BRONDIZIO, Professor, Indiana University Bloomington/ RIHN Invited Scholar
2, 6 and 9 June, 2016

From fieldwork to systems thinking in contemporary environmental studies (Lecture Series)
Sander van der LEEUW, Professor, Arizona State University/ RIHN Invited Scholar
13 and 20 October, 9 November, 19 December, 2016

Metastability, communication and change: Observations from the Shinano-Chikuma River
Simon Charles KANER, Professor, Head, Centre for Archaeology and Heritage, Sainsbury Institute for the Study of Japanese Arts and Culture/ RIHN Invited Scholar
6 January, 2017

Fixing the world - Excess, leftovers and innovation
Frederic JOULIAN, École des Hautes Études en Sciences Sociales
Yann-Philippe TASTEVIN, Centre National de la Recherche Scientifique
Yoann MOREAU, École des Mines
TAKEZAWA Shoichiro, National Museum of Ethnology
Mikaël LE MEUR, Université Libre de Bruxelles
10 January, 2017

RIHN Book Series: Global Environmental Studies

RIHN has partnered with Springer Publishers to establish the Global Environmental Studies book series. Titles in the series reflect the full breadth of RIHN scholarship.

Other Symposia

Facilities

Research rooms on the RIHN campus are designed to provide a sense of openness. The design concept is to allow implemented projects to be loosely interconnected as they occur in one large curved space 150 meters in length. The facilities help external researchers as well as RIHN research staff to meet one another, since they are designed with the maximization of shared use in mind. At the center of the main building, a library and computer room are located for the convenience of many users, and three common rooms are provided for casual discussions. On the basement floor, a cluster of fully functional laboratories has been designed with emphasis on convenience for shared use, as with the research rooms.

The separate RIHN House is a guesthouse. The assembly hall and a dining lounge located to the left of the house entrance serve as meeting spaces for the RIHN staff as well as for guests.

Appropriately for an institution researching the global environment, RIHN is housed in a tile-roofed building suited to the Kyoto landscape, where as many as possible of the trees already on the site have been retained. Lighting and air-conditioning also employ the latest designs to minimize the building's impact on the environment. The design has won acclaim, receiving awards from the Illumination Engineering Institute of Japan, the Japan Institute of Architects, the Green Building Award from MIPIM Asia, and the Architectural Institute of Japan.

Management

RIHN researchers work across the breadth of global environmental studies. If the diverse knowledge they produce is the warp, then the unifying weft is provided by field measurement, laboratory analysis, data and information management, and academic and social communication of research progress and results. In maintaining and supporting RIHN research capacity to collect and analyze data and to communicate research in numerous professional and public fora, the RIHN Center enhances our collaborative research around the world and contributes the kind of integrated knowledge that can solve global environmental problems.

Laboratories

RIHN research projects are multi-disciplinary and multimethod; in common they share the need for high quality physical observation and chemical and biological analysis of the surface environments of the earth. As a national institute, RIHN houses eighteen basement laboratories designed to address this need. There are state-of-the-art laboratories dedicated to microscopic, DNA and stable isotope analysis. Additional facilities include two fieldwork preparation rooms for storage and maintenance of observational and sampling equipment, three low-temperature rooms for organism and ice core storage, three incubator rooms for storage of organisms requiring specific temperatures, and a clean room in which samples can be processed in a contamination-free environment.

Instruments

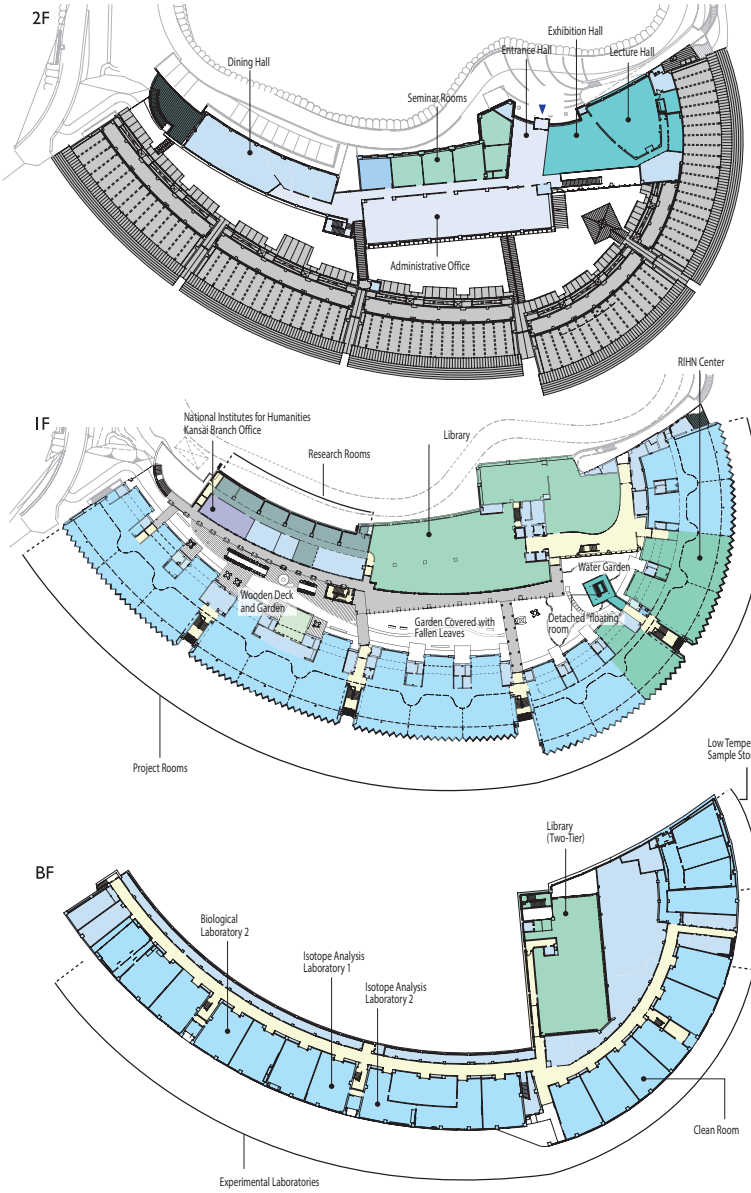
RIHN research projects conduct a variety of studies around the world and collect a diverse range of samples that contain valuable information that will help illuminate human-nature interactions. Stable isotope and DNA data in particular can give very precise descriptions of how materials and species interact, change, and move through time and space. In addition to maintaining state-of-the-art laboratories, the Laboratory and Analysis Division of the RIHN Center continues to develop new methods of data analysis and application. In conducting this research in collaboration with RIHN projects, universities and affiliated institutions throughout Japan, the division enhances the sophistication of experimental techniques and exchange of research information, and promotes the shared use of facilities.

Main building

Main entrance hall

Basement laboratories

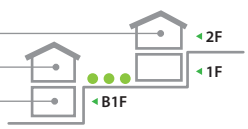
The RIHN House with one-, two-, and three-bedroom apartments for guest researchers and their families.



2F
Main Entrance Hall
Administration
Lecture Hall
Seminar Rooms
Dining Hall

1F
Employee Entrance
Research Project Rooms
RIHN Center
Library
Media Center
National Institutes for the Humanities Kansai Office

Basement
Laboratories
Book Repository
Field Research Equipment and Facilities
Cold Storage



Ecohealth

New Development of Ecohealth Research in Asia

This project is a collaboration with the National Museum of Ethnology and the National Institute of Japanese Literature, supported by the National Institutes for the Humanities. It adopts an Ecohealth approach that places human health in a wider ecosystem context and explores the linkages among livelihoods, food and subsistence, ecological environment and demographic and social change in Asia. Through historical examination of concepts of health in East Asia and contemporary fieldwork in communities in Laos, China and Japan experiencing rapid demographic change, the project aims to move beyond disease-oriented understandings to a holistic and positive appreciation of health in specific contexts and places.

The participants of Japan-Swiss joint colloquium for Ecohealth research

Future Earth

Future Earth is a major international research platform providing knowledge and support to accelerate transformations to a sustainable world (see www.futureearth.org). It aims to generate solutions-oriented research and innovation to address complex global problems, by linking the expertise of researchers across disciplines with policy-makers, business leaders, practitioners and other societal partners. The Collaboration Division in the RIHN Center is actively engaged in the co-design of research development, including by articulating a strategic research agenda for Japan.

The Division also hosts the Regional Centre for Future Earth in Asia. The Centre supports the development of Future Earth in the region, helps connect researchers and other stakeholders, and facilitates the formation of regionally relevant and credible governance structures for the initiative. The Centre has convened a Regional Advisory Committee to accelerate the regional development of Future Earth and facilitated the launch of two Future Earth programs focused in Asia: Sustainability Initiative in the Marginal Seas of South and East Asia (SIMSEA) and Monsoon Asia Integrated Research for Sustainability – Future Earth (MAIRS-FE). The Centre has also led the development of a Knowledge-Action Network on the focal topic of “Systems of Sustainable Consumption and Production”.

The 5th International Workshop on Future Earth in Asia

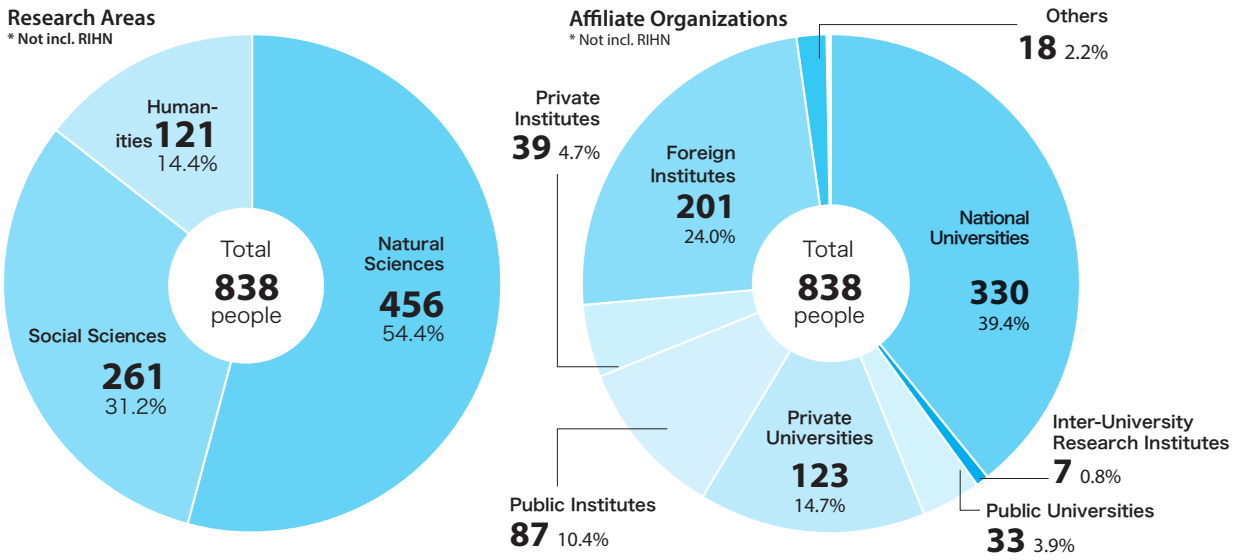
Japan Strategic Research Agenda (JSRA)

The JSRA was developed in collaboration with stakeholders to identify priority research areas to contribute to a sustainable future while optimizing Japan's distinct research arenas.

Regional Centre for Future Earth in Asia Website

A map of the Future Earth Community in Asia is being developed on the website. This map shows research institutes in Asia which have a relationship with the Future Earth. (www.futureearth.org/asiacentre/)

Collaboration



*As of March 31st, 2017

Collaboration in Japan

Research Institutions

1. Graduate School of Environmental Studies, Nagoya University
2. Doshisha University
3. Nagasaki University
4. Kyoto Sangyo University
5. Tottori University of Environmental Studies
6. Miyagi University
7. Kyoto University
8. Center for Environmental Remote Sensing, Chiba University
9. Institute of Decision Science for a Sustainable Society, Kyushu University
10. Institute of Nature and Environmental Technology, Kanazawa University
11. Hokkaido University

Municipal Governments and Other Agencies

1. Saijo City, Ehime Prefecture
2. Kyoto Municipal Science Center for Youth
3. Food and Agricultural Materials Inspection Center (FAMIC)
4. Ono City, Fukui Prefecture
5. Kameoka City, Kyoto Prefecture
6. Inabe City, Mie Prefecture
7. Kyoto Prefectural Hokuryo Senior High School
8. Kyoto Prefectural Rakuhoku High School

International Collaboration

Memoranda of Understanding and Research Cooperation Agreements (As of March 31st, 2017)

AUSTRIA
International Institute for Applied Systems Analysis

BANGLADESH
International Centre for Diarrhoeal Disease Research

CHINA
East China Normal University
Peking University
People's Government of Changzhou City
Yunnan Health and Development Research Association

FRANCE
La Fondation Maison des Sciences de l'Homme

INDIA
Institute of Rajasthan Studies, JRN Rajasthan Vidyapeeth
Maharaja Sayajirao University of Baroda

INDONESIA
The Agency of Peatland Restoration (Badan Restorasi Gambut)
The Center for International Forestry Research

LAOS
National Institute of Public Health, Ministry of Health

MALAWI
University of Malawi

NAMIBIA
Ministry of Agriculture, Water and Forestry

NIGER
L'Organisation Nigériennes des Educateurs Novateurs

PHILIPPINES
Laguna Lake Development Authority
University of the Philippines Diliman
University of the Philippines Visayas
University of Santo Tomas

RUSSIA
Far Eastern Federal University

SUDAN
Sudan University of Science and Technology

SWEDEN
The Sven Hedin Foundation

TAIWAN
Research Center for Environmental Changes, Academia Sinica

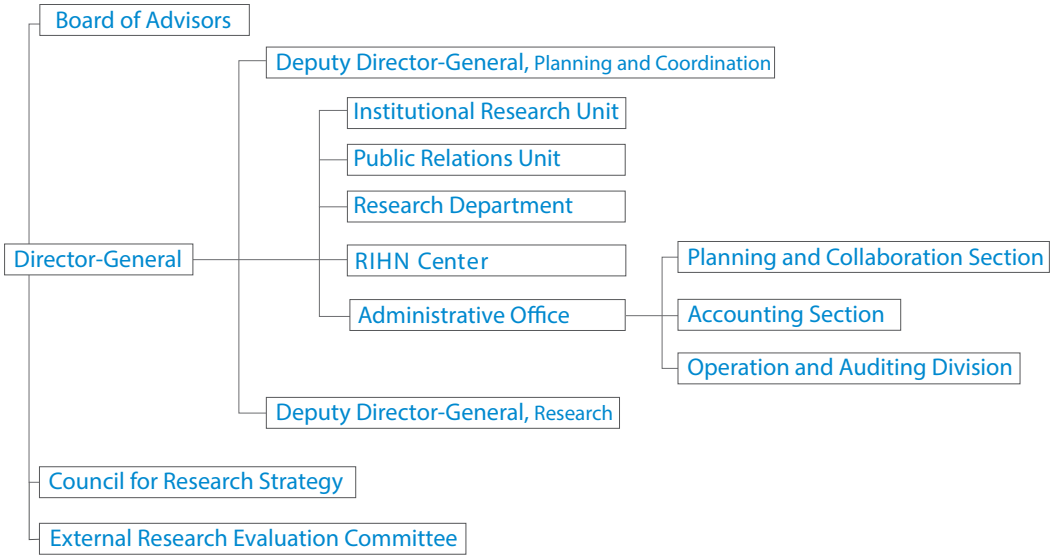
THAILAND
Faculty of Fisheries, Kasetsart University
Rice Department, Ministry of Agriculture and Cooperatives
Southeast Asian Fisheries Development Center

UNITED KINGDOM
Sainsbury Institute for the Study of Japanese Arts and Cultures

UNITED STATES OF AMERICA
Mote Marine Laboratory
University of California, Berkeley
University of the Virgin Islands

ZAMBIA
Zambia Agricultural Research Institute, Ministry of Agriculture and Livestock

Administrative Structure



Financial Information

Segmental Financial Information (Fiscal Year 2015)

Operating Expenses

Category	Amount (Yen in thousands)
Operating Expenses	1,741,809
Inter-University/Joint Research	717,813
Outsourced Studies	107,741
Outsourced Operations	96,005
Personnel	820,248
General Management	80,370
Financial Expenses	21,416
Total Expenses	1,843,596

Operating Income

Category	Amount (Yen in thousands)
Subsidy for Operation	1,584,702
Contract Operations, etc.	96,348
Donations	13,945
Others	135,193
Total Earnings	1,830,190

Operational Balance 13,406

External Sources of Funding

(Fiscal Year 2015)

Category	Amount (Yen in thousands)
Fund for Promotion of Academic and Industrial Collaboration	75,966
Grants-in-Aids for Scientific Research	94,250
Donations for Research	45,900

* Fund for Promotion of Academic and Industrial Collaboration is the sum of contract research expenses.

Boards and Committees

*As of May, 2017

Board of Advisors

Oversees personnel, planning, administration and operation of the institute

IKEYA Kazunobu
Professor, National Museum of Ethnology
KADA Yukiko
President, Biwako Seikei Sport College
KANZAWA Hiroshi
Professor, Graduate School of Environmental Studies, Nagoya University
KOIKE Toshio
Director, Global Centre of Excellence for Water Hazard and Risk Management
KONO Yasuyuki
Director, Center for Southeast Asian Studies, Kyoto University
NIIKAWA Tatsuro
Professor, Graduate School, Doshisha Univesity
NOE Keiichi
Professor Emeritus & President-appointed Extraordinary Professor, Tohoku University
OTSUKI Kyoichi
Professor, Faculty of Agriculture, Kyushu University
KUBOTA Jumpei
Deputy Director-General, RIHN
TANIGUCHI Makoto
Deputy Director-General, RIHN
MALLEE, Hein
Professor, RIHN
NAKATSUKA Takeshi
Professor, RIHN
TANAKA Ueru
Professor, RIHN
TAYASU Ichiro
Professor, RIHN

External Research Evaluation Committee

External review of research project proposals

Domestic

KOIKE Isao
Professor Emeritus, the University of Tokyo
NAKANISHI Hisae
Professor, Graduate School of Global Studies, Doshisha University
OKADA Mitsumasa
Professor & Director of Center for Open Distance Education, The Open University of Japan / Professor Emeritus, Hiroshima University
TANAKA Masaru
Director, Moune Institute for Forest-Sato-Sea Studies / Professor Emeritus, Kyoto University
TODA Takao
Senior Special Advisor, International Cooperation Agency (JICA)
UCHIBORI Motomitsu
Professor, The Open University of Japan
WADA Eitaro
Member of the Japan Academy / Professor Emeritus, Kyoto University
YASUOKA Yoshifumi
Professor Emeritus, The University of Tokyo

Overseas

BAI, Xuemei
Professor, Fenner School of Environment and Society, Australian National University, Australia
BINDER, Claudia
Professor, Laboratory for Human-Environmental Relations in Urban Systems (HERUS), IIE - ENAC - EPFL, Switzerland
LU, Yonglong
Professor, Research Center for Eco-Environmental Science Chinese Academy of Sciences, China
MCDONALD, Anne
Professor, Graduate School of Global Environmental Studies, Sophia University, Japan
RANDALL, Roland
Life Fellow, Girton College, University of Cambridge, UK
SCHOLZ, Roland
Professor Emeritus, Institute for Environmental Decisions, Swiss Federal Institute of Technology Zurich, Switzerland
VAN DER LEEUW, Sander
Foundation Professor, School of Sustainability, Arizona State University, USA
ZHANG, Shiqiu
Professor, College of Environmental Sciences and Engineering, Peking University, China

Council for Research Strategy

Oversees research strategy, personnel, project, and evaluation system

YASUNARI Tetsuzo	Director-General	SAIJO Tatsuyoshi	Specially Appointed Professor	TANAKA Ueru	Professor
KUBOTA Jumpei	Deputy Director-General	SUGIHARA Kaoru	Specially Appointed Professor	TAYASU Ichiro	Professor
TANIGUCHI Makoto	Deputy Director-General	MALLEE, Hein	Professor	KAWANO Hiroshi	Director, Administrative Office
NAKASHIZUKA Tohru	Specially Appointed Professor	NAKATSUKA Takeshi	Professor		

Senior Advisor

TACHIMOTO Narifumi

Professors Emeritus

NAKANISHI Masami	FUKUSHIMA Yoshihiro	TACHIMOTO Narifumi	NAKANO Takanori
WADA Eitaro	AKIMICHI Tomoya	SATO Yo-Ichiro	SATO Tetsu
HIDAKA Toshitaka	KAWABATA Zen'ichiro	MOJI Kazuhiko	
NAKAWO Masayoshi	OSADA Toshiki	KADA Ryohei	

RIHN STAFF

DIRECTOR-GENERAL YASUNARI Tetsuzo
DEPUTY DIRECTOR-GENERAL (Planning and Coordination) KUBOTA Jumpei
DEPUTY DIRECTOR-GENERAL (Research) TANIGUCHI Makoto

ADMINISTRATIVE OFFICE

ADMINISTRATIVE DIRECTOR KAWANO Hiroshi

PLANNING AND COLLABORATION SECTION

Head
Deputy Head KITA Yoshifumi

General Affairs and Planning Subsection
Head BIVONE Junko
Clerk INOUE Yuko
Clerk KARIYA Midori
Clerk NAKANISHI Keita

Personnel Subsection
Head NAGATA Yukihiro
Clerk MATSUKI Takeyuki

International Affairs Subsection
Head BIVONE Junko
Clerk NAGATA Satoko

Collaboration Unit
Head UEDA Yasutoshi
Specialist ISHII Hatsue

Research Planning Subunit
Head YUKI Toshitake

Cooperative Research Support Subunit
Head ZENIZUKA Rie
Clerk MASUDA Maho

Information and Library Subunit
Chief YAMASHITA Takayoshi

ACCOUNTING SECTION

Head OBAYASHI Reiko
Deputy Head KITAURA Toshiaki

Financial Planning Subsection
Head TOJIMA Mitsuo
Chief HONDA Takayuki
Chief TSUJIMURA Hanako

Facility Management Subsection
Head OISHI Toru
S.A.Specialist ZUI Zoujin

Accounting Subsection
Head SIHBUYA Hiroyuki

Procurement Subsection
Head NONAMI Masatoshi
Clerk SAWAMURA Takahiro

OPERATION AND AUDITING DIVISION

Head OBAYASHI Reiko

Auditing Subunit
Head TOJIMA Mitsuo
Chief HONDA Takayuki

RESEARCH DEPARTMENT

Program Directors

NAKASHIZUKA Tohru	Forest Ecology, Biodiversity
SAIJO Tatsuyoshi	Future Design
SUGIHARA Kaoru	Economic History, Environmental History

Professors

FUNAMIZU Naoyuki	Sanitary Engineering
ISHIKAWA Satoshi	Conservation Ecology, Global Fisheries Science
MIZUNO Kosuke	Indonesian Area Research
NAKATSUKA Takeshi	Biogeochemistry, Paleoclimatology
TANAKA Ueru	Agricultural Studies

Associate Professors

ENDO Aiko	Marine and Coastal Policy, Fishery Economics
KIKUCHI Naoki	Environmental Sociology
MCGREEVY, Steven R.	Environmental Sociology
OKUDA Noboru	Ecological Science

Specially Appointed Professors

NAKASHIZUKA Tohru	Forest Ecology, Biodiversity
SAIJO Tatsuyoshi	Future Design
SUGIHARA Kaoru	Economic History, Environmental History

Visiting Professors

HABU Junko	Environmental Anthropology, East Asian Archaeology
KANEKO Shinji	Environmental Economics
KANIE Norichika	Earth System Governance
KASUGA Fumiko	Food Safety
KAWASAKI Masahiro	Atmospheric Chemistry
KOHSAKA Ryo	Natural Resource Management and Global Environmental Policy
KUSAGOU Takayoshi	Action-based Development Studies
MORI Kouichiro	Ecological Economics
MURAMATSU Shin	Architectural History, Urban History
MURAYAMA Satoshi	Economic / Environmental History
NAKAGAMI Ken'ichi	Environmental Economics and Policy
RAMPISELA, Dorotea Agnes	Soil and Water Management
SAKAKIBARA Masayuki	Earth and Environmental Sciences
SHIBATA Akira	Rural Development, Biomass Carbonization
YONEMOTO Shohei	History and Philosophy of Science

Visiting Associate Professors

HOMMA Kousuke	Forest Ecology
MATSUDA Hirotaka	Agricultural Economics, Development Economics
SHIRAIWA Takayuki	Glaciology, Physical Geography
TERADA Masahiro	History, Metahistory
YOSHIDA Takehito	Ecology

Invited Scholars

BROWN, Antony Gavin	Geoarchaeology, Palaeoecology
KOOHAFKAN, Abolghassem Parviz	Integrated Natural Resources Management

Senior Project Researchers

KAMATANI Kaoru	History
TAMURA Norie	Natural Resource Management

Program / Project Researchers

ASANO Satoshi	Regional Planning
HAYASHI Koji	Ecological Anthropology
IKEYA Tohru	Aquatic Ecology, Environmental Science
ISHIDA Takuya	Forest Environmental Science
ITO Keisuke	Japanese History
KAJITA Ryosuke	Area Studies
KOBAYASHI Kunihiko	International Environmental Law
KOBAYASHI Mai	Environmental Sociology
LI Zhen	Earth and Environmental Sciences
MASUHARA Naoki	Public Administration Studies, Energy Policy
MOROTA Hiroaki	Asian Economic History
NAITO Daisuke	Southeast Asian Area Study, Political Ecology
NAKAO Seiji	Historical Anthropology
OH Tomohiro	Resource Governance
OTA Kazuhiko	Japanese Environmental Ethics
RUPPRECHT. Christoph D. D.	Geography
SHIBATA Rei	Forest Ecology
SPIEGELBERG, Maximilian	Environmental Management
SUZUKI Haruka	Area Studies
TSUSHIMA Akane	Peleoclimatology
UEHARA Yoshitoshi	Ecology

Program / Project Research Associates

HONDA Hisami	Coastal Oceanography
KARATSU Fukiko	
KATSURA Tomomi	
KIMURA Ayako	
KOBAYASHI Yuko	
MATSUOKA Yuko	
OKAMOTO Takako	
TERAMOTO Shun	
TESHIMA Mika	
WATANABE Kirie	
YAMAMOTO Aya	
YANAKA hiroko	

FS Research Associate

KATAOKA Megumi

RIHN Center

DIRECTOR KUBOTA Jumpei

Deputy Director TAYASU Ichiro AND MALLEE, Hein

Core Program Director TANIGUCHI Makoto

Heads of Divisions

Laboratory and Analysis Division	TAYASU Ichiro
Information Resources Division	SEKINO Tatsuki
Collaboration Division	MALLEE, Hein
Communication and Production Division	ABE Ken-ichi

Professors

ABE Ken-ichi	Ecological Anthropology
KUBOTA Jumpei	Hydrology
MALLEE, Hein	Social Science
SEKINO Tatsuki	Information Science
TANIGUCHI Makoto	Hydrology
TAYASU Ichiro	Isotope Ecology, Isotope Environmental Science

Associate Professors

ISHII Reiichiro	Theoretical Ecology
KONDO Yasuhisa	Archaeology, GIS
KUMAZAWA Terukazu	Environmental Planning, Regional Informatics
NILES, Daniel	Geography

Assistant Professors

ONISHI Yuko	Biogeography, Macroecology
SHIN Kicheol	Petrology, Geochemistry, Isotope Geology

Specially Appointed Assistant Professor

HASEGAWA Asako	Science Communication, Russian Literature

Research Fellow, NIHU Center for Transdisciplinary Innovation (Ecohealth)/ Specially Appointed Assistant Professor

JIANG Hongwei	Human Ecology

Center Researchers

HARAGUCHI Takashi	Community Ecology
KATO Yoshikazu	Aquatic Ecology
OSADA Yutaka	Ecology
SAITO Yu	Sedimentology
YABUSAKI Shiho	Isotope Hydrology
YOSHIMIZU Chikage	Biogeochemistry

Center Research Associates

KISHIMOTO Sayaka	International Collaboration Studies
MIMURA Yutaka	Architectural History, Urban History, Historical GIS
OKA Masami	
SHIMADA Nahoko	Study of Ecological Thought

Institutional Research Unit

HEAD TANIGUCHI Makoto

Members of Unit

FUNAMIZU Naoyuki, KUBOTA Jumpei, TAYASU Ichiro, KONDO Yasuhisa, KUMAZAWA Terukazu

Specially Appointed Specialist

OSHIUMI Keiichi

Public Relations Unit

HEAD KUBOTA Jumpei

Members of Unit

ABE Ken-ichi ISHIKAWA Satoshi SEKINO Tatsuki TANAKA Ueru
KIKUCHI Naoki MCGREEVY, Steven R. NILES, Daniel KUMAZAWA Terukazu

Specially Appointed Associate Professor

TOYAMA Mari	Science Communication

Specially Appointed Specialist

WADE Shin-ichi

A Brief History of RIHN

1993
- Prime minister's advisory panel on the Global Environment in 21st Century launched

1995
- "On the Promotion of Global Environmental Studies" published by The Science Council of Japan

1997
- Report "On the core research institute for Global Environmental Studies" published by MEXT (Ministry of Education, Culture, Sports, Science and Technology)

2001
- RIHN Established on the Kyoto University campus
- HIDAKA Toshitaka, Director-General

2002
- RIHN relocated to the former Kasuga Primary School
- The 1st RIHN Forum

2004
- RIHN becomes a member of the National Institutes for the Humanities
- The 1st RIHN Public Seminar

2005
- The 1st RIHN Area Seminar

2006
- RIHN relocates to current facilities in northern Kyoto
- The 1st RIHN International Symposium

2007
- TACHIMOTO Narifumi appointed as the second Director-General
- The Center for Coordination, Promotion and Communication established
- RIHN-China established
- First research projects concluded

2008
- The 1st Collaborative Symposium with the International Research Center for Japanese Studies

2009
- The Earth Forum Kyoto and Earth Hall of Fame Kyoto Award established

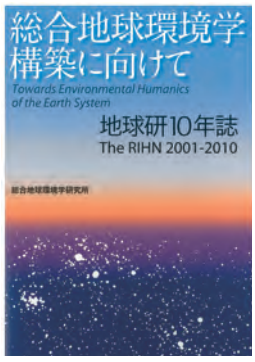
2010
- Core Research Hub established
- The RIHN Encyclopedia of Global Environmental Studies published

2011
- RIHN 10 year anniversary and publication
- GEC-Japan network established

2013
- YASUNARI Tetsuzo appointed as the third Director-General
- The Center for Coordination, Promotion and Communication reorganized into the Center for Research Development and the Center for Research Promotion

2014
- Selected as Regional Center for Future Earth in Asia

2016
- 3 Research Programs and Core Program established and RIHN Center reorganized



Inter-University Research Institute Corporations National Institutes for the Humanities (NIHU)

http://www.nihu.jp/

NIHU is one of the four Inter-University Research Institute Corporations. It consists of six Inter-University Research Institutes involved in research in humanities. While each one of the institutes is deeply involved in foundational research in their field as a core research center of Japan and as an international research center, six institutes interact in a complementary fashion and transcending the frameworks of previous scholarship. They also cooperate with research institutes in Japan and other countries in their attempt to identify and solve issues in contemporary society. To achieve a truly enriched human life, NIHU promotes research on the human sciences and aims to create new value.

Promotion of Research and Public Information Activities

NIHU set up the Center for Transdisciplinary Innovation (CTI) and the Center for Information and Public Relations (CIP) in FY 2016. The two Centers are promoting international joint research by building a research network around six institutions positioned as its hubs. At the same time, they publish information to the world proactively, and enhance and promote the development of the next generation of scholars.

Center for Transdisciplinary Innovation (CTI)

The CTI promotes collaboration and cooperation within and between the six institutes, linking them to domestic and international universities, research institutes and local communities. It promotes the NIHU Transdisciplinary Project, an organizational joint research project that identifies contemporary issues, with the aim of creating a new value system for the human sciences.

NIHU Transdisciplinary Project

Institute-based Projects

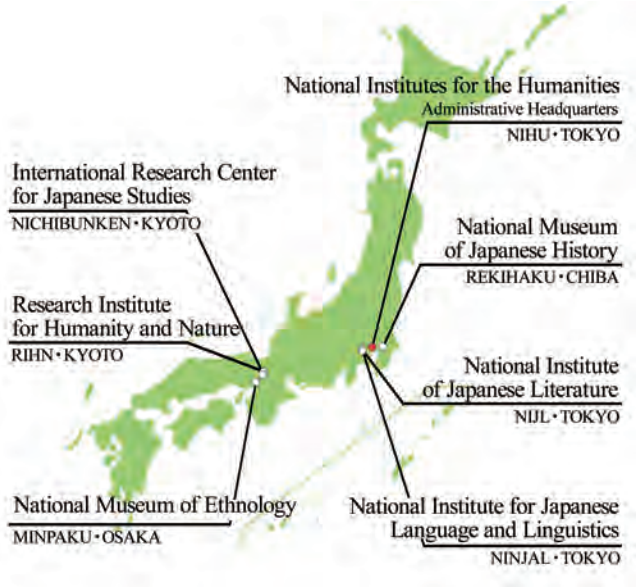
REKIHAKU: Constructing Integrated Studies of Cultural and Research Resources, and Renovating Sharing Infrastructures of Research Resources in Japanese History and Culture
NIJL: Project to Build an International Collaborative Research Network for Pre-modern Japanese Texts
NINJAL: Diverse Language Resources and the Consolidation of Japanese-language Studies
NICHIBUNKEN: Historical and International Research into Popular Culture to Pursue New Images of Japan
RIHN: Transformation towards Sustainable Futures in Complex Human-Nature Systems in Asia
MINPAKU: Info-Forum Museum for Cultural Resources of the World

Multidisciplinary Collaborative Projects

Change of Local Communities and Reconstruction of Community Cultures after Disasters in Japanese Archipelago
Rethinking Eco-health in Asia
Development of a Field of Comprehensive Bibliographical Studies from an Interdisciplinary Perspective

Network-based Projects

NIHU Area Studies
Northeast Asia Modern Middle East South Asia
Japan-related Documents and Artifacts Held Overseas: NIHU International Collaborative Research and Utilization
The Archives of the Dutch Factory in Hirado
Insights into Japan-related Overseas Artifacts and Documents of the 19th Century in Europe through Research and Use
Research, Conservation and Utilization of the Marega Collection Preserved in the Vatican Library
Survey, Study and Use of the Japan-related Documents and Artifacts in North America
Coordination between Projects to Make Effective Use of Research Results



The NIHU Headquarters and six Inter-University Research Institutes

The four Inter-University Research Institute Corporations

Center for Information & Public Relations (CIP)

The CIP digitalizes comprehensive academic research resources related to the human sciences to promote the widespread use of the resources by universities and scholars all over the world. At the same time, it encourages sharing of research outcomes for the common good by strengthening two-way collaboration with society.

Public Information Activities

Resource Sharing nihu INT http://int.nihu.jp/

nihu INT is a database on research in the human sciences for the integrated retrieval of information resources from inside and outside NIHU

Public Information

Institutional Repositories and Research Achievements Database http://nrd.nihu.jp/search?m=home&l=en

Each institute publishes a repository for sharing research outcomes with the world. An integrated database of scholars, which provides information about scholars who belong to NIHU, is also in operation

English Resource Guide for Japanese studies and Humanities in Japan. http://www.nihu.jp/sougou/kyoyuka/japan_links/

NIHU magazine: This magazine provides information about NIHU's latest research activities and findings to the world

https://www.nihu.jp/ja/publication/nihu_magazine

Collaborations with Society

NIHU Symposium: Information about research activities and findings is made widely available

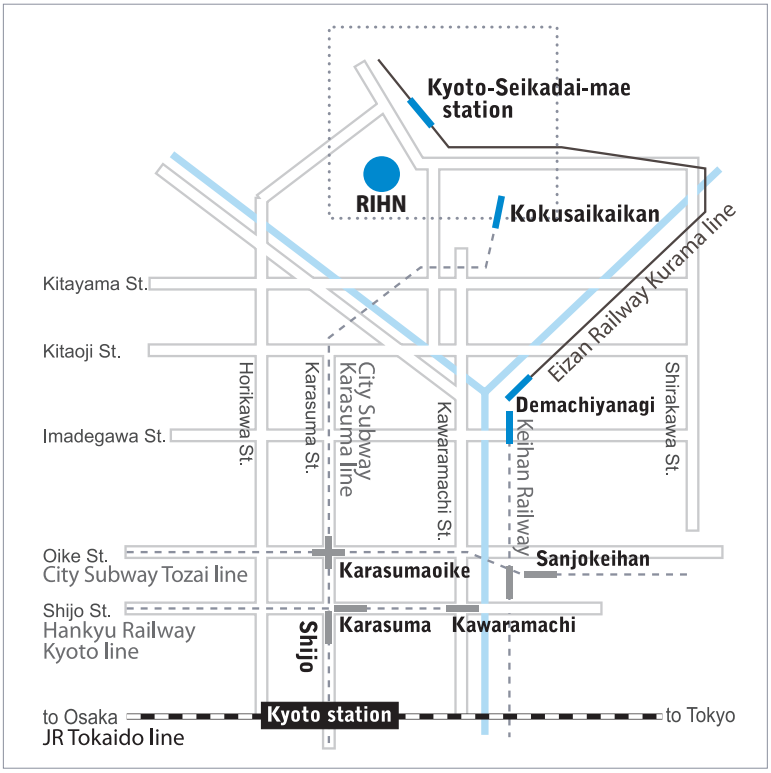
28th: "Yokai Kukan – Desouna Basho (Niche of Yokai)", Jun. 11, 2016

29th: "Diversity of Japan's Dietary Cultures - Thinking about Dietary Cultures on food production, processing and consumption-" Oct. 15, 2016

Industry-Academia Collaborations

Promoting sharing of research outcomes for the common good by collaborating with industries such as the tourism industry

Access



By City Subway

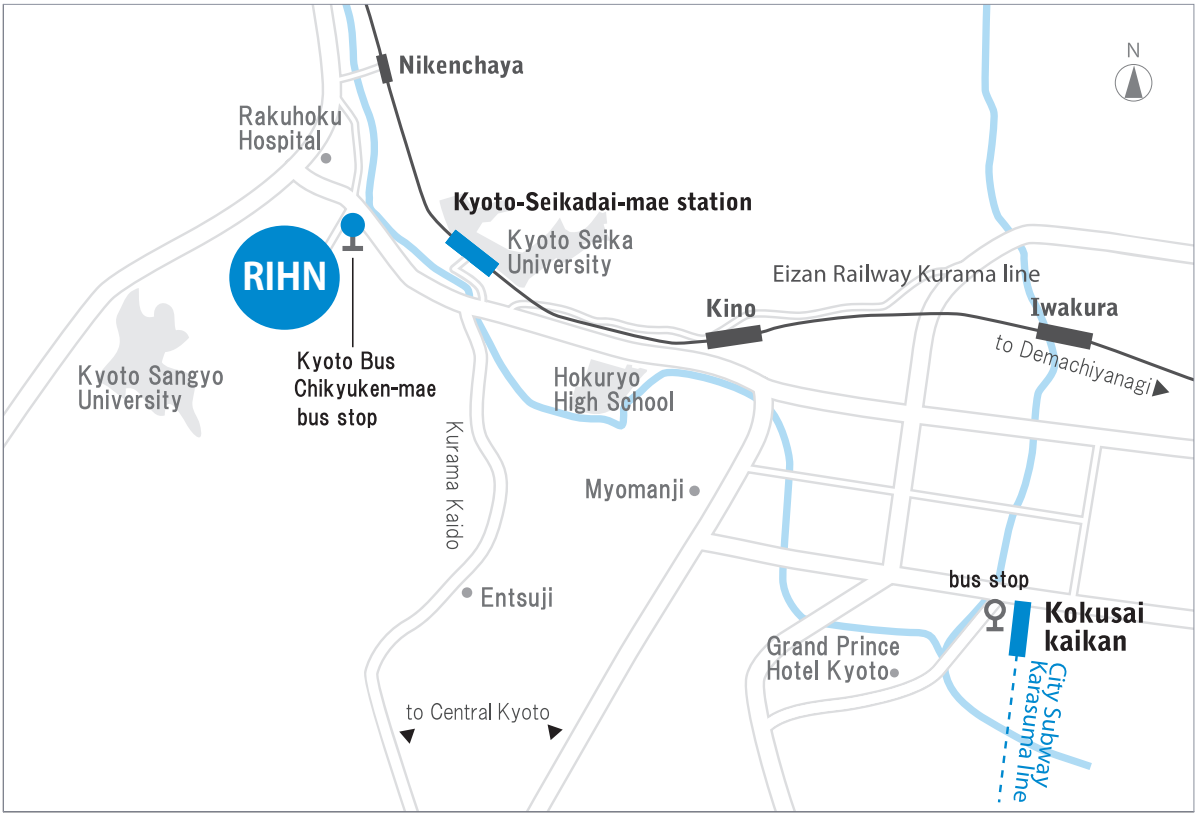
From Kyoto Station, take the Karasuma Line to Kokusaikaikan Station (the last station), and transfer to Kyoto Bus.

By Kyoto Bus

From Kokusaikaikan Station, take bus No. 40, 50 or 52 to Chikyuken-mae.
RIHN is at the base of the hill on your left.

By Eizan Railway

From Demachiyanagi Station in Kyoto City, take the Kurama Line.
Get off at Kyoto-Seikadai-mae Station.
RIHN is a 10-minute walk from the station.



RIHN Prospectus 2016-2017

Managing Editor: KUBOTA Jumpei

Designed by OKAZAWA Rina

Front Cover photo:
Welcome song, Yunnan, China
Photo by ABE Ken-ichi

Back Cover photo:
We are happy with friends, Zambia
Photo by MIMURA Yutaka

Flying over RIHN in the autumn sky
Photo by WATANABE Kazuo

Inter-University Research Institute Corporation
National Institutes for the Humanities
Research Institute for Humanity and Nature

457-4 Motoyama, Kamigamo, Kita-ku, Kyoto
603-8047, JAPAN

TEL. +81-75-707-2100
FAX. +81-75-707-2106

kokusai@chikyu.ac.jp
www.chikyu.ac.jp

ISSN 2185-8055
June 2017