



Research Institute for
Humanity and Nature
大学共同利用機関法人 総合地球環境学研究所
人間文化研究機構

RIHN 2023-2024

Prospectus





Front Cover Photo by SHINJO Ryuichi
(Yoron Island, Japan, 2022)

Research Institute for Humanity and Nature

Prospectus 2023-2024

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A portrait of Yamagiwa Juichi, the Director-General, standing outdoors in a light grey suit and a yellow patterned tie. The background shows green foliage and a building.

Message from the Director-General

YAMAGIWA Juichi

Director-General
Research Institute for Humanity and Nature

The Research Institute for Humanity and Nature (RIHN), established in April 2001, is an inter-university research institute promoting comprehensive research in global environmental studies. Its motto is “The root of global environmental problems is the problem of human culture,” and while it belongs to the Inter-University National Institutes for the Humanities, it has conducted research that incorporates a wide range of humanities and social sciences perspectives, based on data from the natural sciences.

Today, the earth is facing many challenges. Rapid population growth, urbanization, massive industrial production, and rapid movements of people and goods are causing serious changes in the global environment, including increased carbon dioxide emissions, global warming, ocean acidification, and tropical deforestation. The coronavirus pandemic was triggered by massive human intervention in nature, and it is no exaggeration to say that the recent rapid population growth and global movement of people and goods have caused a man-made disaster. The sixth report of the Intergovernmental Panel on Climate Change (IPCC) (2021) goes so far as to assert, “There is no doubt that human impacts have warmed the atmosphere, oceans, and land.”

The Planetary Boundary, a set of nine indicators of the safe zone or degree of safety for the planet, has already been exceeded for biodiversity (species extinction rate), biogeochemical flows (nitrogen and phosphorus cycles), and new chemicals such as plastics. At the 27th Conference of the Parties (COP27) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2022, measures to limit the global average temperature increase to less than 1.5 degrees Celsius above pre-industrial levels were discussed, and a fund was agreed to be established to assist developing countries with “losses and damages” caused by climate change. Japan has declared that it will reduce its greenhouse-gas emissions to virtually zero by 2050.

In 2015, another important decision was made at the United Nations: the 2030 Agenda for Sustainable Development was adopted to guide long-term development until 2030. The Sustainable Development Goals (SDGs) consist of 17 goals and 169 targets (specific goals) to be achieved by developed and developing countries working together to ensure that no one is left behind. Japan is an issue-oriented country in the SDGs and is even considered an advanced problem-solving country in some areas. However, achieving these goals is not an easy task and requires a variety of efforts and technological innovations.

In particular, solving these problems requires not only natural scientific numerical targets and science and technology, but also a social way of thinking that will significantly change people’s lives. The impact of the new coronavirus has widened social and economic disparities among people, and there is a growing tendency to prioritize one’s own country. In 2022, the Club of Rome looked back on 50 years after the “Limits to Growth,” and offered concrete proposals to reverse poverty and inequality, empower marginalized groups, and transform food and energy by 2050. It offered concrete proposals to advance the transformation of food and energy.

With those proposals in mind, RIHN will continue to explore and advocate for future possibilities, using local culture as a major stepping stone and extending the concept of the global commons. Over the past 22 years, RIHN has conducted 41 research projects and made various proposals based on the results of those projects. From now on, we will use these results as a springboard to promote transdisciplinary research, which aims to solve multiscale and complex environmental problems from the local to the global level, and to create a future-oriented society. Transdisciplinary research is a research activity in which researchers, companies, governments, municipalities, NGOs, and other interested parties come together across disciplines to address issues, and work toward multidisciplinary solutions. The modern era is called a “knowledge-intensive society.” However, there is a lot of wisdom and traditional ways of thinking that lie dormant in local communities. It is important to uncover them and draw a design for the future society that fits the local climate.

RIHN’s projects and ongoing themes have effectively interwoven the natural sciences with the humanities and social sciences, and have produced significant results that have caught the world’s attention. It has become an international center for environmental studies, leading the global network Future Earth and the Earth Hall of Fame KYOTO, and supporting the institutional design of the Globally Important Agricultural Heritage Systems (GIAHS). In collaboration with universities, local governments, and industrial companies throughout Japan, we serve as the secretariat of the University Coalition for Carbon Neutrality and the Kyoto Climate Change Adaptation Center in cooperation with Kyoto Prefecture and Kyoto City. In addition, starting this fiscal year, we have assumed responsibility for the doctoral program in Global Environmental Studies as part of the Graduate University for Advanced Studies, SOKENDAI, and will be accepting graduate students. I am determined to continue along our current path and demonstrate to the world the significance of Research Institute for Humanity and Nature while keeping an eye on the future of academia and society.



Philosophy and Goals

Vision and Mission

The Research Institute for Humanity and Nature (RIHN) promotes research activities aimed at contributing to solving global environmental problems based on the following vision and mission.

Vision

To strive for the realization of an equitable, fair and sustainable society globally by formulating how the relationship of people and nature to be, from the community to global scale.

Mission

To lead the way in the comprehensive study of the environment that aims for a practice directed towards solving global environmental problems and a fundamental and inclusive understanding of the mutual interaction of humans and nature, based on interdisciplinary research that fuses humanities, social science and natural science and as well as transdisciplinary research that cooperates and collaborates with society.

RIHN recognizes that global environmental problems are a challenge common to all humankind, and conducts research based on the foundations of various academic fields. In this context, we approach issues from a slightly different perspective from that of conventional research. The accumulation of research in individual academic fields may be insufficient by itself to approach the essence of global environmental problems. We believe that what is needed is not a partial understanding, but a holistic understanding of the relationships formed by the interaction of humans and nature. To realize this, we are promoting “integrated global environmental studies” as the pursuit of comprehensive knowledge incorporating interdisciplinary research that combines the humanities, social sciences, and natural sciences in combination with a transdisciplinary approach that aims to solve problems in cooperation with society.

According to Dr. HIDAKA Toshitaka who is the first director of RIHN, “Global environmental problems are a matter of human *culture* in the broadest sense of the word.” This means that it is a matter of culture whether we revere nature, desecrate it, feel it to be part of us, or consider it a resource to be used. Furthermore, we need to learn not only from the various cultures on the planet today, but also from the cultures of the past. An important issue in this context is what kind of culture based on the view of nature (view of Earth), that is, what kind of relationship between humans and nature, we should build in the future on a global scale based on the recognition that culture is rooted in the nature of each local region.



In response to this challenge, we have adopted the concept of “futurability,” which extends beyond the commonly used concept of sustainability. This is because it is more important to search for possibilities that will enable future generations to live better (futurability) than to find ways for us to sustain our current lives (sustainability). While understanding and considering the current problems, we must think of ways to leave the planet to the generations of our grandchildren, great-grandchildren, and more in a state that is more livable than it is today.

In 2001, the year RIHN was established, the UNESCO General Conference in Paris signed the Universal Declaration on Cultural Diversity. Article 1 of this declaration states: “As a source of exchange, innovation, and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature.” In Article 2, it states: “It is essential to ensure harmonious interaction among people and groups with plural, varied, and dynamic cultural identities as well as their willingness to live together.” Today, as the information and communication revolution progresses and urban dwellers account for about half the world’s total population, cultural diversity and its values are rapidly disappearing. Furthermore, we have now reportedly entered the “Anthropocene” era, a new geological age in which the effects of human activities have become apparent in every corner of the planet. The depletion of limited resources, deterioration of the biosphere, and pollution of the atmosphere and hydrosphere are progressing on a global scale, and problems are piling up. To solve these problems, the amelioration of which are included in the SDGs of the United Nations, as issues common to all humankind, it is necessary to create new values through various dialogues and exchanges while taking advantage of diverse values. Futurability expresses our desire to further establish “integrated global environmental studies” that consider what the future of people and Earth should be.

To achieve integrated global environmental studies, RIHN conducts interdisciplinary research traversing the academic foundations of the humanities, social sciences, and natural sciences, as well as problem-solving transdisciplinary research in collaboration and cooperation with society. We believe research should contribute to solving real-world problems, and we promote a collaborative approach in which researchers and people in society work together to uncover problems and find new frameworks and solutions.

National Institutes for the Humanities (NIHU)

The National Institutes for the Humanities (NIHU) was established in 2004 as a corporation to support and further develop inter-university research institutes* that promote research in the humanities.

NIHU's six institutes

- National Museum of Japanese History (REKIHAKU)
- National Institute of Japanese Literature (NIJL)
- National Institute for Japanese Language and Linguistics (NINJAL)
- International Research Center for Japanese Studies (NICHIBUNKEN)
- Research Institute for Humanity and Nature (RIHN)
- National Museum of Ethnology (MINPAKU)



As international centers of excellence in their respective research fields, these institutes promote fundamental and interdisciplinary research in collaboration with domestic and international universities and other research institutes and researchers. In addition, these institutes offer courses at the Graduate University for Advanced Studies (SOKENDAI). The six graduate (doctoral) courses are designed to take advantage of the institutes' resources and provide an array of specialized training for researchers.

The NIHU Headquarters houses the Center for Innovative Research (CIR), which conducts research and projects that link multiple institutes and universities, and promotes joint research using a research infrastructure built on digital technology.

* Inter-University Research Institutes

As Japanese Centers of Excellence (COE) in their respective research fields, these institutes provide universities and other research institutes in Japan and overseas with large facilities and equipment as well as vast materials and information that are difficult for any individual university to maintain, thereby facilitating effective joint research.

NIHU's Mission

As the only inter-university research institute corporation for the humanities, NIHU's mission is to comprehensively explore humanity and its cultures, and through this exploration, to ask what true abundance is, to promote harmony between nature and humanity, and to contribute to the survival and coexistence of humankind.

NIHU's Vision

To realize its mission, in the NIHU's Fourth Mid-term Plan Period (FY2022-2027), NIHU aims to explore various social issues related to the diversity of human culture and social dynamics, try to solve them, and present new values and humanities knowledge that will serve as guidelines for the formation of a future society in which people and nature live in harmony and where science, technology, and humanity coexist. To achieve this, the Center for Innovative Research was established within the NIHU headquarters with the aim of forming new knowledge open to society. Based on the philosophy of open humanities research through co-creation with various people in Japan and overseas, the center will build a research platform using digital technology, promote joint research through that platform, and work on the formation of a "Knowledge Forum" as a place for exchange and collaboration with various people in society and the formation of an international network.

Center for Innovative Research (CIR)

CIR promotes “NIHU Research Projects” and “NIHU Co-creation Initiatives.”

NIHU Research Projects

As basic and interdisciplinary research on the humanities, which forms the core of NIHU, eleven research projects in three types will be implemented, leading to an expansion of academic networks and the creation of new fields to strengthen functions for fulfilling our mission as an inter-university research institute.

Institute-based Projects NIHU's six institutes have established priority research themes in accordance with their respective missions.	Construction of Japanese Historical Knowledge and Open Science Research
	Model Building in the Humanities through Data-Driven Problem Solving
	Empirical and Applied Research on the Japanese Language Based on Open Language Resources
	New Departures and Consortium for Global Japanese Studies: Pioneering and Cultivating Global Japanese Studies
	Renewing Modern Civilization through Nature-culture Complex toward Solving Global Environmental Problems
	Sustainable Development Humanities Research Based on the Info-Forum Archives of Human Culture
Multidisciplinary Collaborative Projects These are projects in which NIHU's institutes take on a central role while collaborating with other NIHU's institutes as well as universities and other external institutes, working with research themes that cut across different fields.	Interdisciplinary and Integrated Studies on Local Cultures: Aiming for the Emergence of Novel Communities
	Object-based Research of Nature-human Interactions up to the Anthropocene
	Expansion Studies of Synthetic Bibliology
Network-based Projects These are projects in which NIHU's institutes play a central role in forming a network with universities and other research institutes in Japan and overseas as well as implementing issues that are important to Japan and the world.	NIHU Global Area Studies
	Inter-University Research Institute Network Project to Preserve and Succeed Historical and Cultural Resources

NIHU Co-creation Initiatives

These are projects that promote the sharing of research results and co-creation with local communities and societies, promote **Co-creation research projects** and **Co-creation outreach**, whose aim is to develop research in three ways: “social co-creation,” “digitalization,” and “international co-creation.”

Co-creation Research Projects

These projects promote joint research through co-creation with various organizations and people within and without NIHU as well as develop research in three ways.

- Establishing Science for Universal Communication (S_COM) [social co-creation]
- Building Digital Library for Humanities [digitalization]
- Japan-related Documents and Artifacts Held Overseas: [international co-creation]
 - Early Diplomatic Japanese Collections Abroad: Contextualizing 19th Century Japanese Material Heritage in World History through On-site and Online Research and Use
 - Study on the Construction of Archival Infrastructure for the History of Modern Japan-Vatican Relations
 - Japan-related documents and artifacts in Hawai'i: historical and social survey interface

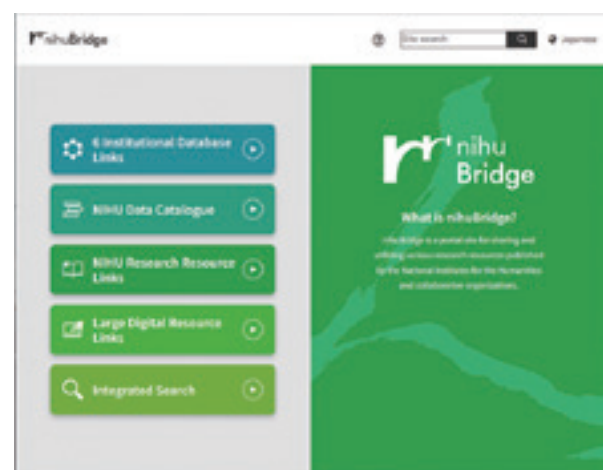
Co-creation Outreach

These initiatives implement projects to accelerate the three types of research development as well as aim to enhance and innovate research at NIHU's institutes and universities and other external institutes.

- NIHU Knowledge Co-creation Projects [social co-creation]
- NIHU “Digital Humanities” (DH) Projects [digitalization]
- NIHU Global Partnership [international co-creation]

nihuBridge

This is a portal site for sharing and utilizing diverse research resources disseminated by the NIHU and associated institutes.

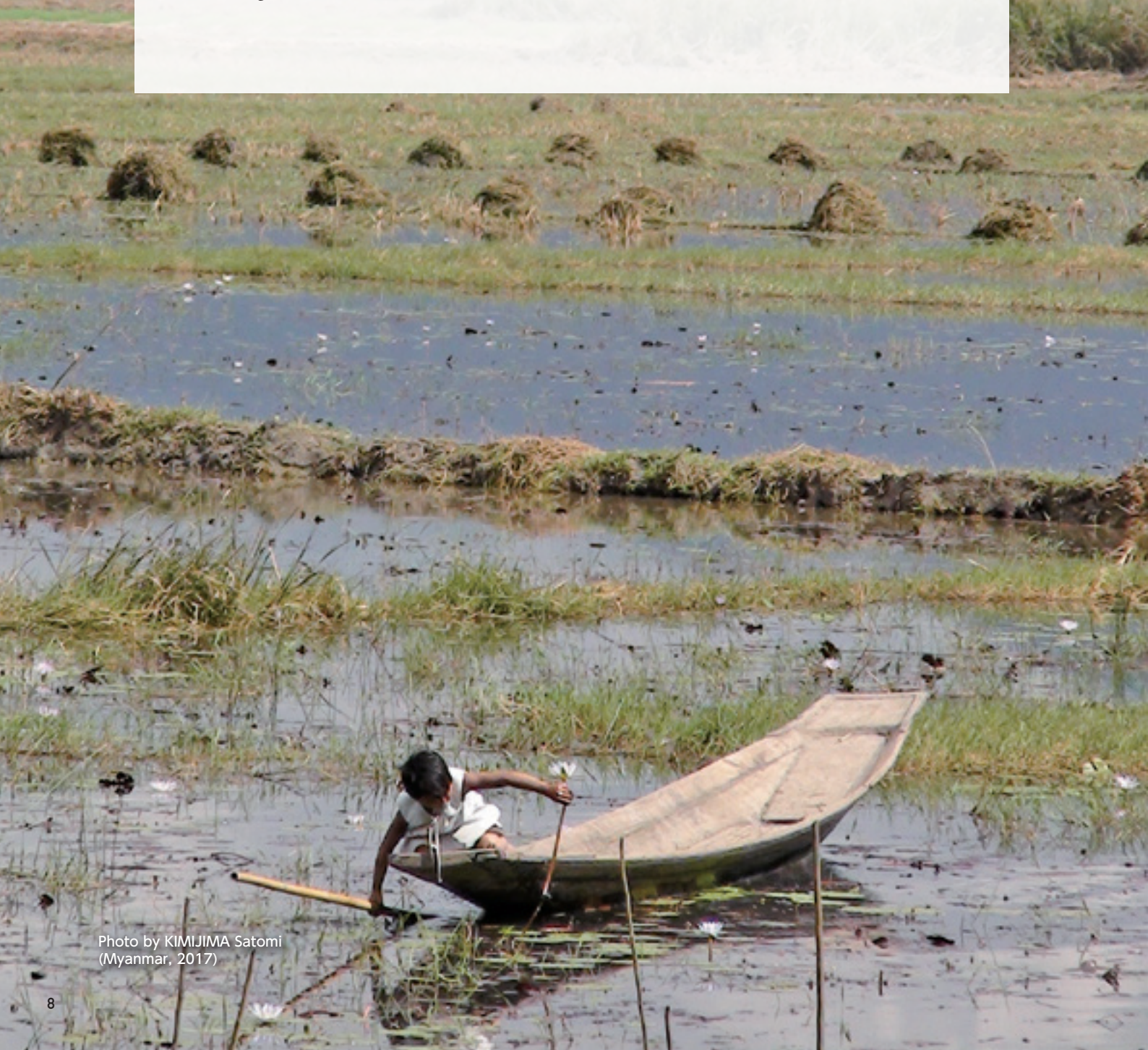


Research Activities at RIHN

RIHN, as an inter-university research institute corporation, aims to lead integrated research in the field of global environmental studies by providing a research infrastructure that universities alone cannot offer. This endeavor focuses on achieving a fundamental and comprehensive understanding of the interaction between humans and nature and addressing environmental issues.

At RIHN, research projects are conducted through a “program-project system,” which involves soliciting research topics from a wide community of researchers through international collaboration. Additionally, the “Environmental Isotope Study Collaborative Research Program” provides an environment for domestic and international researchers to effectively engage in advanced collaborative research by utilizing experimental facilities and equipment.

Furthermore, special collaborative research projects called “Designated Research” are conducted in response to the societal demands for the formation of integrated research in the field of global environmental studies and the resolution of global environmental issues.



Program-Project System

The Research Institute for Humanity and Nature (RIHN) is developing integrated research that transcends existing academic fields and disciplines through the “Program-Project System,” in which several research projects are bundled together in a program. Programs consist of “Research Programs” and “Strategic Program,” with several research projects under each program. The research projects are conducted in accordance with the priority issues set for each program.

In the fourth mid-term goals and plans for RIHN, which started in fiscal 2022 and span six years, the institute aims to reveal the dynamics of the interrelationships among various elements in the global environmental issues and the temporal historical development process leading to the “Anthropocene.” It sets programs that will contribute to a more future society and implements them. The institute aims to achieve flexible, versatile and effective outcomes and disseminate them to society.

Research Program

Research Programs are implemented based on the mission of each of the programs, which was developed in accordance with RIHN’s mission and the activity policy that contributes to the realization of the promotion goals during Phase 4 and includes the following three perspectives. Each Program Director sets a mission statement and announces an open call for projects aiming to achieve such mission.

1. The perspective to explore the understanding of environmental changes and the responses to degradation from the stand point of the Earth system.
2. The perspective to explore “way of life” in the Anthropocene by grasping environmental problems from their connection with culture and value systems.
3. The perspective to develop approaches and ideas for solving global environmental problems and suggest mechanisms to realize the solutions in collaboration with various actors in society.

Strategic Program

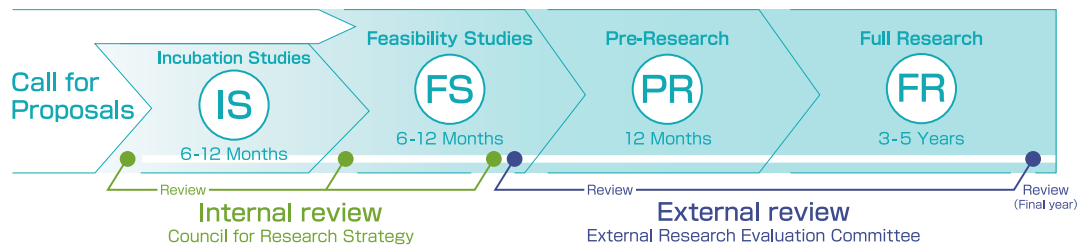
This program is designed to formulate important concepts and theories for interdisciplinary and transdisciplinary research towards further synthesis of global environmental research, and to formulate a framework for methodologies for social practice in problem-solving. While working in collaboration with Research Programs and Projects, this program will make use of the resources of the RIHN Center and incorporate transdisciplinary research from external sources to construct concrete and applicable theories, methodologies and concepts that align with RIHN’s mission.

Research Phases of Projects Promoting the Integration of Humanities and Natural Science and Transdisciplinary Research

Promoting interdisciplinary research through exchanges across a wide range of fields is essential for understanding and addressing global environmental issues. However, it is not always easy for scientific disciplines with different problem-solving approaches and research methods to set common issues and collaborate on them. Additionally, in order to address cutting-edge challenges, there is a need to establish a structure that clearly define objectives and goals, and conduct appropriate pre- and post-evaluations. Therefore, in the Research Projects at RIHN, researchers from different disciplines exchange ideas and collaborate with society. They progressively deepen and refine their research through internal reviews and external evaluations, taking on difficult challenges.

Research Projects consist of three stages: Incubation Studies (IS), Feasibility Studies (FS) and Full Research (FR). There is also a preparatory phase called Pre-Research (PR) before Full Research (FR). Research proposals that can immediately contribute to Research Programs may skip the IS stage and begin with the FS stage.

Project Formation for Research Projects



Project Formation for Strategic Projects



IS is a collaborative research stage with the purpose of discovering new research seeds in integrated research aimed at solving global environmental issues. After passing the internal review at RIHN, the project can advance to the FS stage. FS is a preliminary collaborative research to verify the feasibility of the Full Research (FR). During the IS and FS stages, Principal Investigators gather researchers from domestic and international sources and form research teams necessary to advance their research.

Once the proposal is accepted as PR/FR, the project leader becomes a full-time faculty member of RIHN and can publicly recruit and employ project researchers. The number of collaborative researchers in a single project may exceed 150 in some cases, and to date, over 4,000 researchers have been involved in RIHN's projects.

Through these multi-stage processes, outcomes are generated through interdisciplinary collaboration and integration, and the research resources such as methodologies and information obtained during this process are passed on to subsequent projects.

■ Programs of the 4th Mid-Term Plan and Fiscal Year (FY) of Project Application

Program Name	Program Director	FY of Project Application
Research Program		
Towards a Global Environmental Culture by Articulating Science with Indigenous Knowledge (Global Environmental Culture Program)	MATSUDA Motoji	FY2021 (IS and FS) FY2022 (FS only)
Combining Knowledge for a Fundamental Innovation of Land Use to Combat Global Environmental Challenges (Combining Knowledge for a Fundamental Innovation of Land Use Program)	SHOBAYASHI Mikitaro	FY2022 (IS and FS) FY2023 (FS only)
Co-creation of the Sustainable Future based on the Linkage of the Earth-human System (Co-creation of the Earth-human System Program)	TANIGUCHI Makoto	FY2023 (IS and FS) FY2024 (FS only)
Strategic Program	TANIGUCHI Makoto	No open call in Phase 4

Project Index

Research Program

■ Full Research (FR)

Global Environmental Culture Program MATSUDA P13
Towards a Global Environmental Culture by Articulating Science with Indigenous Knowledge Motoji

FR5 Supply Chain Project KANEMOTO P14
Mapping the Environmental Impact Footprint of Cities, Companies, and Households Keiichiro

FR5 SRIREP Project SAKAKIBARA P16
Co-creation of Sustainable Regional Innovation for Reducing Risk of High-impact Environmental Pollution Masayuki

Combining Knowledge for a Fundamental Innovation of Land Use Program SHOBAYASHI P19
Mikitaro

Combining Knowledge for a Fundamental Innovation of Land Use to Combat Global Environmental Challenges
FR2 FairFrontiers Project Grace WONG P20
Fair for Whom? Politics, Power and Precarity in Transformations of Tropical Forest-agriculture Frontiers

Co-creation of the Earth-human System Program TANIGUCHI P23
Co-creation of the Sustainable Future based on the Linkage of the Earth-human System Makoto

FR4 Aakash Project Prabir K. PATRA P24
An Interdisciplinary Study Toward Clean Air, Public Health and Sustainable Agriculture: The Case of Crop Residue Burning in North India

FR2 LINKAGE Project SHINJO Ryuichi P26
Adaptive Governance of Multiple Resources based on Land-Sea Linkages of the Water Cycle: Application to Coral Reef Island Systems

FR1 Sustai-N-able Project HAYASHI Kentaro P28
Towards Sustainable Nitrogen Use Connecting Human Society and Nature

■ Pre-Research (PR)

PR Organic Material Circulation Project OYAMA Shuichi P30
Building up Organic Material Circulation System among Urban and Rural Area: Toward the Integration of Local Perception and Scientific Knowledge

PR SceNE Project WATANABE P31
High-resolution Reconstruction of Resilient Indigenous Lifestyle in Environmental Changes to Future Collective Knowledge Deduced from the Fusion of Science and Arts Tsuyoshi

■ Feasibility Studies (FS)

The Value of Forests - A Vision of the Future for People and Society Living in Harmony with Forests - OHTE Nobuhito P32

Creation of Passive Architectural Culture among Urban Houses in the Monsoon Asia KUBOTA Tetsu P33

Grasping the Base Values of "Sustainability" and Cross-cultural Comparison of Cognitions and Practices on Global Sustainability Concerns YAMADA Shoko P34

Coproduction Research with Local Practice and Science for Sustainable and Fair Hunting of Forest Wildlife HONGO Shun P35

Satoyama Reconnections: Engaging Communities in Resilient, Nature- and Climate-positive Land Use Futures Janet DWYER P36

Strategic Program

■ Full Research(FR)

FR2 Future Design Project NAKAGAWA P38
Development and Pluralistic Coexistence of Sustainability Visions Through Future Design Yoshinori



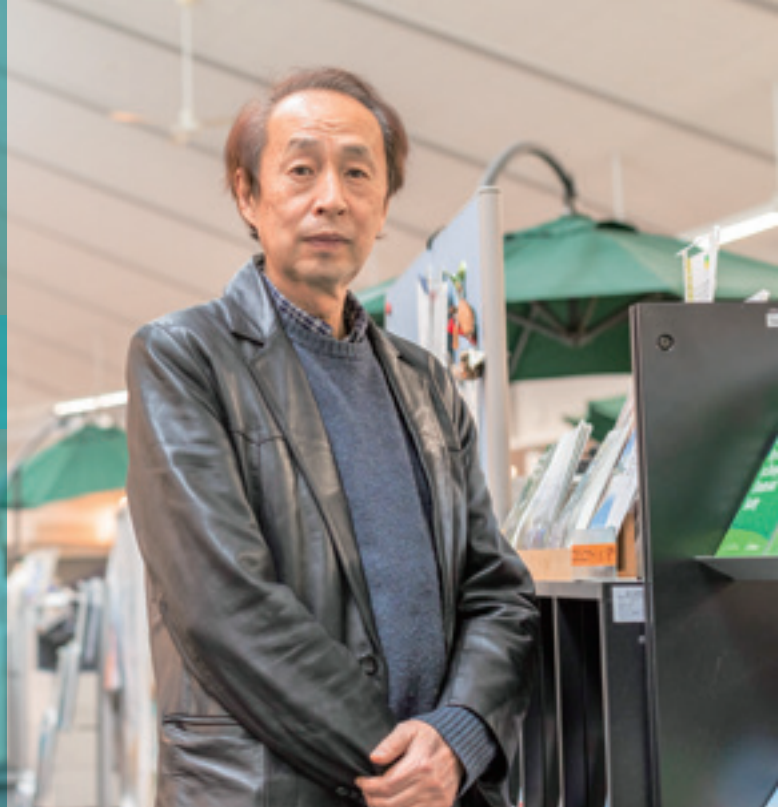
Photo by MYO HAN HTUN
(Myanmar, 2010)

Research Program

Global Environmental Culture Program

Towards a Global Environmental Culture by Articulating Science with Indigenous Knowledge

Program Director
MATSUDA Motoji



Program outline

How should we deal with global environmental problems and what steps should we take to solve them? This program combines research that approaches this question from the perspective of changes in culture and values. We need to recognize what types of problems are emerging as global environmental issues. To achieve this goal, we need to analyze enormous amounts of complex data through collaborations in various fields of natural and social sciences to visualize actual crises. Through these studies, we can gain awareness of environmental crises and share our perceptions of them. Using science to visualize, become aware of and share information on crises, we can prepare to solve global environmental problems.

However, this is not the ultimate goal of this program. We need to identify how we as a society can change our behaviors and values in response to this shared perception of global

environmental crises.

We are exploring how the perspective of culture can be incorporated into the concept of global environmental issues to build a sustainable society. The cultural perspective should not be discussed in terms of global or national levels, but as something more familiar and relatable. This implies prioritizing the cohesiveness of the people who actually live together and emphasizing values of better living. The cultural perspective also includes values that differ from scientific knowledge. Rather than correcting, praising, or approving these values, we need to develop a convivial atmosphere (wherein different things are connected using each other's characteristics) and creative perspective that is mutually transformative. This program integrates research projects that create such perspectives.



Nairobi River in Kenya becoming a dumping ground.



Community forest in Northern Thailand reforested by local communities.

Program Director

MATSUDA Motoji

Specialty Appointed Professor, RIHN

Motoji MATSUDA is Professor of Sociology and Anthropology, Research Institute of Humanity and Nature, Japan. The regional focus of his research include Nairobi and Western Kenya, and his research topics are urbanization, migration and conflict resolution. His major works include *Urbanisation from Below* (Kyoto: Kyoto University Press, 1998), *African Virtues in the Pursuit of Conviviality: Exploring Local Solutions in Light of Global*

Prescriptions (co-edited with I. Ohta and Y. Gebre, Bamenda: Langaa RPCIG, 2017), *The Challenge of African Potentials: Conviviality, Informality and Futurity* (co-edited with Y. Ofosu-Kusi, Bamenda: Langaa RPCIG, 2020), and *AFRICAN POTENTIALS: Bricolage, Incompleteness and Lifeness* (co-edited with I. Ohta and F. Nyamnjoh, Bamenda: Langaa RPCIG, 2022).

Researcher at RIHN

HAMADA Takeshi

Researcher



Supply Chain Project

Mapping the Environmental Impact Footprint of Cities, Companies, and Households

Rapid economic growth in China and other developing countries due to expanding global supply chains is causing severe environmental burdens. These burdens, such as PM_{2.5} emissions, have a critical effect on health hazards and other environmental problems, but the full extent is unknown. This project is investigating the effects of global supply chains in cities, companies, and households on the environment.

Project Leader
KANEMOTO Keiichiro



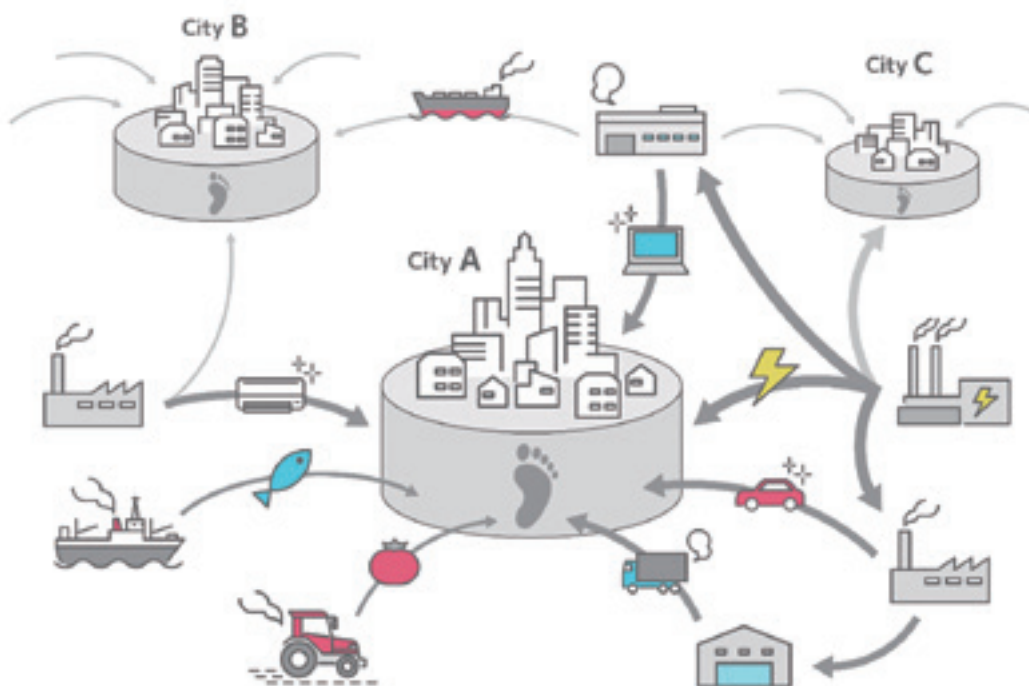
Project overview

The health hazards caused by PM_{2.5} in China and India and the biodiversity crisis in Southeast Asia and the Amazon are often viewed as foreign environmental problems. However, some of the PM_{2.5} may be emitted from factories that make the products that support our daily lives. Deforestation, which threatens biodiversity, may be happening to obtain wood for our homes.

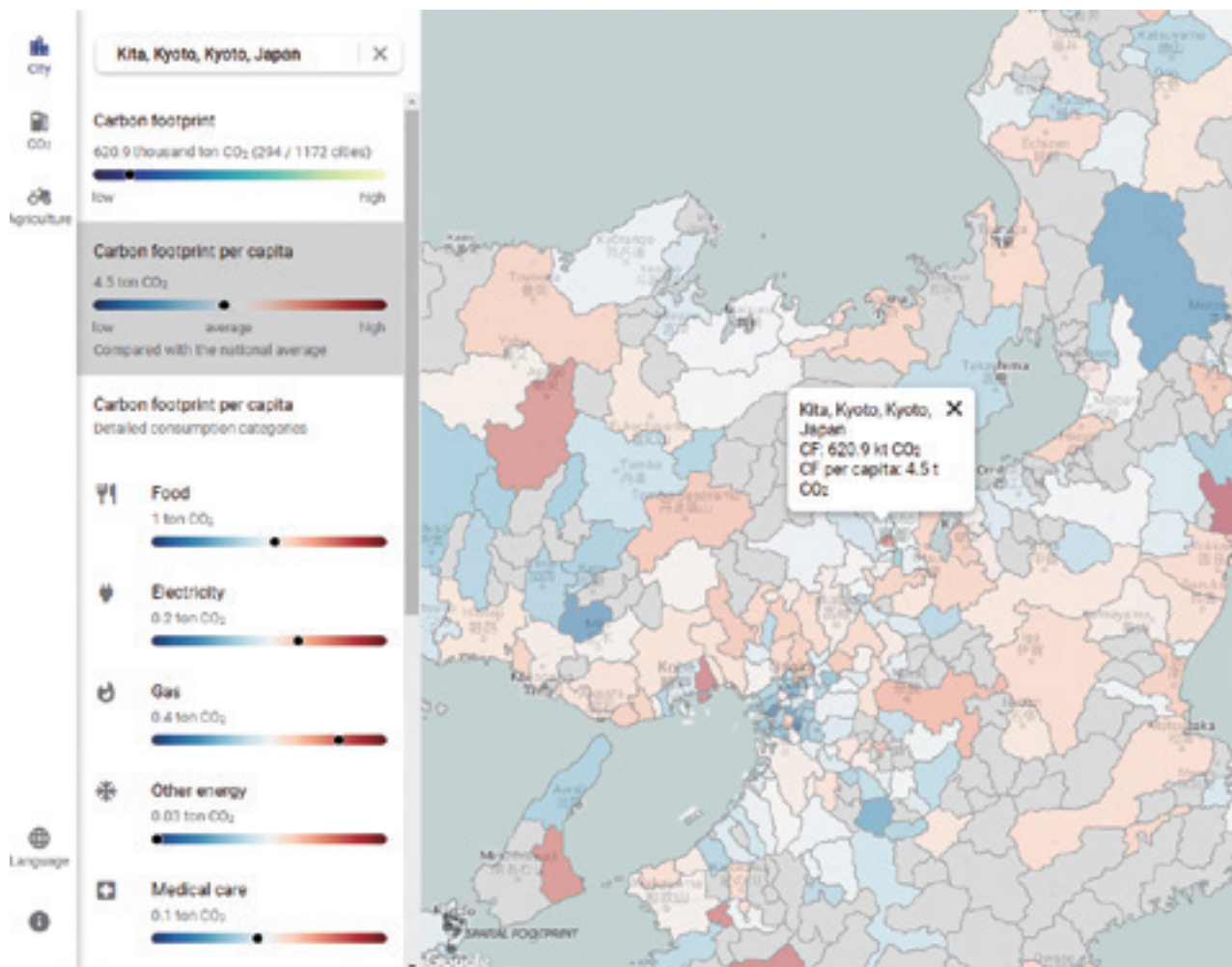
In today's age of global distribution of products and services, environmental issues are also global in scope. However, it is still not fully clear how household consumption behavior and corporate procurement behavior affect the environment through the global supply chain. In this project, we are conducting research to clarify this through the analysis of

various data. Specifically, by combining our consumption data and data on environmental impacts through the supply chain, we are comparing CO₂ emitted through the supply chain by consumers in cities such as Tokyo, Osaka, Paris, Mumbai and Jakarta. We analyze the carbon footprint and environmental impact of consumption and procurement behaviors in cities and households as our research subjects.

While the research for this project is data-driven, we also collaborate with researchers in the field. We hope that the results of our research will help to “visualize” the global environmental impact of urban consumption behavior and bring about changes in consumption and procurement behavior.



A conceptual figure of the environmental footprint of cities.



A webpage screenshot of the carbon footprint of cities.

Research progress

2017 2018 2019 2020 2021 2022 2023
 FS1 - FS/PR - FR1 - FR2 - FR3 - FR4 - **FR5**

What we know so far

Previous studies have shown how much CO₂ is emitted through the supply chain for urban and household consumption. Cities around the world are not complete unto themselves, but consume products and services produced outside of them, and understanding the environmental impacts emitted in this process helps us understand the sustainability of cities. It is also becoming clear that a small number of households are having a very large amount of environmental impact compared to other households. The carbon footprints of cities in Japan, India, the EU and Indonesia can be found on the website <https://city.spatialfootprint.com/ja/>. We have also published an analysis of the amount of CO₂ emitted through consumption by people living in about 13,000 cities worldwide in fiscal 2018. While there have been studies that have calculated the carbon footprint of cities in individual cases, this is the first study to

comprehensively estimate the carbon footprint of cities around the world. In addition to CO₂, we are addressing a variety of environmental issues through our supply chain. For example, we have successfully mapped the extent to which consumption around the world is causing deforestation through timber and food imports.

The results of these studies have been published in the journals “Environmental Research Letters,” “One Earth,” and “Nature Ecology & Evolution.”

Noteworthy items

In 2022, we not only revealed the carbon footprints of cities in several countries, but also conducted household-level analyses and analyses combining multiple environmental issues. We disseminate information widely not only through academic journals but also through our website, etc.

Project Leader

KANEMOTO Keiichiro

Associate Professor, RIHN / Associate Professor, Tohoku University
 Keiichiro Kanemoto is an Associate Professor of the Research Institute for Humanity and Nature. Before that, he was a Lecturer at the Institute of Decision Science for a Sustainable Society, Kyushu University, and Faculty of Economics and Law, Shinshu University. From 2009 - 2011, he was a visiting research fellow at Integrated Sustainability Analysis, the University of Sydney. Dr. Kanemoto received his Ph.D. in 2014 from Tohoku University. From 2018 to 2022, he was named a Highly Cited Researcher in the field of Cross-Field by Clarivate Analytics.

Researchers at RIHN

Nguyen Tien Hoang

Specially Appointed Assistant Professor

Jemyung Lee

Senior Researcher

Yuya Katafuchi

Senior Researcher

Muhamad Fahmi

Researcher

Xinmeng Li

Researcher

SRIREP Project

Co-creation of Sustainable Regional Innovation for Reducing Risk of High-impact Environmental Pollution

This project is based on sustainable and local innovation for mercury pollution from artisanal and small-scale gold mining (ASGM) through the learning and practice of Transdisciplinary Communities of Practice (TDCOP) with residents using Transformative Boundary Objects (TBOs); local icons with high cohesive power for the residents. In addition, it is using “Mercury Free Society Networks” to link bottom-up and top-down approaches to build solutions.

Project Leader
SAKAKIBARA Masayuki



Project overview

Environmental pollution is a serious problem caused by human activities. Especially in developing countries, where economic development takes precedence over environmental conservation, there are no clear paths to solving this problem. Our research aims to find a way to solve poverty and environmental problems at the same time and to create a sustainable society.

Our research focuses on mercury pollution caused by artisanal and small-scale gold mining (ASGM) in ASEAN. In ASGM, gold ore is mixed with mercury to extract the gold as a mercury amalgam, and then heated to vaporize the mercury to obtain gold. The residual leavings containing mercury are dumped into soil and rivers, etc., and large amounts of mercury vapor are released into the atmosphere, leading to extensive mercury contamination of soil, rivers, and oceans (Figure 1).

To address this problem, this project is conducting research at three levels, with researchers collaborating with local residents, private sector officials, NGO staff, and local government officials. The second level is to build inter-regional

networks between the ASGM region and other regions, and to work with citizens to make mercury pollution a national problem and to achieve zero mercury emissions. We are working to strengthen the environmental governance through citizen collaboration in ASEAN and to establish a collaborative network to address the issue of mercury pollution (Figure 2).

In these studies, we hope to generate strong interest among stakeholders and encourage them to participate in the Transdisciplinary Communities of Practice, especially through the use of TBOs, such as technologies, activities, and local icons that can lead to solutions to the problems. We also want to connect people in ASEAN countries. Furthermore, by creating and working with the Mercury Free Society Networks (MFSN), which connects people in ASEAN countries, we aim to provide a realistic path to solving the problem, taking into account the cultural, social, and economic background of the ASGM region, and to build momentum for tackling mercury pollution issues throughout ASEAN.



Figure 1 Hg amalgamation process and pollution related to ASGM.

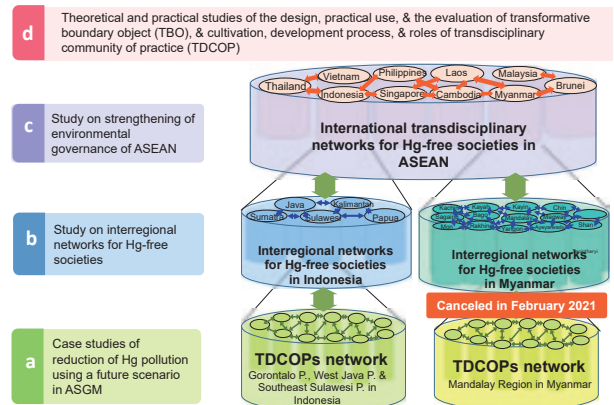


Figure 2 Structure and composition of the SRIREP research project.

What we know so far

In a case study in Indonesia, a TBO was used to form a TDCOP with local residents to discuss, learn, and implement solutions to mercury pollution caused by ASGM. In the process, the residents' awareness of the environment and their hopes for the future have changed. We believe that this change in residents' values will lead to sustainable regional innovation. Furthermore, the MFSN can further advance the clarification of the path to solving the mercury problem through ASGM by linking bottom-up and top-down processes.

Noteworthy items

In the case study, each TDCOP was able to develop active activities even when Japanese members were unable to travel from Japan due to COVID-19, as a result of continuous in-depth online meetings held two to three times per month along with practical studies conducted by local researchers (Figure 3). In particular, the residents and researchers involved in the study of natural fibers and traditional embroidery have been working to develop natural fiber products and traditional

embroidery-making into sustainable industries as alternative livelihoods for communities, including miners' families in the ASGM region. They are also promoting the development of the Indonesian TDCOP into an international multi-sectoral collaboration between Japan and Indonesia. The project is evolving from an Indonesian TDCOP activity into an international multi-sectoral collaboration between Japan and Indonesia. In addition, as part of the interregional network research aiming for zero mercury, three medical workshops were held for Indonesian medical professionals and researchers (Figure 3). Furthermore, we have started to produce comics in Japanese, English, and Indonesian on the subject of environmental pollution caused by mercury (to be published in August 2023) (Figure 4). In addition, 10 joint research papers by domestic and international members have been published in international journals.



Figure 3 Flyers of the medical workshops on mercury pollution.

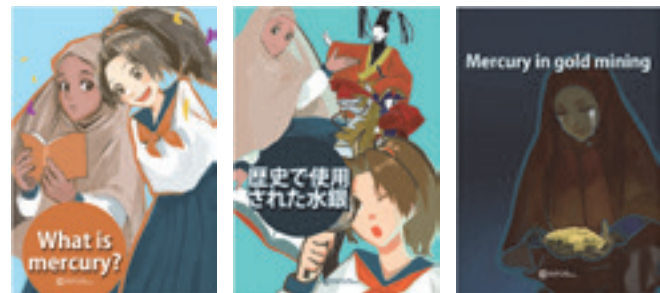


Figure 4 Comics cover pages on mercury pollution.

Project Leader

SAKAKIBARA Masayuki

Professor, RIHN / Professor, Ehime University

Professor Masayuki Sakakibara is an earth scientist with a multidisciplinary background in geology, petrology, astrobiology, geochemistry, medical geology, geoengineering, and remediation engineering. He is currently working at the Faculty of Collaborative Regional Innovation and Graduate School of Science and Engineering, Ehime University. His interest in environmental pollution has enabled him to conduct intensive fieldwork and activities to reduce mercury pollution and poverty problems in artisanal and small-scale gold mining (ASGM) areas in Indonesia and Myanmar. He has further participated in numerous international conferences and seminars, such as Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA) and Transdisciplinary Research and Practice for Reducing Environmental Problems (TRPNEP).

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A. Idham Kurniawan	Institut Teknologi Bandung
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Hanung Isomono	Lampung University
Basri	Institute of Technology and Health of Tri Tunas Nasional
Bobby	Network Activities Groups



Photo by UEHARA Yoshitoshi
(Philippines, 2018)

Research Program

Combining Knowledge for a Fundamental Innovation of Land Use Program

Combining Knowledge for a Fundamental Innovation of Land Use to Combat Global Environmental Challenges

Program Director

SHOBAYASHI Mikitaro



Program outline

Land use generates a variety of socioeconomic benefits, and as a foundation for socioeconomic activities, it plays a major role globally in addressing population growth and reducing poverty. However, both socioeconomic activities on land and changes in land use create core global environmental challenges, such as greenhouse-gas emissions and the depletion of ecosystem services. Drastic improvements in land use and management practices, such as sustainable intensification, are required in certain geographic areas. For example, changing the sites or methods of land use in rural or urban areas can enhance ecosystem services, flood control capacity, and soil carbon sequestration, while stimulating the deployment of renewable energy. These science-based innovations are urgent, as the remaining time is limited.

Challenges must be confronted to substantially improve land use. One is to resolve the conflict between regional collective actions and the actions of individual actors, including private

sectors in the current socioeconomic system. Another challenge is the need to develop strategies and organizations that address issues arising from the varied relationships between socioeconomic activities and natural capital in diversified contexts and geographical areas. Furthermore, there are additional perspectives to coordinate in new strategies. As examples, land use forms the basis of local culture, and rural and urban areas further complement and interlink with each other as well.

This program aims to propose initiatives for improving the use of land and its associated water resources, as well as the institutional frameworks and policies for scaling them up. Additionally, it should contribute to the establishment of international standards for institutional frameworks and policies. The program will do so by facilitating an international policy ecosystem for the exchange and generation of innovative ideas.



Photo by Yuzuru Wakabayashi

Program Director

SHOBAYASHI Mikitaro

Specially Appointed Professor, RIHN

Dr. Shobayashi graduated from the Graduate School of Agricultural Sciences, of the University of Tokyo, and the Master's Course from Johns Hopkins University, Department of Geography and Environmental Engineering. He holds a doctorate in agriculture from the University of Tokyo. Since 1982, he has worked in policy planning related to agricultural policy,

agricultural environment and water resource policy, trade and environment, etc. at the Ministry of Agriculture, Forestry and Fisheries, the World Bank, the OECD (Organization for Economic Co-operation and Development), and the Shiga Prefectural Government. Since 2007, he has been a professor at Gakushuin Women's College, in the Faculty of Intercultural Studies. Since 2017, he has been a vice president of the same college. He has been in his current position since April 2023. His major publications include "Agri-environmental Policy in Japan" and "The Concept and Policy Design of Agricultural Direct Payments."



FairFrontiers Project

Fair for Whom? Politics, Power and Precarity in Transformations of Tropical Forest-agriculture Frontiers

In the tropics of Central Africa and Southeast Asia, frontier deforestation is rapidly transforming landscapes, livelihoods, and the well-being of its local people. This is not only a global environmental problem, but also a crisis of local social and ecological systems. This project is conducting case studies on the development and transformation of the forest frontier to identify conditions that will enable more equitable and sustainable development.

Project Leader
Grace WONG



Project overview

Throughout the tropics, forest-agriculture frontiers dominated by diverse swidden and smallholder practices are rapidly being converted to homogenous landscapes of commodity agriculture. These frontiers of agriculture, fallow and forest mosaics provide multiple ecosystem services, support social, cultural and livelihood needs, and are areas where farmers have traditional rights to land and resources. This is not a simple trajectory of change, however. Land use intensification – often pursued under the guise of sustainable development – has often not led to expected win-win social and ecological outcomes, and smallholders in these landscapes often benefit less than local elites and external investors, reflecting underlying politics and institutional and power structures around forests and land-use tenures. FairFrontiers applies inter- and transdisciplinary approaches to ask: Whose interests drive the transformations of forest-agriculture frontiers, who benefits and who is made precarious? What are possible policy options that can deliver ecologically sustainable and socially equitable outcomes?

To address these research questions, the project is organized into five interlinked research modules (see Project Structure) and will carry out research in Southeast Asia (Malaysia (Sabah, Sarawak), Laos, Myanmar and Indonesia) and Central Africa (Cameroon, Democratic Republic of the Congo). The first research module delves into the historical (and colonial)

constructs of policies for forest and land and their contemporary pathways, and carry out critical discursive analyses of how policies frame and problematize development in forest-agriculture frontiers. The second and third modules examine how ecosystem services and wellbeing bundles are changing in frontiers using a set of mixed methods and participatory approaches. The fourth module applies transdisciplinary approaches in the co-production of knowledge on and inclusion of diverse and local narratives of sustainable futures. Last but not least, the fifth module carries out integrative and comparative analyses across modules, scales and countries through structured qualitative and quantitative analyses. The case study regions provide unique contexts along different ecological, social and institutional gradients such as forest cover, ecosystem diversity, inequality and human well-being, institutional/political control, and democracy and civil society engagement in policy processes. Together, these approaches support the advancement of theory and methods for assessing equity, ecosystem services and well-being, and identification of the enabling and hindering conditions for more equitable and sustainable development pathways for the millions of people who still depend on these diverse landscapes for their livelihoods and well-being.



Figure 1 FairFrontiers project structure



Photo 1 Forest-agriculture frontier in Sarawak

What we know so far

We are carrying out literature reviews and empirical analyses on the interlinkages between ecosystem services and wellbeing, with a particular focus on non-material wellbeing. This thinking is in line with the IPBES approach (<https://www.ipbes.net/>) which recognizes diversity in how people interact with and value nature, beyond narrow economic values. Another topic of ongoing research is media-based discourse analyses to examine how development in frontiers is framed in the media, by whom and for whom. A recent study led by our project core members used twitter data to investigate advocacy coalitions and the power to influence deforestation politics in DR Congo (Malkamäki et al., in press). We are carrying out similar analyses with newspaper media to unpack the coalitions advocating for, and resisting against, a forest carbon offset policy in Sabah, Malaysia, and oil palm development in Kribi, Cameroon. This work enables us to understand the discursive power underlying how decisions and practices of development in forest frontiers can exclude, yet disproportionately affect, indigenous peoples and local communities who live and work in these spaces.



Photo 2 Graduate interns interviewing local community members in Kribi, Cameroon

Noteworthy items

The project's analytical framework is built on theories of power and everyday politics, social and environmental justice, and ecosystem service science. Over the past year, we have initiated field research activities in the Kribi region of Cameroon with local partner Green Development Advocates and graduate student interns (see Photos 2-3).

We continue to carry out in-depth background studies, such as the critical review on narratives of development in forest frontiers within the scientific literature and their persistence over time (Wong et al. 2022) and produced several empirical papers addressing issues of indigenous rights (Tsanga et al. 2022) and injustices of conservation practice in Cameroon (Assembe-Mvondo et al., in press), and the politics of knowledge co-production in Indonesia (Sahide et al. 2023).



Photo 3 Graduate interns and RIHN researchers discussing field work results

Project Leader

Grace WONG

Associate Professor, RIHN / Stockholm Resilience Centre, Stockholm University

Grace Wong is a natural resource economist. Over the past two decades, her research has largely converged on assessing social, economic and ecological trade-offs in changing tropical environments at the interface of development and conservation processes. She has worked extensively throughout Southeast Asia and Latin America and more recently in Sub-Saharan Africa. Her current research is on the politics and governance of forest, climate and ecosystem services, with particular focus on issues of power, gender, and equity.

Sub Leaders

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Maira Moeliono	CIFOR
Shoko Sakai	Hong Kong Baptist University

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Kia Meng Boon	Researcher
Catherine Hepp	Researcher

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Researcher
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Photo by TERAMOTO Shun
(Kyoto, Japan, 2019)

Research Program

Co-creation of the Earth-human System Program

Co-creation of the Sustainable Future based on the Linkage of the Earth-human System

Program Director
TANIGUCHI Makoto



Program outline

Global environmental problems are local, regional and global challenges that have arisen from the intricately intertwining of various phenomena created by humankind as part of the development of civilization with the earth and life history. In order to solve these problems, this program aims to shed light on the connections among people, society and nature, and to integrate research that considers the earth and humans as a linked system.

How can human beings build a sustainable society in the overwhelmed global environment due to the expansion of human activities and the cascade of events that will exceed them? The underlying basic question is how people should behave. This program clarifies the various boundaries and linkages existing in the earth-human system that compose complex global environmental issues. The program focuses on promoting better understanding and communication methods

that make changes in human lifestyles, values, behavior and society. We want to transform the relationship between humans and nature for a sustainable future by co-creating a multi-scale social design that connects all the people.

In our lives, we make seemingly contradictory choices, such as securing homogeneous resources and maintaining a diverse environment, enjoying benefits and mitigating disasters, and choosing between immediate decisions and distant goals. It is necessary to reconsider and re-establish various boundaries among people, society, and nature by moving from the confrontation and separation of nature and human society toward a symbiotic, coexisting society based on norms. This program tries to reduce conflicts/tradeoffs among resources, and among social activity processes, and increase synergy among them through co-creation with stakeholders.



Program Director

TANIGUCHI Makoto

Professor, RIHN

Prof. Makoto Taniguchi is a hydrologist and a deputy director-general at the Research Institute for Humanity and Nature (RIHN), Japan. He is an IUGG Elected Fellow, a JpGU Fellow, a Cooperation Member of Science Council of Japan, a Future Earth Assembly member, and a Steering Committee member of Water-Energy-Food Nexus KAN. He served as PI

and Co-PI of many research projects including UNESCO-GRAPHIC, Groundwater in Asian Megacities, Water-Energy-Food Nexus, and the Belmont Forum SUGI Food-Energy-Water NEXUS. He has worked on water-related projects around the world, authored or co-authored over 180 articles, and edited or co-edited eight books.

Aakash Project

An Interdisciplinary Study Toward Clean Air, Public Health and Sustainable Agriculture: The Case of Crop Residue Burning in North India

A large amount of rice straw is burned after the harvest of kharif crops (summer crops such as rice and corn) in the state of Punjab in northwest India, releasing large amounts of pollutants into the atmosphere. The air pollution effects of this practice extend to Delhi and beyond. The Aakash project is exploring ways to shift people's behavior to sustainable agriculture in the Punjab region to reduce the health hazards caused by air pollution.

Project Leader

Prabir K. PATRA



Project overview

In the Punjab region of northern India (Figure 1), double cropping of rice and wheat is popular since the green revolution. However, to protect groundwater resources, rice planting is delayed by law until the rainy season begins, so the rice harvesting and field preparation for wheat seeding period are concentrated in a short period of time. Therefore, a large amount of rice straw is burned from late October to early November, and the smoke from this burning is believed to cause air pollution in neighboring areas, including the national capital region of Delhi. (Photo 1)

In recent years, policies to reduce straw burning have begun to be implemented, but in order for such policies to be effective, it is important that the people of this region become more aware of the health hazards caused by air pollution and motivate themselves to improve the environment through their own efforts. Therefore, we are promoting Aakash activities by the following three groups.

The Air Pollution Group estimates the amount of air pollutants emitted from straw burning and compares the simulation results with observed values to clarify the relationship between straw burning and local air pollution.

Conducting intensive observation of air pollutants over a wide area during the straw burning season at the site, the team will compare and verify the simulation results with PM_{2.5} observation data. By presenting scientific data, we aim to make residents aware of the effects of straw burning.

The Health Group aims to raise awareness of the importance of maintaining clean air among residents by holding health classes and conducting health checkups. The results from air pollution group provide more accurate information on human exposure by mapping observation based PM_{2.5} concentrations at surface level, which has been lacking in the source region (Figure 2).

The Rural Village Group is working to propose effective ways to use rice straw. With the cooperation of local universities and research institutes, we are considering ways to use rice straw while taking into account the cultural and socio-economical background of the region, and we are also conducting field experiments on the university campus.

We hope our activities will help the local people regain clean air.



Photo 1 Rice straw burning in Ludhiana district, Punjab, November 2, 2018.



Figure 1 Map showing locations of Punjab and Haryana states.

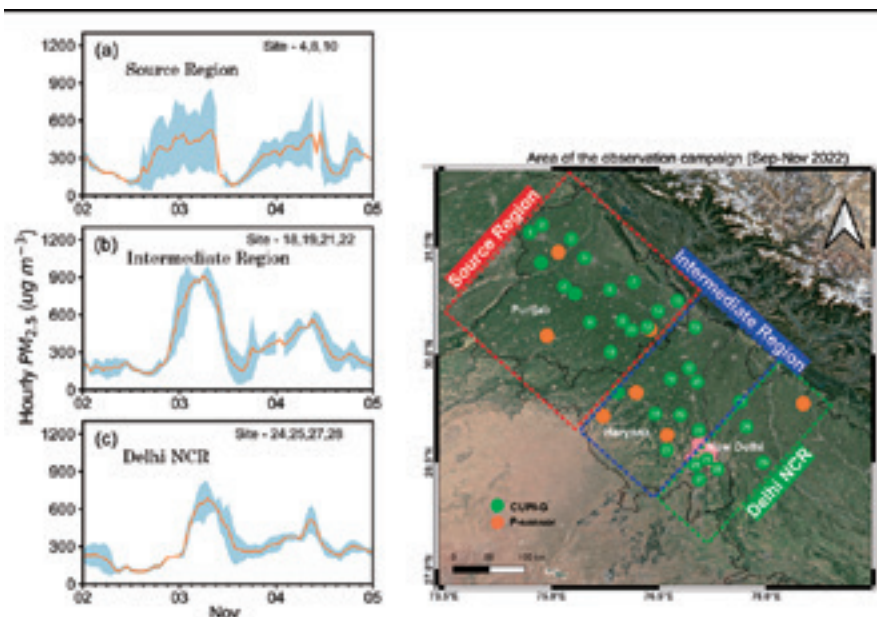


Figure 2 (Right) Location of air pollution instruments (green: PM_{2.5} and gas sensors; orange: PM_{2.5} sensors) deployed in northwest India (left) in early November in (a) Source Region (b) Intermediate Region (c) Delhi Metropolitan Region (Delhi-NCR) in early November. The time-averaged values of PM_{2.5} (solid line) and their variations (shadow) at four stations in each region. Units are in $\mu\text{g}/\text{m}^3$.

Research progress

2018 2019 2020 2021 2022 2023 2024
FS - FS/PR - FR1 - FR2 - FR3 - **FR4** - FR5

What we know so far

So far, three surveys have been conducted in Punjab. Two of them asked village representatives how they manage rice straw in their respective villages and the area of paddy fields where straw burning was done. Apart from that, a questionnaire-based interview survey was conducted with 2,200 households across the entire province of Punjab. As a result, the majority of farmers responded that air pollution is a problem, but that the main source of air pollution in Delhi is not straw burning in the Punjab, but sources of pollution around Delhi. As part of our work to show the link between straw burning and Delhi's air pollution, we conducted intensive observations of air pollution from Punjab to Delhi in the fall of 2022. As a result, we observed the migration of pollutants due to straw burning from the Source Region of Punjab to Delhi on November 3-4, 2022. (Figure 2)

Noteworthy items

Among the various options for how to stop straw burning, we decided to focus on two promising options: (1) shift from rice to other crops and (2) use of rice straw as biomass fuel. For (1), we have started crop cultivation experiments in university plots in Pagwara, Punjab, starting in 2021. For (2), a number of small-scale biomass power plants have been constructed in recent years, to which farmers can sell rice straw. However, it costs money to rent a baler (straw baling machine) to transport the straw, and it is not always profitable for the farmers because they cannot sell the straw at a high price when the humidity is high. We are currently working with Japanese companies, and Japanese and Indian government and non-government organizations to continue to find ways to help the new technology take root locally.

Project Leader

Prabir K. PATRA

Professor, RIHN / Principal Scientist, Japan Agency for Marine-Earth Science and Technology

Dr. Patra earned his Ph.D. from Gujarat University, India. After working at IBM India Research Laboratory, he became a principal researcher at Japan Agency for Marine-Earth Science and Technology and is a visiting professor at Chiba University and Tohoku University, and Aakash project leader since 2023. His main research interests include estimation of sources and sinks of greenhouse gases and ozone-depleting substances using atmospheric chemistry-transport models. He is also deeply interested in air pollution and human health. He received the Horiuchi Award from the Meteorological Society of Japan (2016). He has contributed to the estimation of CO₂, CH₄, and N₂O budgets for the Global Carbon Project and IPCC, served as lead author for the IPCC AR6, and has been active internationally as editor of numerous journals and as steering committee member of satellite observation, carbon cycle science projects.

Sub Leaders

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 <https://aakash-rihn.org/en/>

LINKAGE Project

Adaptive Governance of Multiple Resources based on Land-Sea Linkages of the Water Cycle: Application to Coral Reef Island Systems

Focusing on coral reef island systems located in the Ryukyu Arc as well as in the tropical and subtropical western Pacific, we are elucidating the connections between land and sea through the water cycle, the biocultural diversity and community capability, and the evolution and structure of organizations and institutions that govern the use and management of multiple resources. By integrating and visualizing the above interconnected components, we aim to shed light on adaptive governance of multiple resources based on the water cycle.

Project Leader
SHINJO Ryuichi



Project overview

People living in tropical and subtropical islands where coral reefs develop utilize the blessings of limited water resources such as groundwater and spring water, as well as marine and forest resources.

Water circulates between the land and the sea while changing its shape, connecting the coral reef ecosystem and the land, and nurturing the biodiversity and culture unique to the region.

However, recent land use and socioeconomic changes have led to the depletion of water resources and deterioration of water quality, as well as changes in precipitation patterns due to climate change, rising sea temperatures and sea levels due to global warming, and ocean acidification. Due to changes in the marine environment, the deterioration of coral reef ecosystems is progressing, making it difficult for people to use natural resources such as water resources, fisheries resources, and forest resources, that is, multiple resources.

Therefore, we are conducting research to strengthen “adaptive governance,” in which social mechanisms and institutions for environmental conservation and natural resource management are adjusted to the situation together with local people, so that people living on coral reef islands can continue to use multiple resources.

To this end, in this project, we will first clarify the actual state of the water cycle and multiple resources by analyzing groundwater and coral reef ecosystems, and understand and predict the responses of multiple resources to socio-economic changes and climate change. In addition, using a historical ecological approach, we will elucidate the connections and diversity between organisms and cultures in the lives of island people, and elucidate the mechanisms that sustain the foundations of survival in island communities.

On the other hand, through behavioral science and institutional analysis, we will clarify the transition and multilayered nature of the system, organization, and awareness of adaptive governance. In addition, we will act as a bridge to create new value by visualizing and integrating the relationships between scientific knowledge, indigenous knowledge, policy knowledge, and other knowledge necessary for adaptive governance.

Through these results, we hope to shed light on the connections between land and sea through water cycle as well as on the adaptive governance of multiple resources, in order to contribute to the realization of a resilient nature-symbiotic society in coral reef island systems.

Research progress

What we know so far

In the southern part of Okinawa Island, nitrate nitrogen contamination in groundwater has become a problem in some areas. We have developed an accurate evaluation method for nitrogen sources (chemical fertilizers, livestock manures, etc.) using several stable isotopes to lead to effective pollution control measures.

In the Sekisei Lagoon, located between Ishigaki Island and Iriomote Island, a field survey revealed that the coral density becomes almost zero when the concentration (threshold) of phosphate (accumulated phosphorus) adsorbed in the calcareous sediment exceeds a certain level. By setting this threshold as a target, it becomes possible to determine and implement an acceptable land-derived load, and it is expected that coral coverage will recover in the future.

From the perspective of behavioral science, we conducted an

2020	2021	2022	2023	2024	2025	2026
FS1	FS/PR	FR1	FR2	FR3	FR4	FR5

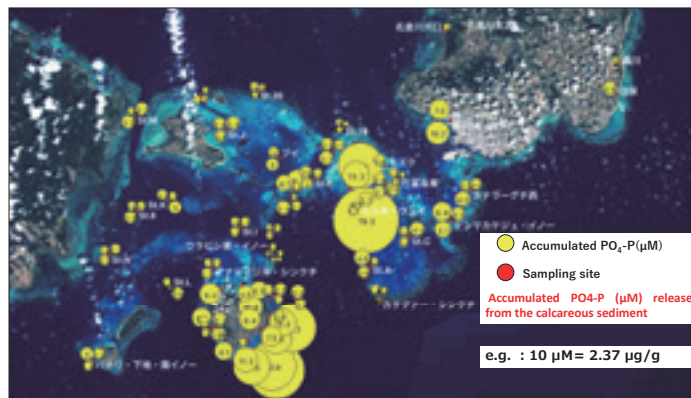


Figure 1 Mapping of accumulated nutrients (phosphate) at seafloor in the Sekisei Lagoon. Circle size corresponds to concentration.



Photo 1 Projection Mapping Model (P+MM) of southern Okinawa exhibited in the lobby of Yaese Town Hall.



Photo 2 Coral core sample by drilling of massive coral with children at Yoron Island.



Figure 2 Poster for an old photo exhibition on the theme of "carrying" on Yoron Island.

awareness survey on the compatibility of human movement and infection control during the corona crisis on an island with limited resources. It has become clear that negative reactions to the movement of people are mitigated by the acquisition of health certificates and the effects of infection control certification by local governments.

Noteworthy items

We built a 3D water circulation simulation model for the southern part of Okinawa Island. We created a projection mapping model (P+MM) that can visualize various types of information, such as groundwater flow and changes in land use, and used it in the Yaese town hall and regional roundtable meetings (Photo 1).

In order to elucidate the diversity of resource use on the island and the changes in the connections between them, we are working with local residents to collect and record local

historical and cultural materials as well as surveys of "interviews" related to indigenous knowledge. On Yoron Island, an exhibition of old photographs and a participatory digital exhibition (<https://yunnu-photo.org/>) were held on the theme of "transportation" from among approximately 3,000 photographs provided by the local residents (Figure 2), focusing on logistics, changes in island life, bay construction, and environmental changes in the coral reefs since the 1960s.

In addition, children also participated in coral-coring survey at Yoron Island (Photo 2). By analyzing coral growth rings from ~200 years ago to the present, we will elucidate how the coral reef system of Yoron has changed due to human activities.

Project Leader

SHINJO Ryuichi

Professor, RIHN / Professor, Faculty of Science University of the Ryukyus

Ryuichi Shinjo took a research position at the Faculty of Science, University of the Ryukyus, in 1992, becoming a professor in 2007. His specialties are geology, petrology, mineralogy, and isotope geochemistry. Fascinated by isotope geochemistry as powerful tool to explore dynamics occurring in earth system, he built a unique mass spectrometry laboratory including a laser ablation system and developed a technique for several isotope systematics (Sr, Nd, Pb, Hf, B, and Li) as tracers for the earth sciences. He has expanded the research subjects into submarine hydrothermal activity, hotspot and subduction zones magmatism at fields of the Okinawa Trough-Ryukyu Arc system, the African continent and the Himalayas. He is also working on quantitative assessment of groundwater contamination using stable isotopes.

Sub Leader

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Researchers at RIHN

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Researcher

Chris Leong

Researcher

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Kanazawa University

Kyushu University

Okayama University of Science

Okinawa Prefectural University of Arts

Okinawa Prefectural University of Arts

Kobe Women's University

National Museum of Japanese History

Kumanomi Nature-School

Tokyo Gakugei University

Okinawa Environment Club

Institution for Marine & Island Cultures, Mokpo National University, Korea

Halu Oleo University, Indonesia

Halu Oleo University, Indonesia

Wakatobi Regency, Indones

Sustai-N-able Project

Towards Sustainable Nitrogen Use Connecting Human Society and Nature

Nitrogen provides great benefits to humankind as a fertilizer, industrial material and fuel. However, our use of nitrogen unintentionally causes nitrogen pollution and threatens the health of humans and nature. In this project, we will elucidate the dynamics of nitrogen, of which much remains unknown; quantify the environmental burden and impact of nitrogen use; evaluate its benefits and threats and the effects of countermeasures and behavior change; and design the future to realize sustainable nitrogen use.

Project Leader
HAYASHI Kentaro



Project overview

Nitrogen is an essential element for creating proteins, nucleobases, and other biomolecules. Although nitrogen is ubiquitous, with 78% of the earth's atmosphere being nitrogen gas (N_2), most living organisms, including humans, do not have access to stable N_2 and require a form of nitrogen other than N_2 (reactive nitrogen, Nr). Our diet is also a means of obtaining nitrogen in the form of protein. To get more food from limited land, we need Nr as fertilizer, and ammonia synthesis technology (Haber-Bosch process), developed in the early 20th century, made it possible to obtain as much Nr as desired.

Synthesized Nr has been used as an industrial raw material as well as a fertilizer, providing a great benefit to mankind. On the other hand, much of the Nr used by humans is discharged into the environment along with its reactive properties. This is especially due to the low nitrogen use efficiency (NUE) of the

food system. In addition to the low NUE of food production, there are consumption challenges such as food loss and a preference for livestock products with relatively low NUE. Combustion of fossil fuels and others is another source of Nr emissions.

As a result of Nr emissions into the environment, various forms of nitrogen pollution such as global warming, stratospheric ozone depletion, air pollution, water pollution, eutrophication, and acidification have occurred, causing damage to human and natural health. The trade-off between the benefits of nitrogen use with the threat of nitrogen pollution is called the “nitrogen issue” (Figure 1). To ensure that our future possibilities are sound, we conduct this research to gain integrated knowledge that will lead to solutions to the nitrogen issue and sustainable nitrogen use for future generations.

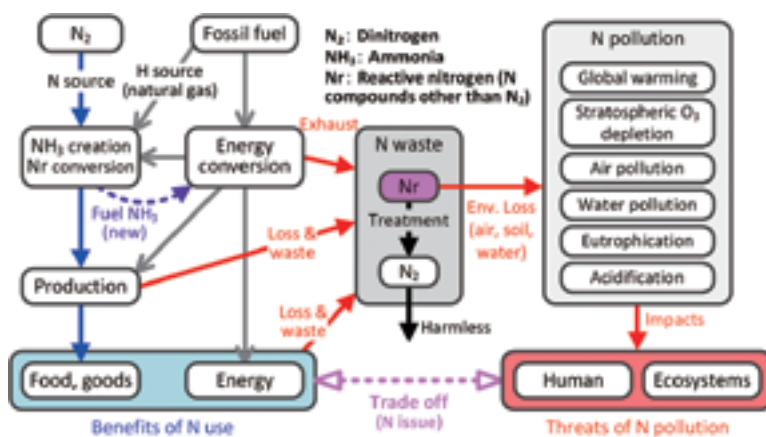


Figure 1 The nitrogen issue is a tradeoff between the benefits of nitrogen use and the dangers of nitrogen pollution.

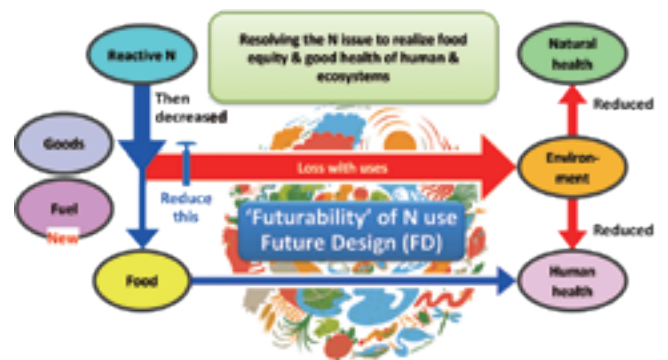


Figure 2 The concept of Sustai-N-able project.



Photo 1 Spring in a field crop area (April 2009, Memuro-cho, Hokkaido, Japan)

Research progress

2021 2022 2023 2024 2025 2026 2027
 FS - PR - **FRI** - FR2 - FR3 - FR4 - FR5

What we know so far

This research aims to achieve three breakthroughs in solving the nitrogen issue: first, the development of tools to enable quantitative analysis of the causal relationship between nitrogen use and nitrogen pollution; second, the spread of awareness of the nitrogen issue, which is not as well-known as other global environmental problems; and third, the implementation of future design to achieve sustainable nitrogen use. In the pre-research in FY2022, we established a research system to achieve these breakthroughs. In FY2022, we established three research groups: the Natural Circulation Group, the Human Society Group, and the Economic Evaluation Group, which are responsible for interdisciplinary research, and the Future Design Group, which is responsible for transdisciplinary research to achieve breakthroughs in collaboration with the three groups.

Noteworthy items

We have produced a project leaflet (in Japanese and English) that can be used to provide an overview of the nitrogen issue to various stakeholders and can be used as a catalyst for free discussion. The leaflets can be downloaded from the project website. In addition, a number of study sessions on the nitrogen issue were held at relevant ministries, agencies, and schools. The project leader was appointed as the representative of the East Asia Regional Centre of the International Nitrogen Initiative (INI), a group of experts, in November 2022.

Project Leader

HAYASHI Kentaro
 Professor, RIHN

Kentaro Hayashi is a biogeochemist interested in nitrogen cycling in a variety of terrestrial ecosystems from cropland to polar regions as well as holding comprehensive scientific knowledge for sustainable nitrogen use involving food, industry, and energy production and consumption. Trained at Hokkaido University (M.Eng.) and Tokyo University of Agriculture and Technology (Ph.D.), he was a member of the Pacific Consultants Co., Ltd., National Institute of Advanced Science and Technology, and Institute for Agro-Environmental Sciences, NARO, before his current joint appointment at RIHN. He received the JSSSPN Award from the Japanese Society of Soil Science and Plant Nutrition in 2021.

Researchers at RIHN

Soyoka Makino
 Aurup Ratan Dhar
 Shinsuke Kyoi
 Makoto Saiki
 Ayako Kimura

Researcher
 Researcher
 Researcher
 Researcher
 Research Associate

Main Members

Keisuke Koba
 Kazuyo Matsubae
 Koichi Kuriyama

Kyoto University
 Tohoku University
 Kyoto University

Organic Material Circulation Project

Building up Organic Material Circulation System among Urban and Rural Area: Toward the Integration of Local Perception and Scientific Knowledge

Based on the principle of returning to nature what is obtained from nature, we are creating a biomass circulation system that contributes to environmental restoration and agricultural production improvement. We return urban organic waste to degraded land in sub-Saharan Africa and Asia including Japan. In the Sahel region of Republic of Niger, we have been working with local residents, municipalities, and central government for 20 years to green the degraded land using organic waste. We aim to contribute to the lives of local residents and prevention of ethnic conflicts among farmers and herders.

Project Leader

OYAMA Shuichi

Professor, RIHN / Professor, Kyoto University

Why do this research?

The world population is now over 8 billion. Fifty-five percent live in cities. Cities are convenient and very comfortable. But we use energy, consume a lot of food, and generate huge amount of waste. Most of this waste is either landfilled or incinerated without being used. We believe that the “mass consumption and mass waste” is major problems for the environmental issues.

For the past 20 years, I have been working in Republic of Niger, near the Sahara Desert in West Africa, on land degradation caused by desertification and its land restoration with urban waste. I have learned that urban waste contains a lot of nutrients, and when placed on degraded land, it can promote greening and land restoration. From this perspective, we could see the root cause of land degradation and food shortages in rural areas caused by urban lifestyles.

Progress of your research: what you want to do in the future

Many studies have revealed the gravity of environmental issues. In the everyday life, we feel a sense of urgency about environmental issues. However, there are no ways for the citizens to tackle the environmental issues in the everyday life. We hope to show actual approach that can be used in our daily life to tackle the environmental issues.

Our project focuses on the material cycle between urban and



Photo 1 “Cleaning the Cities, Greening the Land.”: Pastureland created after eleven years of urban waste application (Republic of Niger, August 2022)



Photo 2 Hotel buffet style meals

rural areas in Africa, Southeast Asia, and Japan, and examines the effective use of food left-over and human waste. We will develop technologies to improve agricultural production and environmental restoration through composting.

We are now working with hotels and restaurants in Kyoto City, the Kyoto Municipal Zoo, and elementary schools in Kyoto Prefecture. Our project aims to create soil suitable for agriculture and environmental restoration by using food waste and animal dungs. We will call this initiative “dry compost”.

However, some people do not like the idea of farming with food waste and animal dungs, and then eating the agricultural products. We produce food waste and poop in toilets every day, but why is it so difficult to use them for agriculture? Together, for making sustainable society, we would like to think about the reasons and the conditions to overcome the perceptions.

Main Members

Tomoko Nakano
Takuto Sakamoto
Yuichiro Tsuchiya
Yasuyuki Kosaka
Hidenori Harada
Naoto Yabe

Chuo University
University of Tokyo
Kyoto University of Education
Kyoto University
Kyoto University
Tokyo Metropolitan University

Area

Sub-Saharan Africa (Niger, Zambia, Ghana)
Asia (Japan, Laos, Malaysia)

ScENE Project

High-resolution Reconstruction of Resilient Indigenous Lifestyle in Environmental Changes to Future Collective Knowledge Deduced from the Fusion of Science and Arts

How can we make global environmental issues our own? By using high-resolution environmental reconstruction using coral annual bands, this project will discover local indigenous knowledge born from the relationship between humans and nature, and local issues buried in global-scale changes. Using art as a medium, we will discuss how local communities can work toward spontaneous solutions to global environmental problems, and create future collective knowledge to obtain an image of local communities that can easily be empathized with.

Project Leader

WATANABE Tsuyoshi

Associate Professor, RIHN / Senior Lecturer, Hokkaido University

Why do this research?

Climate change has profoundly affected terrestrial and marine ecosystems, human migration, settlements, lifestyles, and civilizations. Recent economic development, population growth, and globalization risk societal vulnerability, perhaps leading to simpler lifestyles. This project aims to re-evaluate indigenous knowledge from nature and human memories and create a future collective knowledge that is resilient and sympathetic to future global environmental changes.

Progress of your research: what you want to do in the future

This research compares high-resolution coral records with human beings' memories to make a shared vision about the resilient and sympathetic past and future lifestyles using a method that combines the sciences and art. We are developing methods incorporating art to promote empathy and collective future thinking among researchers from different fields, local stakeholders, and generations. By providing a place to examine and select scenarios that lead to the future, we propose a way for local communities to easily generate empathy, facilitate future generations' choices easily and develop this into a collaborative effort.

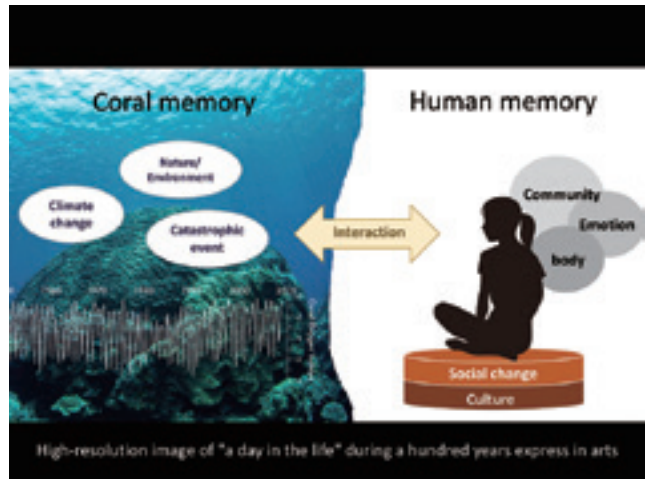


Figure 1 An image of the high-resolution image that we aim to achieve in this research. Transforming coral and human memories into art.



Photo 1 Performances of plays produced in this project at Kikaijima.

Main Members

Atsuko Yamazaki
Akira Goto
Hirofumi Kato
Hiroto Takamiya
Oriza Hirata

Hiroya Yamano

Takashi Nakamura
Kentaro Tanaka
Yuya Nishimura
Takeshi Ito
Mami Yoda
Katsumi Kato

Nagoya University
Nanzan University
Hokkaido University
Kagoshima University
Professional College of Arts and Tourism

National Institute for Environmental Studies
Tokyo Institute of Technology
Tokyo City University
Osaka University
Osaka University
Sagami Women's University
JTB Corporation

Area

Kikaijima, Amami Islands

The Value of Forests

– A Vision of the Future for People and Society Living in Harmony with Forests –

Japan is a leading forested country, but in recent years, the lack of management of planted forests, which occupy a large area, and their abandonment have been spreading unchecked. People are “separated” from forests in terms of both livelihood and economy, and various problems caused by underutilization are becoming apparent. This study aims to investigate people’s and society’s perceptions of the value of forests, including their cultural aspects, and to identify ways to rebuild a sustainable mutual relationship between people, society, and forests.

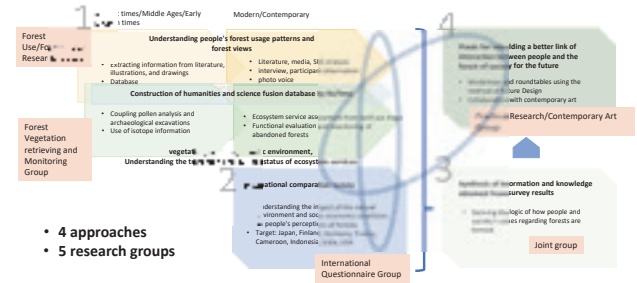


Figure 1 How our research project works

FS Principal Investigator
OHTE Nobuhito
Professor, Kyoto University

Why do this study?

Japan is one of the most forested countries in the world, with nearly 70% of its land area covered by forests. However, forestry is not an active industry in Japan today, and the population decline in the near-forest areas has not been halted. The reason for this situation is that people have lost the sense of value of why forests are necessary and what kind of forests are needed. As a result, we are losing the ability to see the future direction of forest management and use.

With this awareness of these issues, we aim to show the way to reconstruct a sustainable relationship between people and forests, and to create the approaches and methods necessary to reach this goal.



Oguni, Fukushima



Watsuka, Kyoto

Photo 1 Which forest are you familiar with?

What we want to do

At the same time, we will investigate what kind of thoughts and ideas Japanese people have about forests today, as well as historically clarify the changes in the values that Japanese people and society have held toward forests.

In addition to this research in Japan, we will conduct surveys of people’s views on forests in developed European countries such as Finland and countries in the Global South such as Indonesia, and compare them with the Japanese survey to explore how differences in socioeconomics, natural environment, ethnicity, and culture affect their views on forests.

Main Members

- | | |
|-------------------|-------------------------------------|
| Takuya Takahashi | The University of Shiga Prefecture |
| Takanori Oishi | Tokyo University of Foreign Studies |
| Tsutom Hiura | The University of Tokyo |
| Akira Mori | The University of Tokyo |
| Masae Ishihara | Kyoto University |
| Ken'ichi Fujimura | Fukuoka University |
| Hiroshi Abe | Kyoto University |
| Ryoma Hayashi | Lake Biwa Museum |
| Marjo Neuvonen | Natural Resources Institute Finland |
| Agnes Rampisela | Hasanuddin University |

Area

Japan, Finland, Indonesia

Creation of Passive Architectural Culture among Urban Houses in the Monsoon Asia

Aiming to create a “passive architectural culture” for decarbonization among urban dwellers in emerging and developing countries in monsoon Asia, this study will analyze factors affecting occupant well-being and energy consumption in the study site, India. The study will also investigate actual living environments and behaviors, and consider how to simultaneously satisfy “thermal comfort and health,” “energy efficiency and decarbonization,” and “well-being and quality of life.”

FS Principal Investigator

KUBOTA Tetsu

Professor, Hiroshima University

Why do this study?

Currently, most growing countries and cities are situated in Africa and Asia, particularly in the tropical regions. It is therefore crucial to achieve zero-carbon societies in these tropical regions. In these growing cities, middle classes are on the rise and urban houses experience a dramatic shift from open-design, traditional passive houses to enclosed, air-conditioned contemporary ones. This shift leads to rapid increases in energy consumption for space cooling in these regions.



Photo 1 Urban housing in Delhi

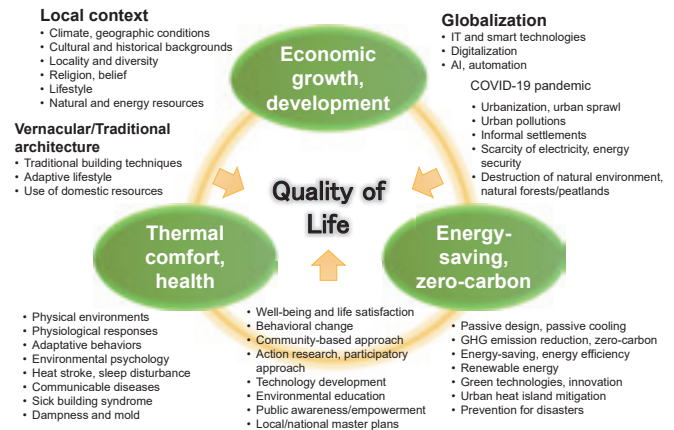


Figure 1 Three goals for sustainable development in developing countries.

What we want to do

This study aims to create a new passive architectural culture, where people naturally prefer passive lifestyle without relying on mechanical means such as air-conditioning. First, we conduct surveys on well-being in New Delhi and Kharagpur, India. Second, we conduct field investigations in the same cities to understand their current living environments as well as lifestyle in urban houses. Based on the results, we attempt to find the ways to harmonize “thermal comfort and health,” “energy-saving and low-carbon,” and “improvement of well-being and QoL (quality of life)” simultaneously among the urban residents.

Main Members

Takashi Asawa

Yasuto Nakano

Nikhil Kumar

Shankha Pratim Bhattacharya

Prashant Anand

Kshetrimayum Bangkim Singh

Tokyo Institute of Technology

Kwansei Gakuin University

Hiroshima University

Indian Institute of Technology Kharagpur

Indian Institute of Technology Kharagpur

School of Planning and Architecture (SPA) New Delhi

Area

New Delhi and Kharagpur (India)

Grasping the Base Values of “Sustainability” and Cross-cultural Comparison of Cognitions and Practices on Global Sustainability Concerns

“Sustainability” is not a question of whether to refer to the SDGs, but rather of fundamental ideas about coexistence between humans and the environment. This research will take as its entry point the terms that are used to describe “sustainability” and analyze how they relate to people’s perceptions and actions in the life world*. Furthermore, we will explore whether there is knowledge that enables us to coexist with an environment which we do not know in a society with different cultures and ways of thinking.

FS Principal Investigator
YAMADA Shoko
 Professor, Nagoya University

Why do this study?

With the SDGs agreed upon by the UN General Assembly in 2015, the word “sustainability” has become familiar to the general public. People sprinkle this word on their statements in writing and speech, but the connotations they attach to it are diverse. However, there is a lack of essential discussion about values, norms, and systems to balance conflicting interests which would hinder the achievement of a sustainable world. As the basis for such discussion, this study examines people’s beliefs, their positionalities, problems they recognize, and actions they consider necessary.



Figure 1 Words likely to appear with “sustainability”

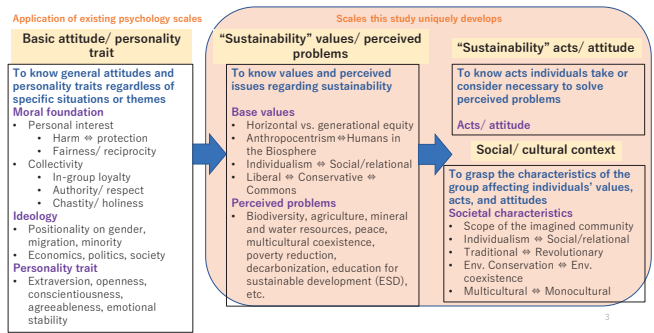


Figure 2 The relationships among values, actions, attitudes, and culture which this research will investigate

What we want to do

A questionnaire will be developed to investigate the relationship between people’s sustainability values, perceived problems, behaviors and culture, following the framework shown in Figure 2. By accumulating analysis of individual responses embedded in the culture and context, we will examine commonalities and differences across societies. We mean to reconstruct the notion of “sustainability” deductively. We hope to present new approaches and ideas from the humanities and social sciences to sustainability studies, which tend to be dominated by physics, chemistry, and engineering.

*Life world: The world in which we exist in an intuitive, everyday way through physical practice, before it is ideologically structured by science. This term was proposed by Edmund Husserl.

Main Members

Aki Yonehara
 Kosuke Kiyama
 Yuki Shimazu

Toyo University
 University of Tsukuba
 Aichi Shukutoku University

Coproduction Research with Local Practice and Science for Sustainable and Fair Hunting of Forest Wildlife

As interest in biodiversity conservation grows, the livelihoods and cultures of rainforest inhabitants who have made a living by hunting wild animals are threatened. Mutual understanding between local peoples and conservation authorities is essential to solve this issue. This also implies the need for the collaboration of different knowledge systems—indigenous and local knowledge and science. We will promote “coproduction research” that builds on an equal relationship between the two stakeholders and develops locally-based wildlife management systems for sustainable hunting.

FS Principal Investigator

HONGO Shun

Specific Assistant Professor, Kyoto University

Why do this study?

Rainforest mammals support both forest biodiversity and rainforest peoples' lives and cultures. Over the past 30 years, however, rainforests have faced a sharp increase in hunting pressure and declines in wildlife populations. As international attention was drawn to this “wildmeat crisis,” rainforest governments established protected areas and imposed strict hunting restrictions. But this has caused restrictions even on local subsistence hunting, provoking conflicts with conservation officials.

Furthermore, we believe this problem is a mutual incomprehension between Science and Indigenous and local knowledge regarding wildlife management. Conservation officials emphasise explicit management based on scientific evidence. Local people, on the other hand, are considered to have managed implicitly based on indigenous and local



Photo 1 A Peters's duiker—one of the main targets of subsistence hunting in the Cameroon rainforest.



Photo 2 Meeting with local residents in Wamba village, Democratic Republic of Congo.

knowledge of wildlife gained through years of hunting practice. Although the two knowledge systems have much in common in practice, there is a significant gap in underlying philosophy and worldviews. So, a management system based solely on the knowledge of one is not considered sustainable or fair by the other. To fundamentally solve the wildmeat crisis, Science and ILK must develop a mutual understanding and a locally-based wildlife management system incorporating subsistence hunting.

What we want to do

To address the wildmeat crisis, the project aims to introduce wildlife management systems to enable subsistence hunting in five sites of the world's three major rainforest regions. We take a “coproduction research” approach, where conservation governments and local people plan, conduct and evaluate research on an equal footing. We work with local people and conservation officers to gather hunting-related ILK, develop harvest-based wildlife monitoring, and create sustainable hunting management systems. We will also expand the network of local people living in each study site over the three rainforest regions and share their initiatives using photographs and video letters.

Our coproduction research, which assumes no superiority of science over ILK, will create five different management systems in the five areas. The detailed descriptions of building the five management systems will help verify the effectiveness of the coproduction approach in environmental issues.

Main Members

Nahoko Tokuyama
Hirokazu Yasuoka
Nathalie van Vliet

Kyoto University
Kyoto University
Center for International Forestry Research

Naoki Matsuura
Miyabi Nakabayashi

Sugiyama Jogakuen University
Hiroshima University

Area

Cameroon, Democratic Republic of Congo, Colombia, Malaysia, Gabon

Satoyama Reconnections: Engaging Communities in Resilient, Nature- and Climate-positive Land Use Futures

In many developed economies, fragmentation of the goals and drivers for land use linked to the pursuit of commodity production and higher financial returns has fractured and weakened former longstanding interdependencies between people and nature, contributing to significant environmental damage. Satoyama, as promoted by the IPSI partnership, highlights the importance of recognising and working with longstanding cultures and knowledge of land management and people-nature interdependencies in rural communities, in order to repair such damage, to sustain biodiversity and better address the climate emergency. This study aims to identify, understand and promote options for enhanced land-use governance, ownership and stewardship of cultural landscapes, now and into the future.

FS Principal Investigator

Janet DWYER

Professor, University of Gloucestershire, UK

Why do this research?

The deep interdependence of people and nature is often noted but rarely supported in modern economies and societies. Satoyama landscapes hold a vital repository of knowledge and skills that can help to affirm and renew this interdependence, but their future is challenged by a lack of appreciation and support from current policies, legal institutions, markets and wider societal processes, in both Japan and Europe. This research will help to reconnect people with the values and understanding coming from Satoyama examples across these territories, in order to explore improved ways to tackle our current and future ecological challenges, including biodiversity decline and the climate emergency.



Photo 1 Hill-farming Satoyama landscape in South-west England, UK (photo by Janet Dwyer)

What we want to do

Our current research involves a literature review to capture diverse experience in Satoyama landscapes in Europe and Japan and to better understand the challenges and opportunities for reconnections. It will also gather information and ideas from contemporary inter- and trans-disciplinary research methodologies on how best to engage research, practice and policy together in action-oriented analysis and transformation. The ideas will be shared and developed in seminars and workshop meetings, to identify a robust approach for a significant research project centred around Satoyama reconnections. The central model for the research is the 'living lab' technique that has come to prominence in recent participatory studies as a mechanism to promote experimentation and real-world change alongside active research and wider public engagement. It adopts a staged process of visioning, experimentation, learning lessons and promoting transferable practice centred around the animation and facilitation of place-based examples of challenge and change. The research will select a range of cases in contrasting European and Japanese locations and communities, in which to create and exploit living labs to benefit local communities and inform global understanding and policy action. We aim to generate new ideas to better enable the reconnection of Satoyama concepts and practice so as to revitalize and sustain cultural landscapes, making a positive contribution to reversing biodiversity decline and tackling the climate emergency. Our hope is that this research will help society to recognize the value of a continued and strengthened Satoyama ethic, in future land use governance and practice.



Figure 1 Conceptual Diagram of the Satoyama Initiative (source: IPSI/UNU, Tokyo)

Main Members

Katsue Fukamachi	Kyoto University
Davy McCracken	Scotland's Rural College (SRUC)
Sophie Devienne	AgroParisTech
Camilla Sandström	Umeå University
Tobias Haller	University of Bern
Mai Kobayashi	Kyoto University
Christopher Short	University of Gloucestershire
Angela Lomba	University of Porto

Area

International comparison across European (EU and non-EU) and Japanese territories

Strategic Program

In collaboration with research projects, Strategic Program aims to develop concepts and methodologies to solve global environmental problems in collaboration with society.

Program Director
TANIGUCHI Makoto



Program outline

The Strategic Program develops concepts and methodologies for transdisciplinary research to solve global environmental problems in collaboration with society. The project develops comprehensive and systematic concepts and methodologies for transdisciplinary research, which are widely applicable to global environmental issues, and accessible to related stakeholders. The Strategic Program produces conceptual and methodological frameworks together with RIHN research projects, based on

individual methods, techniques and tools from the divisions in the RIHN Center. It collaborates with research projects, building on the case studies developed by these projects, and develops comprehensive and systematic methodologies beyond an individual research program or project. It also delivers completed concepts and methodology to research programs and projects, the RIHN center, and related stakeholders.



A scene from a workshop of the Future Design Project (p.38), which belongs to the Strategic Program

Program Director

TANIGUCHI Makoto
Professor, RIHN

Prof. Makoto Taniguchi is a hydrologist and a deputy director-general at the Research Institute for Humanity and Nature (RIHN), Japan. He is an IUGG Elected Fellow, a JpGU Fellow, a Cooperation Member of Science Council of Japan, a Future Earth Assembly member, and a Steering Committee member of Water-Energy-Food Nexus KAN. He served as PI and Co-PI of many research projects including UNESCO-GRAPHIC, Groundwater in Asian Megacities, Water-Energy-Food Nexus, and the Belmont Forum SUGI Food-Energy-Water NEXUS. He has worked on water-related projects around the world, authored or co-authored over 180 articles, and edited or co-edited eight books.

Reseachers at RIHN

Eri Aoki
Tomoko Miura

Senior Researcher
Research Associate

Future Design Project

Development and Pluralistic Coexistence of Sustainability Visions Through Future Design

Our goal is to formulate a vision of a sustainable society that incorporates the perspectives of its future populations and to develop methods that apply this vision. Since future populations do not exist presently, it is impossible in principle to incorporate their perspectives. Therefore, we are trying to capture these future perspectives into scientific language.

Project Leader
NAKAGAWA Yoshinori



Project overview

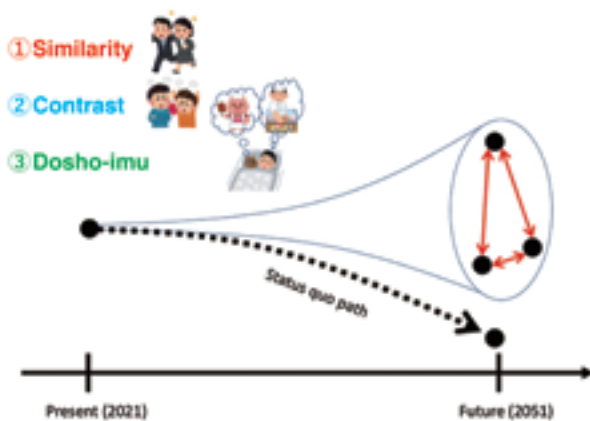
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Vision formation is an important research topic in sustainability science. This is because vision formation and strategy formulation based on the vision are considered essential for the transformation to a sustainable society. However, sustainability science faces trade-offs that are difficult to resolve. The more motivating the vision, the more likely it is that it will be shared by only a small segment of society with certain values and will not contribute to social change. In a situation where there is a lack of methodology to solve this problem, the transformation to a sustainable society will not proceed successfully. Therefore, the ultimate goal of this project is to build a future design methodology for the multilayered and multidimensional implementation of a sustainable vision. In other words, when people, from the national level to the micro level such as a municipality or a company, freely and creatively imagine their visions of the future from the standpoint of a virtual future person using the Future Design approach, and from there

consider what they should do next, even if these visions do not necessarily coincide with each other, they will be able to think about what they should do next. Even if these visions do not necessarily coincide with each other, a consensus can be formed on what should be done, and society as a whole can move toward the realization of sustainability through this process.

What we know so far

When a vision conceived with the involvement of some people in a community is shared by others in the same community, the vision itself may be shared, and there may be situations where the “way of thinking” or “way of seeing things” behind the vision should be shared. Guidelines are becoming clearer on how researchers should be involved in the community, depending on the situation and the occasion.



Individuals taking the perspective of future generations in specific future states come to consensus using present options in at least three different scenarios: ① similarity ② contrast and ③ “dosho-imu” (a Japanese expression literally meaning “to dream different dreams in the same bed”). The idea to apply the concept of “dosho-imu” to public policy issues was first proposed by Kato et al. (2013). Kato, H., Shiroyama, H., and Nakagawa, Y. (2013). Public policy structuring incorporating reciprocal expectation analysis. *European Journal of Operational Research*, 233(1), 171-183.

Project Leader

NAKAGAWA Yoshinori

Professor, RIHN / Professor, Sophia University

Yoshinori Nakagawa has applied the methodology of life stories and qualitative research to understand and structure social issues such as the mobility of elderly people and the skill succession of different generations in construction. He has used his experience to help develop and implement Future Design methodology in collaboration with both municipalities and private companies.

Main Members

Hironori Kato
 Shunsaku Komatsuzaki
 Yukako Inoue
 Masako Ichihara

The University of Tokyo
 The University of Tokyo
 Yasuda Women's University
 RIHN

List of Completed Projects

Fiscal Year Completed	Leader	Research Title
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 Tsugihiko	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: With Reference to Environmental Changes Caused by the Use of Land and Water Resource
	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 - A ten-thousand-year history
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	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	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
2017	ENDO Aiko	Human-Environmental Security in Asia-Pac Ring of Fire: Water-Energy-Food Nexus
2018	NAKATSUKA Takeshi	Societal Adaptation to Climate Change: Integrating Palaeoclimatological Data with Historical and Archaeological Evidences
2019	OKUDA Noboru	Biodiversity-driven Nutrient Cycling and Human Well-being in Social-Ecological Systems
	TAYASU Ichiro	Proposal and Verification of the Validity of Isotope Environmental Traceability Methodology in Environmental Studies
2020	Steven R. McGREEVY	Lifeworlds of Sustainable Food Consumption and Production: Agrifood Systems in Transition
	KONDO Yasuhisa	Information Asymmetry Reduction in Open Team Science for Socio-environmental Cases
2021	KOZAN Osamu	Toward the Regeneration of Tropical Peatland Societies: Building International Research Network on Paludiculture and Sustainable Peatland Management
	YAMAUCHI Taro	The Sanitation Value Chain: Designing Sanitation Systems as Eco-Community-Value System
2022	YOSHIDA Takehito	Research and Social Implementation of Ecosystem-based Disaster Risk Reduction as Climate Change Adaptation in Shrinking Societies
	ONISHI Yuko	Methods and Tactics to Foster Knowledge Co-creation: A Practical Framework for Implementing Transdisciplinary Research

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

What have we learned and to what extent?

We evaluated current land use from the perspective of socioeconomic risks of disasters and ecosystem services provided by nature, and conducted scenario analysis for a future with a declining population. The Business as Usual (BAU) scenario is a future scenario in which land use and population distribution will continue to change in the future, and the Eco-DRR scenario is the one in which disaster risks are avoided and ecosystem services provided by nature are actively utilized through the wise use of land. Compared to the BAU scenario, the Eco-DRR scenario reduced disaster risks in most municipalities, but the degree of reduction varied greatly from municipality to municipality.

On the other hand, for ecosystem services, the relationship between the two scenarios differed depending on the type of provisioning, regulating and cultural ecosystem services. Municipalities that seize the opportunity of population decline to avoid exposure to disaster hazards are expected to benefit greatly from improved land use, which will reduce disaster risk and improve ecosystem services. These results are published on the J-ADRES “Japan’s Assessment of land use based on Disaster Risks and Ecosystem Services” website.

In the study areas of Fukui, Shiga, and Chiba, we have collaborated with a variety of local stakeholders to conduct research on the functional evaluation of Eco-DRR and its local implementation. We have collected examples of traditional disaster response practices that are still active in various parts of Japan, analyzed their significance in modern society, and examined measures for their preservation and utilization in the local area. These results were compiled and published in the booklets of the series “Eco-DRR as Learned from Local History” and the booklet “How to get started with Green Infrastructure.”

We have also been working with international Eco-DRR efforts, and have translated into Japanese and published educational materials and instructors’ manuals for Eco-DRR-related educational programs. We hope these materials will be

used at Japanese universities and other institutions.

Our concept of global environmental studies

The blessings and disasters brought by nature are deeply connected. The same nature that is all around us not only brings blessings but also disasters. Biodiversity, which brings many blessings, is supported by the workings of nature, which is also the source of disasters. This deep connection between blessings and disasters has long been engraved in the hearts and cultures of local people. Our project has taught us the importance of rethinking the deep connection between nature’s blessings and disasters when responding to natural disasters, which are becoming more severe and more frequent due to climate change.

New connections

- ✓ The second version of the J-ADRES “Japan’s Assessment of land use based on Disaster Risks and Ecosystem Services” website (j-adres.chikyu.ac.jp) is now available (Fig. 1).
- ✓ All five booklets of the series “Eco-DRR as Learned from Local History” (Japanese and English editions) and a booklet “How to get started with Green Infrastructure” to promote Eco-DRR and local implementation of green infrastructure have been published (Fig. 2). The electronic version is available free of charge on the RIHN website.
- ✓ Japanese translations of educational program materials and instructor’s manuals on Eco-DRR are available free of charge on the RIHN website.

Project Leader

YOSHIDA Takehito

https://www.chikyu.ac.jp/rihn_e/activities/project/project/07/



Figure 1 J-ADRES website



Figure 2 Series “Eco-DRR as Learned from Local History” and “How to get started with Green Infrastructure”

Methods and Tactics to Foster Knowledge Co-creation: A Practical Framework for Implementing Transdisciplinary Research

What have we learned and to what extent?

We proposed a framework consisting of four elements for implementing TD research: theory, methodology, knowledge, and social outcomes. In recent years, the term TD research has been used in a variety of contexts, but existing theories do not necessarily apply to all those environmental issues and regions. As such, it is important to identify and apply methods that are appropriate to individual cases. In addition, since TD is relatively new in Japan, the available knowledge on the effective implementation is limited. We extracted over 450 ideas to foster co-creation from researchers and developed about 30 patterns of knowledge co-creation. Further, we collected and analyzed the societal outcomes of the TD research by conducting a follow-up survey in the Kosaji area of Koka, Shiga Prefecture, which was one of the field sites of RIHN research project (e-rec project). We found that while winter flooding, which the project facilitated during the project FR period was decreasing, indirect outcomes, such as changes in participants' perceptions and knowledge transfer to non-participants, were occurring even three years after the project completed.

Our concept of global environmental studies

In order to solve global environmental problems, it is not enough to advance scientific knowledge on the status of the natural environment, but we must identify effective and feasible solutions with experts in various disciplines the people facing the problems. However, it is not easy to co-create and collaborate with people from different backgrounds and across disciplines, industries, experiences, and regions.

Thus, we aimed to contribute to the construction of global environmental studies by presenting a method for fostering co-creation.

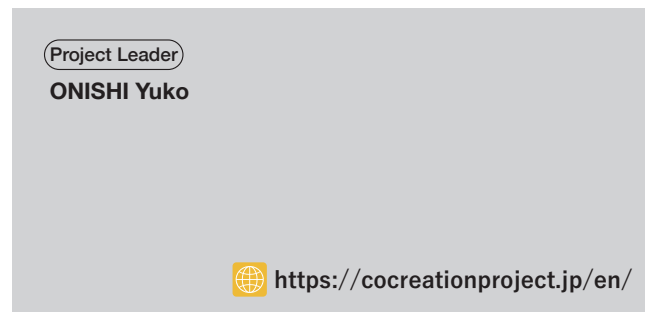
New connections

We organized a session on “Transdisciplinarity and the Concept of Co-creation in Asia” at SRI (Sustainability Research + Innovation Congress) 2022, where we discussed knowledge and experience on TD research with researchers from various countries and regions, including Japan, Korea, Mongolia, Germany, Thailand, India, and Zambia. Project leader, Yuko Onishi, made an oral presentation as an invited speaker at the Union Session “What is the Value of Knowledge Creation” at the JpGU (Japan Geoscience Union) 2022 Congress.

In addition, we constructed a website, “Kankyō Tomoshiru” (<https://cocreationproject.jp/en/>), as a platform for sharing information on transdisciplinarity and co-creation. We also manage various SNS accounts, which we will continue maintaining in the future.



Co-creation Patterns Workshop: Extracting and grouping seeds of ideas



SRI2023 Session: Transdisciplinarity and the Concept of Co-creation in Asia

Environmental Isotope Study Collaborative Research Program

The Environmental Isotope Study Collaborative Research Program provides an environment in which domestic and foreign researchers can use experimental facilities and equipment to effectively conduct cutting-edge joint research, and also widely used by the academic community, such as by publishing the results of past research activities on its website.

What is Environmental Isotope Study?

In research on the global environment, although the target regions and time scales are diverse, various elements make up ecosystems such as water, the atmosphere, organisms and soil; human activities and their history; and all human and natural phenomena. Within the interacting ring, there is an inherent “fingerprint” of the stable isotope ratio of the element. RIHN has developed experimental equipment that can obtain this fingerprint information for various environmental substances and many elements. It is an important mission to conduct research that contributes to solving global environmental problems through these analyses. At RIHN, we call this research “environmental isotope studies” and have been conducting joint research with researchers nationwide since 2012.

Program outline

The Environmental Isotope Study Collaborative Research Program uses isotope method which is used in subdivided specialized academic fields, such as geochemistry, hydrology, ecology, geology, mineralogy, anthropology, food science (locality determination), and forensic science. The isotope method, which is used in specialized academic fields, is used in a wide range of environmental studies. The Environmental Isotope Study Collaborative Research Program accepts applications from a wide range of fields for “General Joint Research” and “Laboratory and Analysis Unit Joint Research,” which involves the development of new analytical methods in close collaboration with the Laboratory and Analysis Unit. In addition, the “NIHU Joint Research” program was launched in FY2020 to strengthen collaboration with institutions of the National Institutes for the Humanities. From FY2022, we started the “ORNHIA-joint Research” collaborative publicly solicited joint research with the Multidisciplinary Collaborative Projects of NIHU “Object-based Research of Nature-Human Interactions up to the Anthropocene (ORNHIA).”

Participants in the “Environmental Isotope Study Guidance” (held in June every year) will learn how to use the common equipment and the pre-treatment that needs to be done in advance, and will present their research results at the “Environmental Isotope Study Symposium” (held in December every year). The Environmental Isotope Study Symposium provides an opportunity for students and young researchers to make new discoveries and research seeds by receiving a wide range of opinions that cannot be obtained through discussions in laboratories or individual academic societies. In addition, we have set up a session, “Development and application of environmental traceability methods,” at the Japan Geoscience Union (JpGU) meeting, which is being used to disseminate our research results. Taking advantage of the COVID-19 crisis, we created online video teaching materials, provided online guidance, and held a hybrid Environmental Isotope Study Symposium. In addition, commentary on isotope environment studies and research results to date are available on the website of The World as Illustrated by Environmental Isotope Studies. (<https://www.environmentalisotope.jp/>)

In FY2023, 43 “General Collaborative Research” proposals, seven “Laboratory and Analysis Unit Collaborative Research” proposals, and 21 “ORNHIA-joint research” collaborative public research proposals were selected for the Environmental Isotope Study Collaborative Research Program. In addition, between FY2012 and FY2022, 54 national and public universities, 16 private universities, 29 national and public research institutes, and 19 overseas universities and research institutes have used this program. For more information, including application guidelines, please visit the website.

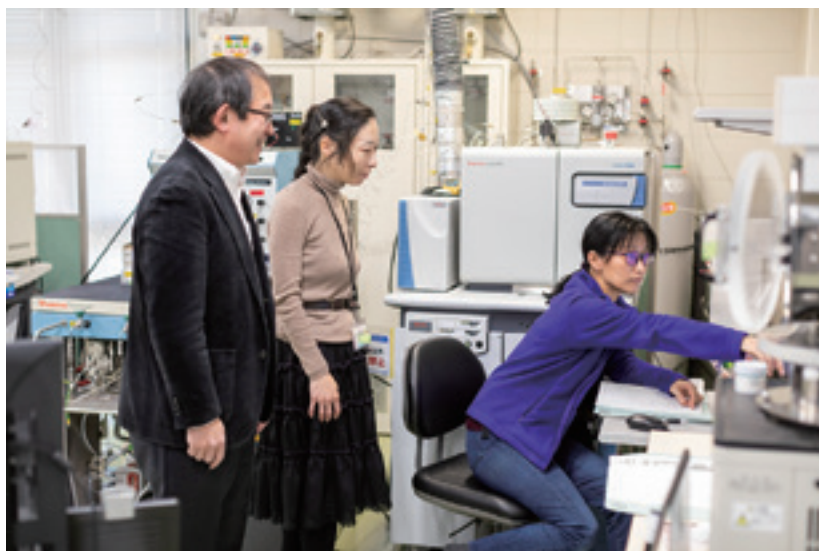
Experimental facilities

RIHN conducts joint research in various regions in Japan and abroad, and handles a wide variety of research samples. By extracting various types of environmental information from these samples and comprehensively understanding the relationships among them, it is possible to clarify the interaction between humans and nature that is causing global environmental problems. Researchers from Japan and overseas (221 researchers from 48 institutions in FY2022) involved in research projects and the Environmental Isotope Study Collaborative Research Program conducted by RIHN are using the experimental facilities at RIHN to conduct research aimed at solving global environmental problems.

Equipment and devices

RIHN has 18 laboratories. There is a clean room where samples are processed in a contamination-free environment, a low-temperature storage room where samples such as organisms and ice cores are stored, and a temperature-controlled room where organisms are grown in an artificially controlled environment. It enables the development of ongoing environmental research. In addition, we are focusing on advanced common equipment that is highly versatile and expected to develop into new global environmental research. In addition to experimental equipment such as microscopes and field observation equipment such as surveying equipment, stable isotope ratio mass spectrometers (IRMS) for light elements, a thermal ionization mass spectrometer (TIMS), a high-resolution multicollector inductively coupled plasma mass spectrometer (MC-ICP-MS), an inductively coupled plasma mass spectrometer (ICP-MS), a Cavity Ring-Down Spectroscopy for water isotope ratios, and a gamma ray spectrometer for dating, etc. are installed.

The information of analytical techniques and methods for identifying trace elements and stable isotopes have been developing rapidly in recent years, and we are equipped with state-of-the-art analytical equipment to acquire highly accurate information. For information on using common equipment, please visit the laboratory website.



 https://www.chikyu.ac.jp/rihn_e/share/

Designated Research

Apart from the projects based on the Research and Strategic Programs, this Designated Research contributes to the achievement of the mission of the Research Institute for Humanity and Nature (RIHN) in response to social demands for the formation of integrated research in the field of global environmental studies and the solution of global environmental problems. This Designated Research will be conducted in close collaboration and cooperation with the Research and Strategic Programs, and will share the results. Designated Research consists of the following projects.

Projects promoted by the National Institutes for the Humanities (NIHU)

Multidisciplinary collaborative projects

Object-based Research of Nature-human Interactions up to the Anthropocene	FY2022-2027
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(Lead institute: RIHN)

Humanity living in nature have made use of a wide variety of resources from the environment. The goal of this project is to study the relationship between nature and people along temporal and spatial axes by analyzing the concentrations and isotope ratios of elements contained in the human body and substances, and to clarify the changes in human resource usage that lead to modern global environmental problems from the perspective of material culture. In addition to conducting collaborative research with the National Museum of Ethnology on the ancient Andes, the academic collaboration will be done also with universities and research institutes inside and outside NIHU. (Principal Researcher: Ichiro Tayasu)

Interdisciplinary and Integrated Studies on Local Cultures: Aiming for the Emergence of Novel Communities	FY2022-2027
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(Lead institutes: REKIHAKU and MINPAKU)

RIHN will promote research as “Regional Culture Studies to Avoid Disasters by Utilizing the Bounties of Nature” unit, one of the five units under the project, and will implement the inheritance and local application of regional culture related to the bounties of nature and disasters in regions throughout Japan. (Unit Representative: Makoto Taniguchi)

Co-creation Outreach - NIHU Knowledge Co-creation Projects

RIHN will also play a part as project, which aims for co-creation of knowledge and open humanities research.

NIHU Interactive Museums	FY2022-2027
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A “circulation of knowledge” between universities, other research institutions, and society will be created by using digital technology to prepare materials and data owned by NIHU's institutes, visualize them through museums and various exhibitions, and share and publish research processes and results by various methods and in various places. In this way, the aim is to build a model for promoting open humanities research through co-creation with various people in Japan and overseas. Moreover, joint research will be conducted to solve communication challenges, such as visual and auditory difficulties, and, based on the results, to develop exhibition methods that support diversity.

Director-General's Discretionary Budget Project

This research is funded by the RIHN Director-General's Discretionary Budget. Applications are solicited and accepted within RIHN once a year.

Grants-in-Aid for Scientific Research (KAKENHI) Project

The Grant-in-Aid for Scientific Research is a research grant program of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), which aims to promote the development of outstanding, original, and pioneering research in all fields from humanities and social sciences to natural sciences in order to promote science in Japan.

Communication with Society and the Research Community

In order to widely disseminate its research results to society, RIHN holds symposiums, seminars, and other events for the general public and researchers. We also actively publish a variety of publications related to integrated global environmental studies.

Major events

| For Researchers

RIHN International Symposium

RIHN holds an annual symposium for the domestic and international research community with the aim of disseminating the results of RIHN's research to the world.

Symposium on Environmental Isotope Study

Held once a year for the purpose of developing and disseminating the latest analytical techniques and exchanging information on environmental research.

RIHN Seminars

Invited foreign researchers in residence at RIHN and outside experts serve as lecturers in these open seminars for researchers to share the latest topics and research trends on global environmental issues and to view global environmental studies from a broad perspective.

| For the general public

RIHN Public Seminars

These seminars are held once a year at either RIHN or other venues in Kyoto to introduce the results of RIHN's research and trends in global environmental issues to the general public in an easy-to-understand manner.

RIHN Open House

Since FY2011, RIHN has been holding Open House events to introduce the facilities and research activities of RIHN to the general public in order to deepen interaction, especially with the local community. We are implementing plans to make the RIHN more accessible to the society.

Major publications

| RIHN Series (for general public)

RIHN publishes a series of books that introduce the research results of the Institute in an easy-to-understand academic manner. So far, 26 volumes have been published.



| RIHN Series (for researchers)

This is a publication that presents the results of RIHN's research to researchers. So far, 14 volumes have been published.



| RIHN Book Series

This Book series publishes RIHN research results for the international community. Ten volumes have been published so far and have been accessed approximately 109,000 times online.



| RIHN News (Humanity & Nature Newsletter)

The Humanity & Nature Newsletter provides up-to-date information on the activities of RIHN, including field reports, staff profiles, and round-table discussions. It aims to function as a communication tool, especially for domestic and international researchers and the general public who are involved with RIHN.



Website and Social Media

The website provides basic information about RIHN and its latest activities. We also provide information on events and research results through social networking services.



| Website www.chikyu.ac.jp



| X (Twitter) @CHIKYUKEN



| Facebook @RIHN.official/



| YouTube @CHIKYUKENofficial

Graduate Education

RIHN has been indirectly involved in the education of graduate students at various universities through research of Research Projects and Strategic Projects, as well as through Isotope Environmental Studies Collaborative Research Projects. From FY2023, The Graduate University for Advanced Studies,

SOKENDAI, has established the Global Environmental Studies Program (Three-year doctoral program) at RIHN and will offer various courses and research guidance directly to graduate students seeking a doctoral degree in the field of Global Environmental Studies.

Global Environmental Studies, Graduate University for Advanced Studies, SOKENDAI

Graduate University for Advanced Studies, SOKENDAI

The Graduate University for Advanced Studies, SOKENDAI, is an independent graduate university (the first of its kind in Japan) founded in 1988 with the aim of contributing to the creation and development of culture through education and research in academic theory and application. As a world-leading international graduate university, SOKENDAI operates in close partnership and collaboration with affiliated inter-university research institutes. The world-class research environment which the inter-university research institutes offer is the most distinctive feature of SOKENDAI.

To nurture PhDs who can tackle complex and interdependent issues arising in the context of ever-changing academic trends and the ever more pressing demands of modern society, it is necessary to develop a system that allows the flexible use of highly specialized resources across a wide range of disciplines. To achieve this goal, SOKENDAI has reorganized its educational structure and established the Graduate Institute for Advanced Studies on April 1, 2023. At the same time, the National Institute for Japanese Language and Linguistics and the Research Institute for Humanity and Nature were incorporated into SOKENDAI as parent institutes to further enhance the educational environment.

Introduction of Global Environmental Studies Program

Global Environmental Studies Program is based on international research projects promoted by the Research Institute for Humanity and Nature (RIHN). This interdisciplinary research with elements of transdisciplinarity utilizes a problem-solving approach in collaboration with society. The program is designed for students to gain knowledge and methodologies accumulated by the academic fields that constitute Global Environmental Studies and to become independent researchers who will engage in solving global environmental issues with their expertise. In addition, the program will provide research training that avails the research environment for cutting-edge research and the advantages of small-group education.

- Doctoral Program: Three-year doctoral program
- Degree: Doctor of Philosophy
- Career Opportunities for Graduates:
 - Faculties engaged in education and research on environmental studies at universities and other institutions of higher education
 - Engineers, researchers, and support staff in environment-related fields at companies, government offices, national and public research institutes, local governments, international organizations, and NGOs
 - Researchers and curators at museums and other institutions

For Prospective Students

- The Type of Students we seek
The Global Environmental Studies Program seeks students who have a strong interest in research related to Global Environmental Studies, and who have the will and enthusiasm to work internationally, constantly honing their rich intellect and sensitivity, aiming for practical research that will open up a new era, while taking a comprehensive view of the entire field of study, not limited by existing disciplines.

- Selection of Students for Admission
In selecting students for the Global Environmental Studies Program, we place importance on basic academic skills, research planning ability, and logical thinking ability to promote research independently in the field of Global Environmental Studies. In order to properly judge such abilities, the selection process will focus on research and social experience prior to admission, including research from master's degree programs, the specificity and feasibility of research to be conducted after admission, and the ability to carry out such research.



List of Faculty Members, 2023 *As of April 1st, 2023

Professor

Name	Expertise	Research Topic
ABE Ken-ichi	Anthropology of Sensitivity, Environmental Studies of Empathy	An academic discipline that considers new regional affluence, based on the relationship between people and nature, from (1)transparent “observation” in the field, (2)“intuition” based on empathy, and (3)“abduction” for creative discovery
SAKAKIBARA Masayuki	Earth and Environmental Sciences	Heavy metal pollution of human and natural origin and its impact on biosphere, hydrosphere and atmosphere
SHOBAYASHI Mikitaro	Agriculture and Agri-environmental Policies, Water Resources Policies, Rural Development, Agricultural Economics	Research on policies to improve the relationship among agriculture, the environment, land and water resources
SHINJO Ryuichi	Petrology and Mineralogy, Isotope Geochemistry	Research on the geology and water cycle of coral reef islands and marine paleoenvironmental study using geochemical analyses
TANIGUCHI Makoto	Hydrology	Research on issues linking a region and the earth such as the linkage between water, energy, and food, and climate change
TAYASU Ichiro	Isotope Ecology, Environmental Isotope Study	Research on the relationship between organisms and the environment, ecosystems, and the global environment through stable isotope analysis of elements contained in organisms, water, and environmental samples, and research on environmental traceability (provenance and history estimation) based on isotopic information
NAKAGAWA Yoshinori	Future Studies, Qualitative Research	Research to solve problems that involve conflicts between current and future generations through field research on the practice of organizations and communities shaping their own long-term visions with global sustainability as a constraint, and the development of methodologies to support such practice
HAYASHI Kentaro	Biogeochemistry, Soil Science	Research on nitrogen cycling based on biogeochemical studies and integrating various fields for sustainable nitrogen use for future generations
MATSUDA Motoji	Cultural Anthropology, Environmental Sociology	Conflict and dialogue between culture and science at field sites where global environmental issues arise, and exploration of convivial relationship between them

Associate Professor

Name	Expertise	Research Topic
ISHII Reiichiro	Theoretical Ecology	Research aimed at elucidating the sustainability of ecosystems and biodiversity and their conditions under multiple human activities using diverse ecosystem observation data and modeling methods
Grace Wong	Forest and Natural Resource Economics, Development Studies	Research focuses on social-environmental justice and politics of forest frontiers, social forestry and climate change
KUMAZAWA Terukazu	Regional Planning, Environmental Informatics	Research on empirical analysis and method development for designing future society by sharing people’s knowledge about environmental issues and local communities
KONDO Yasuhisa	Archaeological Geography, Environmental Sociology, Science of Team Science	Research on archaeological geography of Arabia and community capability development based on the integration of open science and interdisciplinary co-creation theories
SHIN Ki-Cheol	Petrology, Geochemistry, Isotope Geology	Research on the environmental assessment of Global Environmental Studies by using traceability methods utilizing isotopic and geological information of metal elements
Daniel Niles	Geography	Human-environmental geography specializing in sustainability studies, material culture, and environmental knowledge
MATSUMOTO Tae	Educational Technology	Research on the development of systems and data analysis methods to effectively utilize advanced technologies, etc., in order to realize data-driven education

Assistant Professor

Name	Expertise	Research Topic
ONISHI Yuko	Environmental Studies	Theory and methods of co-creation with the stakeholders, climate change impact assessment, biological conservation, and sustainability

Organization



YAMAGIWA Juichi	Director-General, Director of Strategic Planning and Management Department	LAMBINO, Ria	Head of International Engagement Unit
TAYASU Ichiro	Deputy Director-General (Planning and Coordination), Director of RIHN Center, Head of Laboratory and Analysis Unit	KONDO Yasuhisa	Head of Institutional Research Unit
TANIGUCHI Makoto	Deputy Director-General (Research), Director of Research Department	OKADA Saeko	Head of Public Relations Unit
KUMAZAWA Terukazu	Head of Information Development Unit	ABE Ken-ichi	Head of Communication Unit
ISHII Reiichiro	Head of Collaboration Unit	NILES, Daniel	Head of International Publications Unit

Boards and Committees *As of August 1st, 2023

Board of Advisors

Oversees personnel, planning, administration and operation of the institute

ASAOKA Mie	President, Kiko Network/ Lawyer	SHINODA Kenichi	President, National Museum of Nature and Science
KAMEYAMA Yasuko	Professor/ Director, Sustainable Society Design Center, Graduate School of Frontier Sciences, The University of Tokyo	TAKENAKA Chisato	Emeritus Professor, Nagoya University
KOBAYASHI Izumi	Independent Outside Director, ANA Holdings Inc.	NAGAO Seiya	Director, Institute of Nature and Environmental Technology, Kanazawa University
KOBAYASHI Tadashi	Emeritus Professor, Osaka University/ Specially Appointed Professor, Osaka University/ Director-General, Research Institute of Science and Technology for Society, Japan Science and Technology Agency	TAYASU Ichiro	Deputy Director-General, RIHN
SATO Jin	Professor, Institute for Advanced Studies on Asia, The University of Tokyo	TANIGUCHI Makoto	Deputy Director-General, RIHN
		MATSUDA Motoji	Program Director, RIHN
		SHOBAYASHI Mikitaro	Program Director, RIHN

Council for Research Strategy

Oversees research strategy, personnel, project, and evaluation system

YAMAGIWA Juichi	Director-General	MATSUDA Motoji	Program Director	SHIMANE Toru	Administrative Director
TAYASU Ichiro	Deputy Director-General	SHOBAYASHI Mikitaro	Program Director		
TANIGUCHI Makoto	Deputy Director-General				

External Research Evaluation Committee

External review of research project proposals

<i>Domestic</i>			
YUMOTO Takakazu	Emeritus Professor, Kyoto University	YOSHIDA Naohiro	Professor Emeritus, Tokyo Institute of Technology/ Fellow, Earth-Life Science Institute (ELSI), Tokyo Institute of Technology/ Executive Researcher, National Institute of Information and Communications Technology (NICT)
HARUYAMA Shigeko	Emeritus Professor, Mie University	HAYASAKA Tadahiro	Professor, Center for Atmospheric and Oceanic Studies, Radiation and Climate Physics Group, Graduate School of Science, Tohoku University
MUTO Megumi	Vice President, Japan International Cooperation Agency (JICA)		
MOJI Kazuhiko	Professor, Graduate School of Tropical Medicine & Global Health, Nagasaki University		
<i>Overseas</i>			
CHABAY, Ilan	Research Professor, Global Futures Lab, School for Complex Adaptive Systems and Director, ASU Decision Theater at Barrett & O'Connor Center, Washington, DC; Arizona State University (ASU), U.S.A.	STRIER, Karen B.	Vilas Research Professor & Irven DeVore Professor, Department of Anthropology, University of Wisconsin-Madison, U.S.A.
AILIKUN	Professor, Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China	HELGESON, Jennifer F.	Research Economist, Acting Program Manager, National Institute of Standards and Technology, U.S.A.
DAZ, Sandra	Professor, Universidad Nacional de Cordoba, Argentina	HISCOCK, Kevin	Professor of Environmental Sciences, School of Environmental Sciences, University of East Anglia, UK
JOULIAN, Frederic	Professor, EHESS, France	MEINZEN-DICK, Ruth	Senior Research Fellow, The International Food Policy Research Institute (IFPRI), U.S.A.
KIRUMIRA, Edward K.	Director, Stellenbosch Institute for Advanced Study/ Professor Extraordinary, Department of Sociology and Social Anthropology, Stellenbosch University, Stellenbosch, South Africa		

Senior Advisor • Emeritus Professor • Honorary Fellow

TACHIMOTO Narifumi	Senior Advisor, Emeritus Professor	NAKANO Takanori	Emeritus Professor
YASUNARI Tetsuzo	Senior Advisor, Emeritus Professor	NAKASHIZUKA Tohru	Emeritus Professor
AKIMICHI Tomoya	Emeritus Professor	NAKAWO Masayoshi	Emeritus Professor
FUKUSHIMA Yoshihiro	Emeritus Professor	OSADA Toshiki	Emeritus Professor
HIDAKA Toshitaka	Emeritus Professor (deceased)	SATO Tetsu	Emeritus Professor
KADA Ryohei	Emeritus Professor	SATO Yo-Ichiro	Emeritus Professor
KAWABATA Zen'ichiro	Emeritus Professor	WADA Eitaro	Emeritus Professor
KUBOTA Jumpei	Emeritus Professor (deceased)	SAIJO Tatsuyoshi	Honorary Fellow
MALLEE, Hein	Emeritus Professor	SUGIHARA Kaoru	Honorary Fellow
MOJI Kazuhiko	Emeritus Professor	VAN DER LEEUW, Sander Ernst	Honorary Fellow
NAKANISHI Masami	Emeritus Professor		

RIHN Staff *As of August 1st, 2023

Director-General

YAMAGIWA Juichi Global Studies for Humanity and Nature, Social Ecology, Human Evolution, Primatology, Anthropology

Deputy Director-General • Professor

TANIGUCHI Makoto Hydrology RHN Center
TAYASU Ichiro Isotope Ecology, Environmental Isotope Study RHN Center

Professor

ABE Ken-ichi Ecological Anthropology Strategic Planning and Management Department • Communication Unit
HAYASHI Kentaro Biogeochemistry, Soil Science Research Department • Sustai-N-able Project
NAKAGAWA Yoshinori Future Studies, Qualitative Research Research Department • Future Design Project
OYAMA Shuichi Geography, Land restoration study, Peace building study, African area study Research Department • Organic Material Circulation Project
PATRA, Prabir K. Study of greenhouse gases and ozone depleting substances, Air pollution, Biomass burning, Atmospheric modelling and measurements Research Department • Aakash Project
SAKAKIBARA Masayuki Earth and Environmental Sciences, Transdisciplinary Research Research Department • SRIREP Project
SHINJO Ryuichi Petrology and Mineralogy, Isotope Geochemistry Research Department • LINKAGE Project

Specially Appointed Professor

MATSUDA Motoji Cultural Anthropology, Sociology Research Department • Global Environmental Culture Program
SHOBAYASHI Mikitaro Agriculture and agri-environmental policies, Water resources policies, Rural development, Agricultural economics Research Department • Combining Knowledge for a Fundamental Innovation of Land Use Program

Associate Professor

ISHII Reiichiro Theoretical Ecology RHN Center • Collaboration Unit
KANEMOTO Keiichiro Industrial Ecology, Environmental Economics Research Department • Supply Chain Project
KONDO Yasuhisa Archaeological Geography, Environment and Societies, Science of Team Science Strategic Planning and Management Department • Institutional Research Unit
KUMAZAWA Terukazu Regional Planning, Environmental Informatics RHN Center • Information Development Unit
MATSUMOTO Tae Educational Technology RHN Center • Information Development Unit
NILES, Daniel Geography Strategic Planning and Management Department • International Publications Unit
OKADA Saeko Public relations, Science communication Strategic Planning and Management Department • Public Relations Unit
SHIN Ki-Cheol Petrology, Geochemistry, Isotope Geology RHN Center • Laboratory and Analysis Unit
WONG, Grace Forest and Natural Resource Economics, Development Studies Research Department • FairFrontiers Project

Specially Appointed Associate Professor

LAMBINO, Ria Global Environmental Studies, Environmental Governance RHN Center • International Engagement Unit

Assistant Professor

ONISHI Yuko Biogeography, Macroecology RHN Center • International Engagement Unit

Specially Appointed Assistant Professor

NGUYEN, Tien Hoang Geoinformatics, Environmental Modeling and Mapping Research Department • Supply Chain Project
ONISHI Yuji Biogeochemistry RHN Center • Laboratory and Analysis Unit
SAWAZAKI Kenichi Aesthetic Practices RHN Center
WAKAMATSU Hisanori Scientometrics, Evaluation Strategic Planning and Management Department • Institutional Research Unit
YASUTOMI Natsuko Meteorology, Climatology Research Department • Aakash Project

Senior-Researcher

AOKI Eri Environmental Systems, Environmental psychology, Urban Environmental Engineering Research Department • Co-creation of the Earth-human System Program
ASSEMBE MVONDO, Samuel Environmental Law, Forest Governance, Policy and Institutional Change, China Africa Trade and Investment, Social inequalities Research Department • FairFrontiers Project
DHIAULHAQ, Ahmad Forest and natural resource governance, Land-use conflicts, Social-environmental justice Research Department • FairFrontiers Project
KATAFUCHI Yuya Econometrics, Applied Econometrics Research Department • Supply Chain Project
LEE-Jemyung Regional Informatics, Rural Planning Research Department • Supply Chain Project
YABUSAKI Shiho Isotope Hydrology, Groundwater Hydrology RHN Center • Laboratory and Analysis Unit
YOSHIMIZU Chikage Biogeochemistry RHN Center • Laboratory and Analysis Unit

Researcher

ARAI Hirotsugu	Isotope Ecology	RIHN Center • Laboratory and Analysis Unit
BACHRIADI, Dianto	Rural social transformation	Research Department • SRIREP Project
BISWAL, Akash	Air Pollution, Air Quality, Bigdata analytics in Air Pollution, Remote Sensing	Research Department • Aakash Project
DHAR, Aurup Ratan	Nutrient Accounting	Research Department • Sustain-N-able Project
FAHMI, Muhamad	Bioinformatics, Molecular Evolution	Research Department • Supply Chain Project
HAMADA Takeshi	Sociology	Research Department • Global Environmental Culture Program
HEPP, Catherine Maria	Agricultural development, Ecosystem Services and Livelihood Studies, Soil Science	Research Department • FairFrontiers Project
KIMIJIMA Satomi	Geoinformatics, Area Studies	Research Department • SRIREP Project
KYOUJI Shinsuke	Environmental Economics, Agricultural Economics	Research Department • Sustain-N-able Project
LEONG, Chris	Hydrology	Research Department • LINKAGE Project
LI Ximeng	Regional Science and Spatial Economics	Research Department • Supply Chain Project
MAKINO Soyoka	Material cycling in Forest ecosystems	Research Department • Sustain-N-able Project
MANGARAJ, Poonam	Atmospheric Chemistry, Urban Air Quality, Greenhouse Gas Emission Inventory, Measurement of Air Pollutants, Health Impact Assessment, Mitigation and strategies	Research Department • Aakash Project
METARAGAKUSUMA, Andi Patiware	Rural development	Research Department • SRIREP Project
MEUTIA, Ami Aminah	Hydrology	Research Department • SRIREP Project
MIMURA Yutaka	Architectural History, Urban History, Historical GIS	Strategic Planning and Management Department • Communication Unit
MURAO Rumiko	Area Studies, Anthropology	Research Department • Aakash Project
SAIKI Makoto	Material cycle, Water environment	Research Department • Sustain-N-able Project
SHIMADA Nahoko	Study of Ecological Thought	Strategic Planning and Management Department • Communication Unit
SIDIBE, Alimata	Atmospheric Chemistry	Research Department • FairFrontiers Project
SODA Katsuya	Forced Migration Studies	Strategic Planning and Management Department • Communication Unit
TAKANO Shinya	Isotope Hydrology	RIHN Center • Laboratory and Analysis Unit
TOMOJIRI Daiki	Ecology, Area Studies	Research Department • LINKAGE Project
WIN THIRI KYAW	Neurology and Clinical Pharmacology	Research Department • SRIREP Project

Visiting Professor

ASARI Misuzu	MATSUMI Yutaka
BABA Kenshi	MIZUNO Kosuke
DWYER, Janet	NAKATSUKA Takeshi
EMORI Seita	NIKAWA Tatsuhiro
HABU Junko	OHTE Nobuhito
HASEGAWA Yuko	SAIJO Tatsuyoshi
HAYASHI Hiroaki	SAKAI Shoko
HAYASHIDA Sachiko	SUGIHARA Kaoru
KADA Yukiko	TERADA Masahiro
KANIE Norichika	YAMADA Shoko
KASUGA Fumiko	YAMANAKA Manabu
KONO Yasuyuki	YAMAUCHI Taro
KUBOTA Tetsu	YASUNARI Tetsuzo
KUSAGO Takayoshi	YOSHIDA Takehito
MALLEE, Hein	

Visiting Associate Professor

KIHARA Hirotsuka
KOZAN Osamu
MASUHARA Naoki
MC GREEVY, Steven Robert
OTA Kazuhiko
OTSU Eri
SHIMIZU Takao
WATANABE Tsuyoshi

Visiting Assistant Professor

HONGO Shun
JIANG Hong-wei
KIM Satbyul

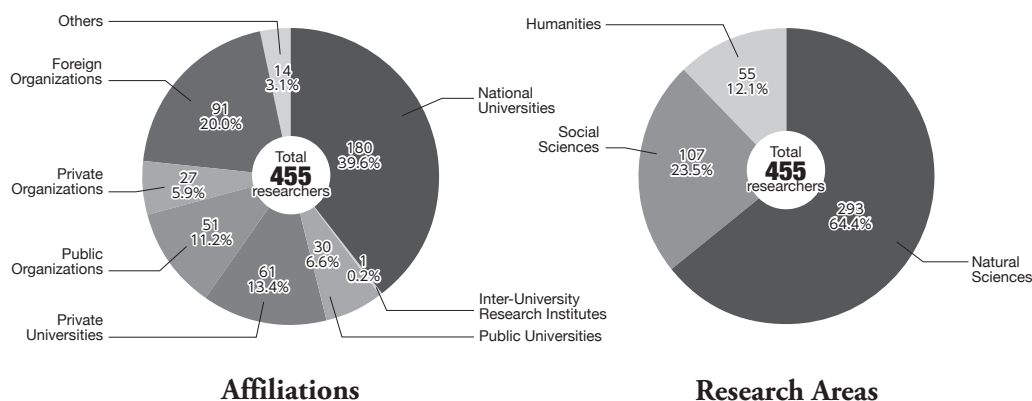
Budget (FY 2023)

	Amount (Yen in thousands)
Income	1,403,311
Subsidy for Operation	1,388,985
Self Revenue	14,326

External Sources of Funding (FY 2022)

Category	Amount (Yen in thousands)
Fund for Promotion of Academic and Industrial Collaboration	46,510
Grants-in-Aids for Scientific Research (KAKENHI)	74,750
Donations for Research	2,379

Collaborative Researchers *As of March 31st, 2023



Domestic Collaboration *As of August 1st, 2023

RIHN has concluded 36 agreements on academic exchanges with research institutes and administrative agencies nationwide, and is working to promote cross-organizational academic research and to enhance and develop mutual research and education.

Universities and 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. Kyoto University
7. Center for Environmental Remote Sensing, Chiba University
8. Institute of Nature and Environmental Technology, Kanazawa University
9. Graduate School of Life Sciences, Tohoku University
10. Faculty of Collaborative Regional Innovation, Ehime University
11. Kyoto Seika University
12. Nara Women's University
13. University of the Ryukyus
14. Hokkaido University
15. Graduate School of Environmental Studies, Tohoku University
16. National Agriculture and Food Research Organization
17. Kochi University of Technology
18. Center for Research and Application of Satellite Remote Sensing, Yamaguchi University
19. Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology
20. Sophia School Corporation

Municipal Governments and Other Agencies

1. Saijo City (Ehime Prefecture)
2. Kyoto Municipal Science Center for Youth
3. Food and Agricultural Materials Inspection Center
4. Ono City (Fukui Prefecture)
5. Kameoka City (Kyoto Prefecture)
6. Kyoto Prefectural Hokuryo Senior High School
7. Kyoto Prefectural Rakuohku Senior High School
8. Miyazaki Prefecture
9. Noshiro City (Akita Prefecture)
10. Kyoto City, ICLEI Japan, Kyoto Environmental Activities Association
11. Kyoto Institute, Library and Archives
12. Oshino Village (Yamanashi Prefecture)
13. Kyoto Prefecture, Kyoto City (2 agreements)
15. Asia Center for Air Pollution Research, Japan Environmental Sanitation Center
16. Kyoto Prefectural Board of Education

International Collaboration *As of August 1st, 2023

RIHN has actively concluded 25 memorandums of understanding with overseas research institutes, laboratories, etc., promoting joint research, sharing research materials, and encouraging personal interaction. In addition, in order to build closer ties with overseas researchers, we have invited many prominent researchers from various countries as invited foreign researchers.

Austria	-International Institute for Applied Systems Analysis	-University of Lampung
Cameroon	-Green Development Advocates	-Wakatobi Regency
China	-East China Normal University	Laos
	-Hainan Provincial Center for Disease Control and Prevention / Hainan Provincial Preventive Medicine Association	-Lao Tropical and Public Health Institute, Ministry of Health
		-The Faculty of Forest Science, National University of Laos
Democratic Republic of the Congo	-Center for Intercultural and Interdisciplinary Research for Sustainable Development in Southern and Central Africa	Malaysia
	-Forgotten Parks	-PACOS Trust
	-Research Institute for Sustainability	-Universiti Malaysia Sarawak
Germany	-Lovely Professional University	Myanmar
India	-Halu Oleo University	-Ministry of Natural Resources and Environmental Conservation, Environmental Conservation Department
Indonesia	-Institut Teknologi Bandung	-Network Activities Group
	-Institut Teknologi dan Kesehatan Tri Tunas Nasional	Netherlands
	-The State University of Gorontalo	-Copernicus Institute of Sustainable Development, Utrecht University
	-Universitas Riau	Republic of Korea
		-Institution for Marine and Island Cultures, Mokpo National University
		Sweden
		-Stockholm Resilience Centre at Stockholm University
		United States of America
		-University of California, Berkeley

Management of secretariats for external organizations

In addition to concluding various agreements with domestic and overseas research institutes, administrative agencies, universities, etc., RIHN serves as secretariat of the Future Earth Global Secretariat Hub Japan, the Kyoto Climate Change Adaptation Center, and the University Coalition for Carbon Neutrality, contributing to external frameworks that tackle global environmental issues.

Future Earth Global Secretariat Hub Japan

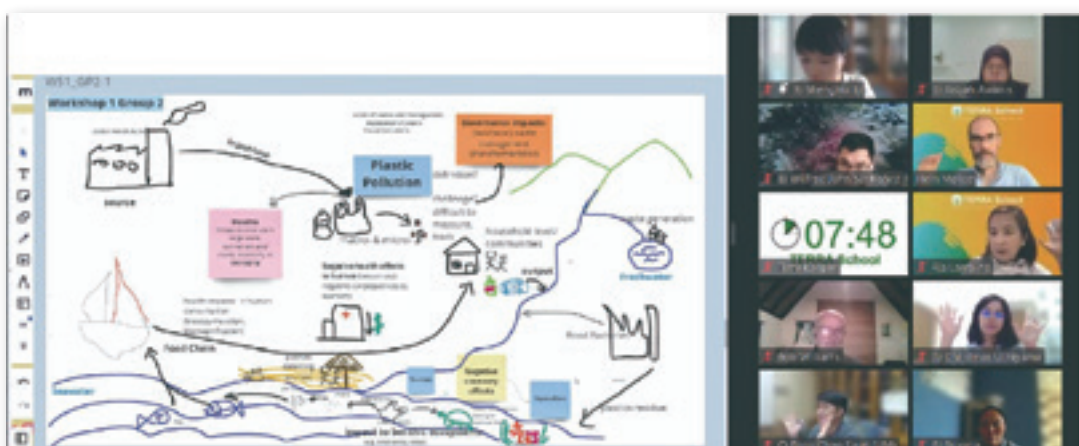
RIHN, in collaboration with Nagasaki University, National Institute for Environmental Studies and other organizations, forms part of the consortium that hosts the Future Earth Global Secretariat Hub Japan.



Future Earth is a global network of scientists, researchers and innovators collaborating for a more sustainable world. This global community is composed of experts from the natural sciences, humanities, and social sciences, as well as practitioners from various sectors of society who facilitate research, mobilize networks, and turn knowledge into action.

In August 2021, the Future Earth Asia Regional Center, which had been hosted by RIHN since 2014, and the Future Earth Japan Hub in Tokyo merged to form the Japan Hub of the Future Earth Global Secretariat. This new Japan Hub is responsible for the global operation of Future Earth, including coordinating and managing research projects, cross-thematic and cross-regional cooperation, and collaboration with key partners, as well as developing research networks and research plans at the international, regional (with an Asia focus) and domestic level.

RIHN through the International Engagement Unit takes on the following key functions of the Japan Hub : organizing outreach and capacity-building development through the TERRA School (a training course on Transdisciplinarity for Early career Researchers in Asia), liaising and convening the Knowledge-Action Network on “Systems of Sustainable Consumption and Production” (<https://sscp.futureearth.org/>), coordinating Early Career Researchers Networks and Low Middle Income Country networks, establishing and supporting the Future Earth Asia Regional Committee and providing support for the Future Earth Japan National Committee.



TERRA School participants went through lectures and interactive group works using Miro and other online platforms. On the last day of the program, each group presented a proposal for a transdisciplinary research project.

 <https://futureearth.org/about/who-we-are/international-offices/japan-global-hub>

Kyoto Climate Change Adaptation Center

On July 14, 2021, Kyoto Prefecture, Kyoto City, and the Research Institute for Humanity and Nature (RIHN) agreed to set up the cooperative body for adaptation to climate change in Kyoto, based on which the “Kyoto Climate Change Adaptation Center” was established at RIHN as a new facility in accordance with the natural and social conditions of the region.



Because of global-scale environmental changes brought about by human civilization, we have entered a new era of global history known as the “Anthropocene,” and we are now facing a variety of global environmental issues that will seriously affect the lives of many people and the sustainability of our society. These issues should be considered by the global community as a whole, but also by the diverse regions in which we actually live. In order to solve climate change, one of the most serious global environmental problems, we must work to mitigate it by reducing global emissions of greenhouse gases such as CO₂, the main cause of climate change. We also must address the climate conditions that cannot be quickly reversed by local communities, each of which has its own unique natural environment and history and culture to cope with these conditions. At the same time, it is necessary to consider how local communities, with their unique natural features and corresponding histories and cultures, should adapt to climate conditions that are not immediately reversible. Without these two approaches of global mitigation and local adaptation, there can be no solution to the climate change problem. The Kyoto Center for Climate Change Adaptation considers its mission to be to explore ways to comprehensively resolve climate change issues at a global scale by considering nature and society from the perspective of Kyoto, a region with an ancient culture and history.

This center was established to promote efforts in Kyoto to adapt to climate change through collaboration between Kyoto Prefecture, Kyoto City, and RIHN, based on the Climate Change Adaptation Act enacted by the Japanese Diet in 2018; collect, analyze, and research information on the impacts of climate change and adaptation measures as described below; and act as a base to disseminate these results.

1. Collection, organization, and analysis of information on climate change impacts and adaptation, and prediction and assessment of climate change impacts
2. Aggregation of the latest knowledge on climate change impacts and adaptation through collaboration with universities and other research institutes
3. Dissemination of information on climate change impacts and adaptation, and enlightenment of citizens and business operators
4. Support for the creation of adaptation businesses for the autonomous dissemination of climate change adaptation measures
5. Information sharing and cooperation with related organizations such as the national government and the National Institute for Environmental Studies



<https://kccac.jp/>

University Coalition for Carbon Neutrality

The University Coalition for Carbon Neutrality aims to develop efforts to achieve carbon neutrality from universities, etc. to regions, countries, and the world, and to contribute to bringing about better changes in society through dissemination. The Coalition was established on July 29, 2021, and as of April 1, 2023, 203 universities are participating. RIHN conducts the overall operation as the secretariat of the Coalition.

In recent years, there has been a rapid increase in domestic and international debate on the issue of realizing carbon neutrality, and it is necessary for all participants, including the national government, local governments, universities, and companies, to work together according to their respective positions and strengths. Universities, whose mission is to create scientific knowledge that will serve as the basis for national and regional policies and technological innovation, and to disseminate that knowledge, are expected to play an especially large role both domestically and internationally. Universities are becoming more and more important in local communities, and collaborations between universities and communities are increasing to promote the decarbonization of local communities and the development of a model for this across the country and around the world.

From this perspective, with the cooperation of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Economy, Trade and Industry, and the Ministry of the Environment, the University Coalition for Carbon Neutrality was established as a forum to share and disseminate information for universities that are actively working toward carbon neutrality or are planning to strengthen their efforts.

The Coalition currently has five working groups (Zero Carbon Campus WG, Regional Zero Carbon WG, Innovation WG, Human Resources Development WG, and International Collaboration WG) to achieve its goals.

RIHN, serving as the secretariat of the Coalition, holds a General Assembly (chaired by the Director-General of RIHN) where representatives (such as university presidents) of 203 participating institutions gather to manage the Coalition's activity policies and progress. RIHN also holds a steering committee that manages and operates the Coalition based on the decision of General Assembly, hosts a symposium of the Coalition, and supports the daily activities of the five WGs.

<https://uccn2050.jp/>

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
 - 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
- 2011 – RIHN 10 year anniversary and publication
- 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 – The Center for Research Development and the Center for Research Promotion reorganized into RIHN Center
- 2021 – YAMAGIWA Juichi appointed as the fourth Director-General
 - RIHN 20 year anniversary and symposium
 - Kyoto Climate Change Adaptation Center established
 - Joined the Consortium that hosts the Future Earth Global Hub Japan
- 2022 – Strategic Planning and Management Department established
 - RIHN logo redesigned
- 2023 – Global Environmental Studies Program, the Graduate University for Advanced Studies, SOKENDAI established

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.

Outline

Site area	31,453m ²
Building area	6,266m ² (Main building : 5,626m ² , RIHN house : 640m ²)
Total floor area	12,887m ² (Main building : 11,927m ² , RIHN house : 960m ²)
Structure	Main building : RC, partly S structure, RIHN house : RC structure
Number of floors	Main building : 1 basement and 2 floors above ground, RIHN house : 1 basement and 2 floors above ground

2 F

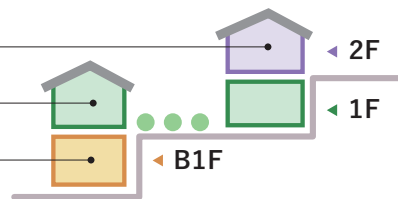
Main Entrance Hall
Administration
Lecture Hall
Seminar Rooms
Dining Hall

1 F

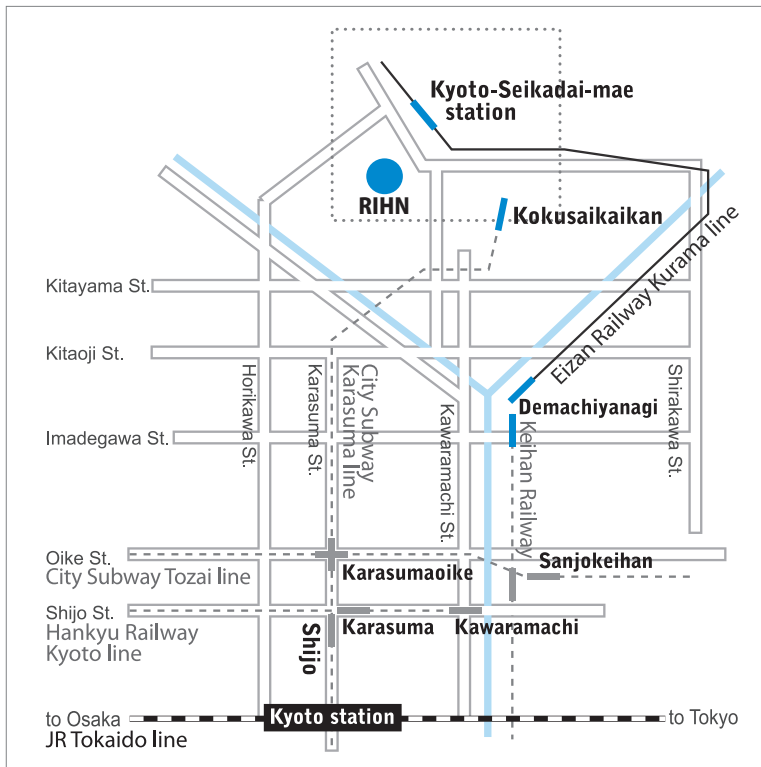
Project Rooms
RIHN Center
Library

Basement

Laboratories
Book Repository
Field Research Equipment and Facilities



Access



By City Subway

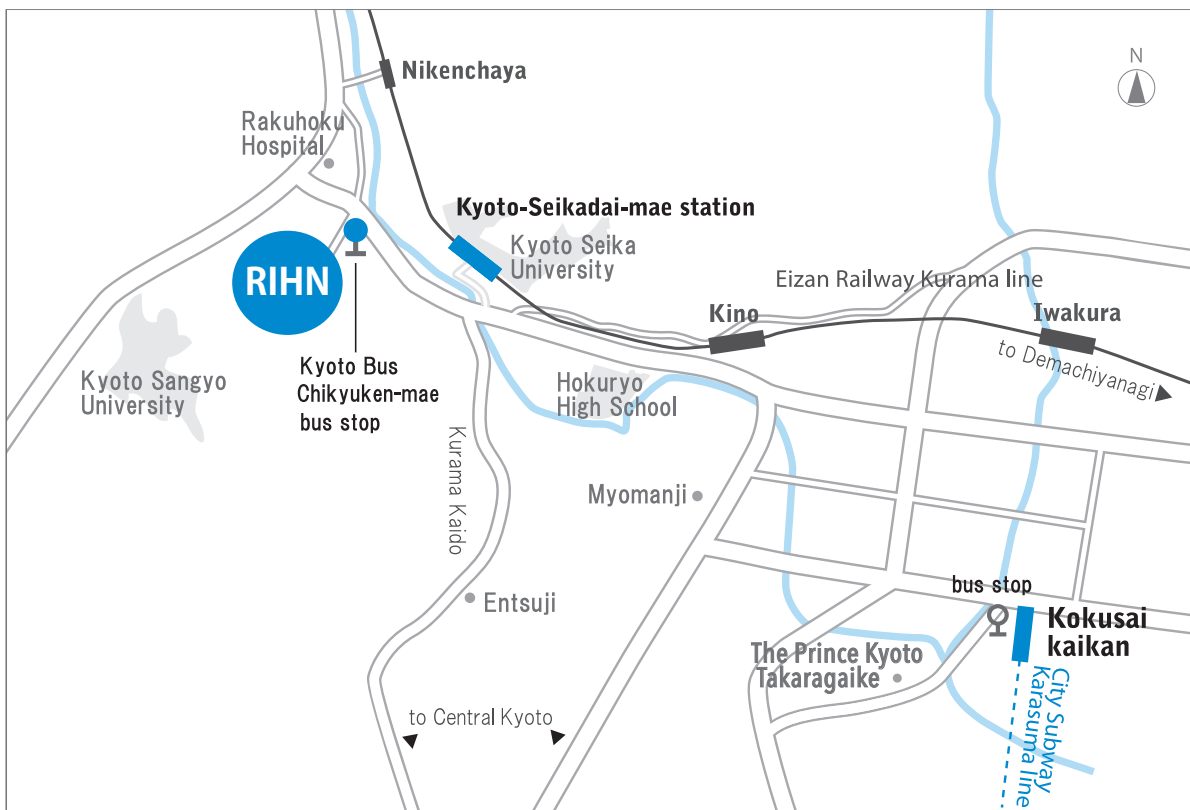
From Kyoto Station, take the Karasuma Line to Kokusaikaikan Station (the last station), and transfer to Kyoto Bus.

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.





Research Institute for
Humanity and Nature
大学共同利用機関法人 総合地球環境学研究所
人間文化研究機構

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ISSN 2185-8055

November 2023