







Research Institute for Humanity and Nature

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Prospectus 2024-2025

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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, conducts comprehensive research in global environmental studies. RIHN's research is based on the idea that human culture—beliefs, values and actions—are at the root of contemporary global environmental problems. As a member of the National Institutes for the Humanities, RIHN research investigates the causes and possible solutions of contemporary environmental problems from a wide range of humanities and social sciences perspectives, while also creatively drawing on data defined by the natural sciences.

Today, it's well known that the Earth is facing many challenges. Rapid increases in population, urbanization, large-scale industrial production and the movement of people and goods have led to significant changes in the global environment. Carbon dioxide emissions, global warming, ocean acidification and tropical rainforest deforestation continue to increase despite years of effort to contain them, while phenomena such as the coronavirus pandemic, for example, draw our attention to the complex intersections of climate change and public health.

Important ongoing efforts, such as the United Nations Framework Convention on Climate Change (UNFCCC) and the 2030 Agenda for Sustainable Development Goals show some signs of promise at the international level. Meanwhile Russia's invasion of Ukraine, and the recent military clashes between Hamas and Israel, have increased tensions in the international political order. Governments now face novel challenges as societies around the world appear newly vulnerable to flows of digital information. Information flows may connect people more efficiently and lead to cultural homogenization and loss of ties to local culture and nature. The digital world also can lead to societal fragmentation, and the rise of populism, and mutual suspicion. Fifty years ago the Club of Rome offered concrete proposals to reverse poverty and inequality, empower marginalized groups and transform food and energy—but many of these proposals remain unfulfilled.

At RIHN we believe that addressing such global problems requires not only proper use of science and technology, but also deeper inquiries into the way societies operate, in past and future, and in particular their relationships to and beliefs about nature. Over the past twenty-three years, RIHN has conducted forty-three research projects, many of which were designed to offer specific solution-oriented proposals to their study problems. Such results help us to promote transdisciplinary research, which addresses complex multi-scale environmental problems from the local to the global level, and to create a future-oriented society. Transdisciplinary research involves researchers, governments, municipalities, NGOs, the private sector and other interested parties in solution-oriented projects. It also engages the different kinds of knowledge necessary to culturally-relevant solutions. While we live in knowledge-intensive societies, much wisdom and traditional practices lie dormant in local communities. It's often said that global sustainability requires total transformation, but we should not overlook such deep wells of human experience.

Since its foundation, RIHN research has sought creative interweaving of the natural sciences with the humanities and social sciences. Our approach has established RIHN as a novel international center for environmental studies. RIHN has made important contributions to the global network Future Earth and the Earth Hall of Fame KYOTO, the Globally Important Agricultural Heritage Systems Programme of the U.N. Food and Agriculture Organization, and many other international endeavors. Nationally, RIHN cooperates with Kyoto Prefecture and the city of Kyoto and universities in Japan to serve as the Kyoto Climate Change Adaptation Center and the secretariat of the University Coalition for Carbon Neutrality, collaborations involving many universities, local governments, and industrial companies throughout Japan. With support of the Uehiro Foundation on Ethics and Education, in 2024 RIHN established the Uehiro Research Center for Japan Environmental Studies to consider the ethical dimensions implicit in our environmental studies. As of 2024 RIHN is also a part of Japan's Graduate University for Advanced Studies, SOKENDAI, which offers a doctoral course in Global Environmental Studies and accepts postgraduate students. Our research networks continue to grow.

As Director-General, I am determined to deepen our practical and conceptual exploration of the future potential of local places, while also remaining sensitive of the need to extend our concept of the global commons. In this way, we will further demonstrate to the world the significance of the Research Institute for Humanity and Nature. We invite you to join us.



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 Article2, 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.



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

* 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 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.

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.

	Construction of Japanese Historical Knowledge and Open Science Research
	Model Building in the Humanities through Data-Driven Problem Solving
Institute-based Projects	Empirical and Applied Research on the Japanese Language Based on Open Language Resources
NIHU's six institutes have established priority research themes in accordance with their respective missions.	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	Interdisciplinary and Integrated Studies on Local Cultures: Aiming for the Emergence of Novel Communities
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 used in a constant fields.	Object-based Research of Nature-human Interactions up to the Anthropocene
institutes, working with research themes that cut across different fields.	Expansion Studies of Synthetic Bibliology
Network-based Projects These are projects in which NIHU's institutes play a central role in forming a	NIHU Global Area Studies
network with universities and other research institutes in Japan and overseas as well as implementing issues that are important to Japan and the world.	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)
- Building Digital Library for Humanities
- Japan-related Documents and Artifacts Held Overseas:
 - 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.



[social co-creation] [digitalization]

[international co-creation]

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.

Photo by KIMIJIMA Satomi (Myanmar, 2017)

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 futurable 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.
- 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 problemsolving. While working in collaboration with Research Programs and Projects, this program will make use of the resources of the Fundamental Research Department 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.



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.

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

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

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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.

Research progress update

This program commenced in April 2022. It comprises various research projects ranging from embryonic stages to full-fledged studies, all contributing to the overarching goals of the program. To integrate diverse projects with different research themes and organizational structures, the program regularly conducts workshops and research meetings where participants share a common question and juxtapose their respective answers. Additionally, there are plans to organize symposiums to synthesize these discussions.

The central question driving this program is: "What does it mean to approach the transformations of human behavior and values in response to environmental crises, both global and local, from a cultural perspective?" Specifically, in the context of environmental crises at both global and local levels, there often exists a disconnect between scientific prescriptions for addressing these crises and the ways in which local communities live and cope with them. In many cases, scientific prescriptions

are perceived as the sole "solution" imposed on the local context, or there might be a convergence of scientific and indigenous/local knowledge to form a solution. Conversely, clashes or conflicts may arise between scientific knowledge and local cultures and values. While such interactions between "science" and "culture" are commonplace in environmental problem-solving contexts, thorough examinations of these complex interactions have often been lacking.

Research projects participating in this program are tasked with elucidating these complex interactions from their respective challenges and fields. They aim to report on the process of grappling with these conflicts during the programs workshops and share their findings with a wider audience.

The program includes the Full Research (FR) 1st Year Organic Material Circulation Project and the SceNE Project, each leveraging their unique experiences and accomplishments for the advancement of the program.

Projects in this program

FR

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(Program Director)

MATSUDA Motoji

Specially 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

Research Program (Global Environmental Culture Program)

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 organic material circulation system that contributes to land 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 land restoration, the lives of local residents and prevention of ethnic conflicts among farmers and herders.

> Project Leader OYAMA Shuichi

Project overview

The world's population is expected to reach 10 billion by 2050. The number of megacities -- cities with populations of 10 million or more -- is also increasing. Cities collect and consume a lot of food, energy, and other resources from their surroundings and around the world, but the wasted nutrients are not actively returned to farmland or the natural environment.

Under natural conditions, it can take as long as 1,000 years to form 1 cm of soil. In addition to economic disparity, food shortages and hunger, there is a serious problem of food loss in many parts of the world. There are fears that the production of food will not be able to keep up with demand due to the overuse of land and soil erosion caused by agriculture and pastoralism, which have led to land degradation. The food needs to be clean, and the organic waste and manure we throw away are abhorred as dirty. In Japan, the majority of organic waste is disposed of by incineration, with the ashes going to landfills instead of being used. The nutrients do not circulate in the ecosystem.

To achieve sustainability of our urban-based civilization in the future, we must accept the human characteristic of producing dirtiness from cleanliness. We need to understand the importance of the rebirth of life through such dirtiness, and to situate human existence in the earth system. This project hopes to promote a shift in thinking and values that seeks to build a material cycle between urban and rural areas.



Photo 1 "Cleaning the Cities, Greening the Land": On-site greening experiment (Republic of Niger, February 2012)



Photo 2 Pastureland created after 11 years of urban waste application (same location as Photo 1, August 2022)

Research progress

What we know so far

This research project aims to establish "RIHN compost (dry compost type)" technology for food waste disposal that utilizes natural process of fermentation, simple materials, and animal dung. Monitoring the temperature and moisture content of the materials determines the timing of the garbage input and allows for rapid garbage processing. This natural process involves the gut bacteria of thermostatic animals, and the basic temperature of compost material is between 35 and 37 degrees Celsius during the summer. The idea is to process food waste from hotels, using chicken and cattle dung from home improvement stores and nine species of animal dung from the Kyoto City Zoo, including Asian elephants, giraffes, hippopotamuses, zebras, tigers, chimpanzees, gorillas, and sloths. The project is also trying to establish fermentation techniques and recipes to promote the use of food waste discarded by hotels.

Noteworthy items

The first was to use "RIHN compost (dry compost type)" technology to make compost from kitchen waste from hotels and animal dung from the Kyoto City Zoo. We clarified the mechanism and established techniques and recipes by controlling temperature and moisture. The second point is networking with companies, the Kyoto City Zoo, the Kyoto Prefectural Board of Education, elementary schools, and farmers. Third, we introduced the concept, technology and recipe for "RIHN compost (dry compost type)" to elementary schools in Kyoto Prefecture, and provided classes so as to give opportunities to consider this possible countermeasure to the environmental problem.

The lifestyles and the content of waste in Japan, Southeast Asia and sub-Saharan Africa are different. By studying the lifestyles, consumption and waste composition in each society, we will promote appropriate use of organic waste, improvement of farmland productivity, land restoration, and nature regeneration through the establishment of an urban-rural organic circulation system.



Photo 3 A hotel buffet



Photo 4 Teaching about composting of school lunch leftovers (Collaboration with Kyoto Prefectural Board of Education)

(Project Leader)

OYAMA Shuichi

Professor, RIHN / Professor, Kyoto University

OYAMA Shuichi is a Professor at RIHN and the Center for African Area Studies, Kyoto University. His specialty is geography, land restoration, peace building research and African area studies. He has conducted multi-disciplinary research based on geography in Zambia, Uganda, Niger and Djibouti. Also, he is tackling building up organic material circulation systems between urban and rural areas in sub-Saharan Africa and Asia including Japan. His main publications include "Reverse thinking and 'African Potentials' to combat desertification in the West African Sahel" (African Study Monographs supplementary 57, 2018), and "Waste Valorisation and African Potentials: "(in Ohta, I., Nyamunjoh, F. B., and Matsuda, M. (eds.) African Potentials: Bricolage, Incompleteness and Lifeness, 2022).

(Sub Leader)

SHIOYA Akiyo

Kyoto University

(Researchers at RIHN)

NODA Kentaro AOIKE Utako MAEHATA Teruya NAKADE Michiko

(Main Members)

NAKANO Tomoko SHIMADA Sawahiko SAKAMOTO Takuto TSUCHIYA Yuichiro KOSAKA Yasuyuki HARADA Hidenori YABE Naoto Researcher Researcher Researcher Research Associate

Chuo University Tokyo University of Agriculture University of Tokyo Kyoto University of Education Kyoto University Kyoto University Tokyo Metropolitan University Research Program (Global Environmental Culture Program)

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

Project overview

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.



Figure 1 An example of the high-resolution images that we aim to achieve in this research, by transforming coral and human memories into art.



Photo 1 Underwater drilling of reef coral cores. Geochemical analysis of columnar samples can reconstruct hundreds of years of past marine environments on a weekly to monthly resolution.

Research progress

2021 2022 2023 2024 2025 2026 2027 2028 FS – FS – FS/PR – (FR1) – FR2 – FR3 – FR4 – FR5

What we know so far

In this research, we incorporate artistic methods, including theater, to develop and implement methods aimed at promoting empathy acquisition and collaborative futurethinking among interdisciplinary researchers, local stakeholders, and different generations. In previous studies, we have set virtual SceNEs (Scenes of the Era) in the model region of Kikaijima, where pivotal points of environmental and social change in the past were depicted on theater stages. This allowed for the sharing of high-resolution images of the relationship between people and the environment under different historical periods and environmental conditions. Furthermore, to integrate science and art, researchers and artists are engaging in discussions on how to express scientific concepts through art in a collaborative and equitable manner.

Noteworthy items

During the PR period, we conducted a process of deriving the necessary conditions for integrating science and art. Researchers and artists conducted retreats together, sharing living spaces and engaging in numerous sessions where scientists shared scientific concepts that artists (directors) translated into physical expressions. This process brought researchers and artists closer to a point where the boundary between them became blurred.

Furthermore, instead of researchers and artists leading the transformation of the community in the project, we implemented the creation of a new festival as a mechanism for equal information exchange and dialogue between researchers, artists, and local residents, mediated by art.



Photo 2 Performances of plays produced in this project at Kikaijima.



Photo 3 SceNERUIM -Dome for experience of "Umwelt"-

(Project Leader)

WATANABE Tsuyoshi

Associate Professor, RIHN / Senior Lecturer, Hokkaido University WATANABE Tsuyoshi started in coral research in Hokkaido University with BS in 1994, MS in 1996, and PhD in environmental earth science in 1999 and continued to study on the coral reefs and earth environmental sciences in Australia, France, Germany, and US. He established KIKAI institute for coral reef sciences since 2014 and is organizing a lot of field excursions inside and outside of Japan, with his friends and students.

(Sub Leader)

YAMAZAKI Atsuko

Nagoya University

(Main Members)

GOTO Akira KATO Hirofumi TAKAMIYA Hiroto HIRATA Oriza YAMANO Hiroya NAKAMURA Takashi TANAKA Kentaro NISHIMURA Yuya ITO Takeshi YODA Mami KATO Katsumi FUJIEDA Mamoru Nanzan University Hokkaido University Kagoshima University Professional College of Arts and Tourism The University of Tokyo Tokyo Institute of Technology Tokyo City University Osaka University Osaka University Sagami Women's University JTB Corporation Kyusyu University **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

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.

Research progress update

This program began in April 2023. Under the program, multiple projects operate autonomously, each utilizing its own ideas and methodologies, while collectively aiming to achieve the program's objectives. In FY2024, alongside the Full Research third-year project titled "Fair for Whom? Politics, Power and Precarity in Transformations of Tropical Forestagriculture Frontiers," a new Pre-Research project called "Satoyama Reconnections: Engaging Communities in Resilient, Nature- and Climate-positive Land Use Futures" has been added. Additionally, six projects have progressed from the incubation stage to the assessing feasibility stage.

To advance the projects under this program, it is crucial to create an environment where projects stimulate each other while enhancing complementarity. Each research project shares a focus on land use as its mission and a strong awareness of the impact on actual policies and institutions, as well as adopting interdisciplinary and transdisciplinary methodologies. However, there are differences in the scope of land targeted, the nature of environmental issues addressed, and the approach to impacting policies and institutions. To maximize the individuality of projects while enabling the achievement of the program's overall objectives, efforts will be made to enhance complementarity based on activities such as setting up forums for exchanging opinions on project content and progress and organizing seminars and workshops on common themes.

Relatedly, the program aims to become a "policy ecosystem," where policymakers, relevant actors, and researchers converge, generating innovative ideas for land use innovation. Research on the conditions conducive to policy and institutional innovation is progressing, and building on these findings, the program itself seeks to serve as a venue for a sort of social experiment, contributing to policy and institutional innovation.

Projects in this program

FR

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Designing Payments for Ecosystem Services to Innovate Farmland Use	KAMII Hiroyuki	P32
Nature- and Culture-based Solutions for Disaster Mitigation and Ecosystem Conservation in Floodplain Landscapes: Co-creative Designs of Floodplain Community for River Basin Disaster Resilience and Sustainability with Nature Positive Practices	TASHIRO Takashi	P33
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Establishment of a New Land Use Policy System of Rural Area That Simultaneously Realizes Decarbonization, Stable Food Supply, and Solution of Local Issues	NOZU Takashi	P37



Photo by Yuzuru Wakabayashi

(Program Director)

SHOBAYASHI Mikitaro

Specially Appointed Professor, RIHN

SHOBAYASHI Mikitaro 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. In 2007, he became a professor at Gakushuin Women's College, in the Faculty of Intercultural Studies. Between 2017 and 2023, he was 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."

Research Program (Combining Knowledge for a Fundamental Innovation of Land Use Program)

FairFrontiers Project

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

Deforestation and land use intensification in the tropical frontiers of Central Africa and Southeast Asia are rapidly transforming landscapes, livelihoods, and local well-being. This is both a global environmental problem and a local social-ecological crisis. This project carries out critical policy analyses and case study research to identify the conditions for how development and transformation of forest-agriculture frontiers can enable more equitable and sustainable development.

> Project Leader WONG, Grace

Project overview

Forest-agriculture frontiers of diverse swidden and smallholder practices are rapidly being converted to homogenous landscapes of commodity agriculture across the tropical Global South. These frontiers of agriculture, fallow and forest mosaics provide multiple ecosystem services, support social, cultural and livelihood needs, and are areas where indigenous communities and local people have traditional rights to land and resources. Land use intensification is often pursued as "sustainable development" and progress, but has often not led to expected win-win social and ecological outcomes. Indigenous groups and smallholders in these landscapes have simultaneously engaged with, adapted to, and resisted different kinds of development, and yet regularly find themselves and their customary rights marginalized at the expense of the interests of local elites, states and external investors, reflecting the complexities of underlying politics, institutions and power structures around forests and land-use. 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 carries out five interlinked strands of research (see Figure 1) and carries out research in Southeast Asia (Malaysia (Sabah, Sarawak), Laos and Indonesia) and Central Africa (Cameroon and 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 well-being 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. The fifth module carries out integrative and comparative analyses across modules, scales and countries through structured qualitative and quantitative analyses. All research is carried out collaboratively with country partners and involve researchers, civil society activists, conservation practitioners, villagers, and students.

FairFrontiers

The case study regions provide unique contexts along different ecological, social and institutional gradients such as forest cover, ecosystem diversity, inequality and human wellbeing, institutional/political control, and democracy and civil society engagement in policy processes. Together, these approaches support the advancement of theory and novel 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

Research progress

What we know so far

Under Module 1, we carried out media-based discourse analyses to examine different coalitions advocating for, and resisting against, a forest carbon offset policy in Sabah, Malaysia (Kan et al., in review), and a new palm oil plantation in Kribi, Cameroon. This work enables us to understand the discursive power underlying how decisions and practices of development in forest frontiers exclude, yet disproportionately affect, indigenous peoples and local communities who live and work in these spaces. We are also examining the diverse ways that civil society and local people express resistance (Brockhaus et al., in progress).

Another strand of critical research in Module 1 examines the roles that distal flows of commodities, finance and discourses play in shaping land and forest policies in local landscapes. Our analyses highlight how interests and financialization of frontiers drive inequalities and reinforce power structures in DR Congo (Pietarinen et al., 2023) and Sabah (Ali and Varkkey, 2023).

We are currently carrying out field research activities at all research sites (see Photos 1 and 2). Analyses of data collected by local partners and M.Sc. students in Campo Ma'an, Cameroon, highlight perceptions of well-being and justice of local and



Photo 1 Focus Group Discussion in Oudomxay, Laos

(Project Leader)

WONG, Grace

Associate Professor, RIHN / Researcher, Stockholm University WONG Grace is a resource economist and has over two decades of research experience on forest conservation, development and climate change governance in the tropical Global South. She has worked extensively throughout Southeast Asia and Sub-Saharan Africa. Her current research examines global-local interactions on local well-being and ecosystem services, with a particular focus on issues of politics, power, and equity.

(Sub Leaders)

BROCKHAUS, Maria MERTZ, Ole BRUUN, Thilde Bech MOELIONO, Moira SAKAI Shoko

(Researchers at RIHN)

SIDIBE, Alimata METARAGAKUSUMA, Andi Patiware WAI PHYOE MAUNG SUJASWARA, Azwar Azmillah KAN Ayami University of Helsinki University of Copenhagen University of Copenhagen CIFOR-ICRAF Hong Kong Baptist University

Researcher Researcher Researcher Research Associate Research Associate 2019 2020 2021 2022 2023 2024 2025 FS - FS/PR - PR - FR1 - FR2 - (FR3) - FR4

indigenous communities, squeezed between the creation of Campo Ma'an National Park and expanding large-scale oil palm and rubber plantations (Dhiaulhaq et al., 2024). Results were shared with the communities in the area and their feedback was critical to improving our understanding of the social-cultural contexts underlying the well-being and ecosystem service linkages.

Noteworthy items

The project's analytical framework is built on theories of power and everyday politics, social and environmental justice, and ecosystem service science. We are carrying out critical policy analyses in collaboration with in-country partners (2022 Law on Protection of Indigenous Pygmy Rights in DR Congo and 2022 Omnibus Law in Indonesia) to examine their potential for changing business-as-usual practices in frontiers.

The project has created a Research Brief series to share new and emerging research findings, conceptual papers or opinion pieces by researchers, partners and students. The series is peerreviewed and two briefs were published in 2023.



Photo 2 Focus Group Discussion in Haut-Katanga, DR Congo

(Main Members)

CHACGOM, AristideGreenEGAY, John KelvinUniverISHIKAWA NoboruKyotoJOHN, Gordon ThomasPACOLAIN, ChristineForgotNAITO DaisukeKyotoNKONGOLO MUKAYA, Jules FortunatCenterInterdiInterdi

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Green Development Advocates Universiti Malaysia Sarawak Kyoto University PACOS Trust Forgotten Parks Foundations Kyoto University Center for Intercultural and Interdisciplinary Research for Sustainable Development in Southern and Central Africa University of Kinshasa Kyoto University of Advanced Science Universitas Hasanuddin University of Pretoria Stockholm University National University of Laos Universiti Malaya

Research Program

Co-creation of the Earthhuman 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

Research progress update

This program commenced in April 2024. Various types of research projects at different stages will collaborate to advance research toward achieving the program's goals. In FY2024, the program consists of six Incubation Studies (IS), three Feasibility Studies (FS), and three Full Research (FR) Projects, which include:

- 1 An Interdisciplinary Study Toward Clean Air, Public Health and Sustainable Agriculture: The Case of Crop Residue Burning in North India
- 2 Adaptive Governance of Multiple Resources based on Land-Sea Linkages of the Water Cycle: Application to Coral Reef Island Systems
- 3 Towards Sustainable Nitrogen Use Connecting Human Society and Nature

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.

Additionally, the program has initiated the T³ Earth Forum, which discusses transformations such as perception change, behavior change, and institutional change, which are common challenges of the program. The program will share the challenges and research processes of these forums and individual projects, utilizing their outcomes within the program.

Furthermore, the second year open call (FS only) will be conducted with a deadline in January 2025.

Projects in this program

FR

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LINKAGE Project	SHINJO Ryuichi	P26
Sustai-N-able Project	HAYASHI Kentaro	P28

FS

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From Data to Localized Climate Action: An Environmental AI Approach to Strategies for Local Carbon Neutrality with Personalized Data Security	LEE Jemyung			
Towards an Ethical Economy: Addressing the Impacts of Commodity Trade and Consumption on Indigenous Land and Survival	NGUYEN Tien Hoang			
Disasters and Development in East Asian Regionalism in the Anthropocene	ITO Takeshi			
Thinking from Negative Relational Values: The Nexus and Co-creation of Humans, Culture and Nature	NAKADAI Ryosuke			
Water and Nutrient Transport from Land to Ocean: Toward the Healthy, Productive, and Sustainable Asian Coasts	ZHANG Jing			
Diagnosis and Treatment to Multisolve for Ecological Civilization	HENDLIN, Yogi Hale			



(Program Director)

TANIGUCHI Makoto

Professor/Deputy Director-General, RIHN

TANIGUCHI Makoto 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. Researchers at RIHN MIURA Tomoko ICHIHARA Yuko

Research Associate Research Associate

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Research Program <Co-creation of the Earth-human System Program>

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 kharif crop season in the northwest India region. This practice of crop residue burning releases large amounts of pollutants into the atmosphere, causing severe conditions for human health and economic activities. The Aakash project is delineating the science of air pollution in the region (including the national capital of Delhi), raising social awareness, and exploring ways for sustainable agriculture.

> Project Leader PATRA, Prabir K.

Project overview

In the Punjab and Haryana region of northern India (Figure 1), double cropping of rice and wheat is popular since the green revolution. However, to alleviate deepening groundwater level, rice planting is delayed until the beginning of the rainy season by the Preservation of Subsoil Water Act (2009). This has shortened the gap for field preparation between rice harvesting and wheat seeding. The delayed rice straw burning, during mid-October to mid-November, causes the smoke to reside longer in the atmosphere and is believed to affect air pollution in neighboring areas, including the national capital region (NCR) of Delhi. (Photo 1)

The National Green Tribunal Act (2010) passed an order in 2015 to ban agricultural residue burning in Northwestern Indian states (Punjab, Haryana, Delhi-NCR and Rajasthan). 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 in the surrounding through their own efforts. We, at the Aakash Project, are involved in related research activities by following three working 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-regional air pollution. Conducting intensive observation of air pollutants over a wide area during the straw burning season, the team will compare and verify the simulation results with PM2.5 and related air pollutant observations. By presenting the best scientific knowledge, we aim to make residents aware of the effects of straw burning.

आकाश

The Health Group aims to raise awareness of the importance of maintaining clean air among residents by holding health classes and conducting health checkups. Results from the air pollution group provide more accurate information on human exposure by mapping observation based PM2.5 concentrations at surface level, which has been lacking in the source region (Figure 2). We also provide quantitative assessment of crop residue burning contribution to PM2.5.

The Rural Village Group is working to propose effective ways to use rice straw, through in situ or ex situ management methods. With the cooperation of local universities and research institutes, we are considering ways to use rice straw while respecting the cultural and socio-economical background of the region. We are also conducting field experiments on the university campus on crop diversification toward deriving co-benefit for air pollution and greenhouse gases emission mitigation.

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





Photo 1 Rice straw burning in Ludhiana district, Punjab, November 2, 2018. Photo courtesy of S. Hayashida.

Figure 1 Map showing locations of Punjab and Haryana states. Country and state boundary data is sourced from GIS software.



Figure 2 (center map) Location of air pollution instruments deployed in northwest India during September-November in 2022 and 2023. The variations in six hourly-averaged values of PM_{2.5} are shown at several sites in Punjab, Haryana and Delhi. Measurements at two sites (panels a,b) are available only in 2023 (red line) and all other sites (panels c-g) have measurements in both 2022 (blue line) and 2023. Units are in μg/m³.

Research progress

What we know so far

We have conducted surveys in Punjab. Two of them asked village representatives how they managed rice straw in their respective villages and the area of paddy fields where straw burning was done. Apart from that, two questionnaire-based interview surveys were conducted with 2,200 households in all districts and all farmers' households in one village of Punjab. As a result, most farmers responded that air pollution was a problem, but that the main source of air pollution in Delhi was not straw burning in Punjab, but sources of pollution around Delhi. The areas of higher and lower fraction of rice stubble burning, as assessed from the surveys, are well supported by remote sensing measurements of fire detection counts, which are indicative of crop residue burning.

To elucidate the link between rice crop residue burning and Delhi's air pollution, we conducted intensive observations of air pollution in Punjab, Haryana and Delhi-NCR in the fall of 2022 and 2023. We observed the pollution "events" in Delhi-NCR due to transport of emissions from straw burning in the source region of Punjab during early November of both years (RIHN press release, research news). Further research is being conducted to estimate the contribution of crop residue burning to harmful air pollutants and identify causes of the decrease of PM2.5 in rural areas and an increase in Delhi-NCR in 2023,

(Project Leader)

PATRA, Prabir K.

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

Dr. Patra earned his Ph.D. from Gujarat University, India in 1998. After working briefly at IBM India Research Laboratory, he joined JAMSTEC in 2001. He is currently a principal scientist and deputy group-leader at JAMSTEC, visiting professor at Tohoku University, and leading the Aakash Project 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)

HAYASHIDA Sachiko SUDO Shigeto

RIHN

Institute for Agro-Environmental Sciences, The National Agriculture and Food Research Organization relative to 2022 (Figure 2). Preliminary analysis suggests a decrease of fire detection counts by satellite over Punjab and Haryana, while more stagnant conditions prevailed over Delhi-NCR in 2023 in comparison with those in 2022.

2018 2019 2020 2021 2022 2023 2024

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Noteworthy items

We are making considerable progress in understanding the cause of high PM2.5 air pollution events in Punjab, Haryana and Delhi-NCR using the low-cost sensor (CUPI-G) deployment at about 30 sites. Based on our analysis of 2022 measurements, made in the first half of 2023 (Singh et al., Sci. Rep., 2023), we provided operational updates of PM2.5 and other meteorological conditions over the northwest India region on a regular basis. A tracer simulation model was also set up to predict the pollution transport from the crop residue burning regions (as seen by fire detection counts) for the next couple of days. Details on the updates from the 2023 field campaign can be seen at https://aakash-rihn.org/en/data-set/

Interviews with stakeholders such as farmers and cooperative societies are carried out to ascertain points of view on two promising options for stopping straw burning: (1) shift from rice to other crops and (2) promote use of rice straw as biomass fuel. We are currently working with Japanese companies, and Japanese and Indian government and non-government organizations, to continue to find ways to help modern technologies take root locally.

(Researchers at RIHN)

YASUTOMI Natsuko BISWAL, Akash MANGARAJ, Poonam ARAKI Hikaru IWASAKI Yumiko

(Main Members)

ASADA Haruhisa UEDA Kayo KAJINO Mizuo INUBUSHI Kazuyuki MATSUMI Yutaka MURAO Rumiko Assistant Professor Researcher Researcher Research Associate Research Associate

Nara Women's University Hokkaido University Meteorological Research Institute Tokyo University of Agriculture Nagoya University Ritsumeikan University

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Research Program (Co-creation of the Earth-human System Program)

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.

Canon

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 seawater temperature 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, this project first aims to elucidate the realities of water circulation and multiple resources through various means of analyzing groundwater and coral reef ecosystems. We seek to understand and predict the responses of multiple resources to changes in socio-economic factors and climate change. Additionally, utilizing a historical ecological approach, the project aims to uncover the cultural values, connections, and diversity of nature nurtured within island communities. By doing so, we will elucidate the mechanisms for sustaining livelihoods in island communities with limited resources.

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 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.

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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.



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 exhibition of old photographs with the theme of "Working," on Yoron Island.

From the perspective of behavioral science, we conducted an awareness survey on the compatibility of human movement and infection control during the coronavirus 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 "work" from among approximately 5,000 photographs provided by the local residents (Figure 2), focusing on logistics, changes in island life, port development, and land-use 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 ~100 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, University of the Ryukyus

SHINJO Ryuichi took a research position at the Faculty of Science, University of the Ryukyus, in 1992, becoming a professor in 2007. His specialties are earth science, geology, petrology, and mineralogy. 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)

YASUMOTO Jun

(Researchers at RIHN)

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Wakatobi Regency, Indonesia

Research Program (Co-creation of the Earth-human System Program)

Sustai-N-able (SusN) 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 (N2), most living organisms, including humans, do not have access to stable N2 and require a form of nitrogen other than N2 (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 Breakthroughs those SusN project aims.



Figure 3 Illustration of the nitrogen issue (drawing: NAKABAYASHI Madoka)



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

Research progress

What we know so far

In fiscal 2023, FR1, we published analyses and reviews on the nitrogen cycle in natural and human societies. We also conducted numerous outreach activities using leaflets (Figure 3) created to promote awareness of the nitrogen issue, actively supporting nitrogen management activities both domestically and internationally.

Noteworthy items

As the director of the International Nitrogen Initiative (INI) East Asia Center, the project leader contributed to organizing the 9th International Nitrogen Conference (New Delhi, February 2023), which was hosted by INI. Furthermore, at the request of the Ministry of the Environment, Japan, two members of our project participated in the fourth and fifth 2021 2022 2023 2024 2025 2026 2027 FS – PR – FR1 – FR2 – FR3 – FR4 – FR5

meetings of the Working Group on Nitrogen (WGN) established by the Global Partnership on Nutrient Management (GPNM) of the United Nations Environment Programme (UNEP), contributing as an expert to facilitating international nitrogen management. As a result of these activities, our institute also became involved in GPNM. Some members have also contributed to the "National Action Plan for Sustainable Nitrogen Management," which is prepared by the Ministry of the Environment in collaboration with other ministries of the government of Japan.

(Project Leader)

HAYASHI Kentaro Professor, RIHN

HAYASHI Kentaro 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 position at RIHN. He received the JSSSPN Award from the Japanese Society of Soil Science and Plant Nutrition in 2021.

(Researchers at RIHN)

SAIKI Makoto ARAI Hirotsugu KIMURA Ayako

(Main Members)

KOBA Keisuke MATSUBAE Kazuyo KURIYAMA Koichi Researcher Researcher Research Associate

Kyoto University Tohoku University Kyoto University

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PR Global Environmental Culture Program

Fashloks Project

Fair and Sustainable Hunting Management through Dialogues between Local Knowledge and Science

– (FS/PR)

While international concern grows over the overhunting of wildlife in rainforests, there is also a threat to people's livelihoods and cultures, which have long been based on hunting. This "wild meat crisis" must be addressed through mutual understanding between local people and conservation organisations, which can only be achieved through dialogue between local knowledge and science. We aim to build locally-based, sustainable hunting management systems by driving "coproduction research," where both actors work together on an equal footing.

Project Leader

HONGO Shun

Junior Associate Professor, Kyoto University

Why do this research?

Duikers, monkeys, crocodiles-rainforest wildlife supports rich biodiversity through food chains and seed dispersal. In the meantime, wildlife hunting is an essential livelihood that provides protein and income for rainforest-living people. And it also serves as a source of cultural diversity that fosters locally specific social norms and worldviews.

Over the past few decades, however, hunting pressure in rainforests has increased rapidly, and many areas have reported substantial declines in wildlife abundance. This issue has attracted the attention of the international community as the "wild meat crisis," prompting governments to establish protected areas and impose strict hunting restrictions. Consequently, even subsistence hunting by local people has been restricted, causing conflicts between conservation organisations and local communities. The wild meat crisis is a typical example of environmental problems that occur in the context of the friction between global values (conserving wildlife population) and local values (sustaining subsistence hunting).

Furthermore, a more profound problem lies in mutual





one knowledge system are not considered sustainable or fair by the other. Thus, a genuine solution to the wild meat crisis requires a mutual understanding between local knowledge and science. This equitable partnership will lead to a locally-based

wildlife management system that actively incorporates

What we want to do

subsistence hunting.

The project aims to introduce fair and sustainable hunting management systems in five sites in the world's three largest rainforest regions. To achieve this, we will adopt a "coproduction research" approach, in which local people, conservation administrations, and researchers design, conduct and evaluate research on an equal footing. Scientific propositions of ecologists and the local knowledge-based indices proposed by skilled hunters will be tested jointly, and we will provide wildlife monitoring methods that bring together both actors' knowledge. Moreover, we will establish management platforms in the Priority Sites in Cameroon and Colombia, which ensure equitable involvement of all stakeholders in management decision-making.

With an approach that bears in mind the equality of local knowledge and science, the five sites will create different management systems aiming at the common goal of "use while conserving." By describing and comparing the five processes in coproducing the hunting management systems that respond to site-specificities, we test the effectiveness of coproduction research in global environmental issues.

(Main Members)

TOKUYAMA Nahoko YASUOKA Hirokazu VAN VLIET, Nathalie

MATSUURA Naoki NAKABAYASHI Miyabi **Chuo University** Kyoto University Center for International Forestry Research Sugiyama Jogakuen University **Hiroshima University**

(Research Area)

Cameroon, Colombia, Malaysia (Sabah), Gabon, Democratic **Republic of Congo**

Figure 1 Subsistence hunting-based wildlife monitoring. Illustration by **IZUMORI Yo**



PR<Combining Knowledge for a Fundamental Innovation of Land Use Program>

SATOCONN Project

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 and social damage. Satoyama, as promoted by the IPSI partnership, highlights the importance of recognising and working with longstanding cultures and knowledge of land management and peoplenature interdependence 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.

Project Leader **DWYER, Janet** 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.



Our four-year research project involves integrated and transdisciplinary analysis and engagement to characterize and revitalise Satoyama landscapes in Europe and Japan. It aims to achieve a deep understanding of their challenges and opportunities for strengthened (re)connection between people and nature, to enable appropriate and resilient responses to the global climate and biodiversity crises. It will deploy cuttingedge research methods within a Living Labs framework, to engage research, practice and policy in planning and undertaking action for positive change. Insight from natural and social sciences, economics and performance arts will be developed and shared within and between 6 case study locations in Japan and Europe. The 'living lab' technique has come to prominence in recent participatory and impact-oriented 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, experimenting, learning lessons and promoting transferable practice, centred around the animation and facilitation of place-based examples of challenge and change.

Working within and between our 2 Japanese and 4 European cases, we will create and exploit living labs to benefit local communities and inform global, national and regional policies. Our plan is to combine indigenous and expert knowledge in new ways to strengthen Satoyama concepts and contemporary practice, to revitalize and sustain cultural landscapes, making a positive contribution to more resilient rural futures. Our goal is to help society to recognize the value of a continued and strengthened Satoyama ethic, in future land use governance and action.



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



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(Research Area)

UK, Europe (Portugal, Sweden), Switzerland, Japan – Satoyama and High-Nature-Value landscapes



FS (Combining Knowledge for a Fundamental Innovation of Land Use Program)

Designing Payments for Ecosystem Services to Innovate Farmland Use

While unsustainable use of agricultural land is considered a factor in global environmental issues, depending on interventions such as agricultural production activities, it is also possible to contribute to problem-solving through the provision of various ecosystem services (benefits that humans receive from ecosystems). In this study, we focus on "Payments for Ecosystem Services" (payments for land use, etc., that provide ecosystem services) involving the participation of various stakeholders as a mechanism to promote innovative agricultural land use that leads to problem-solving. To facilitate its dissemination, we propose designing and implementing social experiments.

FS Principal Investigator

KAMII Hiroyuki

Professor, Nihon University

Why do this research?

We receive various ecosystem services from agricultural land (agroecosystems), such as food provision (provisioning services), atmospheric and water regulation (regulating services), recreation (cultural services), and more.

On the other hand, unsustainable land use in agriculture is considered one of the most significant factors contributing to global environmental issues. Moreover, amidst concerns about food shortages, prioritizing only food provision services may lead to a decline in other ecosystem services and exacerbate environmental problems.

However, depending on transformations such as the adoption of sustainable farming practices, improvements in soil quality, carbon sequestration, water quality regulation, and other ecosystem services enhancements are also possible. Among various types of land use, agricultural land use is a significant area where changes in stakeholders' actions (such as agricultural production activities) can greatly impact the overall provision of ecosystem services (solving environmental problems).



Photo 1 Farm work in rice field (Ikeda Town, Fukui Pref.)

Viewing agricultural land use from the perspective of sustainably generating diverse ecosystem services, unlike provisioning services which have long been traded in markets, regulating services such as those less familiar in market transactions are prone to being under-supplied. Since the method of land use is primarily determined by the rights holders, such as farmers, it is crucial to design and widely implement institutional frameworks that generate economic incentives for the comprehensive and sustainable provision of ecosystem services by farmers.

In this study, the objective is to propose a social experiment involving the participation of various stakeholders to promote innovative agricultural land use that contributes to solving environmental problems, with the dissemination of "Payments for Ecosystem Services" (payments for ecosystem services or land use/management that provides ecosystem services) as a mechanism.

What we want to do

In this study, we will consider synergies and trade-offs among various ecosystem services, and examine from the perspectives of impact on local communities, businesses, and policies, as well as feasibility, to compile proposals for social experiments as interdisciplinary research, aiming to widely implement effective payments for ecosystem services.

To design and promote effective payments for ecosystem services, important points include defining the ecosystem services as payment targets, the actions of farmers and other stakeholders, the scope of providers and payers of ecosystem services, methods of payment, dialogue and consensus-building among stakeholders, and monitoring and evaluation methods.

On the other hand, agricultural land (agroecosystems) is a typical complex system, making it difficult to plan institutional frameworks by understanding all events in advance. Therefore, to promote the dissemination of payments for ecosystem services that lead to effective environmental problem-solving through agricultural land use innovation, it is necessary to plan social experiments and reflect their verification results in practice.

For this purpose, workshops will be held involving researchers from various fields related to payments for ecosystem services, local governments, and private companies to discuss and propose social experiment plans for payments for ecosystem services. Additionally, through this deliberation process, we aim to build a collaborative framework among various stakeholders to participate in future interdisciplinary research.

(Main Members)

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(Research Area)

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Nature- and Culture-based Solutions for Disaster Mitigation and Ecosystem Conservation in Floodplain Landscapes: Co-creative Designs of Floodplain Community for River Basin Disaster Resilience and Sustainability with Nature Positive Practices

(FS)

Floodplains, where many cities are located, suffer floods, storm surges and tsunamis. As rivers, coasts and inland areas have been improved for greater convenience and safety in the modern era, the habitats of diverse organisms and their interconnected ecological networks that once existed have been degraded. We focus on the natural and social communities that have been nurtured on such historical flood plains, and codesign new "Floodplain Communities" through water and land use reform for river basin disaster resilience and sustainability, with nature positive practices.

FS Principal Investigator TASHIRO Takashi

Designated Professor, Nagoya University

Why do this research?

Floods caused by heavy rainfall, tsunamis triggered by earthquakes, and storm surges from typhoons have significant impacts on the floodplains that we use and where many of us reside. Many of these floodplains were once dominated by untouched wetland landscapes and were floodplains of major rivers. Subsequently, in response to population growth in modern times, reclamation projects and infrastructure development (such as discontinuous embankments called "Kasumi-tei" and ring embankments called "Waju-tei") were partially carried out, resulting in increased food production and improved biodiversity (see Photo 1).

As modernization progressed, riverbanks and coastlines were developed as national and prefectural projects, and intensive land use in urban areas and large-scale agricultural lands led to the accumulation of assets on dry floodplains. However, the once-rich ecosystems began to deteriorate. While extensive embankments reduce the frequency of flooding, they also weaken the lifestyles, customs, norms (such as water defense community systems), and conflict-cooperation relationships between settlements. These were nurtured by people living in



Photo 1 The Tsuya River, a spring-fed river that divides alluvial fans and ring-leveed paddy fields in the western margin of the Nobi Plain



Figure 1 Overview of landscape and climate components in Floodplain Communities and the study subthemes organized with them

floodplains, who cooperated in surveillance during normal times and assisted each other in recovery and reconstruction during disasters. Currently, as floods and storm surges occur on an unprecedented scale that modern infrastructure cannot withstand, widespread and prolonged flooding can lead to irreparable damage to both human society and ecosystems. This highlights the need for contemporary and sustainable "floodplain communities" through the transformation of water and land use practices rooted in watershed management and natural restoration.

What we want to do

To analyze floodplain communities from both natural and social perspectives, we will investigate the historical land use infrastructure/systems constructed on floodplains where floods and storm surges have historically occurred, as well as the river systems supporting them and multiple settlements depending on them. Subsequently, we will explore and extract landscape and cultural elements related to floodplain communities and describe solutions based on the natural and cultural interactions that have emerged.

At this stage, we conceptually illustrate the relationship between the four sub-themes that constitute this study: land, biology, resources, settlements, livelihoods, and culture, along with their interconnections (see Figure 1). We will assess sedimentary substrates, ecosystem networks, etc., in a "natural science" approach for the evaluation of nature and biology, and investigate modern settlements, customs, livelihoods, etc., in a "social science" approach for the evaluation of history and culture. Additionally, we will analyze scenarios for watershed management/natural restoration based on numerical simulations for the examination of water and land use. Based on these findings, we will consider the nature of floodplain communities through disaster prevention and environmental facilitation based on the analysis of existing water security community.

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(Research Area)

Nobi Plain "Waju (ring leveed) settlement with spring-fed rivers"- Ibi River System, Japan

Toyohashi Plain "Kasumitei (open leveed) reservoir"- Toyo River System, Japan

FS<Combining Knowledge for a Fundamental Innovation of Land Use Program>

Navigating the Transition: Policy Pathways for Amplifying Living-as-nature in Land-use Practices

The anthropocentric exploitation of nature is contributing to a biodiversity crisis. This research project will embrace the "living as nature" concept endorsed by IPBES (the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) and assess its applicability in Japanese society within the context of land use. Specifically, we will study alternative agricultural and forestry methods, create digital tools for visualizing various nature applications, and analyze European policies for potential adaptation to drive social change in Japan.

FS Principal Investigator

TAMURA Norie

Senior Lecturer, Graduate School of Project Design

Why do this research?

Our planet is in the midst of a biodiversity crisis, largely due to the "anthropocentric use of nature," where humans prioritize their own interests without regard for the broader ecosystem. This approach disrupts the natural balance, negatively impacting countless organisms.

To forge a sustainable path forward, we are embracing the concept of "living as nature," championed by IPBES. Drawing from our team's research experience in studying local communities' utilization of nature, agriculture, and forestry, we have identified individuals within contemporary Japanese society who embody this ethos. This suggests that "living as nature" is indeed attainable. Central to this concept is the consideration of not just humans, but also other living beings and the environment when making land use decisions. By conducting research guided by this principle, our aim is to uncover strategies to promote widespread adoption of "living as nature."

What we want to do

In this research project, we are pursuing three main objectives:

1. Validation of Alternative Agricultural and Forestry Practices

Modern agricultural methods have historically prioritized boosting productivity by excluding non-target organisms. However, there is a growing movement toward practices that promote biodiversity. We will thoroughly examine these initiatives, delving into their motivations, values, and innovative land-use strategies. By engaging in discussions with stakeholders, we aim to share their experiences and insights, paving the way for new approaches to land management.

2. Development of Digital Tools to Enhance Understanding of Diverse Nature Uses

Local natural spaces serve various purposes for different individuals. To better understand this diversity of nature uses, we will develop digital tools to visualize and encourage exchange and dialogue. This will enable communities to share perspectives and engage in deeper discussions on sustainable land use practices.

3. Establishment of Comparative Benchmarks through Examination of European Case Studies

The agricultural policies of the European Union strive to strike a balance between biodiversity conservation and agricultural development. By studying European policies and practices, we aim to extract insights relevant to Japan's societal transformation. This will aid in exploring policy frameworks and approaches for fostering new connections between people and nature.

Through these endeavors, we aspire to move toward a more sustainable future.

Values Tupplety	Living from	Living in	Living with	Living as
values Typology	natural resources	natural landscpae	natural species and habitats	nature as part of us
Wold-views	Anthropocentric	Anthroppontric	Bio/ecocentric	Pluricentric
WORD-VIEWS	Anthropocentric	Anthropodentric	Cosmocentric	
Broad values	Prosperity, livelihood	Belonging, health	Stewardship, responsibility	Openness, harmony with nature

created by author from IPBES(2022)

Figure 1 The values assessment typology as indicated by the IPBES Value Assessment Report.



Photo 1 Fish cradle rice paddies in Shiga Prefecture

Main Members OMOTO Reiko KAMADA Mahito SHIGETO Sawako

SHINKAI Rika NIWA Hideyuki

HARADA Morihiro HIRAI Taro MALLEE Hein MIKI Aturo RUPPRECHT, Christoph

Research Area

Tottori University Tokushima University Graduate School of Project Design RIHN Kyoto University of Advanced Science Gifu University Hirosaki University Kyoto Prefectural University Shinshu University Ehime University FS<Combining Knowledge for a Fundamental Innovation of Land Use Program> 2024

Discrete Governance for Regenerative Commons

We believe one reason global environmental issues remain unresolved is that they are not closely linked with activities that improve daily life. In recent years, there has been a trend of activities aiming to address both local and global issues through placemaking. Within this trend, people from multiple regions, not necessarily contiguous, come together or collaborate flexibly even when geographically separated. In this study, we integrate practice and research to establish sustainable and effective mechanisms for these emerging initiatives.

FS Principal Investigator NAKAJIMA Hiroki

Project Lecturer, The University of Tokyo

Why do this research?

Communities are facing the challenge of adapting to social changes such as population decline, aging populations, infrastructure deterioration, and dual-income households, in addition to global environmental issues like climate change. These social changes directly affect daily life and work, posing urgent challenges for individuals and communities. On the other hand, while global environmental issues such as extreme weather events and flooding have become more palpable in daily life, they may still be perceived as less immediate concerns.

In recent years, there has been a trend of activities aiming to regenerate communities and natural ecosystems through placemaking, while simultaneously addressing both local and global issues (Figure 1). Within these initiatives, people from multiple regions, not necessarily contiguous, come together or collaborate flexibly even when geographically separated. This can be seen as a new way of reconsidering existing vulnerable community structures.

Furthermore, through collaboration across multiple regions, these initiatives can help address depopulation in rural areas facing a shortage of workers and increase opportunities for interaction with nature in urban areas. They also contribute to reconstructing the relationship between urban and rural areas by promoting resource circulation.

If diverse stakeholders such as governments, municipalities, private companies, and citizens can establish mechanisms for sustained collaboration, we believe these initiatives have the potential to become effective approaches to regional governance for resolving global environmental issues (Figure 2).



Figure 1 Placemaking to simultaneously resolve local and global issues



Figure 2 Proposal for regional governance that reconstructs communities and relationships between urban and rural areas

What we want to do

In this study, we aim to collaborate with practitioners leading these new initiatives to systematically develop effective regional governance methods. Resolving both local and global issues simultaneously may not always be straightforward. As we advance in practice, we will identify combinations of issues that generate synergistic effects and those that produce conflicting effects. We will also develop evaluation methods to assess these combinations. Additionally, under this evaluation framework, we will explore mechanisms to address conflicts of interest when they arise. Furthermore, we will build a digital platform to ensure continuity for fluid communities that come together and leave. Based on this kind of transdisciplinary research, we will present new concept of communities and new ways of creating relationships between urban and rural areas.

Main Members SHIROYAMA Hideaki OTA Kyoko SHIRATORI Koichiro HARADA Yoshiki ASATANI Kimitaka ITO Izumi MITANI Mayuko HIGASHI Koichi JULAYANONT, Panthira RATANAWARAHA, Apiwat SHIMA Norihisa SETA Fumihiko KOIZUMI Hideki

The University of Tokyo Ehime University Otani University Chuo University The University of Tokyo NPO ETIC. Groove Designs, Inc. Groove Designs, Inc. Chulalongkorn University Chulalongkorn University Toyo University The University of Tokyo The University of Tokyo

Research Area Japan, Thailand FS<Combining Knowledge for a Fundamental Innovation of Land Use Program>

Projection of Land Use Orders in the Bioeconomy Era

2026

Bioeconomy, an economy built on advanced use of biomass and expected to lead defossilization, is set to significantly alter land use and industrial balance. This study aims to develop a toolkit that will facilitate consensus-building between agriculture, forestry, fisheries, secondary industries, local governments and citizens as they plan bioeconomy at municipal and regional level in order to enhance resource circulation within the region, maintaining a balance with ecosystem services.

FS Principal Investigator NAGANO Takanori

Associate Professor, Kobe University

Why do this research?

Shift to defossilization as a way to fight global warming will characterize as a major industrial revolution since the late 18th century, in which circular economy and bioeconomy will play pivotal roles. Circular economy is a resource-circulating economy minimizing underground resource extraction, while bioeconomy refers to a new economy built on advanced use of biomass (organic materials derived from living organisms) (Figure 1). In recent years, these concepts have often been merged and collectively called circular bioeconomy, propelling advanced nations and other nations to formulate national strategies. Even though some of it is already being applied to land use as in more use of renewable energy few can envision the overall picture.

Fossil fuels are not only used for energy but also as raw materials for plastics, synthetic fibers and many other materials. Enormous amounts of biomass will be required, be it from forests or farmlands, if it is to replace fossil fuels. Since the production of biomass varies by region and cultivation practices, land use and resource circulation must be planned meticulously if biomass is to be used sustainably. This will also



Figure 1 Concept of bioeconomy



Figure 2 Tools for bioeconomy planning

significantly change industrial locations. It is also important to add that, if there is no broad vision, it will most likely result in temporary responses that will pose new environmental problems, if not confusion and confrontations in the region.

What we want to do

This study aims to develop a toolkit that will facilitate consensus-building between agriculture, forestry, fisheries, secondary industries, local governments and citizens as they plan bioeconomy at municipal and regional level in order to enhance resource circulation within the region, maintaining a balance with ecosystem services (Figure 2). "Ecosystem service map" refers to making visible the sustainable supplies of biomass from local forests and farmlands. "Industrial value chain map" means presenting biomass-using industries in a map, visualizing the processing and flow of biomass. Further, we will enhance the "database of bioeconomy technologies" that can be employed to improve resource-cycling in the visualizations above, in ways that cater to local issues. The actual process of promoting bioeconomy will incur not only cost but economic and institutional challenges. We will analyze these challenges, creating solutions with local stakeholders. This information will also be made publicly available as a "database of good governance". During the feasibility study phase, we will develop methodologies, using examples such as Japanese cedar - a biomass widely available in Japan - from the Yoneshiro River basin, Akita Prefecture, and rice from Nagaoka, Niigata Prefecture, as well as from other regions. The relationship between urban areas and their suburbs (Kita District, Kobe) will also be examined. During the full research phase, we plan to develop these tools as web applications and support bioeconomy planning at home and abroad, across various regions.

Main Members TANAKA Kenji

MITSUHASHI Hiromune

TAKADA Katsuhiko OGSAWARA Wataru Kyoto University Museum of Nature and Human Activities, Hyogo

Akita Prefectural University Nagaoka University of Technology

Research Area

Akita, Niigata and Hyogo prefecture, Japan

FS<Combining Knowledge for a Fundamental Innovation of Land Use Program>

Establishment of a New Land Use Policy System of Rural Area That Simultaneously Realizes Decarbonization, Stable Food Supply, and Solution of Local Issues

2024 (FS)

Rural areas are garnering significant attention as places contributing to the achievement of decarbonization. However, for instance, introducing solar power generation on agricultural land may lead to conflicts between energy production and food production. This research project focuses on land use issues in rural areas and aims to go beyond the traditional binary discussions. Instead, it seeks to establish a new land use policy system that simultaneously achieves decarbonization, stable food supply, and resolution of regional issues.

FS Principal Investigator

NOZU Takashi

Professor, Waseda University

Why do this research?

Amid the urgent need to address global warming, rural areas are expected to contribute to the realization of decarbonization. For example, agricultural land is receiving significant attention as one of the few remaining suitable locations for solar power generation, as suitable areas for solar power are decreasing. Regarding this issue, there has been discussion about utilizing abandoned farmland nationwide for solar power generation, with arguments such as "if we implement solar power generation on all of X hectares of abandoned farmland nationwide, it would result in X megawatts." However, progress in these initiatives has not been smooth. This is because such discussions evoke a binary debate between energy production and food production, and also because they are based on top-down approaches that do not sufficiently consider the actual circumstances of the regions.

Multifunctional Use of Agricultural Land Starting with Decarbonization



Figure 1 Multifunctional Use of Agricultural Land Starting with Decarbonization

Various types of "Rural Decarbonization Units" and their deployment in the region



Figure 2 Various types of 'Rural Decarbonization Units' and their deployment in the region

This research aims to go beyond the traditional binary discussions and establish a new land use policy system for decarbonization in rural areas that simultaneously achieves decarbonization, stable food supply, and the resolution of regional issues, while flexibly addressing the actual circumstances of the regions.

What we want to do

Our research team aims to establish a new land use policy system for decarbonization in rural areas, with "multifunctional land use" and "modularization" as key concepts.

Multifunctional land use refers to simultaneously utilizing a piece of land in various ways, such as decarbonization, food production, and solving regional issues, to achieve multiple benefits simultaneously. Through collaboration between rural areas and cities, we aim to go beyond the traditional binary debate and solve both local issues like depopulation and global issues like decarbonization simultaneously through land use (see Figure 1). To achieve this, it is necessary to balance detailed land use tailored to local conditions and the scale required by urban companies and other stakeholders.

As a solution, our team envisions a new approach to rural land use based on "modularization" that differs from traditional top-down approaches. Specifically, we plan to construct various types of land modules ("rural decarbonization units") that enable "multifunctional land use" based on decarbonization. By integrating and combining these modules, we aim to realize decarbonization in rural areas with a certain scale, while allowing customization for each region (see Figure 2).

To achieve this, we will examine various conditions required from legal, policy, local community, and technological perspectives. Our goal is to create a "new commons" where rural and urban areas collaborate, starting with decarbonization.

(Main Members)

WATANABE Takashi MORIMOTO Hidetsugu HONDA Yasuko WASHIZU Ayu OKUDA Shinichi KOBAYASHI Hiroshi FANG Yiyuan UENO Hiroshi SAMURA Isao HAYASHI Satoru

Nagasaki University Mie University Okayama University Waseda University Takushoku University Shinshu University Waseda University Naigai Engineering Co., Ltd. PACIFIC CONSULTANTS CO., LTD. Plants Laboratory Inc.

Research Area Mie Prefecture, Japan, etc. 2024

FS Co-creation of the Earth-human System Program

Enhancing Disaster Resilience of Socio-ecological Systems: Integrating Multiscalar and Geospatial Environmentalhydrological-social Data

This research aims to identify and measure the factors that affect multidimensional wellbeing in the context of natural and social disasters using a mixed-methods approach that weaves together geospatial, earth observation, and regional scale household survey data, and local-level participatory action investigation. In doing so, we will develop novel multidimensional wellbeing measures and identify outcomes in pre- and post-disaster affected areas across the Asia-Pacific region. The results of this study will help direct bilateral and development cooperation funding toward enhanced resilience following conflicts and natural disasters.

FS Principal Investigator

SIMANGAN, Dahlia

Associate Professor, Hiroshima University

Why do this research?

This project is motivated by key challenges to disaster recovery, risk reduction, and resilience. The Sendai Framework for Disaster Risk Reduction provides a useful roadmap for addressing these challenges; however, assessments of disaster risk reduction, recovery, and resilience have historically prioritized the economic and physical aspects of wellbeing. Ongoing work to include broader, intangible, and interconnected dimensions of wellbeing is nascent and remains an important area for research. While this applies broadly across disaster-affected and disaster-prone regions, this is particularly true in conflictaffected and fragile contexts where physical security is threatened.

Disasters could serve as opportunities to foster cooperation between conflict parties and build more resilient and inclusive institutions. Integrating climate change, for instance, into humanitarian efforts following disasters could reduce



short-term and long-term vulnerabilities of societies to adapt to conflict and environmental risks. In some cases, disasters can shift power dynamics that could escalate existing conflicts, but there are also cases where they could weaken conflict parties, reducing the intensity of conflicts, at least in the short term. Additionally, the spatial dimensions of disasters and conflicts and pre-existing governance mechanisms and political trends determine the impact of disasters on peace/conflict conditions. This project will provide a fine-grained analysis of these pathways between disasters and peace/conflict conditions.

What we want to do

We will identify the mechanisms, governance, and implementation pathways through which development cooperation and disaster aid contribute to multidimensional wellbeing outcomes in the Asia-Pacific region. The use of ethnographic methods to ground truth the calculated impact at the household level is a novel approach to evaluate conflict, disaster relief, and well-being impacts years after disaster recovery. To do these, we will employ the following three integrated phases.

- Phase 1: Determine the effect of disaster exposure on multidimensional wellbeing through machine learning and spatial econometric modeling.
- Phase 2: Construct generalized non-compensatory multidimensional wellbeing index through household surveys in selected sites.
- Phase 3: Identify the pathways, processes, and mechanisms through which development cooperation is utilized to build resilience in disaster-affected countries through participatory action investigation.





(Main Members)

Research Area

Asia-Pacific region

FISHER, Joshua ALFREDO, Katherine SHARIFI, Ayyoob

Columbia University University of South Florida Hiroshima University

Photo 1 A satellite image of Typhoon Chanthu on September 9, 2021 released by NASA Earth Observatory

FS<Co-creation of the Earth-human System Program

Empirical Research on Improving Area Capabilities Using the Creative Process of Deviation in Art Projects

In the today's world, marked by the need for large-scale transformations toward sustainable societies, harnessing the power of art to address various social challenges and create new societal values is crucial. By merging the creative process of art projects with the generation of area capabilities, we facilitate the "creation process of deviation," fostering novel value creation.

FS Principal Investigator NAKAMURA Masato Professor, Tokyo University of the Arts

Why do this research?

"How does our human creativity function on this Earth?" The concept of God turned into religious paintings, anti-war sentiments depicted in murals, or the impression of an ordinary sunrise captured in landscape paintings-art history has visualized and conveyed the progression of humanity and the zeitgeist. Furthermore, the consciousness and actions of humans manifested in culture and art sometimes spark global movements, opening hearts and generating empathy among the masses. On the other hand, this artistic activity is not solely valued for the worth of its creations but also for the creative power (the ability to generate events from scratch) that underpins them. This power can address any societal challenge and can break open closed minds to create the near future. In my view, if I were to express its existence without using the word "art," it would represent a state of "pure × earnest × deviation." This state signifies the process where the author's pure and earnest spirit and expression create unprecedented and deviated new values. Art possesses the energy to cultivate and generate events that deviate from the norm, blossoming our human creative power.



Photo 1 "Tenmasen Project 2023/Time Race Scene on the Kanda River" Website: https://tenmasen.net A time race scene featuring mini Tenmasen boats made from thinned wood, racing from Sei Bridge to Mansei Bridge on the Kanda River. Participants can join the race with a donation of 1,000 yen per boat. The project is operated with the funds collected, aiming to raise awareness about river environments. Photo provided by: Tokyo Biennale Association / Taken by: TADA



Figure 1 This diagram provides an overview of the entire research, synchronizing the process of local factors deviating into cultural and artistic resources with the improvement process of area capability, resulting in consciousness transformation → behavior transformation → social transformation. Creating art projects that lead to new values enhances the sustainability of the Earth's environment.

In this research, we view events inherent in the deviation of creative processes as "art projects," distinct from art pieces as objects. We conduct an empirical study on "Area Capability Enhancement Utilizing the Deviation of Creative Processes in Art Projects," synchronizing the growth process of regional factors with the enhancement process of area capabilities propelled by human creativity, sustaining environmental awareness while creating new values and social systems. It is essential in this research to not confine human creativity to the narrow view of art as objects but to demonstrate its unknown potential on a global environmental scale.

What we want to do

Studying the "deviation of creative processes" involves providing art project creation processes to local environmental factors, inducing shifts in human perceptions and behaviors. The continuity of these creative activities can stimulate social transformation within community, thus elucidating the correlation and causation between human creativity and the Earth's environment. Understanding the "deviation of creative processes" aims to break away from the negative chains of the Earth's environment and restore its original ecosystems. To this end, we collaborate with diverse stakeholders in transdisciplinary fields to develop ideas and environmental policies to develop the "creation process of deviation" into high-resolution research.

Main Members ISHIKAWA Satoshi FUJI Hiroshi NISHIHARA Min NISHIO Yoshinari KURIBARA Yoshiaki INOUE Shigeru NAMIKAWA Susumu

Kyoto Prefectural University Akita University of Art Tokyo University of the Arts Tokyo University of the Arts Tokyo University of the Arts MITSUBISHI ESTATE CO., LTD DENTSU INC.

(Research Area)

Japan (Tokyo, Nagoya, Chiba), South Korea (Gwangju), Indonesia (Jakarta), Germany (Kassel) 2024

FS Co-creation of the Earth-human System Program

Establishing the Methodology of Attitude and Behavior Change Through Integrating Narrative and Scientific Knowledge Based on Citizen Science and Deliberation: Case of Climate Change

We aim to cultivate a better understanding of data and phenomena by integrating traditional and local knowledge that appear to be the impacts of climate change, collected through citizen science (community-based monitoring), with scientific findings (specialized knowledge), through deliberation with experts and policymakers, and by developing them as narratives. Our goal is to establish methodologies for promoting attitude and behavior change among people with the narratives, toward the construction of a decarbonized society and a climate change-adaptive society, and to reflect this knowledge in climate change policies.

FS Principal Investigator BABA Kenshi Professor, Tokyo City University

Why do this research?

Scientific findings on climate change are provided as open data, but it is anticipated that they will not be immediately utilized in policy-making or lead to understanding from stakeholders and citizens, as well as attitude and behavior changes toward the construction of a decarbonized and climate change-adaptive society. To achieve attitude and behavior changes, it is crucial to integrate local and traditional knowledge, which citizens themselves discover and create about phenomena that appear to be the impacts of climate change, with scientific findings (specialized knowledge). By reconstructing and reframing the records and projections of local climate and environmental changes obtained from the integration, we can develop them as narratives together with experts, policymakers, stakeholders, and citizens. It will provide opportunities to promote attitude and behavior changes among people and to realize Evidence-Based Policy Making (EBPM), where regional policies are formulated based on multiple pieces of evidence. Citizen science (community-based monitoring) is regarded as a powerful method for collecting local knowledge and traditional knowledge.





Figure 1 Integration of local and traditional knowledge with specialized knowledge as narratives and possibilities of attitude and behavioral change

In the context of climate change, practices such as observing the distribution of local flora and fauna, monitoring temperature and rainfall conditions, monitoring water and soil disasters, observing crops, and reporting on the awareness of seasonal changes are being implemented worldwide, but the situation in Japan is still not sufficiently implemented. Therefore, this study aims to establish a method to promote attitude and behavior change among people toward the construction of a decarbonized and a climate change-adaptive society. We will do this by expanding the online citizen science platform that makes it easier to integrate local and traditional knowledge with specialized knowledge and to cultivate a better understanding of data and phenomena through offline and online deliberations with experts and policymakers while sharing the traditional and local knowledge collected by citizens on the platform. We will then reflect the method and results in climate change policies.

What we want to do

In the FS stage, we first identify the fields, indicators, and methods that are considered effective for citizens to monitor phenomena that appear to be the impacts of climate change. Next, we explore the feasibility of collecting local and traditional knowledge (such as the existence of historical materials or citizen scientists) at domestic sites such as Ibaraki and Shiga. Furthermore, we consider the design principles of the online deliberation platform. We then establish a framework for international collaborative research focusing on citizen science related to climate change abroad. We examine the mechanisms by which narratives surrounding climate change immerse individuals and promote attitude and behavioral changes.

(Main Members)

AOKI Kazumasu ISHIKAWA Yoichi ICHIHARA Masako IKKATAI Yuko OZAKI Taira KAMATANI Kaoru KIMURA Michinori KOZAKI koji KOSUGI Motoko TAKEUCHI Kazuhiro TAMURA Makoto NISHIMURA Shintaro MATSUURA Masahiro

Toyama University JAMSTEC RIHN Kanazawa University Kansai University Ritsumeikan University The Lake Biwa Environmental Research Institute Osaka Electro-Communication University Shizuoka University Osaka Electro-Communication University Ibaraki University National Institute of Japanese Literature Meiji University

(Research Area)

Ibaraki, Kanagawa, Shiga (Japan)

Photo 1 Web-GIS registration screen of C³S-PaaS (Climate Change Citizen Science PaaS)

Strategic Program

In collaboration with Research Projects, the 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. It 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

Research progress update

We have developed research within the Strategic Program based on discussions at the Strategic Program meeting and on both internal and external discussions, focusing on collaboration with society to solve environmental issues through "methods/ tools," "methodologies/concepts," and "goals" lists. Furthermore, in collaboration with Research Programs / Projects and the Fundamental Research Department, we are promoting research related to complex global environmental issues, including SDGs, carbon neutrality, nexus research, and integrated data visualization.

individual methods, techniques and tools from the divisions in the Fundamental Research Department. It collaborates with the 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 the Research Programs and Projects, the Fundamental Research Department, and related stakeholders.

The Strategic Program aims to form concepts/methodologies as meta-framing along the mission of global research while implementing Strategic Projects as a bottom-up research process. In the "Future Design" Strategic Project proposing methodologies for multi-layered and diverse implementation of sustainable visions, we are identifying conditions under which different future visions can coexist and constructing methodologies to realize situations where society as a whole moves toward sustainability.

Project in this program

Future Design Project NAKAGAWA Ye	shinori	P42

Program Director TANIGUCHI Makoto Professor/Deputy Director-General, RIHN Researcher at RIHN AOKI Eri

Senior Researcher

Strategic Program

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



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



2021 2022 2023 2024 FS - FR1 - FR2 - FR3

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

At the inception of the project, the focus was on how to reconcile diverse visions that seemed incompatible. However, as the research progressed, the perspective shifted to considering the significance of the accumulation of such diverse visions in society itself. Under this new perspective, the focus became how to achieve such a situation where diverse visions can coexist. The idea emerged to envision a society where various visions for an uncertain future are created using Future Design by people who wish to "create a society that future generations will be grateful for." In this envisioned society, agreements would be formed each time on which vision to choose, depending on the circumstances. The project aims to create a guidebook for practicing Future Design as its main output, with the goal of laying the groundwork for envisioning such a society.



(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.

Individuals taking the perspective of future generations in specific future states come to consensus using present options in at least three different scenarios: ①similarity 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.

Main Members KATO Hironori KOMATSUZAKI Shunsaku INOUE Yukako ICHIHARA Masako

The University of Tokyo Hiroshima University 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 Tsugihiro	Impact of Climate Changes on Agricultural Production System in the Arid Areas
	NAKAWO Masayoshi	Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes
	YACHI Shigeo	Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed
2007	FUKUSHIMA Yoshihiro	Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on Environment
	ICHIKAWA Masahiro	Sustainability and Biodiversity Assessment on Forest Utilization Options
	AKIMICHI Tomoya	A Trans-disciplinary Study on Regional Eco-History in Tropical Monsoon Asia: 1945-2005
2008	SEKINO Tatsuki	Interaction between Environmental Quality of the Watershed and Environmental Consciousness: 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
	UMEISU Chieko	Vulnerability and Resilience of Social-Ecological Systems
2012	OKUMIYA Kiyohito	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	MURAMAISU Shin	Megacities and the Global Environment
2015	KUBOTA Jumpei	Long term Sustainability through Place Based Small Scale Economies: Approaches from
2016	HABU Junko	Historical Ecology
	SATO Tetsu	Environmental Knowledge
	ISHIKAWA Satoshi	Coastal Area-capability Enhancement in Southeast Asia
	TANAKA Ueru	Desertication and Livelihood in Semi-Arid Afro-Eurasia
2017	ENDO Aiko	Human-Environmental Security in Asia-Pacic 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 Verication 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
2023	KANEMOTO Keiichiro	Mapping the Environmental Impact Footprint of Cities, Companies, and Households
	SAKAKIBARA Masayuki	Co-creation of Sustainable Regional Innovation for Reducing Risk of High-impact Environmental Pollution

Completed Project (FY2023)

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 PM2.5 emissions, have a critical effect on health hazards and other environmental problems, but the full extent is unknown. This project investigated the effects of global supply chains in cities, companies, and households on the environment.

Overview of Research Results

In previous research, we were able to quantify the amount of carbon dioxide emitted through the supply chain in urban and household consumption. Initially, we used micro-consumption data to elucidate the carbon footprint of cities and households. Furthermore, we estimated Scope 3 emissions for companies using financial information at the corporate level. Additionally, we addressed various environmental issues beyond carbon dioxide through the supply chain. For example, we successfully mapped out the extent to which consumption in various countries leads to deforestation through the importation of timber and food.

These research findings have been published in academic journals such as "Environmental Research Letters," "One Earth," "Nature Ecology & Evolution" and "PNAS."

Our concept of global environmental studies

Many people know from the news that global environmental problems are becoming extremely serious. For example, they may have read news about air pollution from PM2.5 in China and India causing deaths, or about many species in rainforests in Southeast Asia and the Amazon in South America under the



Figure 1 Cities like Kyoto are not directly creating environmental burdens but are emitting them outside the city through the importation of products and services. We aim to clarify this situation.

threat of extinction. However, can we simply consider these problems to be confined only to China, India, Southeast Asia and South America? When we consider why environmental problems occur in those areas, we can see the solutions to these issues and how we need to be involved. We have conducted research to link the worsening global environmental issues with corporate procurement, urban and household consumption, and to explore solutions derived from these connections.

New connections

We have created connections with companies, NGOs and city policy makers, and we believe that new networks will further expand based on future research results.





Figure 2 An image of a website that maps the carbon footprint of cities. For more details, please visit https://city.spatialfootprint.com.

Completed Project (FY2023)

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



The problem of environmental pollution is not being addressed in developing countries because economic development takes precedence over environmental conservation. To tackle this issue, we conducted research on mercury pollution caused by Artisanal and Small-Scale Gold Mining (ASGM) in the ASEAN region, aiming to address poverty and environmental issues simultaneously in developing countries and to outline a path toward building a sustainable society.

Overview of Research Results

In ASGM, workers mix mercury with manually extracted gold ore to form mercury amalgam, from which gold is then extracted by evaporating the mercury. This process causes both local and global mercury pollution.

In the project, researchers collaborated with local residents, private sector stakeholders, NGO representatives, local government officials, etc., to address this issue and conducted research at three different levels (Figure 1). In particular, they used technology and activities that contribute to problemsolving, as well as Transformative Boundary Objects (TBO) that enhance community cohesion, forming Transdisciplinary Communities of Practice (TDCOP) to generate strong interest among local residents and promote community participation. Through this process, they demonstrated a shift in environmental awareness among residents. Furthermore, it was shown that this change can lead to sustainable regional innovation. Despite the COVID-19 pandemic, each TDCOP continued to hold rigorous web meetings 2-3 times per month, and as a result of on-site research conducted by local researchers, the TDCOPs were able to maintain active engagement. Specifically, members of the community and researchers involved in the study of natural fibers and traditional embroidery expanded their collaboration into

international multisectoral cooperation between Japan and Indonesia to develop sustainable alternative livelihoods for communities, including mine workers and their families in ASGM regions (Figure 2).

Additionally, a Mercury Zero Society Network was established in ASEAN to raise awareness and address mercury pollution issues. Three medical workshops were held for healthcare practitioners and researchers in Indonesia. Furthermore, comics in Japanese, English and Indonesian languages focusing on mercury environmental pollution were created and distributed to young people in Japan, Indonesia and other countries.

Our concept of global environmental studies

I believe it is a discipline of learning and creating together with researchers and local residents, and is a more practical discipline.

New connections

Sustainable connections between among stakeholders in Japan and Indonesia have been established internationally.

(Project Leader) SAKAKIBARA Masayuki (Research Area)

Indonesia, Myanmar

🌐 https://srirep.org/



Figure 1 Structure and Components of the SRIREP Project Research



Photo 1 Working on industrializing traditional embroidery, Kalawo, as an alternative livelihood to gold mining.

Environmental Isotope Study Collaborative Research Program

The Environmental Isotope Study Collaborative Research Program provides an environment in which domestic and foreign researchers can use laboratory 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 Collaborative Research" and "Laboratory and Analysis Unit Collaborative Research," which involves the development of new analytical methods in the close collaboration with the Laboratory and Analysis Division. 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 environmental isotope 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 FY2024, 45 "General Collaborative Research" proposals, seven "Laboratory and Analysis Unit Collaborative Research" proposals, and 24 "ORNHIA-Joint Research" collaborative research proposals were selected for the Environmental Isotope Study Collaborative Research Program. In addition, between FY2012 and FY2023, 56 national and public universities, 18 private universities, 33 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.

Laboratory 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 (244 researchers from 60 institutions in FY2023) involved in research projects and the Environmental Isotope Study Collaborative Research Program conducted by RIHN are using the laboratory 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 lowtemperature 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 multi-collector 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 RIHN laboratory facilities 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.

Operations of Various Organizations

RIHN serves as secretariat of Future Earth and the University Coalition for Carbon Neutrality. Additionally, it houses the Kyoto Climate Change Adaptation Center, and the Uehiro Research Center for Japan Environmental Studies as an endowed research center. Through these organizational operations, we conduct various research activities that contribute to solving global environmental issues and disseminate research results internationally.

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 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⁺) (Photo 1, 2), supporting and advancing the research activities of the Future Earth Asia Regional Committee, providing support for the Future Earth Japan National Committee (https://japan.futureearth.org/), liaising and convening the Knowledge-Action Network on Systems of Sustainable Consumption and Production (https://sscp.futureearth.org/) and disseminating information through various media.



Photo 1 After a presentation about the game material developed by the LINKAGE project, TERRA⁺ School participants tried their hand at it.



futureart

Photo 2 TERRA⁺ School participants visited organic farmers' fields in the suburb of Kyoto City and learned about their collaboration with the local government to provide school lunches.

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

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, 2024, 214 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 itis 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 214 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/

京都気候変動適応センター

Kyoto Climate Change Adaptation Center

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. 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 history and culture.

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/en/

Uehiro Research Center for Japan Environmental Studies

"Japan Environmental Studies" explores the future possibilities of Human and Nature beyond anthropocentrism by co-creating an eco-system without dividing Human and Nature but rather brings them together. This research center was established as an endowed research center through a donation from the Uehiro Foundation on Ethics and Education.

<Mission>

- 1. "Japan Environmental Studies", disseminate it domestically and internationally, and aim for its diffusion and practice.
- 2. Focusing on environmental issues at the boundary between Humans and Nature, which is becoming increasingly homogenized, the department aims to uncover the sensitivity hidden in traditional Japanese knowledge and indigenous knowledge, and to regenerate communities.
- 3. Foster dynamic commons values that span local, national, and global stages in collaboration with local communities, aiming to cultivate human resources.

<Activities>

- 1. Development of international research and educational programs on the question, "What is the environment for humans?"
- 2. Evoking a cultural community that connects the present and the future with the "power of the field" generated in the area where humans and nature are inseparable.
- 3. Design a systematic framework for the 'Japan Environmental Studies' program integrating theory and practice, and to curate it from Japan to the world.



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

The 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 in the academic fields that constitute Global Environmental Studies and to become independent researchers who will engage in solving global environmental issues with their expertise. The program provides small-group education and research training in an environment conductive for cutting-edge research.

- 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 environmentrelated fields at companies, government offices, national and public research institutes, local governments, international organizations, and NGOs
- Researchers and curators at museums and other institutions

Number of Students in the Program (as of April 1, 2024)

	Domestic	International	Total
1st year	5	1	6
2nd year	0	0	0
3rd year	0	0	0
Total	5	1	6

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.



At the Entrance Ceremony 2024

List of Faculty Members, 2024 *As of April 1st, 2024

Name	Expertise	Research topic
OYAMA Shuichi Professor	Area Studies (Sub-Saharan Africa), Geography	Building up organic material circulation system among urban and rural area
KONDO Yasuhisa Professor	Archaeological geography, Transdisciplinary methodologies	Currently setting up international joint research projects on (1) the submerged landscape of Japanese archipelago during the late Pleistocene, (2) the archaeological geography of southeastern Arabia, and (3) the uniqueness of transdisciplinary research in Japan
NILES, Daniel Professor	Geography	Human-environmental geography specializing in sustainability studies, material culture, and environmental knowledge.
NAKAGAWA Yoshinori Professor	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
MATSUDA Motoji Professor	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
YOSHIKAWA Narumi Professor	Agricultural Economics, Japan Environmental Studies	Focusing on environmental issues at the boundary between humans and nature, which is becoming increasingly homogenized, analyzes social acceptability regarding ecological values latent in traditional and indigenous knowledge in Japan, and explores future possibilities for humans and nature.
WONG, Grace Associate Professor	Forest and natural resource economics, development studies	Research focuses on social-environmental justice and politics of forest frontiers, social forestry and climate change.

Cultural and Social Studies

Physical Science

Filysical Science				
Name	Expertise	Research topic		
ASARI Misuzu Professor	Environmental engineering, Sound material-cycle society	Waste management, 3Rs (reduce, reuse, and recycle) policies, Environmental management system at Universities, Environmental education		
SHINJO Ryuichi Professor	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 Professor	Hydrology	Research on issues linking a region and the earth such as the linkage between water, energy, and food, and climate change		
PATRA, Prabir K. Professor	Natural sciences, Environmental science, Agricultural sciences, Climate Change	Air pollutant emissions, concentration and human health; Greenhouse gases emission and mitigation; Atmospheric models and observations		
SHIN Ki-Cheol Associate Professor	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		
WATANABE Tsuyoshi Associate Professor	Earth Environmental Sciences	High-resolution reconstruction of resilient indigenous lifestyle in environmental changes to future		

Life Science

Name	Expertise	Research topic
SHOBAYASHI Mikitaro Professor	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
TAYASU Ichiro Professor	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
HAYASHI Kentaro Professor	Biogeochemistry, Soil Science	Research on nitrogen cycling based on biogeochemical studies and integrating various fields for sustainable nitrogen use for future generations
ISHII Reiichiro Associate Professor	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

Opportunities for Overseas Researchers to Spend Time at RIHN

RIHN has established two programs to enable overseas researchers to spend several months at the Institute, engaging in research and interacting with other RIHN researchers. The basic idea is that such visits benefit both the researcher and the Institute. The programs are open to researchers based outside of Japan (including those with Japanese nationality) and researchers based in Japan with a nationality other than Japanese. Candidates for both schemes are selected competitively.

Invited Scholar

The RIHN Invited Scholar Program enables overseas researchers to spend between one and three months at RIHN and to contribute to the development of the Institute's intellectual foundations and strategic directions. Invited Scholars should be widely recognized in their fields and able to provide a strategic overview of the relevance of their disciplinary or interdisciplinary studies to RIHN's engagement in global environmental studies. Invited Scholars are selected based on nomination by RIHN faculty members who act as their host. Invited Scholars are employed by RIHN during their stay and receive a stipend.





Visiting Research Fellow

The RIHN Visiting Research Fellow Program brings overseas researchers to the Institute for periods of two to six months to engage in specific research in the context of one of the RIHN Programs, Projects, Divisions, Centers or Units. Visiting Fellows are not employed by RIHN, but their travel, accommodation and daily expenses are covered by an allowance. Visiting Fellows are selected based on applications from the candidates themselves. RIHN faculty members act as hosts during the stay and candidates are required to identify and consult with potential hosts before applying.









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 or twice a year at either RIHN or other venues 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, 27 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 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.



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 137,000 times online.



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/rihn_e/



Facebook @RIHN.official/











YouTube @ CHIKYUKENofficial



Boards and Committees *As of April 1st, 2024

Board of Advisors

Oversees personnel, planning, administration and operation of the institute

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

Council for Research Strategy

Oversees research strategy, personnel, project, and evaluation system

YAMAGIWA Juichi	Director-General	MATSUDA Motoji	Program Director	KONDO Yasuhisa	Professor
TAYASU Ichiro	Deputy Director-General	SHOBAYASHI Mikitaro	Program Director	NILES, Daniel Ely	Professor
TANIGUCHI Makoto	Deputy Director-General	ASARI Misuzu	Professor	SHIMANE Toru	Administrative Director

External Research Evaluation Committee

External review of research project proposals

Domestic				
YUMOTO Takakazu	Emeritus Professor, Kyoto University	YOSHIDA Naohiro	Professor Emeritus, Tokyo Institute of Technology/Fellow,	
HARUYAMA Shigeko MUTO Megumi	Emeritus Professor, Mie University Vice President/Chief Sustainability Officer (CSO), Japan International Cooperation Agency (JICA)		Earth-Life Science Institute (ELSI), Tokyo Institute of Technolo- gy/Executive Researcher, National Institute of Information and Communications Technology (NICT)	
MOJI Kazuhiko	azuhiko Professor, Graduate School of Tropical Medicine & Global Health, Nagasaki University		School of Science, Tohoku University	
Overseas				
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.	
		HELGESON, Jennifer F.	Research Economist, Acting Program Manager, National Institute of Standards and Technology, U.S.A.	
AILIKUN	Professor, Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China	HISCOCK, Kevin	Professor of Environmental Sciences, School of Environmental Sciences, University of East Anglia, UK	
DIAZ, Sandra	Professor, Universidad Nacional de Cordoba, Argentina	MEINZEN-DICK, Ruth	Senior Research Fellow, The International Food Policy Research	
JOULIAN, Frederic	Professor, EHESS, France		Institute (IFPRI), U.S.A.	
KIRUMIRA, Edward K.	Director, Stellenbosch Institute for Advanced Study/Professor Extraordinary, Department of Sociology and Social Anthropol- ogy, Stellenbosch University, Stellenbosch, South Africa			

Senior Advisor • Emeritus Professor • Honorary Fellow

TACHIMOTO Narifumi YASUNARI Tetsuzo ABE Ken-ichi AKIMICHI Tomoya FUKUSHIMA Yoshihiro HIDAKA Toshitaka KADA Ryohei KAWABATA Zen'ichiro KUBOTA Jumpei MALLEE, Hein MOII Kazuhiko

Director-General YAMAGIWA Juichi

RIHN Staff *As of April 1st, 2024

Senior Advisor, Emeritus Professor Senior Advisor, Emeritus Professor Emeritus Professor Emeritus Professor Emeritus Professor Emeritus Professor (deceased) Emeritus Professor Emeritus Professor Emeritus Professor (deceased) Emeritus Professor Emeritus Professor Emeritus Professor

Anthropology, Human evolution, Primatology

- NAKANISHI Masami NAKANO Takanori NAKASHIZUKA Tohru NAKAWO Masayoshi OSADA Toshiki SATO Tetsu SATO Yo-Ichiro WADA Eitaro SAIJO Tatsuyoshi SUGIHARA Kaoru VAN DER LEEUW, Sander Ernst
- Emeritus Professor Honorary Fellow Honorary Fellow

Deputy Director-General · Professo **TANIGUCHI Makoto** Hydrology **TAYASU** Ichiro Isotope ecology, Environmental isotope study Professor Environmental engineering, Education for sustainable development, Waste management and material cycles ASARI Misuzu HAYASHI Kentaro Biogeochemistry, Soil science Archaeological geography, Environment and societies, Science of team science **KONDO** Yasuhisa NAKAGAWA Yoshinori Future studies, Oualitative research NILES, Daniel Elv Geography **OYAMA Shuichi** Geography, Land restoration study, Peace building study, African area study PATRA, Prabir K. Study of greenhouse gases and ozone depleting substances, Air pollution, Biomass burning, Atmospheric modelling and measurements SHINJO Ryuichi Petrology and mineralogy, Isotope geochemistry Specially Appointed Professor MATSUDA Motoii Cultural anthropology, Sociology SHOBAYASHI Mikitaro Agriculture and agri-environmental policies, Water resources policies, Rural development, Agricultural economics YOSHIKAWA Narumi Agricultural economics **ISHII Reiichiro** Theoretical ecology

Public relations, Science communication

Petrology, Geochemistry, Isotope geology

Forest and natural resource economics,

Environmental earth science, Coral reef environmental earth sciences

Development studies

Biogeochemistry

Specially Appointed Assistant Professor

OKADA Saeko

SHIN Ki-Cheol

WONG, Grace

ONISHI Yuji

WATANABE Tsuyoshi

SAWAZAKI Kenichi	Aesthetic practices
YASUTOMI Natsuko	Meteorology, Climatology

Research and Education Department, Fundamental Research Department (Deputy Director, Head of Education Division)

Deputy Director-General (Research), Director of Research and Education Department, Director of Program Research Department, Program Director (Co-creation of the Earth-human System Program, Strategic Program)

Deputy Director-General (Planning and Coordination), Director of Fundamental Research Department, Head of Laboratory and Analysis Division, Head of Institutional Research Unit

Research and Education Department, Program Research Department (Sustai-N-able Project)

Research and Education Department, Fundamental Research Department (Education Division)

Research and Education Department, Program Research Department (Future Design Project)

Research and Education Department, Fundamental Research Department (Head of Knowledge Networks Division)

Research and Education Department, Program Research Department (Organic Material Circulation Project)

Research and Education Department, Program Research Department (Aakash Project)

Research and Education Department, Program Research Department (LINKAGE Project)

Research and Education Department, Program Research Department (Program Director of Global Environmental Culture Program)

Research and Education Department, Program Research Department (Program Director of Combining Knowledge for a Fundamental Innovation of Land Use Program)

Fundamental Research Department (Head of Uehiro Research Center for Japan Environmental Studies)

Research and Education Department, Fundamental Research Department (Head of Information and Planning Division)

Research and Education Department, Head of Public Relations Unit

Research and Education Department, Fundamental Research Department (Laboratory and Analysis Division)

Research and Education Department, Program Research Department (SceNE Project)

Research and Education Department, Program Research Department (FairFrontiers Project)

Research and Education Department, Fundamental Research Department (ORNHIA Project, NIHU)

Research and Education Department, Fundamental Research Department (Liberal Arts Communicator, NIHU)

Research and Education Department, Program Research Department (Aakash Project)

Research Fellow HASEGAWA Emi **ICHIHARA Masako**

Senior Researcher

AOKI Eri

YABUSAKI Shiho YOSHIMIZU Chikage

AOIKE Utako **ARAI Hirotsugu** BISWAL, Akash

HAMADA Takeshi

LEONG, Chris MAEHATA Teruya

MANGARAJ, Poonam

METARAGAKUSUMA, Andi Patiware NODA Kentaro SAIKI Makoto SEERA, Georgina SIDIBE, Alimata TOMOJIRI Daiki WAI PHYOE MAUNG

Visiting Professor

ABE Ken-ichi BABA Kenshi DWYER, Janet HABU Junko HASEGAWA Yuko HAYASHI Hiroaki HAYASHIDA Sachiko HUT. Piet IKEGAMI Eiko KADA Yukiko KAMII Hiroyuki KANIE Norichika KASUGA Fumiko KONO Yasuyuki KOZAN Osamu KUMAZAWA Terukazu KUSAGO Takavoshi LATACZ-LOHMANN, Uwe

Ecology

Climate change litigation, Climate change law

Environmental systems, Environmental psychology, Urban environmental engineering Isotope hydrology, Groundwater hydrology

Biogeochemistry

Ecological anthropology, Area studies Isotope ecology

Air pollution, Air quality, Bigdata analytics in air pollution, Remote sensing Sociology

Hydrology Ecology

> Atmospheric chemistry, Urban air quality, Greenhouse gas emission inventory, Measurement of air pollutants, Health impact assessment, Mitigation and strategies Rural development

Area studies, Ecological anthropology Material cycle, Water environment Sociology Atmospheric chemistry Ecology, Area studies Forestry, Area studies

> MALLEE, Hein MATSUMI Yutaka MIZUNO Kosuke NAKAMURA Masato NAKATSUKA Takeshi NIIKAWA Tatsuro NOZU Takashi SAIJO Tatsuyoshi SAKAI Shoko SAKAKIBARA Masavuki SUEMATSU Hiroyuki SUGIHARA Kaoru TASHIRO Takashi TERADA Masahiro YAMANAKA Manabu YAMAUCHI Taro YASUNARI Tetsuzo YOSHIDA Takehito

Fundamental Research Department (Laboratory and Analysis Division)

Fundamental Research Department (Laboratory and Analysis Division)

Fundamental Research Department (Laboratory and Analysis Division)

Program Research Department (Organic Material Circulation Project)

Program Research Department (Global Environmental Culture Program)

Program Research Department (Organic Material Circulation Project)

Program Research Department (Organic Material Circulation Project)

Program Research Department (Organic Material Circulation Project)

Program Research Department (Strategic Program)

Program Research Department (Sustai-N-able Project)

Program Research Department (Aakash Project)

Program Research Department (LINKAGE Project)

Program Research Department (Aakash Project)

Program Research Department (FairFrontiers Project)

Program Research Department (Sustai-N-able Project)

Program Research Department (FairFrontiers Project)

Program Research Department (LINKAGE Project)

Program Research Department (FairFrontiers Project)

Visiting Associate Professor

KANEMOTO Keiichiro

KIHARA Hirotaka

MASUHARA Naoki

NAGANO Takanori

NAKAJIMA Hiroki

SHIMANGAN, Dahlia

SHIMIZU Takao

TAMURA Norie

ONISHI Yuko

OTSU Eri

HONGO Shun

IUE Minako

Fundamental Research Department (Kyoto Climate Change Adaptation Center)

Visiting Assistant Professor JIANG, Hong-wei

KIM, Satbyul NGUYEN, Tien Hoang

Budget (FY 2024)

	Amount (Yen in thousands
Income	1,634,718
Subsidy for Operation	1,622,049
Self Revenue	12,669

External Sources of Funding (FY 2023)

Category	Amount (Yen ir	thousands)
Fund for Promotion of Academic and Indu	strial	69,962
Collaboration		
Grants-in-Aids for Scientific Research (KA	KENHI)	70,740
Donations for Research		10,404

Collaborative Researchers *As of March 31st, 2024



Domestic Collaboration *As of April 1st, 2024

RIHN has concluded 32 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. Kyoto Seika University
- 11. Nara Women's University
- 12. University of the Ryukyus
- 13. Hokkaido University
- 14. National Agriculture and Food Research Organization
- 15. Kochi University of Technology
- 16. Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology
- 17. 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 Rakuhoku Senior High School
- 8. Miyazaki Prefecture
- 9. Kyoto City, ICLEI Japan, Kyoto Environmental Activities Association
- 10. Kyoto Institute, Library and Archives
- 11. Oshino Village (Yamanashi Prefecture)
- 12. Kyoto Prefecture, Kyoto City (2 agreements)
- 14. Asia Center for Air Pollution Research, Japan Environmental Sanitation Center
- 15. Kyoto Prefectural Board of Education

International Collaboration *As of April 1st, 2024

RIHN has actively concluded 19 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	Laos	-Lao Tropical and Public Health Institute, Ministry of Health
Cameroon	-Green Development Advocates		-The Faculty of Forest Science, National University of Laos
China	-East China Normal University	Malaysia	-PACOS Trust
Democratic Republic			-Universiti Malaysia Sarawak
of the Congo	-Center for Intercultural and Interdisciplinary	Netherlands	-Copernicus Institute of Sustainable Development,
	Research for Sustainable Development in		Utrecht University
	Southern and Central Africa	Republic of Korea	-Institution for Marine and Island Cultures,
	-Forgotten Parks		Mokpo National University
India	-Lovely Professional University	Sweden	-Stockholm Resilience Centre at Stockholm
Indonesia	-Forestry Faculty of Universitas Hasanuddin		University
	-Universitas Riau	United States of	
	-Halu Oleo University	America	-University of California, Berkeley
	-Wakatobi Regency		
	-Institut Teknokigi Dan Bisnis Muhammadiyah		
	Wakatobi		

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 The Strategic Planning and Management Department established – RIHN logo redesigned
- 2023 Global Environmental Studies Program, the Graduate University for Advanced Studies, SOKENDAI established
- 2024 The Research and Education Department established
 - RIHN Center reorganized into the Fundamental Research Department, the Research Department reorganized into the Program Research Department
 - Uehiro Research Center for Japan Environmental Studies 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





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.









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