

Inter-University Research Institute Corporation
National Institutes for the Humanities, Japan

RESEARCH INSTITUTE FOR HUMANITY AND NATURE

2006-2007



	■ Message from Director-General	1
	■ Aim and Purpose of Establishment	2
	■ Role, Function, and Characteristics of RIHN	2
	■ The Goal of RIHN: Research Integration	4
	<hr/>	
Research Activities	■ Research Axes and Research Projects	6
	■ Process Leading to FR Project Implementation	7
	■ 1-1FR Impact of Climate Changes on Agricultural Production System in the Arid Areas	8
	■ 1-2FR Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on the Environment	10
	■ 1-3PR Vulnerability and Resilience of Social-Ecological Systems	36
	■ 2-1FR Emissions of Greenhouse Gases and Aerosols, and Human Activities in Eastern Asia	12
	■ 2-2FR Sustainability and Biodiversity Assessment on Forest Utilization Options	14
	■ 2-3FR Human Activities in Northeastern Asia and Their Impact on the Biological Productivity in North Pacific Ocean	16
	■ 2-4FR Human Impacts on Urban Subsurface Environments	18
	■ 2-5FR When Agriculture Destroys the Environment	20
	■ 2-6FS High-Precision Diagnosis and Assessment of Environmental Quality in Japan	41
	■ 2-7FS Relationships between Human Activities and Atmospheric Changes, Possibilities of Harmonious Society for Environmental Issues in the East Asia	42
	■ 2-8FS Environmental Changes and Vector-Borne Diseases in Tropical Asia and Oceania	43
	■ 2-9FS Evaluation for <i>on-farm</i> Conservation of Traditional Farming Systems and Lifestyles	44
	■ 2-10FS Better Understanding of Plant Distribution and Carbon Circulation Change by Human Activities in Asia	45
	■ 3-1FR Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed	22
	■ 3-2FR Interactions between Natural Environment and Human Social Systems in Subtropical Islands	24
	■ 3-3PR Environmental Change and the Indus Civilization	37
	■ 3-4FS High-Altitude Environments Association of Ageing, Diseases and Livelihood with Culture and Nature	46
	■ 4-1FR Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes	26
	■ 4-2FR A Trans-Disciplinary Study on the Regional Eco-History in Tropical Monsoon Asia: 1945-2005	28
	■ 4-4PR Neolithisation and Modernisation: Landscape History on East Asian Inland Seas	38
	■ 4-5PR Historical Interactions between Hybrid Society of Ethnic Groups and the Natural Environment in a Semi-Arid Region, Central Eurasia	39
	■ 4-6FS Historical Interaction between Nomadic States' Activities and Environmental Transformation in the High-Latitude Asian Steppe Region	47
	■ 5-1FR Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives	30
	■ 5-2FR Interactions between the Environmental Quality of a Watershed and the Environmental Consciousness: With Reference to Environmental Changes Caused by the Use of Land and Water Resources	32
	■ 5-3FR A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago	34
	■ 5-4PR Effects of Environmental Change on Interactions between Pathogens and Humans	40
	■ 2006 Incubation Studies	48
	■ External Research Collaboration	48
	■ Research Cooperation in Japan and Abroad	49
	<hr/>	
	■ Activities of Research Promotion Center	50
	■ RIHN Forum, Public Seminars, Research Project Presentation and Seminars	51
	■ Research Staff Profiles	52
	■ A Guide to New Facilities	60
	<hr/>	
Organization	■ History, Organization, Budget	62
	■ Board and Committees	63
	■ Staff Members	64

Message from Director-General

HIDAKA, Toshitaka
Director-General, Professor



Six years have passed since the establishment of RIHN. By the grace of warm support of the ministry of Education, Culture, Sports Science and Technology and all hands, the number of research staff reached the full strength, and more number of researchers are gathering from various study areas. And this innovative research institute has started to present its research results as was expected.

It is our basic understanding the root of the so-called global environmental problems lies behind the human culture in the broadest sense of the word, that is, the way of living of the humans which wish to control nature. Its English name "Research Institute for Humanity and Nature" aims to fulfill its mission to endeavor to understand the manifold relationship between humanity and nature. Its "research project system" aims to effectively integrate studies beyond the barrier between the so-called scientific-technological and humanistic approaches. By its system of "fluid association" researchers of various fields meet to collaborate within this new sphere of study, its "Research Promotion Center" transmits the Institute's research achievements and its contribution to the people. Everything is a new and enthusiastic trial.

Parallel to corporatization of Japanese national universities, we became one of member institutes of the National Institutes for the Humanities (NIHU). RIHN, National Museum of Ethnology, International Research Center for Japanese Studies, National Museum of Japanese History, and National Institute of Japanese Literature comprised this new organization. It would be a desirable position for RIHN and our academic studies to take a cross-disciplinary, integrated approach toward the solution of global environmental problems.

Though corporatization itself might connote problems and demerit, we have to overcome them to realize our aim and succeed. We believe these enthusiastic trial are truly significant challenge for the world and Japan.

We hope that you follow our progress in this new research institute, RIHN.

Aim and Purpose of Establishment

The Research Institute for Humanity and Nature (RIHN) was founded in April 2001. This inter-university research institute, under the Japanese Ministry of Education, Culture, Sports, Science, and Technology, was established to carry out integrated research for innovative solutions to problems related to the global environment.

Environmental problems, such as global warming, loss of biodiversity, and depletion of water resources are said to be the consequences of humanity-nature interactions being manifested today in various parts of the world. It is fundamentally a problem of human life style or culture in the broadest sense of the word.

One of the difficulties of assessing global environmental problems is that many of them have appeared across the vast regions of the earth in a most unpredictable manner. A number of the problems that lie before us are caused by factors seemingly far removed from reality both in time and space. Moreover, recent studies show that not only "natural-scientific" but also "economics, politics, history, and philosophy etc" factors in the broadest sense are exerting strong influences.

The complexity of this work means that these multi-faced problems can not be solved by conventional thinking. In fact, the measures taken hitherto were based on the idea of controlling nature and which has yielded few solutions.

Our first and most fundamental posit is to define what is meant by problems in the global environment and to re-examine the conventional ways of thinking which developed during the 20th century.

Firstly we examine keenly how human interacts with nature, an intricately complex matter. It must be hard work. However this is our primary mission.

Secondly, based on such perspectives we need to consider how we can sustain the global environment that has all the future capabilities and what sorts of life style we must adopt in order to achieve it. To achieve these goals, a new academic approach is called for.

To embody the result, RIHN is tackling to a new trial stated in the message from Director-General of RIHN. And we intend to announce to the public how mankind can benefit from our research, while building academic "knowledge" to further contribute to resolving the problems now present in the environment.

Role, Function and Characteristics of RIHN

Integration

In recent years many studies aimed at solving global environmental problems have been made in various ways in the world, but we now have reached a point where new directions are needed. We are faced with questions such as, what sorts of lifestyles will be acceptable in the future, and how large an area of tropical forest should be retained? To answer these simple but socially demanding questions, it is necessary to develop a new integrated approach, bringing together different disciplines from the natural sciences, social sciences, humanity studies, engineering, land and food sciences, medical sciences, and others.

Fluidity

It is extremely important to maintain high fluidity in the academic center to integrate research in cross-disciplinary fields. RIHN proposes a research organization with the highest possible fluidity operating under the requirements of the "project-based format".

Globalization

It is essential to build the research organization with international vision in order to realize a cross-disciplinary, integrated approach toward the solution of global environmental problems. RIHN will develop strong links with international as well as national research organizations, actively well as



↑ RIHN Public Seminars are held to introduce the general public to RIHN activities in an easy-to-understand manner. These seminars shed light on the reality of the interaction between human and nature, and discuss the development of a sustainable global environment.
← RIHN Forum aims to raise foresighted yet tangible questions, based on the principles and outcomes of RIHN's research activities. About two hundred and fifty people participated in the fourth forum held under the title of "Extinguished Water."

national research organizations, actively promote research projects to be based overseas, and participate in the planning and operation of international research projects. It will also appoint many non-Japanese professors and researchers as integral members of its research staff.

Leadership

Strong leadership is necessary to carry out integrated research in such a fluid organization. RIHN will have its own professors to act as leaders in the planning and operation of multidisciplinary research projects to maintain its leading role in these studies.

Research Project System

RIHN will carry out cross-disciplinary, integrated studies according to the "project-based format" without dividing research activities into traditional disciplinary areas.

RIHN has no "Research Sections". It will carry out its research, not based on traditional research areas, but by establishing 5 research axes that represent integrated perspectives of the global environmental problems and identifying each research project along the direction of the appropriate axis.

Each project will be organized through the period of incubation (IS) and tested in the feasibility study (FS) of about one year. Then the result of the feasibility study will be evaluated and, if assessed as suitable, will proceed to the full-scale study of about 5 years after 1 year Pre-Research. In this process the evaluation of the project is given by the Evaluation Committee and approval by the Advisory Committee.

National Institutes for the Humanities (NIHU)

National Institutes for the Humanities (NIHU) was established on April 1st, 2004 based on the National University Corporation Law. RIHN became one of the member institutes of the NIHU along with the following institutes, National Museum of Ethnology, International Research Center for Japanese Studies, National Museum of Japanese History, National Institute of Japanese Literature, which all are concerned with different viewpoints surrounding cultural problems. RIHN undertakes its own research projects on the one hand and promotes joint research on the other, as the core organization for the collaborative research project "Water and People" organized by NIHU. Furthermore, RIHN is actively engaged in NIHU operations, such as the promotion of research resource-sharing project, open lectures, and symposia, as well as various projects organized by NIHU and the Inter-University Research Institutes.

The Goal of RIHN: Research Integration

Through various projects, RIHN studies the interactions that form the links between human and nature. Since these studies vary in subject and time span, we are aware of the need for indicating a direction of organizing them. Our past research experience has made it clear that the conceptions below are important for the study of global environmental issues and the elucidation of these as problems that pertain to human culture.

Firstly, wide-ranging environmental problems resulting from interactions between human and nature cannot be fully explained in terms solely of universal or scientific logic. We should rather focus on catchphrases and trends specific to particular times or areas, which can be termed illusionary, contained as they are within human behavior and thought.

Secondly, it is our understanding that an important task of studying and addressing environmental issues is to ascertain the effectiveness of a preventive or adaptive standpoint, for exploring sustainability within a forecastable range. In addition, another important task is to locate a social system, practice, or thought that works as a relief valve to prevent the complex web of human-nature interactions from breaking up in one sweep.

Thirdly, our existing research results suggest that Asian attitudes toward nature and the varying ethical considerations in environmental development may be of importance for the future of humanity.

Fourthly, global warming, loss of biodiversity, and climate change are issues that create an extremely complicated web of conflicting interests between various parties and nations. It is clear that understanding the pluralistic phase of environmental issues is of significance. For example, the victimizer is not necessarily different from the victim, and in conducting analysis there is a need to stratify factors such as space, time, and the composition of human groups.

Finally, impact on nature and impact on human society have differing characteristics and thus need different assessment methods. Consequently, we believe that one of the ways to integrate research is to build a model that can deal with both quantifiable and non-quantifiable aspects.

We believe that it is possible at RIHN to promote research integration by systematizing project results gained in various fields, with the above-mentioned viewpoints in mind.



(1) A Glacier in the Tien Shan Mountain in Kirgiz, (2) A glacier lake in the Tien Shan Mountain, (3) Falls in mid-stream of Yellow River, (4) An irrigation system in an arid area in Turkey, (5) A well in semi-arid land in Thailand, (6) Water fountains in an urban area of Japan, (7) An irrigation system in a temperate area in Japan, (8) Paddy field and Lake Biwa, (9) Flooded marshland in Bangladesh

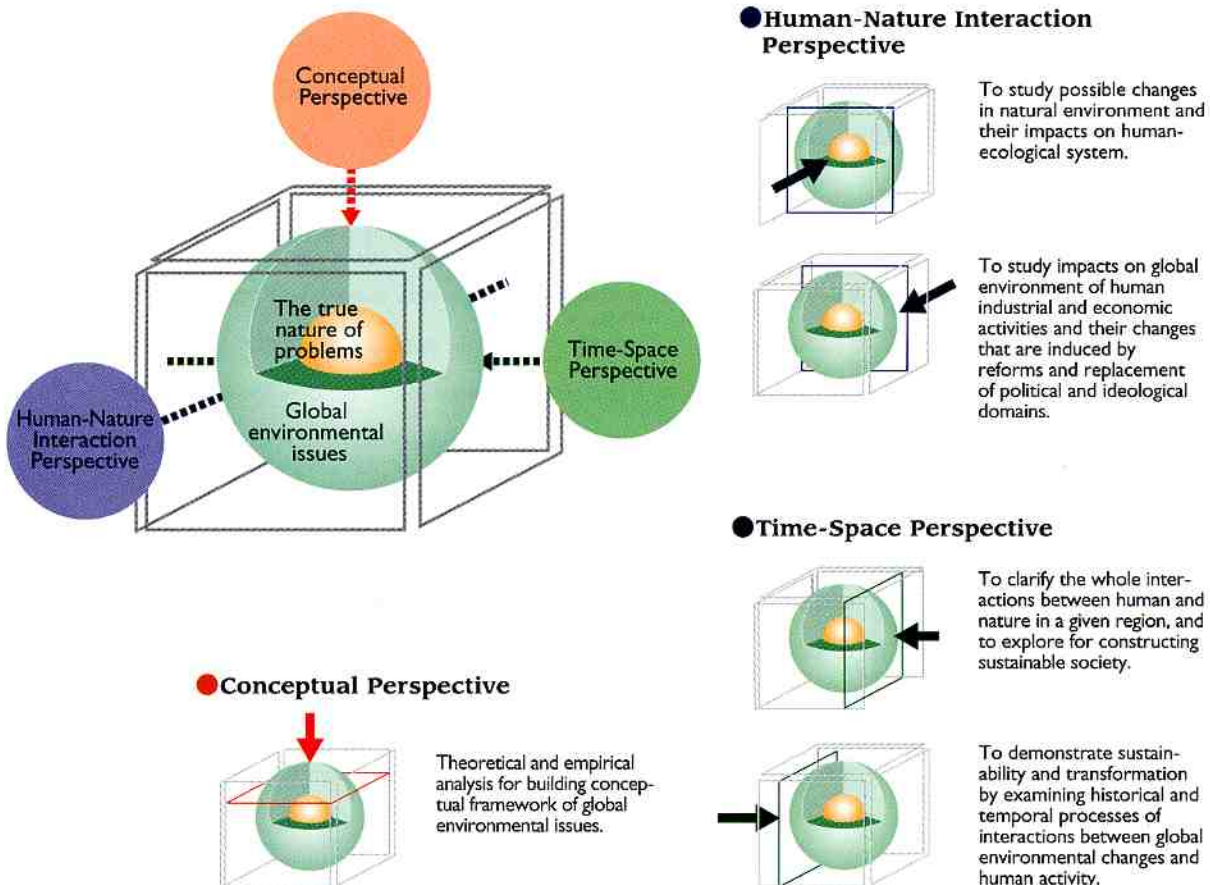
Water is vital to human survival, as well as for agricultural and industrial needs. People's association with the realm of water is diverse in nature, depending on the history, geography, season, and culture of the area. Despite natural and cultural diversities of human-water interactions, we may admit that water is not only for the use of human beings, but also for all life forms on earth. This is the key point to be noted when we tackle water problems at local and global levels.

Approaches toward Research Integration

RIHN studies global environmental problems from three different perspectives: human-nature interactions, time-space, and conceptual perspective. From the human-nature interaction perspective, RIHN focuses attention on the chain of interactions found between humans and nature, and makes approaches to two different sides of these interactions (interactions are regarded as successive human actions on nature and nature's reaction to humans and vice versa). RIHN makes other approaches to time and space from the time-space perspective, by analyzing the distributions and types of various events resulting from human-nature interactions plotted on time-space axes. From the conceptual perspective, RIHN tries to interpret human-nature interactions according to different conceptual frameworks: ecology, culture, history, etc. RIHN takes these different approaches toward studying global environmental issues in their different phases.

Furthermore, RIHN is directing its efforts to reach the core of global environmental issues, as well as to study the tangible parts of these issues. It is necessary to determine the causes of the problems and to discover what is missing or needed in order to find fundamental solutions. Each of RIHN's research projects combines the aforementioned five approaches to set the most important goal of exploring the true nature of global environmental issues, while calling for originality and collaboration in study methodology.

The five approaches described above are necessary for a comprehensive understanding of global environmental issues in their different phase. It is also necessary to combine the differing approaches for knowledge integration. To this end, it is important for each study project to conduct exploration independently yet at the same time to complement one another in creative activity. In this manner, RIHN becomes able to build academic knowledge from within, which will contribute to the finding of solutions to various problems concerning the global environment.



Research Axes and Research Projects

■ 2006 Research Projects Full Research(FR), Feasibility Study (FS), Pre-Research (PR)

AXIS 1
Environmental Change Impact Assessment

To study possible changes in natural environment and their impacts on human-ecological system.

- 1-1FR Impact of Climate Changes on Agricultural Production System in the Arid Areas
- 1-2FR Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on the Environment
- 1-3PR Vulnerability and Resilience of Social-Ecological Systems

AXIS 2
Human Activity Impact Assessment

To study impacts on global environment of human industrial and economic activities and their changes that are induced by reforms and replacement of political and ideological domains.

- 2-1FR Emissions of Greenhouse Gases and Aerosols, and Human Activities in Eastern Asia
- 2-2FR Sustainability and Biodiversity Assessment on Forest Utilization Options
- 2-3FR Human Activities in Northeastern Asia and Their Impact on the Biological Productivity in North Pacific Ocean
- 2-4FR Human Impacts on Urban Subsurface Environments
- 2-5FR When Agriculture Destroys the Environment
- 2-6FS High-Precision Diagnosis and Assessment of Environmental Quality in Japan
- 2-7FS Relationships between Human Activities and Atmospheric Changes, Possibilities of Harmonious Society for Environmental Issues in the East Asia
- 2-8FS Environmental Changes and Vector-Borne Diseases in Tropical Asia and Oceania
- 2-9FS Evaluation for *on-farm* Conservation of Traditional Farming Systems and Lifestyles
- 2-10FS Better Understanding of Plant Distribution and Carbon Circulation Change by Human Activities in Asia

AXIS 3
Spatial Scale

To clarify the whole interactions between human and nature in a given region, and to explore for constructing sustainable society.

- 3-1FR Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed
- 3-2FR Interactions between Natural Environment and Human Social Systems in Subtropical Islands
- 3-3PR Environmental Change and the Indus Civilization
- 3-4FS High-Altitude Environments Association of Ageing, Diseases and Livelihood with Culture and Nature

AXIS 4
History and Time Scale

To demonstrate sustainability and transformation by examining historical and temporal processes of interactions between global environmental changes and human activity.

- 4-1FR Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes
- 4-2FR A Trans-Disciplinary Study on the Regional Eco-History in Tropical Monsoon Asia: 1945-2005
- 4-4PR Neolithisation and Modernisation: Landscape History on East Asian Inland Seas
- 4-5PR Historical Interactions between Hybrid Society of Ethnic Groups and the Natural Environment in a Semi-Arid Region, Central Eurasia
- 4-6FS Historical Interaction between Nomadic States' Activities and Environmental Transformation in the High-Latitude Asian Steppe Region

AXIS 5
Conceptual Framework for Global Environmental Issues

Theoretical and empirical analysis for building conceptual framework of global environmental issues.

- 5-1FR Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives
- 5-2FR Interactions between the Environmental Quality of a Watershed and the Environmental Consciousness: With Reference to Environmental Changes Caused by the Use of Land and Water Resources
- 5-3FR A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago
- 5-4PR Effects of Environmental Change on Interactions between Pathogens and Humans

■ 2006 Incubation Studies

6 studies are adopted (see p.48)

Process Leading to FR Project Implementation

Incubation Studies (IS) are solicited from both inside and outside the Institute since 2005. Required condition is that RIHN research staff must be joined with the team as a co-researcher in order for the applicant becomes well aware of RIHN's mission and is able to propose an appropriate research project.

If an IS project being adopted, it will be reviewed, first through a debating session, in which the leader presents the research plan to all RIHN staff, and also by the Executive Board. Second, if an IS project accepted, it steps up to a Feasibility Study (FS). To a FS project, the evaluation is done through a debating session attended by all the staff of RIHN, by the Executive Board, and finally assessed by the Evaluation Committee. Before reaching the Full Research (FR), the Advisory Committee discusses if a FS project can be implemented, taking account of a budget and other conditions. If confirmed, the FS steps up the Pre-Research (PR) before the budget can be available for the implementation of FS. * Excerpted from the Basic Policies for the Implementation of Research Projects at RIHN.

Incubation Study

Outline: Incubation Studies are proposed by individuals, which then become joint studies that serve to discover new seeds and aims for the development into research projects. Research themes are solicited from both inside and outside the institute.

Period: about 6 to 12 months

IS Application

Review by the Executive Board and through interviews in which all the institute staff participate

IS Implementation

Review by the Executive Board and through a debriefing session attended by all the staff of the institute

Feasibility Study

Outline: Stepping up from an incubation study, a Feasibility Study (FS) is the preparatory research stage before Full-Research.

Period: about 1 year

FS Implementation

Review through a debriefing session attended by all the staff of the institute

Evaluation Committee for Research Projects (Assessment)

The Advisory Committee discusses implementation timing and other issues from a budget point of view.

Pre-Research

Outline: Based on the result of Feasibility Study, Pre-Research is conducted as a transition from FS to FR. The Pre-Research is so called since it is in the budget request stage.

Period: about 1 year

PR Implementation

Evaluation Committee for Research Projects (Advice)

Full-Research

Outline: Full-Research is a project promoted with the aim of gaining study results within five years. Concrete targets are set with the aim of finding solutions.

Period: 5 years

FR Implementation

Evaluation Committee for Research Projects (Interim Evaluation and Post Evaluation)

■ Executive Board

Member: Director-General, Program Directors (5), Director of the Research Promotion Center, and Director of the Administration Office

Governed by: Executive Board Rules

■ Evaluation Committee for Research Projects

Member: All are external members. (17)

Governed by: Evaluation Committee Rules and Evaluation Guidelines

■ Advisory Committee

Member: 14 committee members

Governed by: RIHN Advisory Committee Rules

* See page 63 for member names.

Impact of Climate Changes on Agricultural Production System in the Arid Areas

This research project aims at identifying the direction and dimensions of the potential impacts of climate changes and ensuing adaptation in the agricultural production systems of arid regions, where water resources are limited, based on the projection of future regional climate changes in the eastern coast of the Mediterranean Sea, the case study region. While the relationship between climate and agriculture, both in the past and present, is being analyzed, the impact of climate changes, including the rise in air temperature, decrease of precipitation and sea-level rise, on agricultural production system are being assessed.

Project Leader ■
Core Members ■

WATANABE, Tsugihiko	RIHN
FUJINAWA, Katsuyuki	Faculty of Engineering, Shinshu University
KOBATA, Tohru	Faculty of Life and Environmental Science, Shimane University
KOJIRI, Toshiharu	Disaster Prevention Research Institute, Kyoto University
KIMURA, Fujio	Terrestrial Environment Research Center, University of Tsukuba
NAGANO, Takanori	RIHN
TAMAI, Shigenobu	Arid Land Research Center, Tottori University
TANAKA, Kenji	Disaster Prevention Research Institute, Kyoto University
TSUJII, Hiroshi	Faculty of Bioresources and Environmental Sciences, Ishikawa Prefectural University
UMETSU, Chieko	RIHN
YANO, Tomohisa	Kyushu Kyoritsu University
YATAGAI, Akiyo	RIHN
KANBER, Riza	Faculty of Agriculture, Çukurova University (coordinator of the Turkish team)
ALTAN, Türker	Faculty of Agriculture, Çukurova University
AYDIN, Mehmet	Faculty of Agriculture, Mustafa Kemal University
EKMEKÇI, Mehmet	Faculty of Engineering, Hacettepe University
ERCAN, Onur	Faculty of Agriculture, Çukurova University
EVERENDILEK, Fatih	Faculty of Agriculture, Mustafa Kemal University
SAYDAM, Cemal	Faculty of Engineering, Hacettepe University
ÖZEKİCİ, Bülent	Faculty of Agriculture, Çukurova University

Objectives of the Project – Consideration of Agricultural “Wisdom” through Projecting Impacts

As the population grows and the demand for food increases, agriculture in arid areas is required to improve its productivity, while its development is severely restricted by water availability. In many arid regions of the world, the development of agriculture and irrigation has resulted in land degradation and desertifica-

tion, and has also caused serious problems in the hydrological regime. The changes in agricultural land and water management practices pose serious threats to the sustainability of agriculture itself.

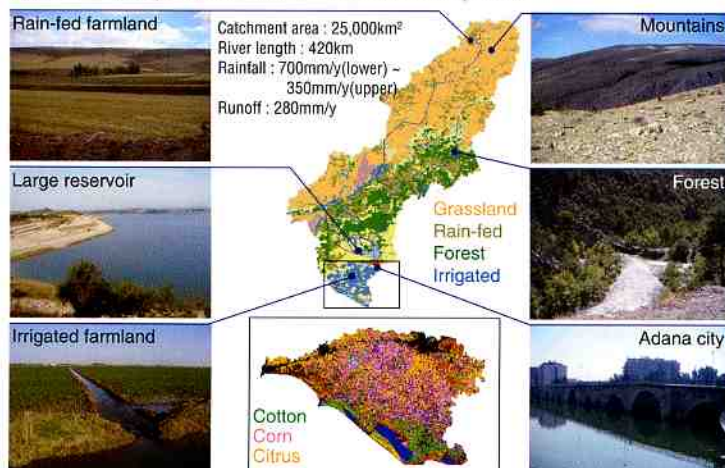
Moreover, future global climate change can provide climatological and hydrological conditions in arid region with substantial changes, thus present another challenge or constraint to the agricultural production system.

This research project attempts to comprehend ‘the agriculture as a system of relationship between human and nature’, with a view to identifying current and future challenges, and effective countermeasures against possible climate changes.

Study Areas and Methods

The research of this project is being implemented in the Seyhan River basin (about 25,000 km²) in the eastern Mediterranean region of Turkey as the main case study area. In the upper hilly area of the basin, rain fed wheat production is widespread and large scale irrigated agriculture producing maize, wheat, cotton, citrus etc. extends throughout the lower plain, which depends on the water supply from the reservoirs that receive runoff of winter precipitation in upper mountainous areas. Field research is being carried out in coop-

Figure 1 The Seyhan River Basin ~ the Case Study Area



Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on the Environment

The recent crisis that occurred in the Yellow River basin is complicated because factors like natural climate fluctuation, global warming and changes of land utilization may be affecting one another. We will evaluate how land use changes affect the water cycle throughout the Yellow River drainage basin and what kind of effect the decrease in groundwater storage downstream could have on marine conditions, through five years research. This study may prove to be at the forefront of ecological studies of densely-populated coastal zones, and through studying the Bohai Sea and Yellow Sea we may also be able to evaluate the effects on marine products in the Sea of Japan through Bohai Sea and Yellow Sea.

Project Leader ■

FUKUSHIMA, Yoshihiro RIHN

Core Members ■

Imura, Hidefumi Graduate School for Environment, Nagoya University
ONISHI, Akio RIHN
ONODERA, Sin-ichi Faculty of Integrated Arts and Sciences, Hiroshima University
GUO, Xinyu Center for Marine Environmental Studies, Ehime University
KINOSHITA, Tetsuya RIHN
GAO, Huiwang College of Environmental Science and Engineering, Ocean University of China
SATO, Yoshinobu RIHN
XIA, Jun Institute of Geographical Sciences and Natural Resources, CAS
SHINODA, Taro Hydrospheric-Atmospheric Research Center, Nagoya University
TAKAHASHI, Atsuhiko RIHN
TANIGUCHI, Makoto RIHN
CHEN, Jianyao School of Geographical Science & Planning, Zhongshan University
HIGUCHI, Atsushi Center for Environmental Remote Sensing Research, Chiba University
HIYAMA, Tetsuya Hydrospheric-Atmospheric Research Center, Nagoya University
HOSHIKAWA, Keisuke RIHN
MATSUOKA, Masayuki Faculty of Agriculture, Kochi University
YANAGI, Tetsuo Research Institute for Applied Mechanics, Kyushu University
LIU, Changming Institute of Geographical Sciences and Natural Resources, CAS
MA, Xieyao Frontier Research System for Global Change
ZHENG, Hongxing Institute of Geographical Sciences and Natural Resources, CAS

Background and Objectives

Environmental problems, related to water resources and managements, have been occurring all over the world. Since 1990, the frequency which river water in the Yellow River does not reach the Bohai Sea has rapidly increased due to uptake of river water to irrigation in the midstream area. In the lower reaches area of the Yellow River basin, people suffer water shortage for irrigation, industrial and drinking water. In addition to these, the shortage of river water induces the decrease of groundwater level and increase of water pollution. Due to the increase in population and food demand on the earth, such cases seem to be increasing and are likely to spread further in the near future worldwide. How we can recognize and resolve this problem is one of the most important and urgent issues facing humanity. The recent crisis that occurred in the Yellow River basin is complicated because natural climate fluctuation, global warming and change of land utilization may affect each another. This research will be based on : the recently- acquired knowledge of the effects of: climate change and

human impact on the water cycle in the Yellow River Basin, and ancient Chinese water management systems.

Methods

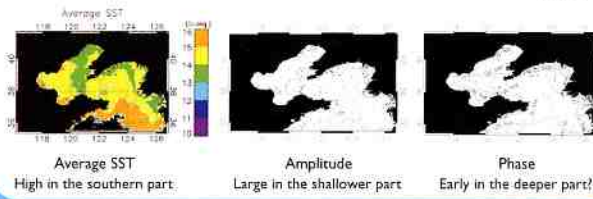
We plan to achieve this study through the following sub-studies;

- (1) Field observations and analyses on land-atmosphere interactions in the Loess Plateau,
- (2) Field observations and analyses on interactions between river water, groundwater, and seawater in the Yellow River delta,
- (3) Development of socio-economical model for sustainable developments,
- (4) Development of ecological model of Bohai Sea,
- (5) Development of an integrated model to evaluate the effects of land use change on the water circulation in the Yellow River basin, and
- (6) Analyses of Chinese thought/idea and knowledge on water managements.

Sub-study (6) has been started from 2005.

The sub-study (5) will integrate the result obtained by each sub-study team.

Development of ecological model of Bohai Sea



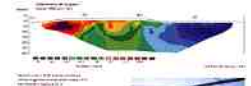
Harmonic analysis of SST (Sea Surface Temperature) of the Bohai Sea from satellite

Interaction between groundwater, seawater and river water

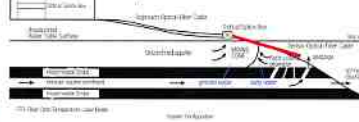
Continuous measurements of SGD by automated seepage meters



Evaluation of freshwater-seawater interface by resistivity measurements with tomography

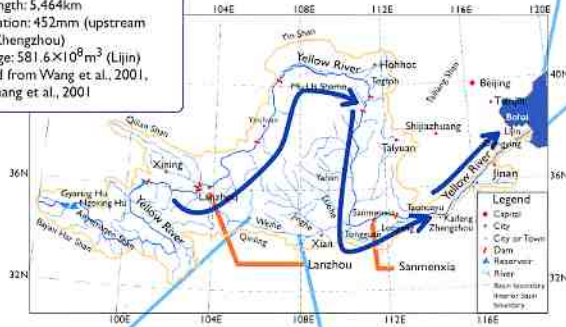


Measurements of seabed temperature by Fiber Thermo Radars



Basin area: 752,443km²
River length: 5,464km
Precipitation: 452mm (upstream from Zhengzhou)
Discharge: 581.6×10⁹m³ (Lijin)
Modified from Wang et al., 2001, and Zhang et al., 2001

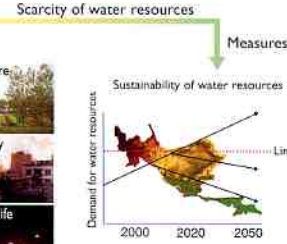
Map of the Yellow River basin



Study area: Yellow River Basin

Socio-economical model for sustainable development

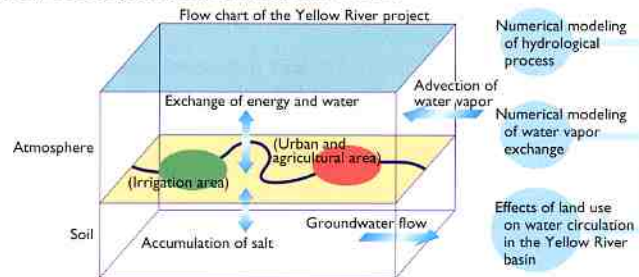
Northwest China



Land-Atmosphere Interactions



Synthesis by development of hydrological model



Expected Results

We aim to understand how changes of land utilization affects the water cycle throughout the Yellow River drainage basin and what kind of effect the decrease in groundwater stored downstream could have on marine conditions. This study may prove to be at the forefront of ecological studies of densely-populated coastal zones, and through studying the Bohai Sea and Yellow Sea we may also be able to evaluate the effects on marine products in the Sea of Japan.

We will evaluate the problems under consideration, which if unchanged could worsen the environment, by consulting written documents more than 3000 years old and recent data of the Yellow River basin.

Attained Results

The dry-up of the Yellow River during the 1990's was mainly happened due to water consumptions, from upstream to downstream, for the maintenance of irrigated areas, coupled with a slight decrease in precipitation. This dry-up

has ceased recently because the changes of water law by Chinese government and introduced water management with seasonal control of water consumption. However the river discharge into the Bohai Sea is still very low. Meanwhile, recent satellite data and numerical simulation models show a decrease in the exchange of water between the Bohai Sea and the Yellow Sea. We will evaluate the relationship between the decrease of the Yellow river discharge and the decrease in the exchanging of water between the Bohai Sea and the Yellow Sea. Observation results at Loess Plateau show a drastic vertical exchange of air from the land surface to the atmosphere. We will develop a model to explain this unexpected new phenomenon. In addition to these, the downstream sedimentation in the Yellow river continues to increase the possibility of flooding, even though embankments are continually being made. Degradation of water quality in irrigated areas is another important issue in the Yellow River basin.

Emissions of Greenhouse Gases and Aerosols, and Human Activities in Eastern Asia

The recent growth of economy in East Asian region is being watched with keen interest. The relationship between human activities and emissions of greenhouse gases and aerosols in this region are studied with collaboration of socioeconomic analysts and atmospheric scientists. This research project consists of macro-analysis of economy, development of emission inventory, analysis of atmospheric transport by using model and satellite data, and ground-based observation around Japan and China.

Project Leader ■

HAYASAKA, Tadahiro RIHN

Core Members ■

IWAMI, TORU School of Economics, The University of Tokyo
 KAWAMOTO, Kazuaki RIHN
 SAEKI, Tazu RIHN
 NAKAZAWA, Takakiyo Center for Atmospheric and Oceanic Studies, Graduate School of Science, Tohoku University.
 NAKAJIMA, Teruyuki Center for Climate System Research, The University of Tokyo
 HAYASHIDA, Sachiko Faculty of Science, Nara Women's University
 SHI, Guangyu Institute of Atmospheric Physics, CAS, China P.R.

Objectives

The objectives of the present research project are to investigate

- 1) the relationship between changes in economy, industry, social system under the globalization and changes in anthropogenic emissions of greenhouse gases and aerosols; and
- 2) influences of these greenhouse gases and aerosols emitted in Asian region on the global-scale atmospheric environment and climate change.

Strategy

While most of studies similar to this research project are mainly carried out by atmospheric scientists, viewpoints from human activities are emphasized in this study.

- 1) Socioeconomic analyses on the anthropogenic emissions are carried out. Changes in land use, consumption, quality, and transport process of energy for the past 20 years in Asia are analyzed.

- 2) Regional emissions of greenhouse gases and aerosols due to human activities are estimated through the analysis of observed data with atmospheric transport model.
- 3) The effects of greenhouse gases and aerosols emitted by human activities in Asia are evaluated synthetically.

Outcomes up to the Present

Pollution property industry and globalization of economy

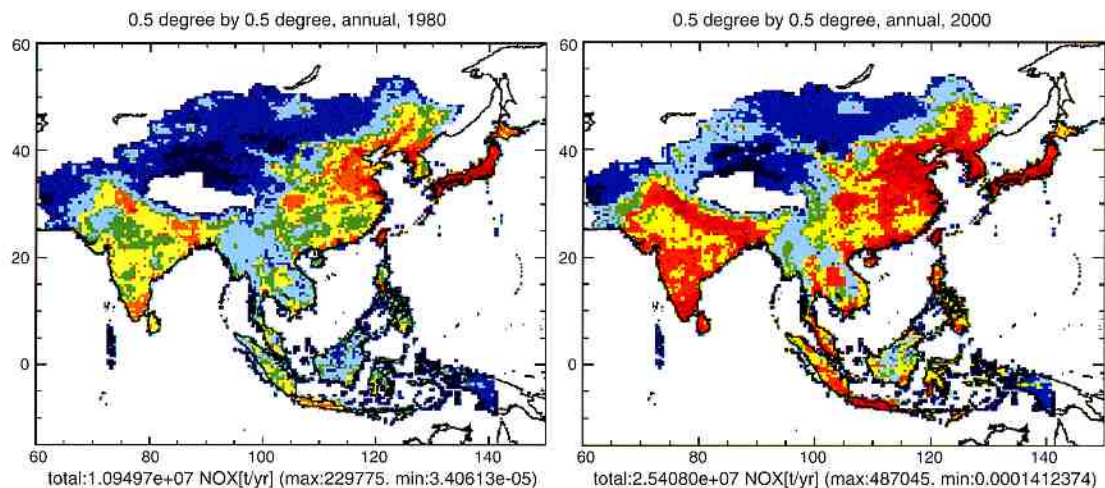
It was presumed from the regression analysis that the production of pollution properties is greatly influenced not by export but domestic consumption and is provided not by the direct export of articles but the indirect export of other related articles. An alternative theory is that the amount of pollution properties produced is determined by the economic magnitude or level of consumption of a country. Moreover, it has been suggested that the production of pollution properties is more closely related to the factor of labor wages rather than that the environmental control.

Table 1 Atmospheric Constituents and their Sources in the Emission Inventory of this Study

		NOx	SO ₂	CO	CO ₂	N ₂ O	NH ₃	NOx	NOx	NOx	NMVOG
Combustion	Industry	Fossil fuel + biofuel	●	●	●	○	●	●	●	●	●
	Power P.										
	Transport										
	Domestic										
Non-combustion	Industrial processes		●	●	●	○	●	●	●	●	●
	Solvent use										●
Agriculture	Agricultural soil	○				○	●			●	
	Livestock					○	●			●	
Others	Biomass burning	×	×	×	×	×	×	×	×	×	○
	Waste handling					×	●			●	

● 1980-2000 available; ○ 1995, 2000 only available; × Not available

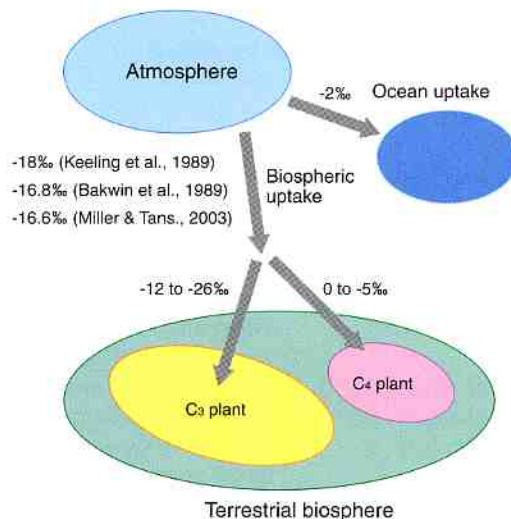
Figure 1 Changes in Annual Emission of NO_x in Asian Region between 1980 and 2000



Blue color shows a small value and the amount of emission increases in the order of blue, green, yellow, and red

Figure 2 Fractionation of Carbon Isotope by C₃ and C₄ plants

Such a characteristic is weak for the C₄ plant though the C₃ plant has the characteristic of taking ¹²C from ¹³C selectively when the photosynthesis occurs. Therefore, whether photosynthesis occurred in the C₃ plant or C₄ plant can be presumed by examining seasonal variation and comparing this with the carbon isotope of carbon dioxide in the atmosphere.



Energy consumption and emission inventory

The emission inventory for 20 years in the Asian region has been made by using various statistics of energy consumption such as the IEA energy balance, United Nations energy statistics, and China's energy statistics, etc. Table 1 shows targeted source and constituents.

Figure 1 shows the change in the amount of emission of NO_x in Asia. Overall the amount of emission in the Asian region increased by 1.3 times (OC) ~ to 2.5 times (NO_x) during the 20 year period from 1980~2000. The increase of the amount of the NO_x emission in China was larger, and the increase in amount in these 20 years reached as high as 3.1 times. This implies that the emission structure of air pollution in Asia, especially in China has changed greatly in recent years.

Observations and analysis of atmospheric constituents and radiation

In order to obtain quantitative information on the emission source and the absorption source

of carbon dioxide (CO₂) in the East Asian region, observation sites were established in coastal regions and inland in China. The isotope ratio of carbon ($\delta^{13}\text{C}$) has also been observed as well as the CO₂ concentration since March 2003. Results showed that the seasonal variations of the CO₂ concentration and $\delta^{13}\text{C}$ at the observation sites in northern China were especially large, and twice or more the amplitude were observed compared with those at the same latitude in western China. It is presumed that such large seasonal variations of CO₂ concentration and $\delta^{13}\text{C}$ reflect an active photosynthesis and respiration of the biosphere in northeastern China. Moreover, the $\delta^{13}\text{C}$ analysis suggests that the seasonal change of CO₂ levels can be ascribed to the C₄ plant. This infers that farmlands, developed by human activities, where grain is produced, and the C₄ plants such as corn and cereals are widely distributed (Figure 2).

On the other hand, the aerosol composition observed on Fukue Island has shown large ratios of the organic carbon aerosol compared with that observed in Okinawa. As for the air parcel observed on Fukue Island, analyzed using the atmospheric transportation model suggested that the influence of airborne materials from the Chinese continent is large. Moreover, satellite observation data shows that the concentration of carbonaceous aerosol is relatively high in the East China Sea. This result reflects the biomass combustion levels (fuel and scorch field, etc.) in China.

Summary

The present population of China has expanded to 1,267.43 million, which is 2.3 times more than the 541.67 million in 1949. In the future, the burden human activities exert on the environment is expected to become heavier due to the growth of the Chinese economy that greatly exceeds population growth and is expected to continue like this for some time.

The results of this research are scheduled to be published in a book for the general public and a dataset for scientists.

Sustainability and Biodiversity Assessment on Forest Utilization Options

Terrestrial biodiversity has decreased mainly because of the loss and/or deterioration of forest ecosystems. A system to utilize forest resources while conserving biodiversity should be developed. This project aims to elucidate the socio-economic background causing forest decrease, its effects on biodiversity, and ecological services that might be lost as a consequence of biodiversity loss. We also evaluate the forest-use options both from ecological and socio-economical aspects to develop a sustainable utilization system.

Project Leader ■

ICHIKAWA, Masahiro RIHN

Core Members ■

AIBA, Shin-ichiro Faculty of Science, Kagoshima University
AKAO, Ken-ichi Graduate School of Social Sciences, Waseda University
NAKASHIZUKA, Toru Faculty of Bioscience, Tohoku University
KITAYAMA, Kanehiro Center for Ecological Research, Kyoto University
KOHYAMA, Takashi Graduate School of Environmental Earth Science, Hokkaido University
MOMOSE, Kuniyasu Faculty of Agriculture, Ehime University
NIYAMA, Kaoru Forestry and Forest Products Research Institute
SATO, Jin Graduate School of Frontier Science, The University of Tokyo

Background

Decrease and deterioration of forest ecosystem is the major reason of drastic loss in terrestrial biodiversity.

The sustainable management system to conserve biodiversity should be developed.

Purposes of the project

- (i) To clarify historical change in forest utilization and its social- and economic backgrounds.
- (ii) To assess impacts of forest utilization on biodiversity.
- (iii) To evaluate function and ecosystem service

provided by forest biodiversity.

- (iv) To develop integrated evaluation system for sustainable forest utilization.

Research sites

- 1) Lambir National Park, Malaysia (Tropical rain forest area)
- 2) Kinabalu National Park, Malaysia (Tropical montane forest area)
- 3) Yaku Island (Temperate evergreen forest area)
- 4) Abukuma Mountains (Temperate deciduous forest area)

Figure 1 Drivers Cause Changes in Land Use in Lambir

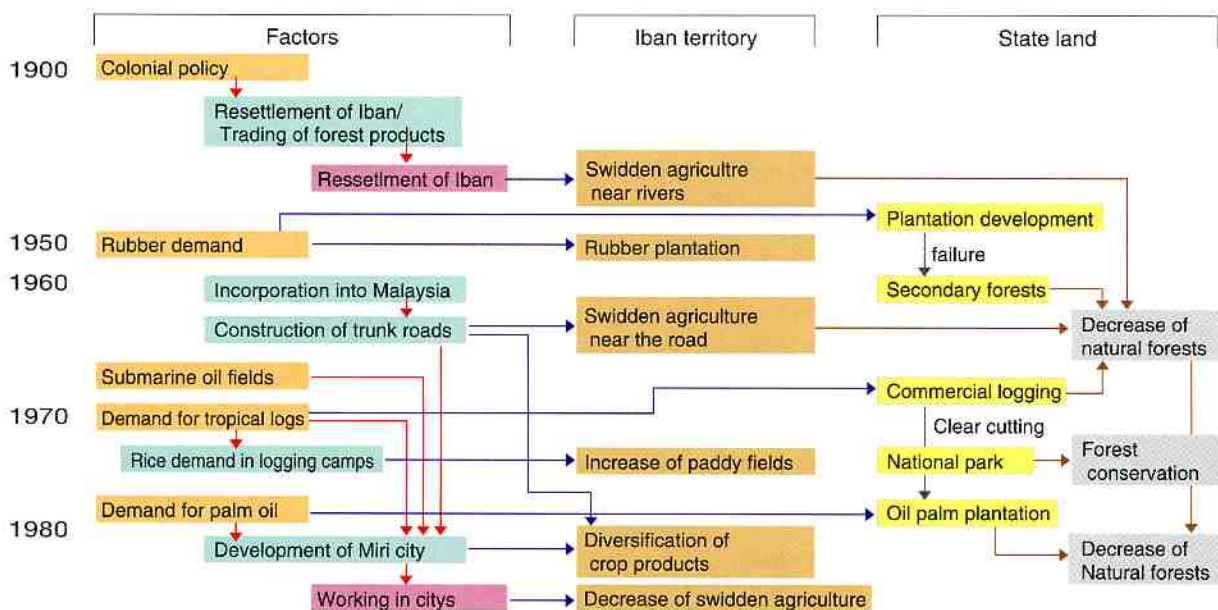


Figure 2 Factors of Changes in Land Use in Lambir

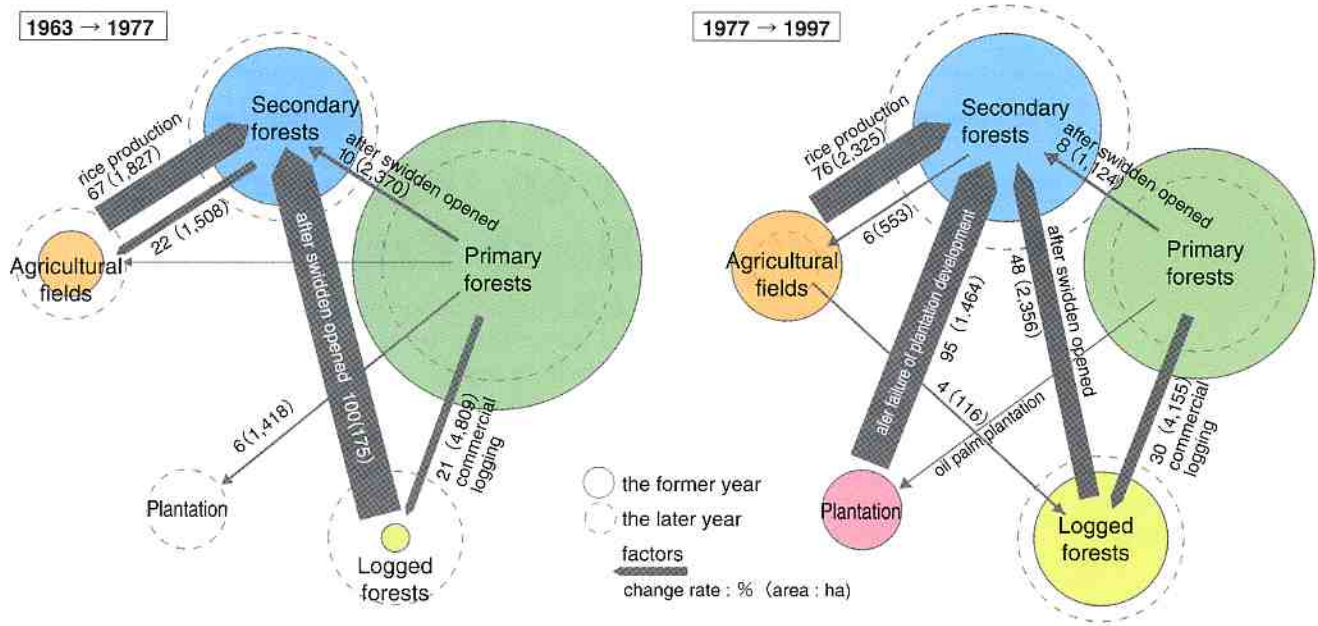
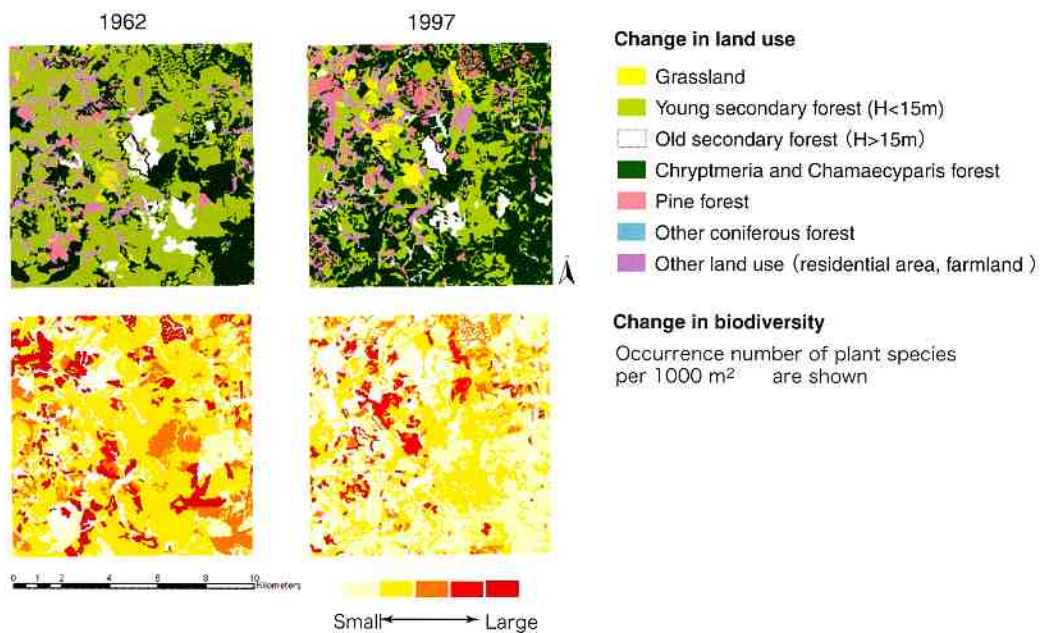


Figure 3 Spatial Assessment of Biodiversity Changes



Expected results

- 1) Basic information applicable for criteria and indices of sustainable forest management.
- 2) Evaluation methodology for ecological services that will be lost by biodiversity decrease.
- 3) Elucidation of socio-economic causes that brought forest deterioration and their global comparison.
- 4) Models to predict the change in forest-use and biodiversity in the future and criteria to design spatial arrangement of forest-use.

Outcome up to the present

- 1) The change in forest utilization and its driving

factors have been analyzed for recent 40-100 years (Fig. 1 and 2).

- 2) Biodiversity assessment was conducted for various types of forest use, and tools for future projection of the biodiversity are developing (Fig. 3).
- 3) Ecological services that are in crisis with the losses of biodiversity have been analyzed.
- 4) Biodiversity resource utilizations by local people have been elucidated in terms of forest use.
- 5) Models of the relationship between sustainable land use and social-economic conditions have been developed.

Human Activities in Northeastern Asia and Their Impact on the Biological Productivity in North Pacific Ocean

Recently, we have recognized a possible function of continental forests feeding fish in ocean. In this study, we will investigate how the Amur River transports nutrients such as iron from forests to the Sea of Okhotsk and supports biological productivity there, and clarify to what extent the human activities on the Amur basin may disturb this material linkage, in order to create an ideal relationship between land and ocean ecosystems including humankind.

Project Leader ■

SHIRAIWA, Takayuki RIHN

Core Members ■

HARUYAMA, Shigeko Graduate School of Frontier Sciences, The University of Tokyo
KAKIZAWA, Hiroaki Graduate School of Agriculture, Hokkaido University
KISHI, Michio Graduate School of Fisheries Sciences, Hokkaido University
KUMA, Kenshi Graduate School of Fisheries Sciences, Hokkaido University
KONDOH, Akihiko Center for Environmental Remote Sensing, Chiba University
MATSUDA, Hiroyuki Graduate School of Environment and Information Sciences, Yokohama National University
NAGAO, Seiya Graduate School of Environmental Earth Sciences, Hokkaido University
NAKATSUKA, Takeshi Institute of Low Temperature Science, Hokkaido University
OHSHIMA, Keiichiro Institute of Low Temperature Science, Hokkaido University
SHIBATA, Hideaki Field Science Center for Northern Biosphere, Hokkaido University
TACHIBANA, Yoshihiro Liberal Arts Education Center, Tokai University
UEMATSU, Mitsuo Ocean Research Institute, The University of Tokyo
WAKATSUCHI, Masaaki Institute of Low Temperature Science, Hokkaido University
YOH, Muneoki Environmental Conservation, Tokyo University of Agriculture & Technology

Background and Objectives

Recent oceanological studies have revealed that biological productivity was limited by iron availability in the northern North Pacific. Because iron can be hardly dissolved in water, phytoplankton largely relies on the iron supply from land via the atmosphere and/or rivers. In contrast to the central region of the northern North Pacific, the phytoplankton productivity is very high in the Sea of Okhotsk, probably due to the sufficient supply of iron from the Amur River. Riverine iron cannot keep dissolved in the sea-

water without being a complex with humic substances created in forest and wetland. Therefore, changes in land uses on the Amur River basin such as deforestation, forest fire, cultivation, urbanization and/or reduction of wetland may reduce the biological productivity in the Sea of Okhotsk and the northwestern area of North Pacific Ocean.

In this study, we try to answer following four questions; 1) How large is the discharged flux of materials such as iron from the Amur River, how far the iron is transported offshore and to what

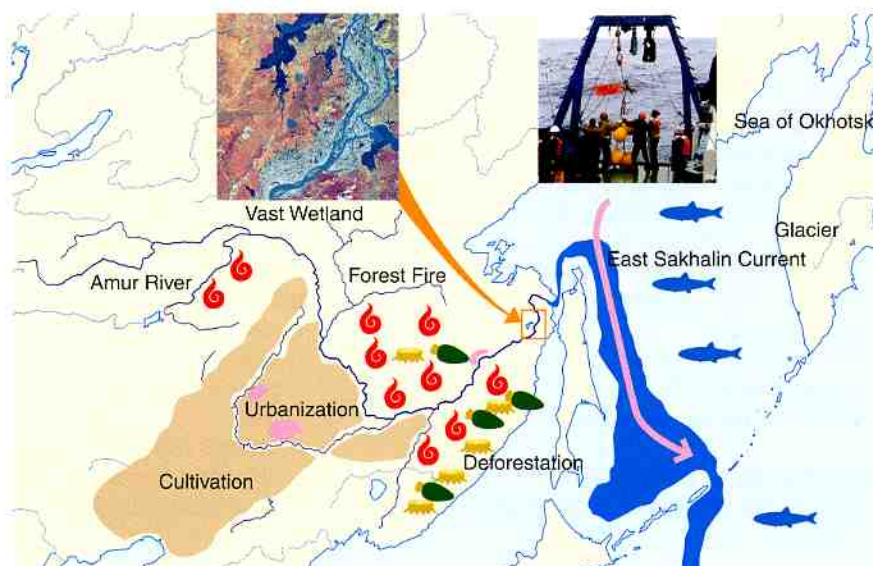


Figure 1 Study Area
Human activities in Amur River basin and flowing out of the river water into Okhotsk sea and North Pacific Ocean.

Figure 2 Landform and Drainage Pattern in the Amur River Basin

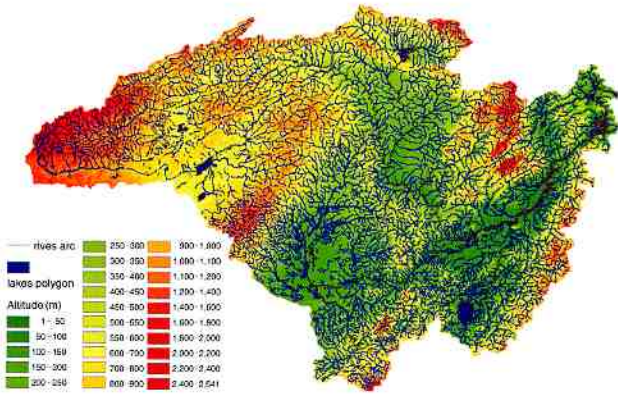


Figure 3 Changes in Wetland-area in Sanjiang Plain from 1980 to 2000

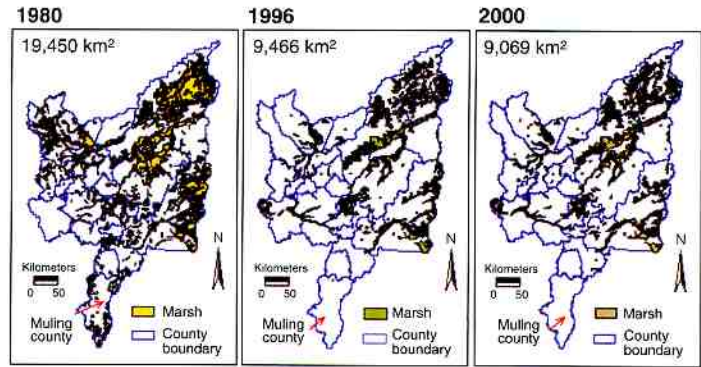


Figure 4 Time-series of Timber Export to Japan, China and Korea

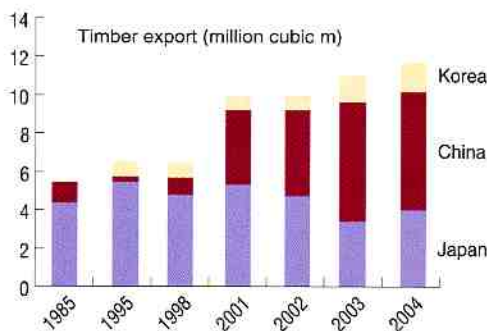
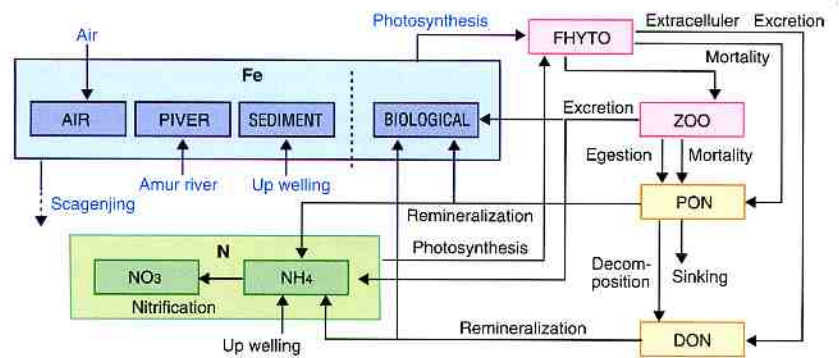


Figure 5 Scheme of Numerical Marine Biological Model in the Sea of Okhotsk



extent the iron is contributing to the biological productivity in the Sea of Okhotsk; 2) What are the factors controlling the release of materials such as iron from the land to the Amur River in the natural and/or artificially altered land surface conditions in the Amur basin; 3) To what extent do the economic and political systems around Northeast China and Far Eastern Russia change the land uses in the Amur basin in the past, present and future? The system is now named, "Kyodai Uotsukirin (Giant Fish Feeding Forest)" which includes both natural and human processes. We will try to establish this theory further and find ways conserve this area.

Current Status and Research Plan in 2006

Water sampling and biogeochemical research were conducted, from Khabarovsk to Nikoraevsk-na-Amure, by the Research Vessel Ladoga, in collaboration with Institute of Water and Ecological Problems, FEBRAS in the summer of 2005. Hydrological and biogeochemical research stations were established in the Greater and Lesser Khingan Ranges, Sanjiang Plain and Sikhote Alin in the Amur River basin. Observation was started in these stations in collaboration with Institute of Applied Ecology CAS, Northeast Forestry University, Northeast Institute of Geography and Agricultural Ecology CAS, Nankai University and Institute of Water and Ecological Problems FEBRAS. Routine

water sampling from the Amur River, at both Khabarovsk and Bogorodskoe, and continuous sampling of aerosol emissions in Kamchatka, were started with the help of the Federal Service for Hydrometeorology and for detailed chemical analyses, Environmental Monitoring.

Digital layers on present topography, river system, geology and land-uses were compiled for the whole of the Amur River basin, in collaboration with Pacific Geographical Institute FEBRAS. GIS will be used for numerical modeling describing hydro-biogeochemical processes, to trace the flow of dissolved iron from the basin to the Sea of Okhotsk as boundary conditions. Background analyses on forestry and agricultural development were also started to understand what potential driving forces could accelerate the land-use changes.

In 2006, we will conduct research cruises at Amur Liman (river mouth of the Amur) and the Sea of Okhotsk to clarify the mechanism of how dissolved iron is transported. We will also carry out an ice-core drilling project at Mt. Ichinsky, Kamchatka, to reconstruct the time-series of iron-deposition to the Sea of Okhotsk through the atmosphere. Numerical simulation of the impact of land-use changes on discharge of dissolved iron is being planned in 2006. Background analyses on land-use changes in the basin will be accelerated.

Human Impacts on Urban Subsurface Environments

This project will assess the effects of human activities on the urban subsurface environment, an important aspect of human life in the present and future but not yet evaluated. This is especially true in Asian coastal cities where population numbers and density have expanded rapidly and uses of subsurface environment have increased. The primary goal of this project is to evaluate the relationships between the development stage of cities and various subsurface environmental problems, including extreme subsidence, groundwater contamination, and subsurface thermal anomalies. We will address the sustainable use of groundwater and subsurface environments to provide for better future development and human well-being.

Project Leader ■
Core Members ■

TANIGUCHI, Makoto RIHN

EHARA, Sachio Graduate School of Engineering, Kyusyu University
YOSHIKOSHI, Akihisa College of Letters, Ritsumeikan University
YAMANO, Makoto Earthquake Research Institute, Tokyo University
FUKUDA, Yoichi Graduate School of Science, Kyoto University
KANEKO, Shinji Graduate School for International Development and Cooperation, Hiroshima University
ADACHI, Itsu Japan International Cooperation Agency
TOKUNAGA, Tomochika Graduate school of Frontier Sciences, Tokyo University
SHIMADA, Jun Faculty of Science, Kumamoto University
ONODERA, Shin-ichi Faculty of Integrated Arts and Sciences, Hiroshima University
NAKANO, Takanori RIHN

Objectives of this project

Securing water resources and clearing contaminated water caused by human activities in urban areas are global environmental issues in the 21st century. Heat island phenomena created by human activities is also a big environmental problem in addition to global warming. These global environmental issues, which are caused by urbanization, should be addressed strongly and prevented, because population increase and concentration occurs rapidly in urban areas.

Most global environmental studies have long been focused on the environmental issues above ground surface such as:

air pollution, global warming, seawater pollution, and decrease in biodiversity. Subsurface environmental issues are also important for human life for the present and future, but have been largely ignored because of the invisibility of the phenomena and difficulty of the evaluations.

Subsurface environmental problems such as subsidence due to excessive pumping and groundwater contamination have occurred repeatedly in major Asian cities, with a time lag depending on the development stage of urbanization. Therefore, we may be able to assess future scenarios if we can evaluate the relationships between subsurface environmental problems and the development stage of the city.

Study area and methods

This project will deal with; (1) Relationships between the development stages of the cities and subsurface environmental problems will be

Window to find subsurface environmental problems



We will evaluate the changes of subsurface environment which has not studied yet.

We will evaluate the driving force which causes the changes of subsurface environment in each developing stage of the cities.

Figure 1 Development Stage of the Cities



Figure 2 Methodology of the Four Sub-themes

Reconstruction of water environment by uses of historical records



Evaluations of change in groundwater storage through gravity measurements



We will use both (1) reconstruction and inverse method (from present to the past) and (2) monitoring, modeling and simulations (from past to present and future)

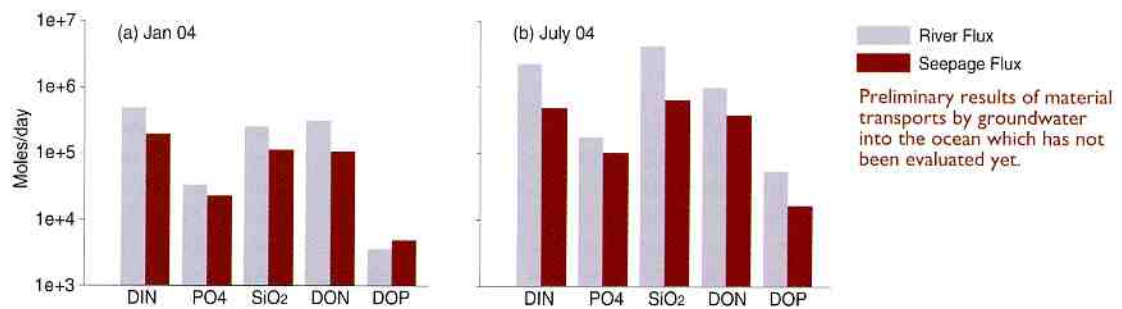
Evaluations of nutrient transports by groundwater to the coast



Soil temperature measurements



Figure 3 Preliminary Results of Estimated Fluxes in the Flow of Inorganic and Organic Nutrients into the Upper Gulf of Thailand via the Chao Phraya River (slashed) and Groundwater (brown)



assessed by socio-economical analyses and reconstructions of urban areas by uses of historical records; (2) Serious problems in subsurface environments and changes in reliable water resources will be studied after evaluations of groundwater flow systems and changes in groundwater storage by uses of hydrogeochemical data and in-situ/satellite-GRACE gravity data; (3) We will also evaluate the accumulation of materials (contaminants) in the subsurface and their transports from land to the ocean including groundwater pathways by uses of chemical analyses of subsurface waters, sediments and tracers; and (4) Subsurface thermal contamination due to the "heat island" effect in urban areas will be evaluated through the reconstruction of surface temperature history and urban meteorological analyses.

Tokyo, Osaka, Bangkok, and Jakarta are targeted as study cities, and Taipei, Manila and Seoul are selected as secondary study cities depending on the four sub-themes. The project will focus on the urban subsurface environments; however, we will treat the problems on a basin scale, because subsurface water, heat, and material transports are interconnected on this scale. We will focus on the relationships between

subsurface environmental changes and human activities during the past 100 years.

Progress of the project

- Preliminary field surveys at Seoul, Taipei, Bangkok, Jakarta, Tokyo and Osaka have been made.
- International Symposium on "Human Impacts on Urban Subsurface Environment" was held, and the proceeding was published (Oct, 18-20, 2005).
- The MOUs between RIHN and Research Center for Geotechnology, Indonesian Institute of Science, and Institute of Earth Sciences, Academia Sinica, Taiwan, became effective
- Assessments of existing data in the study areas have been started.
- Preliminary model developments for GRACE (Gravity Recovery and Climate Experiment) data to evaluate the changes in groundwater storage have been made.
- Preliminary evaluations of material transports by groundwater to the coastal zone have been made.
- Cooperation with international research agencies (UNESCO- GRAPHIC (Apr.2006), GWSP-Asia (Aug.2005) has begun.

When Agriculture Destroys the Environment

Human beings have been changing the nature throughout history. Through this history, human beings have been struggling with big disasters and famines and have also been destroying the natural environment. We are interested in the relationship of the reduction of genetic diversity and species diversity of crops with collapse. We are attempting to divide Eurasia into three areas: the *mugi*-zone, rice-zone and taro-zone, and to investigate the history of agriculture and environment in each zone. Based on the results, we will consider sustainable agriculture for the future.

Project Leader ■
Core Members ■

SATO, Yo-ichiro	RIHN
FUKUNAGA, Kenji	RIHN
ISHIKAWA, Ryuji	Faculty of Agriculture and Life Science, Hiroasaki University
JONES, Martin	Cambridge University
KATO, Kenji	Faculty of Agriculture, Okayama University
MATTHEWS, Peter	National Museum of Ethnology
MUGURUMA, Yumi	School of Art, Tohoku University of Art & Design
NAKAMURA, Ikuo	Graduate School of Science and Technology, Chiba University
SHINODA, Kenichi	National Science Museum
TANNO Ken-Ichi	RIHN
WILLCOX, George	Institut de Prehistoire Orientale, France
YANG, Haiying	Faculty of Humanities and Social Sciences

Contents

Ever since the invention of agriculture, humans have been changing the natural environment into an artificial one, known as the man-made ecosystem (let us call it "*sato*" according to a Japanese traditional concept). Recently there has been criticism of agricultural activities from some quarters because these activities destroy *sato* due to the extremely high-output, which is helping to push humans towards a survival crisis. However, agricultural activities have undoubtedly contributed to the

stability and productivity that enabled humans to have their present status. The content of *sato* differs from place to place, dependant upon natural conditions as well as lifestyle and culture. A Japanese philosopher T. Watsuji once attempted to study the variations, and did so in explaining these through the concept of *fudo*. The present research project aims at elucidating how mankind has been changing *sato* through agricultural activities in the various *fudo*, based on the investigations spanning various disciplines. Further, the project will attempt to propose an advantageous manner of agricultural production suit-

Figure 1 Research Areas in This Project

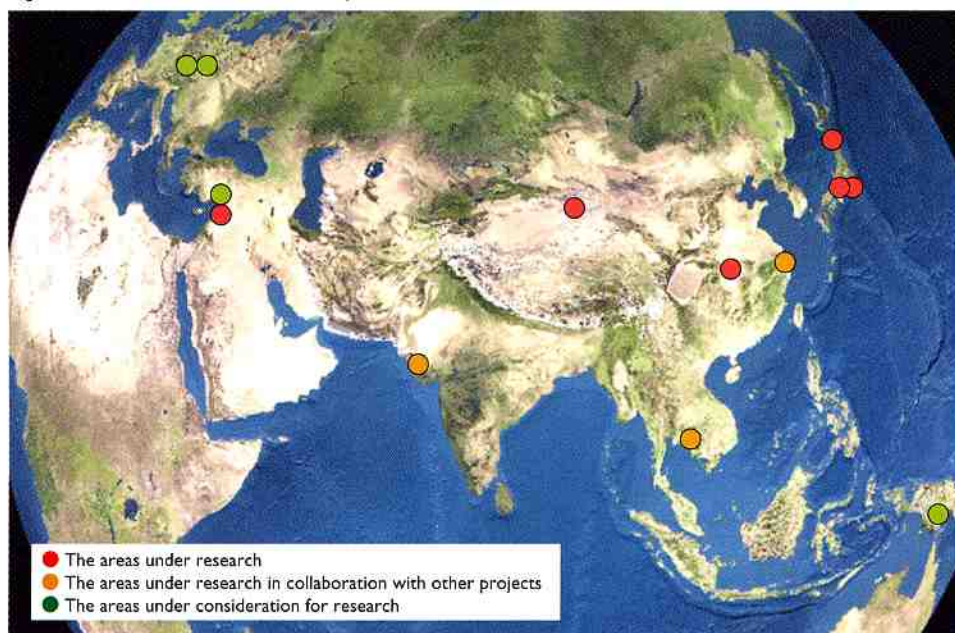


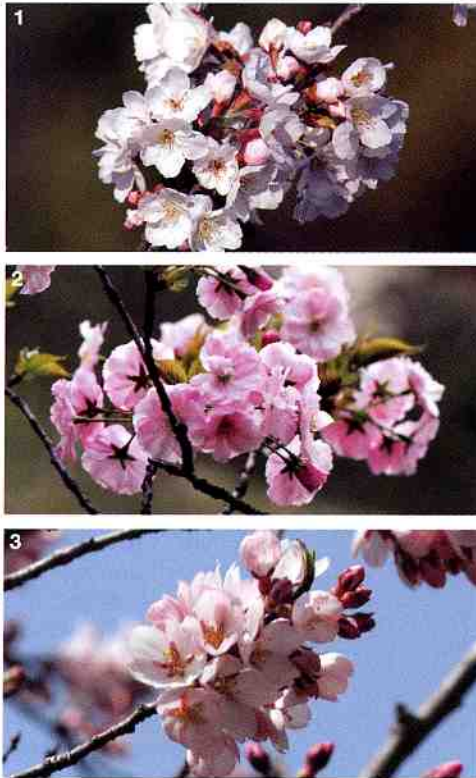
Figure 2 The Xiaoho Tombs in Xinjian-Uygur (Photo in April, 2005)



This place is now a complete dessert, but it seems to have been covered with grasses 3000 years ago.

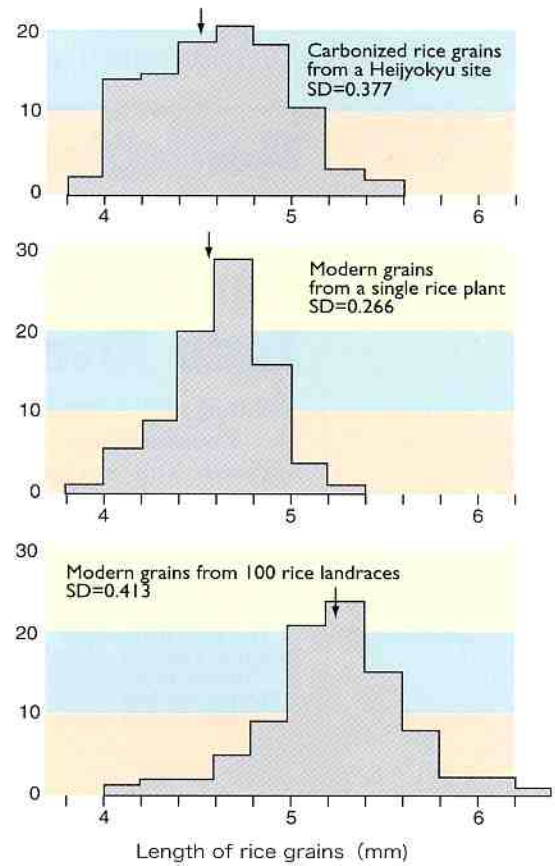
1-3: indicate diversity of cherry blossoms. 4: indicates genetic diversity of rice of a paddy in Laos. A lot of literature indicates that loss of genetic diversity caused famines, e.g., loss of crop diversity caused several famines in Tohoku Area in Edo periods.

Figure 4 Genetic Diversity*1



*1 Genetic Diversity : Diversity (variation) within a species (Fig.4). Agricultural activities in the past can be understood mainly from literature and genetic diversity can be ascertained from archaeological remains. Genetic diversity is often related to productivity and stability and would be a good indicator of the adaptation of human beings to unexpected disasters.

Figure 3 Variation of Rice Grains from a Heijiyokyu Site in Nara, Japan



This result indicates that rice grains from the Heijiyokyu site are as diverse as the 100 modern rice landraces.

able for every *sato*.

The areas to be studied

The project study area will cover Eurasia and its south-eastern neighbouring islands. The area is divided into three zones, *mugi*-zone, rice-zone and taro-zone. Here *mugi* means some annual cereal crops, such as wheat, barley and oats, which are found in drier areas. Watsuji considered "desert" as a *fudo*, but here it is included in the *mugi*-zone, based on its history. Rice-zone here almost matches Watsuji's monsoon zoon. The crops in taro-zone include tuber-plants as well as bananas, because they are perennial plants that usually grow side by side.

What the project studies?

In this project, observations on the history of agriculture will be made, by evaluating crop species as well as the evolutionary stages of each crop, mainly based on DNA analysis or morphological observations. Special attention will be paid to bio-diversity; for instance the kinds of crops (species diversity) and genetic differentiation of varieties (genetic diversity). The transition to the use of cattle will also be focused on. Transition of *sato* will be evaluated mainly by assessing the vegetation history over 10,000 years, based on the analyses of pollen grains and phytolith. In addition, archaeological analyses and, if available, citation of historical records will also be conducted.

Research Axis 3
Spatial Scale

Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed

Focusing on the importance of the characteristic spatial scales of a watershed, we develop and test a methodology for watershed diagnosis and consensus-building through interdisciplinary research. This methodology will help the residents and administration to conduct watershed management, and to elucidate possible future scenarios of the watershed. This is a challenge towards a synthetic understanding and resolution of global environmental problems.

Project Leader ■

YACHI, Shigeo RIHN

Core Members ■

TANAKA, Takuya RIHN

NAKANO, Takanori RIHN

TAYASU, Ichiro Center for Ecological Research, Kyoto University

WAKITA, Ken-ichi Faculty of Sociology, Ryukoku University

HARA, Yuuich Faculty of Bioenvironmental Science, Kyoto Gakuen University

Aim of the Project: Watershed Management Research to Contribute Towards Synthetic Global Environmental Studies

The land on the Earth contains watersheds that are diverse in climate, culture and history. Today, human activities relating to each watershed cause not only regional environmental problems but also global environmental problems through climatic, oceanic processes and global economy beyond watershed spatial scale

of each. Thus, revealing inherent environmental problems in each watershed and its management is an important basis to work on *global environmental issues in the sense of global scale*.

A watershed, however, is a spatially heterogeneous unit. It contains not only an incline structure of upstream and downstream but is also composed of a main river as well as various tributaries branching out like a tree. This hierarchical (or nested) structure of its river systems affects not only characteristics of ecosystems but also human activities, administrative districts and social decision making therein. Therefore, in the process of building consensus with regard to a watershed, it is important to pay careful attention to this fact, i.e., there can be much disagreement between scales regarding what the main issue is on watershed management.

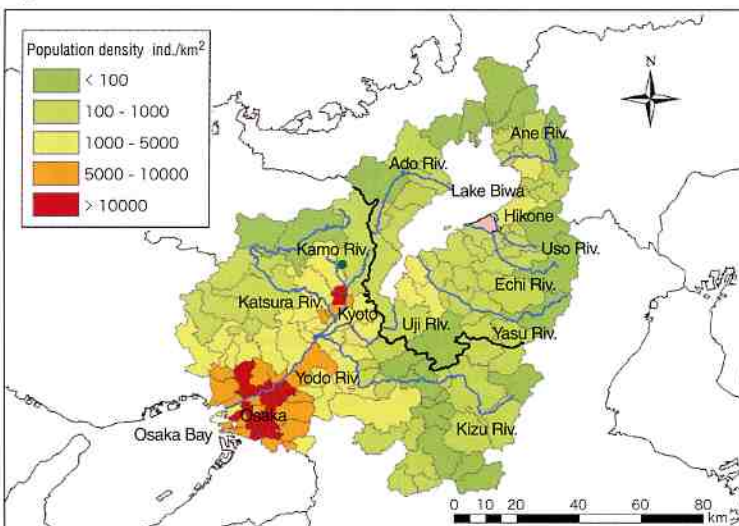
A watershed environmental issue is characterized by its own natural conditions and history, however, at the same time, it driven to emerge on the Earth independently through the

Figure 2 An Example of Turbid Water Flowing into the Lake Biwa



Agricultural drainage flows into the Lake Biwa (paddy field → drainage → river → Lake Biwa). The muddiness of lake water is remarkable at the estuary of rivers and the coast of Lake Biwa, especially, from the Eastern Area to the Northern Area of the watershed.

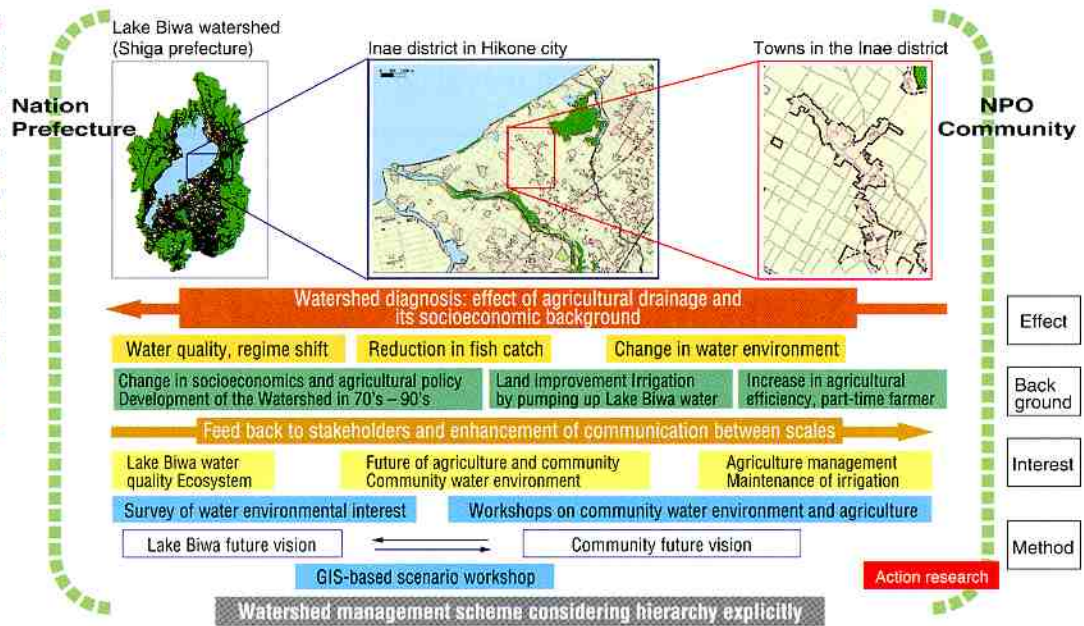
Figure 1 The Lake Biwa-Yodo River Watershed



The Lake Biwa-Yodo River watershed consists of two parts. (1) The *Lake Biwa watershed* (the upstream part) contains the Lake Biwa, the largest lake in Japan, the catchment area of which roughly coincides with Shiga prefecture and has a large farming area. (2) The *Yodo River watershed* (the downstream part to Osaka Bay) contains city areas like Kyoto and Osaka. Only the main stream of each river system is indicated. Our principal research field, Inae district ■ in Hikone city, lies in the Lake Biwa watershed, and RIHN ● in Kyoto in the Yodo River watershed. The population density is based on the data of the year 2003.

Figure 3 Future Perspective

We are presenting a proposal on for the Lake Biwa-Yodo River watershed management based on our watershed management scheme which contains watershed diagnosis indicators, methods for information feedback to stakeholders and enhancing communication between scales, such as environmental consciousness survey and GIS-based scenario survey and GIS-based scenario approaches. Active research to complements our project research is also being launched under the leadership of community residents. The implications of the project results are to be disseminated through an international workshop, presentations at communities and project reports.



common properties of watersheds such as in the hierarchical structure mentioned above. Thus, a watershed environmental issue, which seemingly has its limited effect as to spatial scale, is also a *global environmental issue in the sense that the mechanism of emerging is universally built into watersheds on the Earth.*

Based on this thought process, this project's aim is to seek an effective partnership of scientists, residents and administration through field work on a watershed environmental issue, aiming to develop a methodology for watershed diagnosis and consensus-building as a synthetic approach to global environmental problems.

Methods: Watershed Management Scheme Considering Hierarchy and Interdisciplinary Partnership

To overcome the difficulty arising from the watershed nested structure, we proposed a *watershed management scheme considering hierarchy explicitly*, as a model watershed management system. Based on this model, we are working on a water environmental issue in the *Lake Biwa-Yodo River watershed* (Fig. 1), one of the most intensively human-dominated watersheds in Japan.

In the Lake Biwa watershed, we are focusing our research on the relationship between agricultural drainage and the Lake Biwa as a representative case of trans-scale issue (Fig. 2). For this purpose, we conduct our research activities at three spatial scales related to water environmental management (Fig. 3). We are seeking for a way which enables both the conservation of regional environment and the reduction of environmental load to the Lake Biwa through an interdisciplinary partnership of four working groups; *material cycling, social & cultural system, ecosystem, and watershed information & modeling.* 1) We test the possibility of adaptive management by stakeholders with our aid of monitoring and developing diagnosis indicators

at each scale, and 2) develop a methodology for sharing what the main subject is on watershed management between scales.

In the Yodo River watershed, we aim to extract a critical structure of water environmental issues based on the research activities in the Lake Biwa watershed.

Primary Results

(1) A new watershed diagnosis method reveals the relationship between Lake Biwa and rivers

The results of newly developed watershed diagnosis methods including stable isotope ratios and rare elements, suggest that small rivers in the eastern area of the Lake Biwa watershed which has high farming activity, may have a large impact on the water quality of Lake Biwa. This result on the watershed scale is also supported by detailed water quality analysis before and after the peak of agricultural drainage flow. A mechanism of water quality formation created through human activity is now being revealed.

(2) A synthetic image of the agricultural drainage issues in the Lake Biwa watershed

Agricultural drainage flow combined with other kinds of human waste could cause a drastic change called *regime shift* in the Lake Biwa ecosystem. As background to the agricultural drainage issue, lies a the drastic change of Japan's agricultural policy and agricultural community structure, which has seen an increase in part-time farmers and a decrease in young farmers.

(3) The critical issue of water quality in the Yodo River watershed

In the Yodo-River watershed, which includes a large urban area, household waste affects the regional water environment and ecosystems at the estuary of the Yodo River and the Osaka Bay. It is revealed that water quality improvement policy which depends mainly on technological means, e.g., sewage plants has limitation in water quality improvement of the Osaka Bay.

Interactions between Natural Environment and Human Social Systems in Subtropical Islands

A variety of environmental problems have arisen on islands around the world, leading to the deterioration of precious natural environments and the disappearance of local cultures. In order to resolve environmental issues on islands, it is necessary to thoroughly understand the interaction between natural environments unique to islands and the human social systems that are found on islands. Using Iriomote Island in Okinawa Prefecture as a model, we hope to find information that will help resolve these issues. We aim to provide guidelines for building island human social systems that are sustainable in the future.

Project Leader ■

TAKASO, Tokushiro RIHN

Core Members ■

ARAMOTO, Mitsunori Tropical Biosphere Research Center, University of the Ryukyus
 INOKURA, Youji Faculty of Agriculture, Kagoshima University
 KUBOTA, Yasuhiro Faculty of Education, Kagoshima University
 MAEKADO, Akira Faculty of Law and Letters, University of the Ryukyus
 OSHIRO, Hajime Center for Asia-Pacific Island Studies, University of the Ryukyus
 SATOI, Yoichi Faculty of Education, University of the Ryukyus
 YOSHIMURA, Kazuhisa Graduate School of Science, Kyushu University

The purpose of the project

Islands throughout the world are faced with ongoing deterioration of their precious natural environments due to water shortages, industrial development and other factors. Along with this, local cultures are at risk of disappearing. To solve these problems, it is important to fully understand interaction between natural environments and human social systems on islands. The main subjects of this project are environmental issues related to the unique features of islands. Iriomote Island is an ideal model for studying island environment, as it is rich in natural resources such as water and forests, as well as traditional art and culture.

Research methods and areas

- 1) We will build a water balance model of Iriomote Island based on the estimated amount of precipitation, river flow, and evapotranspiration. The model will be used as a standard for future water usage. We will also assess the human impact on rivers.
- 2) We will clarify functions and maintenance mechanisms of evergreen and mangrove forests, while studying biodiversity and interaction among organisms. We will take a closer look at the dynamism of forests and assess the human impact on forests
- 3) We will look into the background of human activities causing deterioration of natural

Figure 1 Overview of the Project

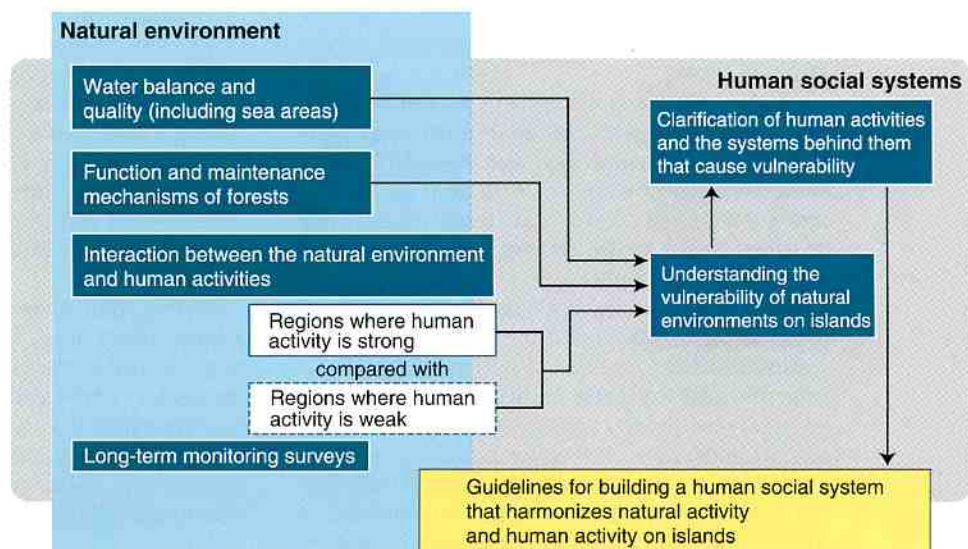


Photo 1 Schichi Festival (Sonai Area)



Photo: Fumio Sakuma, Nature Image Inc.

Iriomote Island, located in the southwest of the Ryukyu Islands, is a perfect place to study natural environments. It is typical of subtropical islands that have precious natural environments. The islanders have developed an original lifestyle, even though the island itself has been under the influence of neighboring districts.

Photo 3 Function and Maintenance Mechanism of Forests



Photo: Fumio Sakuma, Nature Image Inc.

Photo 2 Water Balance on Iriomote Island



Photo: Watanabe Suimon Kikaku

Photo 4 Industries as Bases of Life for the Islanders



Photo: Fumio Sakuma, Nature Image Inc.

environments, from the perspectives of industrial development, demographic structure and government policies. In particular, we will explore how the main industry of the island has changed from traditional agriculture to tourism.

- 4) Regarding the decision-making process in communities, we will study how local people should understand the impact of human activities on the natural environment and how local rules should be modified according to needed changes in the use of natural resources.

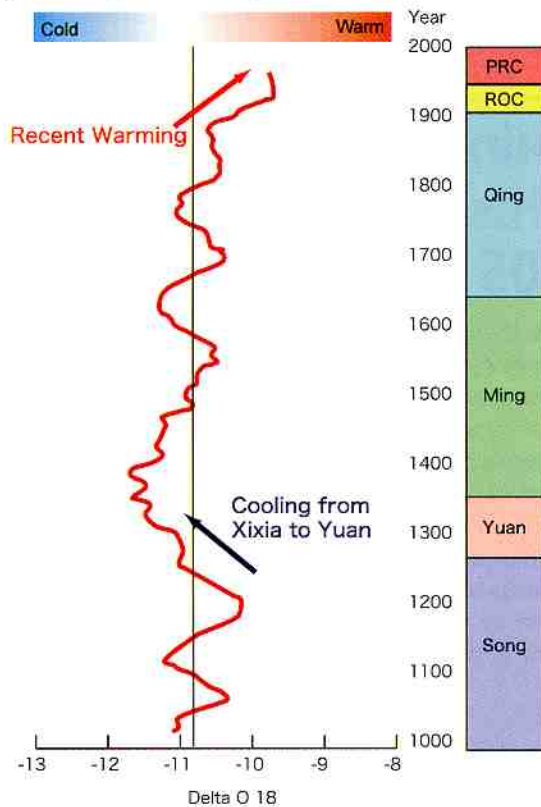
Progress status, achievements, and future challenges

- 1) To clarify the water balance on Iriomote Island, we have installed a monitoring device on the island. A database is being built to help us make more accurate predictions about the quantity and quality of water. Our observations have indicated that rain on the island is acidic throughout the year.
- 2) Our studies have shown that typhoons affect turnover in broadleaved evergreen forests. In forests including those of mangroves, we have been keeping track of production and circulation of substances, while monitoring the impact of human activities. We will provide information on effective maintenance and

management of forests in the near future.

- 3) We have gathered a variety of reference materials including demographic statistics, administration policies and information on local industries, and categorized them for further analysis. We will use these materials to develop measures to promote networking of small-scale industries from the viewpoint of island economics. In this process, we will focus on tourism, agriculture, health and education.
 - 4) We have been in close contact with the islanders by participating in various local events and educational programs designed for schools and communities. As a result, we learned that community centers on the island play a large role in the communities' decision-making processes.
- To solve environmental problems on Iriomote Island, local people need a solid economic infrastructure to build self-esteem and become independent. We will proceed with the project so that the findings can contribute to promoting local industries and growing new ones. We will take part in education at schools and in communities, and help locals promote the island's traditional culture and smooth handover of its performing arts.

Figure 2 Temperature Changes from Ice Cores Assessment



since the present population is about 1.8 million, almost equivalent with that of the past.

Khara Khoto, a buried city with sand

The Xixia Dynasty built the famous Khara Khoto City near the present Ejina Oasis, in the lower reaches of the river. As one of the major transportation hubs this city continued to enjoy prosperity throughout the Yuan Dynasty. When the Ming Dynasty took over the region, however, the city was abandoned, and gradually became buried by sand in the 15th Century. In the Qing Dynasty, people of a Mongolian tribe started living in the region, and they have stayed there through to the present day.

As Figure 1 shows, the Heihe River originated in the Qilian Mountains flowing through such oases as Zhangye, surrounding the Khara Khoto, and terminating at a big lake. Examining satellite pictures, we have confirmed that the river water surrounding the city was used for nearby irrigation. Age determination of excavated pieces of plant branches and wheat seeds found in irrigation canals and ancient farming fields confirmed that they were in use during the Xixia and Yuan Dynasties.

Near the end of the Yuan Dynasty, several historical documents suggest there was a gradual decrease in the river water. This is confirmed by the temperature reconstruction done using an ice core retrieved at a glacier in the Qilian Mountains. This shows that the temperature has decreased gradually (Fig. 2), leading to a growth of glaciers, and consequently caused a decrease in river flow. Also, a comparison of names of present irrigation canals with those on old maps revealed that the

development of farmland was accelerated in the Yuan dynasty with the construction of irrigation canals in the middle reaches.

It is considered, therefore, that the water shortage at that time was a product of both the decrease in river flow from the mountains and the increased water consumption in the middle reaches.

Recent water shortage and the measure

It was recently discovered that terminal lakes of the Heihe River have dried up. Also, the vegetation in the lower reaches is becoming poorer and poorer, and many shallow wells have dried up. Thus, the water shortage has become apparent, especially in the lower reaches.

Although the amount of river flow into the oases zone from the mountain zone has increased slightly, the outflow from the oases zone to the desert zone has decreased significantly in the same time period. This indicates that the water use in the middle reaches (oases zone) has risen very rapidly. The rapid increase has likely been caused by a sharp increase of farmland corresponding with a rapid increase of the population in the basin. In order to compensate for the shortage of river water, water use from wells has drastically increased in the last 20 years. The increase in groundwater consumption could also be attributed to the so called "Environmental Immigration", which means, in this case, the relocation of stock farming people from the piedmont area to the oases zone in order to prevent their animals from damaging the forests, and encouraging them to keep the animals in barns. This change in the style of animal keeping saw the necessity for growing feed, for which the groundwater consumption has increased. A similar situation is taking place in the lower reaches, where the stock farmers who keep their animals in Gobi-areas have started using groundwater quite intensively. It is deduced, therefore, that the water shortage is only being overcome through a heavy consumption of the groundwater, leading to an overall decrease in the amount of water storage in the basin.

The water issue

In the arid and semi-arid region in central Eurasia, it appears people produced successful crops near the shores of rivers and springs. Then they gradually introduced irrigation systems in order to cultivate more plentiful crops. They succeeded in cultivating an enormous area of farmland by extending their agriculture over a wide area. Eventually they had used so much water there was no water flow to the lower reaches. People who wanted to have more water started using groundwater, and as a consequence, shallow wells dried up with the lowering of groundwater. To find more water, they started using deep groundwater by digging deeper wells.

When there is a shortage of in situ water, water is brought from other sites. If there is still a shortage, people continue to look for other sites from where water can be brought. If there is still a shortage, what should humans do? Should this way of approaching the problem be allowed?

Research Axis 4
History and Time Scale

A Trans-Disciplinary Study on the Regional Eco-History in Tropical Monsoon Asia: 1945-2005

This research project aims to study the interaction between people who inhabit the tropical monsoon Asian region and their surrounding environment, from the eco-historical consequences that have occurred during the past several decades since WW II. This region is known for its typically seasonal monsoon climate and diverse ecological habitats in which a number of ethnic groups live, having unique historical and cultural traditions. Through the exposure to changes in political regimes and wars, and due to the impacts of modernization, economic globalization, and population growth that have swept through in the past 50-60 years, it has become a matter of significant concern as to how people have coped with these external impacts, and how they have survived the upheaval. To clarify these problems, we will focus on the subsistence complex, nutrition and health, and resource management in local communities as eco-sensitive aspects of human culture, and examine the integrated picture these factors form, of the regional eco-history.

Project Leader ■
Core Members ■

- AKIMICHI, Tomoya** RIHN
ABE, Kenichi Center for Integrated Area Studies, Kyoto University
IKEYA, Kazunobu National Museum of Ethnology, NIHU
KUBO, Masatoshi National Museum of Ethnology, NIHU
KONO, Yasuyuki Institute for Southeast Asian Studies, Kyoto University
CHRISTIAN, Daniels Institute for Asia and Africa Language Studies, Tokyo University of Foreign Studies
NAKAMURA, Satoshi National Institute for Medical Center
NONAKA, Kenichi RIHN
MOJI, Kazuhiko Institute for Tropical Medicine, Nagasaki University

Aim of the Research Project

This project aims to study the interactions between local populations and their surrounding environments, in the region of Yunnan of southwestern China, Thailand and Laos in monsoon Southeast Asia, focusing on the post-war period up until the present to form a regional eco-history. In this region, a large number of ethnic groups live in diverse ecological habitats such as wetlands, plains, valleys, and hillsides. Historical events that have occurred during the past 50-60 years, such as revolutions and reform

in political regimes, Indo-China War, Viet Nam War, and the infiltration of the market economy, have caused great upheaval to the region as a whole. Indeed, these external influences have overwhelmed not only people's subsistence and communal life, but also their health and nutrition. The main focus of our research is how people have continuously struggled, coped with, and adapted to the changing environmental, economic, and socio-political conditions.

Methodology and Study Areas

In this project, we address three eco-sensitive domains; e.g., subsistence complex, nutrition and health, and resource management. Methodologies we adhere to include Anthropology, Human Geography, History, Agro-forestry and Fisheries Sciences, DNA and stable isotope analyses, Botany, Information Sciences and Ecology.

To date, in order to demonstrate interactive consequences between the three analytical domains, the six research groups of the project have done intensive fieldworks, in collaboration. Study groups and their study areas are (1) Agro-Forestry Group (Northern Laos), (2) Plains Ecology Group (Central Laos), (3) Human Ecology Group (Central-South Laos), (4) Northern Thailand Groups (North Thailand), (5) China Group (Yunnan Province, Southwestern China), (6) Material Culture and Information Retrieval Group. The China Group is further divided into three; (5-1) History Group, (5-2) Forestry Group, and (5-3) Eco-History Group of Chinese scholars at Yunnan University.

The adult worms live in the biliary system and eggs pass out through faces. On reaching water the eggs are eaten by snails. The cercariae then leave snails, entering freshwater fish. Humans and animals get infected by eating raw fish (cited from Harinasuta C. and Harinasuta T. 1984)

Figure 1 Life Cycle of the *Opisthorchis Viverrini* (Thai liver fluke)

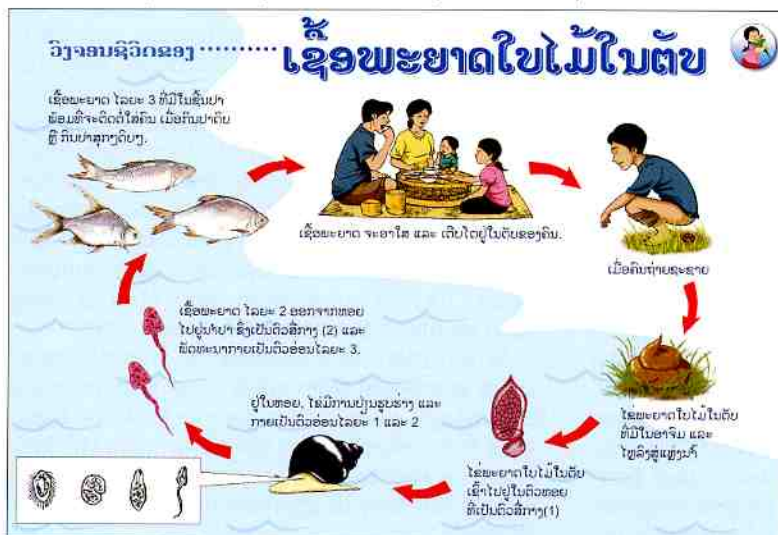


Figure 2 Bird's Eye View of the Study Village and Surroundings in the Vicinity of Vientiane, Laos

The exploitation of diverse microenvironments used as resources varies according to the season and type of resource. (based on the quick-bird photo, taken in Feb. 2006)

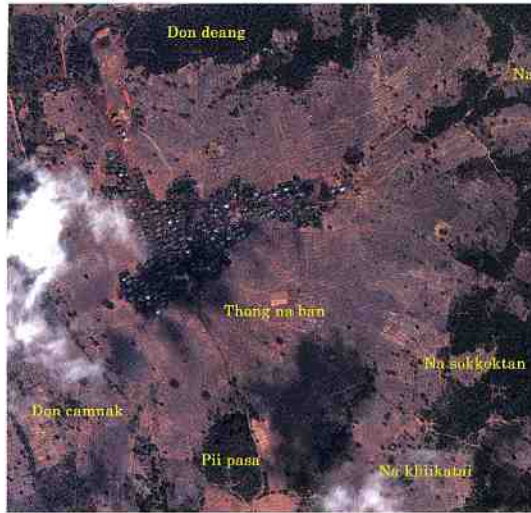


Figure 4 Stone Inscriptions in Villages of Ga niang District, Yuan Yang County, Yunnan Province, China



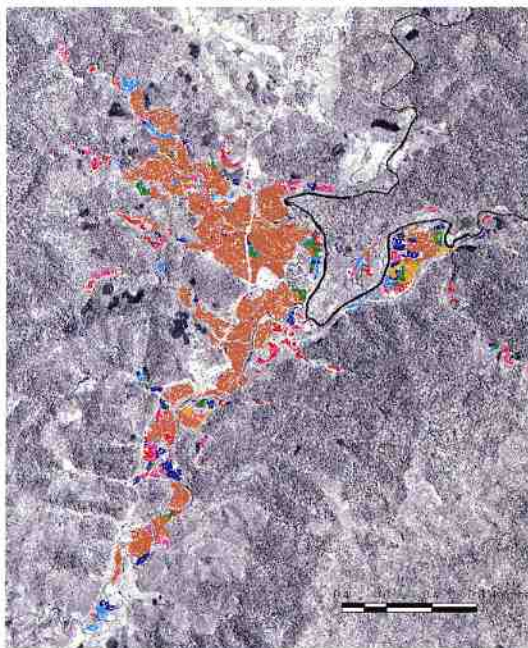
Both inscriptions, engraved about 150 years ago clearly show that local communities paid much attention to conflict resolution over land ownership and regulations for forest management.

Figure 3 Process of Paddy Field Reclamation—A Village Study in Northern Laos

Villagers have continuously made efforts to strengthen their basis for survival, through repeated external interventions including colonization, war, socialization and economic liberalization.

水田開墾年

- Before 1950
- 1950s
- 1960s
- 1970s
- 1980s
- 1990s
- 2000s



Present Status, Results and Future Prospect

We have successfully accumulated in-depth data from studies and appropriate guidelines towards reaching our goal. In central-southern Laos, a high frequency of water-borne infections (Figure 1) and diabetes have been detected in the rural population, the latter perhaps being due to rapid changes in diet and lifestyle. Among some minority groups such as the Akha, Hmong, Tai Lue, and Lao Lum, the transformation process and the degree of resilience in communities have been assessed in the realm of the subsistence system (Figure 2) as the deterioration of forest and the reduction of the fallow period due to rapidly changing external influences, since 2000 (Figure 3). In southern Laos in the fish conservation zone, a new project in harmony with community development has been proposed, since 2000. In northern Thailand, ethnic relations among the Mrabuli, Yao and Hmong, have significances in the analysis of

migration history, subsistence complex and patterns of the infiltration of a market economy. From studies made by thirty-two Chinese scholars during these past few years we can expect the first volume of "Ecohistory in Yunnan" soon. From the stone inscription analysis in various communities along the south of Yuangjiang river, it has been revealed that community-based conservation practices already existed as early as the early 19th century (Figure 4). In addition to this, we are also striving to establish eco-historical archives by combining (1) the compilation of an eco-chronicle, using historical County Gazettes in Yunnan Province and Laos, (2) composition of RCC (Rice Culture Complex) and FCC (Fishing Culture Complex) and their geographical and ecological distributions, (3) analyses of proxies in terms of eco-history, using examples such as bamboo, rubber, lac, opium, water buffalo, water weed, sugar cane and other NTFPs (non-timber forest products), and (4) analyses of research documents and records of Southeast Asia, accumulated by Japanese scholars during the post-war period.

In the last year, we have organized seven international workshops in Japan, China, and Laos, including, "History and the Environment" with the participation of Professor G. Condominas. From studies mentioned above, we hope to present an integrated view on the regional eco-history this year through symposia, publications and books.

Research Axis 5
Conceptual Framework
for Global
Environmental Issues

Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives

It is alleged that the 21st century is the "century of water." Wars over water may occur, like those fought over oil in the last century. The rapid increase in population and the coming global climate change could cause water scarcity. This project attempts to develop global perspectives of such water resource issues by integrating field observations, predicting natural water cycles and human's water usage in the future, and by establishing guidelines for sustainability development from the perspective of water resource issues.

Project Leader ■
Core Members ■

KANAE, Shinjiro	RIHN
ARAMAKI, Toshiya	Graduate School of Engineering, The University of Tokyo
ENDO, Takahiro	RIHN
HIRABAYASHI, Yukiko	Institute of Materials and Environmental Technology, Yamanashi University
HIRAKAWA, Yukiko	Graduate School of International Development and Cooperation, Hiroshima University
KAWASHIMA, Hiroyuki	Graduate School of Agricultural and Life Sciences, The University of Tokyo
KIM, Wonsik	National Institute for Agro-Environmental Science
KITSUREGAWA, Masaru	Institute of Industrial Science, The University of Tokyo
KURAJI, Koichiro	Graduate School of Agricultural and Life Sciences, The University of Tokyo
MATSUMOTO, Jun	Graduate School of Science, The University of Tokyo
Matsumoto, Mitsuo	Department of Economics and Social Sciences, Kochi University
OHTE, Nobuhito	Graduate School of Agriculture, Kyoto University
OKI, Taikan	Institute of Industrial Science, The University of Tokyo
SATOMURA, Takehiko	Graduate School of Science, Kyoto University
SHIBASAKI, Ryosuke	Center for Spatial Information Science, The University of Tokyo
SHIRAKAWA, Naoki	Institute of Engineering Mechanics and Systems, University of Tsukuba
YASUOKA, Yoshifumi	Institute of Industrial Science, The University of Tokyo

Background and Aims of This Research

The expected population increase, mainly in developing countries, will increase the demand for water, resulting in a more intensive use of global water resources. For Japan and European countries, water resources issues will also be serious; for example: decreased water resources due to global climatic change, inappropriate water management and deterioration in water quality.

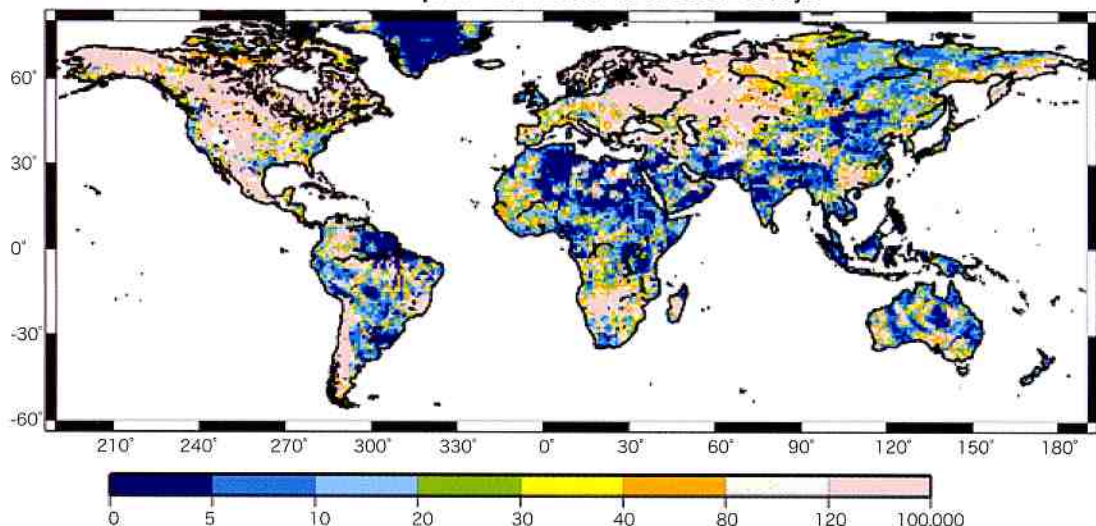
Therefore, water issues are currently considered to be of the most critical problems in the world.

Although much information about water issues is now available, it seems there is little academic resolution. It is also a problem that little information is disseminated by Asian countries including Japan; most information is actually disseminated by the U.S. and European countries.

This project aims at clarifying the true nature

Figure 1 Prediction of Return Periods of Severe Floods in the 21st Century

K1A1B prd3 2071-2100 1941-2000 100.xyz



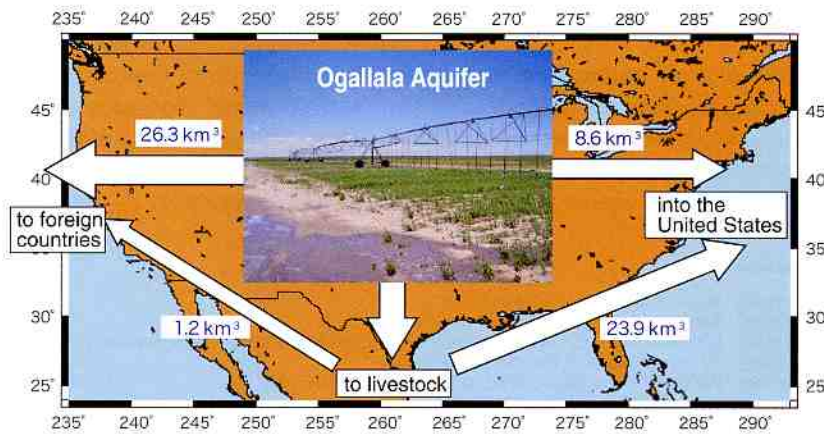
There is concern that severe floods and droughts may occur frequently due to "global warming". This figure shows the projection of return periods of severe floods, which occurs once a century at the present in this century. Both floods and drought are likely to occur frequently in South America, West Europe, South-east Asia and so on.

Figure 2 "Kousui-Bako"



In regions that suffered from water shortages, people developed unique techniques of peaceful allocation of water. Sanuki region in Japan can be cited as an example where there was a custom called "Senkou-Mizu." (Senkou is Japanese incense stick.) In this system water is allocated to each paddy field by the length of time it takes for one senkou stick to burn down. Moreover, people made a box called "Kousui-Bako" in which the senkou stick was put, so that no exterior influences like weather or people could change how long it took to burn down. The fact that such a box was even made indicates that there were severe water shortages in the region.

Figure 3 Virtual Water in the United States



Ogallala Aquifer, which is located throughout the center and western United States, is one of the great grain-producing areas in the world. Recently, there is concern that the groundwater of Ogallala Aquifer may dry up, and it is said that this will impact globally. In this project, the following is clarified, from the perspective of Virtual Water; the shortage of the groundwater in Ogallala Aquifer exerts influence to the United State rather than the rest of the world. Moreover, the lifetime of Ogallala Aquifer is estimated under various future scenarios of the world.

of world water issues, as mentioned above and presenting perspectives for water management in the future. We are not only planning the dissemination of information on water resource issues globally, but also to contribute domestically on the issue of water resources, for example advocating policy change and improving social awareness.

Primary Results

We can present a quantification of "virtual water" attendant to the international trade of food and agricultural products in these past several decades. Through our research we have deduced the following; the quantity of virtual water moving between nations has almost doubled in the past 30 years, and present day Japan depends on foreign countries, in virtual form, for as much water as we supply ourselves from domestic sources.

Water shortage is thought to be one of the key water problems in many countries. We are thinking of what measures need to be taken to tackle this problem. Especially, we are focusing on the water right market. This institution is sometimes called "water bank." Since it was first introduced in the United States, Chile and so on, it has been started in other countries. In this project, we are making a comparative study of national water law amendments used to create the water right market.

Furthermore, we have achieved study of calculating the quantities in world water cycle variations over all terrestrial area in the last one

hundred years. If compared with the figures from before the previous century, the results show that the trends in the most recent decades, which are said to be influenced by global warming, have not reached abnormal levels. Predictions of the variations to come in the next century are also depicted, as shown in Figure 1.

Spread of Our Results, and Future Problems

The results of the study on Virtual Water have been disseminated through various media; books (for example, "Water crisis of the earth" and "Water business" from Iwanami Shinsho), newspapers, TV programs and so on. Parts of the research were awarded a Prize from the Civil engineering society, and a prize for an excellent paper on water and engineering, respectively. A part of the results relating to water circulation and water resource assessment will be published in the IPCC forthcoming report (scheduled for publication in 2007).

As for the water right market, there are pros and cons to this system. We are trying to think not only about the effectiveness but also the limitations of the water right market, without being biased towards either side, in advance.

One of the remaining problems is ground water resource assessment. The quality of water on the global scale should also be studied. Moreover, an assessment of fragile regions to floods and droughts in the world, is an important topic in order to incorporate Asian water problems into the international political agenda.

Interactions between the Environmental Quality of a Watershed and the Environmental Consciousness: With Reference to Environmental Changes Caused by the Use of Land and Water Resource

People's value judgment system on the environment, or the environmental consciousness, is explored through theoretical analyses and empirical surveys in order to identify the environmental elements and the human-sociological factors that are affecting the formation of this consciousness. Environmental changes caused by a virtual impact to a watershed environment are predicted and proposed to people. People's judgments to such environmental changes are analyzed to elucidate the relationship between people's environmental consciousness and the environmental quality. We will develop the response-prediction models for a watershed environment and the methodology to clarify the changes in the people's value judgment on the environment.

Project Leader ■

YOSHIOKA, Takahito RIHN

Core Members ■

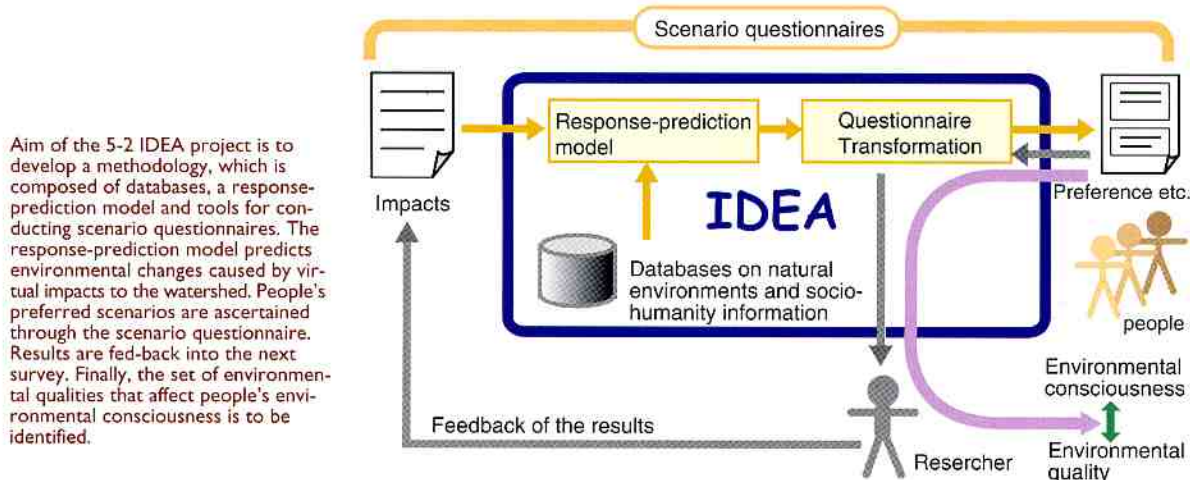
FUJIHIRA, Kazutoshi Institute of Environmentology
HINO, Shuji Faculty of Science, Yamagata University
KOBA, Keisuke Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology
KONOHIRA, Eiichi Graduate School of Environmental Studies
NAGATA, Motohiko Faculty of Humanities and Social Sciences, Mie University
NAKATA, Kisaburo School of Marine Science and Technology, Tokai University
OHTE, Nobuhito Graduate School of Agriculture, Kyoto University
SEKINO, Tatsuki RIHN
SHIBATA, Hideaki Field Science Center for Northern Biosphere, Hokkaido University
SUGIMAN, Toshio Graduate School of Human and Environmental Studies, Kyoto University
TAKAHARA, Hikaru Graduate School of Agriculture, Kyoto Prefecture University
TOKUCHI, Naoko Field Science Education and Research Center, Kyoto University
YASUE, Koh Faculty of Agriculture, Shinshu University
ZHENG, Yuejun RIHN

Aim of the project

How do we percept the environment? Human beings have enjoyed the benefits of nature, while people's perception of the environment affects their value judgments on the environment as a basis to determine their attitudes toward it. We define this value judgment system as the "environmental consciousness." What changes in environmental qualities affect the formation of the environmental consciousness? Quantitative

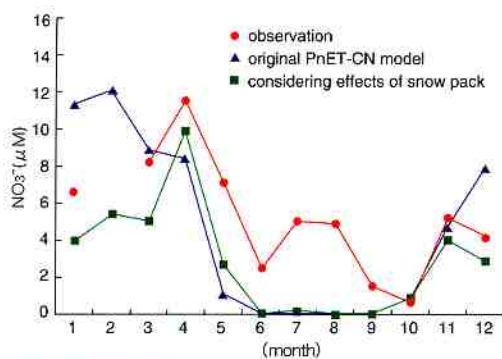
evaluations on the environmental changes are required for us to understand the present status of the environment and to predict its future. On the other hand, to clarify the relationship between the environmental quality and the environmental consciousness must be important for utilizing and conserving the natural environments. In the project, we will develop the response-prediction models for environmental changes and the methodology for presenting the

Figure 1 Framework of the Project



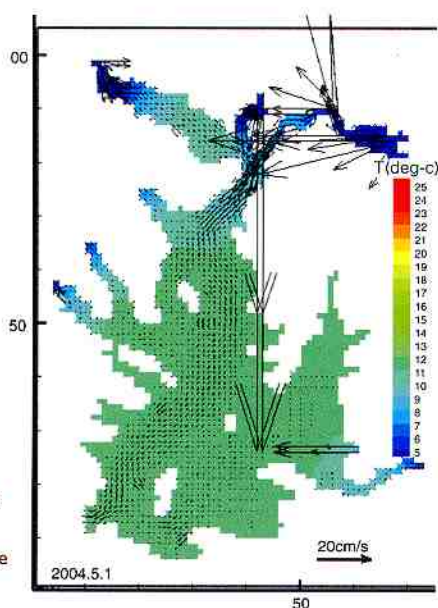
Aim of the 5-2 IDEA project is to develop a methodology, which is composed of databases, a response-prediction model and tools for conducting scenario questionnaires. The response-prediction model predicts environmental changes caused by virtual impacts to the watershed. People's preferred scenarios are ascertained through the scenario questionnaire. Results are fed-back into the next survey. Finally, the set of environmental qualities that affect people's environmental consciousness is to be identified.

Figure 2 Simulation of the Stream NO_3^- Concentration



Modification of the model by NO_3^- accumulation in and leaching from snow packs successfully reproduced the spring peak of NO_3^- , although the summer level of NO_3^- did not concord with observed levels.

Figure 4 Simulations of the Lake Water Flow and Water Temperature of Lake Shumarinai



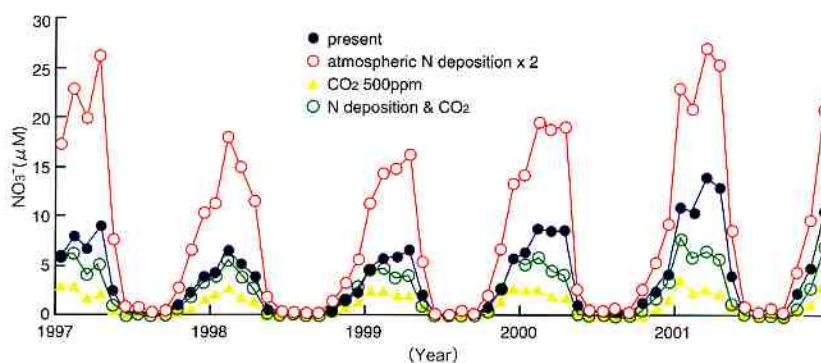
Arrows: lake water flow rate and direction, color: surface water temperature. This model can present temporal variations in water flow and temperature as an animation.

predicted environmental changes to people and for analyzing the people's value judgment on the environmental changes. Although the project is conducted mainly in the Lake Shumarinai watershed, Hokkaido, Japan, the methodology will be developed to be applicable to other environments.

Methods and research area

In this project, several environmental changes are virtually assumed. People's value judgments to those changes will be elucidated. The methodology requires several functions: (1) quantitative prediction of changes in environmental elements caused by virtual environmental modifications, such as logging, and dairy farming, (2) informing appropriately the environmental changes to people and (3) analysis of the relationship between changes in the people's value judgment and in the environmental elements. Interactive Device between Environments and Artifacts (IDEA) will be developed as a main tool that provides these functions (Fig. 1). The IDEA is composed of the response-prediction model for the environment and the tools preparing and analyzing the attitude surveys. The main research area is the Lake Shumarinai watershed

Figure 3 Effects of Environmental Changes on the Stream NO_3^- Concentration Simulated Using the Original PnET-CN Model



in northern Hokkaido, Japan. However, we are developing IDEA not only for this watershed environment, but also for other environments. Attitude surveys are conducted through interest questionnaires and scenario questionnaires.

Progress to date

The response-prediction model includes several sub-models for forest, river and lake environments. Observed dataset has been introduced into the PnET-CN model to simulate the stream NO_3^- concentration. When the accumulation and leaching of NO_3^- in the snow pack were considered in the simulation, the model successfully reproduced the observed seasonal variation found in the stream NO_3^- (Fig. 2). The results suggest that atmospheric N deposition largely affected the stream NO_3^- concentration (Fig. 3). The model also predicted the compensation effect between increases in the atmospheric N deposition (by 2 times) and CO_2 concentration (500ppm). Although precise tuning of the model would be needed, it was indicated that the PnET-CN model was applicable to the project. For the lake ecosystem, the lake water flow model has been developed. It can reproduce the flow rate and direction, as well as water temperature (Fig. 4). Biogeochemical material cycling model will be combined into the lake water flow model.

A survey through interest questionnaires was conducted in order to ascertain people's primary interest in the watershed environment. The results suggest that people evaluate environments similarly with respect to categories such as direct/indirect use values and environmental functions. Tabulations are shown on the project homepage.

Plan hereafter

Development of the response-prediction model has almost been done to schedule. Construction of IDEA has also proceeded on schedule. In the latter period of the research term, we will focus on scenario questionnaires. Relationships between people's environmental consciousness and environmental change will be analyzed using the responses to the questionnaires regarding the environmental change scenarios generated by the response-prediction model.

A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago

The Japanese Archipelago has been extremely densely populated since the Neolithic Age, and most of the natural environment has been strongly affected by human activities. However, in spite of the intensive intervention by humans in the natural environment, there is still a rich biota in the Japanese Archipelago, which includes, for example, an abundance of indigenous species of angiosperm and freshwater fish. But recently, many plants and animals are close to extinction because the human-nature relationships in this Archipelago have changed. This project aims to reconstruct human-nature relationships as historical processes to suggest concrete measures for preventing further extinction of species in the near future.

Project Leader ■
Core Members ■

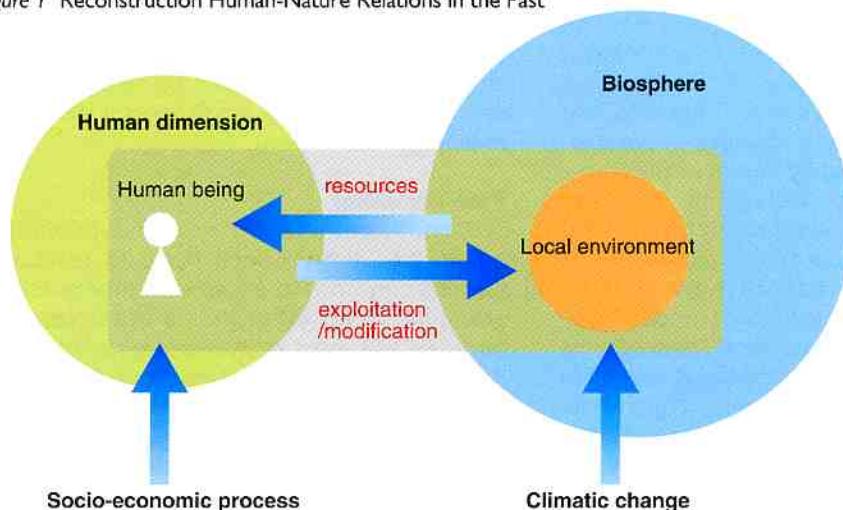
YUMOTO, Takakazu	RIHN
ABE, Hiroshi	Graduate School of Human and Environmental Studies, Kyoto University
ANKEI, Yuji	Faculty of International Studies, Yamaguchi Prefectural University
IINUMA, Kenji	Faculty of Humanities, Beppu University
IKEYA, Kazunobu	National Museum of Ethnology, NIHU
IMAHURA, Akio	Faculty of Bioenvironmental Science, Kyoto Gakuen University
KATAYAMA, Kazumichi	Graduate School of Science, Kyoto University
MATSUDA, Hiroyuki	Graduate School of Environment and Information Sciences, Yokohama National University
MURAKAMI, Noriaki	Faculty of Urban Liberal Arts, Tokyo Metropolitan University
NAKAI, Seiichi	Faculty of Humanities, Toyama University
NAKANO, Takanori	RIHN
OSUMI, Katsuhiro	Forestry and Forest Products Research Institute
SHIMIZU, Isamu	Center for Ecological Research, Kyoto University
SHIROUZU, Satoshi	The Law Faculty, Chuo-Gakuin University
TAJIMA, Yoshiya	Faculty of Economics, Kanagawa University
TAKAHARA, Hikaru	Faculty of Agriculture, Kyoto Prefectural University
TAYASU, Ichiro	Center for Ecological Research, Kyoto University
YAHARA, Tetsukazu	Graduate School of Sciences, Kyushu University
YAMAGUCHI, Hirofumi	Graduate School of Agriculture and Biological Sciences, Osaka Prefecture University

Objectives

The objective of the present project is to reconstruct human-nature relationships as historical processes. The following will be examined: firstly, how the natural environment has changed since the late Paleolithic Age when human beings are first known to have existed in the Japanese Archipelago, secondly, how the biota has changed

during that process, and thirdly, what kind of perceptions, knowledge and skills those humans possessed, concerning both nature in general, and specific life forms. Our aim is to present a foundation for contemplating how human-nature relationships should develop, and to suggest concrete measures for preventing further extinction of species in the near future.

Figure 1 Reconstruction Human-Nature Relations in the Past



Study Area and Methodology

The aim of the project is to elucidate the historical process of change in human-nature relationships due to global and/or local climate changes in these six regions: Hokkaido, Tohoku, Chubu, Kinki, Kyushu and Okinawa, using biological remains that contain pollen samples, archaeological remains, old documents and folkloric materials. In addition, we intend to examine the changes in the historic-economic background and the knowledge and skills concerning nature and living organisms, with special emphasis on their relation to the disappearance, or thriving, of organisms. The main approaches

are: 1) the analysis of ancient vegetation and changes in the distribution of plants and animals; 2) reconstruction of human ecology based on population estimates and diet; 3) reconstruction of human-nature relations in the past, and the analysis of the social systems behind them; and 4) theoretical modeling of human-nature relations.

Progresses Organizing working groups and targeting core sites in six districts

We have re-organized six district-based working groups targeting core sites (shown in parentheses), Hokkaido (Central and Eastern Hokkaido), Tohoku (Kitakami), Chubu (Akiyama-Tsumari), Kinki (Kyoto-Tanba), Kyushu (Kuju-Aso), Okinawa (Okinawa Island and Amami-oshima Island), each of which possesses distinctive climate, vegetation, flora and fauna, and traditional lifestyles of people (Table), and includes ca. 100 km X 100 km area of agricultural and forestry villages, and mountains. Also, we organized three method-based working groups analyzing paleo-ecosystem, plant-geography, and ancient human bones, respectively. We have not organized a working group on animal-geography because several such research pro-

jects are underway in the 21 Century COE program at Kyoto University, Ryukyu University and Hokkaido University; nor human population estimates, which have already been done in a project of the International Research Center for Japanese Studies. Each working group held several meetings to review the pre-existing information and to discuss the approaches, expected results and timeline of the project.

Publication and symposia

- 1) "Threats to World Heritage Sites by *Sika* Deer" (edited by T. Yumoto and H. Matsuda) Bun-ichi Sogo Shuppan, published in January 2006 (in Japanese).
- 2) "Bridging Time and Seas: Historical Landscape Change on Seashore of Northern Inland Sea" RIHN pre-symposium, held in October 2005, Kyoto (in English).
- 3) "Environmental History in the Kinki District from the Jomon to Yayoi Period: From Undated Information of Archeology and Historical Botany" Plenary Symposium of the Annual Meeting of the Japanese Association of Historical Botany, held in December 2005, Kyoto (in Japanese).

Table 1 Characteristics of the Core Site in Each District

District	Core site	Climate	Characteristics
Hokkaido	Central and Eastern	Boreal	Very little agricultural activity until recently Rapid changes occurred after Meiji Era
Tohoku	Kitakami-Shimokita	Cool temperate (less snow)	Frequent suffering due to severe famine caused by low temperatures in summer
Chubu	Akiyama-Tsumari	Cool temperate (heavy snow)	High level of adaptation to heavy snowfall, sometimes reaching to 4 m in depth
Kinki	Kyoto-Tanba	Cool -Warm temperate	Ancient capital and high rate of economic activity until the 19th century
Kyushu	Kuju-Aso	Warm temperate	High volcanic activity and wide range of grassland maintained by burning
Okinawa	Okinawa Island and Amami-oshima Island	Sub-tropical	Economy and culture supported by trade between the islands and China and Japan

Photo Even Primeval Forests are Suffering from Damages by Deer. (Yakushima Island)



Vulnerability and Resilience of Social-Ecological Systems

A vicious cycle of poverty and environmental degradation such as forest degradation and desertification is a major cause of global environmental problems. Especially in the semi-arid tropics (SAT), including Sub-Saharan Africa and South Asia where the majority of the poor concentrates, poverty and environmental degradation is widely prevails. People in this area largely depend on rainfed agricultural production systems and their livelihoods are vulnerable against environmental variability. Environmental resources such as vegetation and soil are also vulnerable against human activities. In order to solve these "global environmental issues", a key factor is the quick recovery from or resilience of human society and ecosystems against the impact of environmental variability. This project aims at identifying the factors affecting resilience and ways to enhance the resilience of rural people in developing countries against environmental variability.

Project Leader ■

UMETSU, Chieko RIHN

Core Members ■

PALANISAMI, K Centre for Agricultural and Rural Development Studies (CARDS), Tamil Nadu Agricultural University
SAKURAI, Takeshi Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries
SHIMADA, Shuhei Graduate School of Asian and African Area Studies, Kyoto University
SHINJO, Hitoshi Graduate School of Agriculture, Kyoto University
TANAKA, Ueru Graduate School of Global Environmental Studies, Kyoto University
YOSHIMURA, Mitsunori RIHN

In the past, no serious attention has been paid to the vulnerability and resilience of people whose livelihoods and production systems heavily depend on environmental resources, thus the projects for disaster relief and environmental conservation in drought-affected areas did not sufficiently take into account the resilience of local people. Especially for farmers and nomads in developing countries who rely on environmental resources, a loss of resilience of social-ecological systems due to an increase of population and the collapse of rural communities is of critical importance. This project tries to consider human activity against environmental change in view of social-ecological resilience and thus to clarify the effects of local environmental change on social-ecological systems as well as the mechanism through which they recover from a shock. Also from various case studies it tries to identify factors of households and communities that determine the capacity of resilience, and the role of institutions on resilience. By analyzing factors influencing social-ecological resilience, it is possible to introduce

policy interventions for enhancing human security in developing countries.

We develop a method for comprehensive assessment of resilience from four research themes. Theme I focus is on soil and forest resources to analyze ecological resilience. In theme II, we will conduct intensive interviews with farm households/communities and will identify the factors affecting social resilience. Theme III considers historical changes in land tenure system made by government policies and their effects on the natural environment as well as socio-political factors of increasing vulnerability and the process of collapse and recovery of resilience in different communities. Theme IV covers larger areas utilizing statistics, remote sensing data and aerial photographs to help trace long-term changes in soil and forestry resources in addition to the analysis of data on rainfall and temperature. By utilizing the information provided by themes I, II and III, we will develop a comprehensive method for assessing social-ecological resilience. The main area to be studied is the

There is a close relationship between ecological resilience and social resilience. The role of institution and technology for resource management is also important for strengthening resilience.

Figure 1 Close Relation of Social and Ecological Resilience



Figure 2 Zambia, the Main Field Site



Taken from URL <http://www.mapquest.com>

semi-arid tropics including Zambia and other areas in sub-Saharan Africa and South Asia where the resource base is critical for human livelihood. This project thus aims at identifying the ways to enhance the resilience of rural people against environmental variability by developing a method to assess resilience of social-ecological systems.

Environmental Change and the Indus Civilization

The Indus or Harappa is one of the four old world civilizations, which flourished in the semi-arid ecological zone on the Indian subcontinent. Unlike the Egyptian or Mesopotamian civilizations the urban phase of this mighty civilization was short i.e., about 700 years. Environmental change is held to be one of the major reasons for its decline, though this is neither fully understood nor unanimously accepted. The aim of our project is to understand the reasons why urban life and society ceased to exist. To do this we will study the processes of urban decay from an interdisciplinary approach. Especially, we will focus on the agriculture and trade network which sustained the urban development.

Project Leader ■

Core Members ■

OSADA, Toshiki RIHN

UNO, Takao

OTA, Shoji

GOTO, Toshifumi

SHOGAITO, Masahiro

MAEMOKU, Hideaki

KHARAKWAL, Jeewan Singh

SHINDE, Vasant

International Research Center for Japanese Studies
Faculty of Biotechnology, Fukui Prefectural University
Graduate School of Arts and Letters, Tohoku University
Faculty of Cultural Studies, Kyoto Sangyo University
Graduate School of Education, Hiroshima University
Rajasthan Vidyapeeth, India
Deccan College, Deemed University, India

Objectives

This project aims at investigating various causes of the decline of the Indus (Harappan) Civilization. Generally, studies of environmental problems involve research on aspects like climate, vegetation, water and/or air pollution and so on, and a large body of data is obtained by scientific analysis. However, our methodology will involve human sciences as well as scientific approaches.

The Indus or Harappan Civilization (2600-1900 BCE), which spread over one million square kilometers in the northwestern part of the Indian subcontinent, is known for its fortified settlements, long distance trade, beautifully painted ceramics, jewelry, unparalleled town planning and so on. Its authors were the first urban and literate people of South Asia. The Indus people were aware of the local natural resources, environment and climate. They developed advanced technology for their agriculture, trade, and manufacture of a variety of crafts, but

this urbanized life ceased around 1900 BC. Thus it is important to reconstruct various aspects of their urban lifestyle in order to understand the causes for the decline of the Indus civilization.

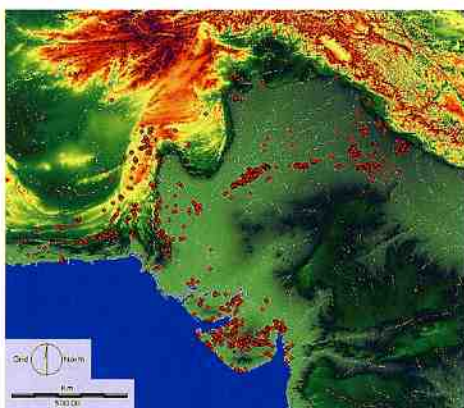
Methodology

The main aim of this research is two-fold-reconstruction of cultural processes and the transformation/ survival of the Indus legacy. The former is done by undertaking systematic survey and excavation of Indus sites. The latter is studied through anthropological field research and Indological text analysis. As the urban lifestyle was sustained by agriculture and trade with Mesopotamia, these factors can be understood using bio-archaeology, DNA analysis, Isotope analysis of trade materials like agate, carnelian, and so on. Agriculture depends on natural environment and therefore we need to reconstruct the palaeo- environment by coring ancient lakes and dating them by the carbon method.

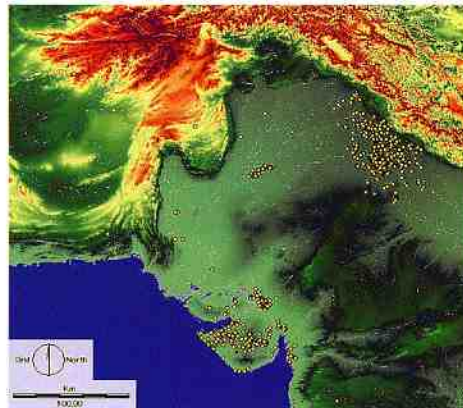
We have started excavating at Kanmer, Kachch, and Gujarat in India since January 2006. We found the Indus citadel and seal there. We expect to start similar excavation at two other sites, one in India and the other in Pakistan, also this year. We have made a Digital Elevation Map (DEM) of distribution of Indus sites, in 2005. In 2006 we will make a micro and detailed DEM for the Kanmer excavation site. This might enable us to visualize ancient structures at the site.

This clearly indicates that the sites shifted from the Indus River basin to Ganges and Gujarat areas.

Figure 1 A DEM Map of the Distribution of Indus Sites



1.a the Indus Urban Phase (BC 2500-1900) indicated by red dots



1.b the Post-Urban Phase (BC 1900-1000) indicated by yellow dots

Neolithisation and Modernisation: Landscape History on East Asian Inland Seas

The aim of this project is to reconstruct and understand historical landscape change to offer new insights into the concept of “cultural landscape”. Focussing on the rim of the East Asian Inland Seas (the Japan Sea and East China Sea), our research concentrates on two periods of revolutionary change in human-nature relations, Neolithisation and Modernisation. Approaching the issues from a human sciences perspective, the present project aspires to explicate the formative history of present-day landscape through a holistic analysis of the mutual relationship between humans and their natural environment.

Project Leader ■
Core Members ■

UCHIYAMA, Junzo	RIHN
BAUSCH, Ilona	RIHN
FUKASAWA, Yuriko	Graduate School of International Cultural Studies, Tohoku University
FUKASAWA, Hitoshi	Faculty of Urban Environmental Sciences, Tokyo Metropolitan University
HARUTA, Naoki	Faculty of Education, Kumamoto University
HOSOYA, Aoi	Institute of Prehistoric Archaeology, Waseda University
IIDA, Taku	College of Environmental Science and Engineering, Ocean University of China
IKEYA, Kazunobu	National Museum of Ethnology, NIHU
KANER, Simon	The Sainsbury Institute for the Study of Japanese Arts and Cultures, U.K.
LINDSTRÖM, Kati	RIHN
NAKAI, Seiichi	Faculty of Humanities, Toyama University
NAKAJIMA, Tsuneo	Lake Biwa Museum
NISHITANI, Masaru	National Museum of Japanese History, NIHU
YASUMURO, Satoru	National Museum of Japanese History, NIHU

Background

Recent years have seen the concept of “cultural landscape” become increasingly important in landscape protection policies, not only in Japan but also on an international scale. Accordingly, it has become especially important to understand the cultural processes and mechanisms of landscape formation, change and evaluation.

Landscape

Landscape is a holistic phenomenon, combining the elements of the natural environment with human actions and traces of cultural processes. As such, landscape allows us to interpret not only the biological or physical processes that lie behind modern environmental problems, but also the

mental and cultural processes that lie behind humans’ destructive behaviour towards their natural environment.

Inland seas

Throughout history, the inland sea regions have been densely populated and have acted as centres of extensive trading networks. Located on the borders of diverse cultural and natural environments, the inland sea regions can be considered a cultural system that has managed to maintain both intense cultural and economic contact and remarkable cultural diversity. The research results of the NEOMAP project will be compared to those from North European Inland Seas (the Baltic Sea and the North Sea).

Neolithisation and Modernisation

Present-day landscape elements can be traced back to different historical layers. The NEOMAP project defines *Neolithisation and Modernisation* as two key layers in historical landscape change. Neolithisation refers to a period of emerging permanent settlements and agriculture, the expansion of trading networks, and the birth of many novel technologies. Similarly, Modernisation is a time of urbanisation and industrialisation, the globalisation of trading activities and the invention of new revolutionary technologies. Showing considerable similarities in overall tendencies, these two periods have been crucial to the formation of present-day landscapes.

Figure 1 The East Asian Inland Seas and the NEOMAP Research Areas (red circles).

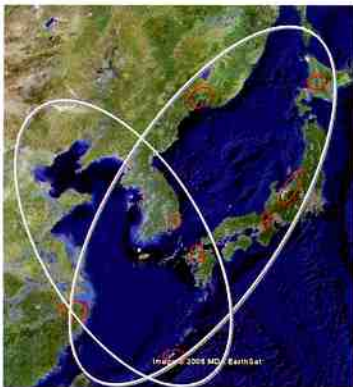


Photo 1 Lake Biwa



Landscape has been formed by the daily activities of its occupants.

Photos 2 and 3



Once a certain landscape has been idealised, it becomes an object of the tourism industry (left: Miyamacho, Kyoto Prefecture), and starts to be reproduced and remodelled throughout the country (right: Happy Terrace on the roof of the Kyoto Station Building)

Historical Interactions between Hybrid Society of Ethnic Groups and the Natural Environment in a Semi-arid Region, Central Eurasia

The project highlights man-made trans-boundary problems between countries or ethnic groups, religions, agriculture and nomadism, or between cities and the surrounding areas. People in the semi-arid region of Central Eurasia, once lived a nomadic lifestyle. After the long transition of the rise and fall of various ethnic groups and countries, a tight and well-defined border divided the region between Russia and Qing. Both sides of the border used to be the same but have developed differently. This project aims to study and clarify the historical interaction of human activities and natural systems in the semi-arid region of Central Eurasia, focusing on trans-boundary problems. This project should provide important keys for proposing fundamental perspectives to examine a desirable mode of living in multicultural regions.

Project Leader ■

KUBOTA, Jumpei RIHN

Core Members ■

UYAMA, Tomohiko Slavic Research Center, Hokkaido University
 MATSUYAMA, Hiroshi Fac. of Urban Environmental Sciences, Tokyo Metropolitan University
 TAKEUCHI, Nozomu Graduate School of Science and Technology, Chiba University
 FUJITA, Koji Graduate School of Environmental Studies, Nagoya University
 SUGIYAMA, Masaaki Graduate School of Letters, Kyoto University
 FUNAKAWA, Shinya Graduate school of Agriculture, Kyoto University
 SOHMA, Hidehiro Fac. of Letters, Nara Women's University
 KONAGAYA Yuki, National Museum of Ethnology
 YOSHIKAWA, Ken Graduate School of Environmental Science, Okayama University
 YOSHIDA, Setsuko Department of Applied Sociology, Shikoku Gakuin University
 NAKAWO, Masayoshi RIHN
 KATO, Yuzo RIHN

Background and objectives

With the exception of those people who lived in oasis areas, people in the semi-arid region, which spreads widely over Central Eurasia, once lived a predominately nomadic lifestyle. After the long transition of the rise and fall of various ethnic groups and countries, a tight and well-defined border divided the region between Russia and Qing in 18th century. At the same time, the people in this area experienced great change in lifestyle, caused by the migration of farmers, the settlement of nomad activities and agricultural development. Finally, with the weakening of the Soviet Union, the Russian side was divided into many republics. Behind the various environment problems in this world, man-made trans-boundary problems, between countries or ethnic groups, religions, agriculture and nomadism, or between cities and the surrounding areas, could have existed. This project aims to study and clarify the historical interaction of human activities and natural

systems in the semi-arid region of Central Eurasia, focusing on trans-boundary problems.

Content and methods

The area of study is the Ili River watershed which flows from China to Kazakhstan, terminating at Balkhash Lake as well as the surrounding areas, including Kyrgyzstan and Uzbekistan. This region is recognized geographically and historically as a key region for East-West interaction. Also, the region includes areas with environmental problems at present due to modern development under socialism. In keeping with our understanding of the present status, the project will attempt to clarify historical changes, the rise and fall of nomadic groups and countries, their removal, changes in subsistence, the use of natural resources and climate change through the analysis of historical documents and archeological investigations as well as various natural proxies such as ice cores, lake sediment samples, tree rings and brown deposit.

Expected results

This project should provide important keys not only for evaluating the effects of projected human activities on fragile ecosystems in semi-arid regions, but also for proposing fundamental perspectives to examine a desirable mode of living in multicultural regions.

Photo 1 The Border Area between China (left) and Kazakhstan (right)



Photo 2 A Preliminary Field Study in the Grigorieva Glacier, Kyrgyzstan



Effects of Environmental Change on Interactions between Pathogens and Humans

The rapid spread of emerging infectious diseases is threatening human lives. Our project team aims to reveal the relationships between environmental alterations due to human activities, outbreaks of pathogens, and changes in human life. We will suggest ways to prevent the outbreak and spread of infectious diseases and explain how to facilitate the safe coexistence of humans and pathogens.

Project Leader ■

Core Members ■

KAWABATA, Zen'ichiro	RIHN
ASANO, Kota	Graduate School of Human and Environmental Studies, Kyoto University
ITAYAMA Tomoaki	National Institute for Environmental Studies
KAKEHASHI, Masayuki	Graduate School of Health Sciences, Hiroshima University
KOHMATSU, Yukihiro	RIHN
KONG, H. N.	Shanghai Jiao Tong University, China P.R.
MATSUI, Kazuaki	RIHN
MATSUOKA, Masatomi	Asahi fisheries cooperative
NASU, Masao	School and Graduate School of Pharmaceutical Sciences, Osaka University
OHMORI, Koji	Center for Marine Environmental Studies, Ehime University
OKUDA, Noboru	Center for Ecological Research, Kyoto University

The spread of emerging infectious diseases is a serious environmental problem, one that humans are now confronting. We hypothesize that environmental changes induced by humans mediate the spread of diseases. Therefore, it is important not only to conduct pathological studies but also to understand the interactions between humans and the environment that generate infectious diseases.

The objective of this study is to clarify the relationships between environmental changes caused by human activities, pathogens that emerge as a result of these changes, and the effects of diseases caused by those pathogens on human life.

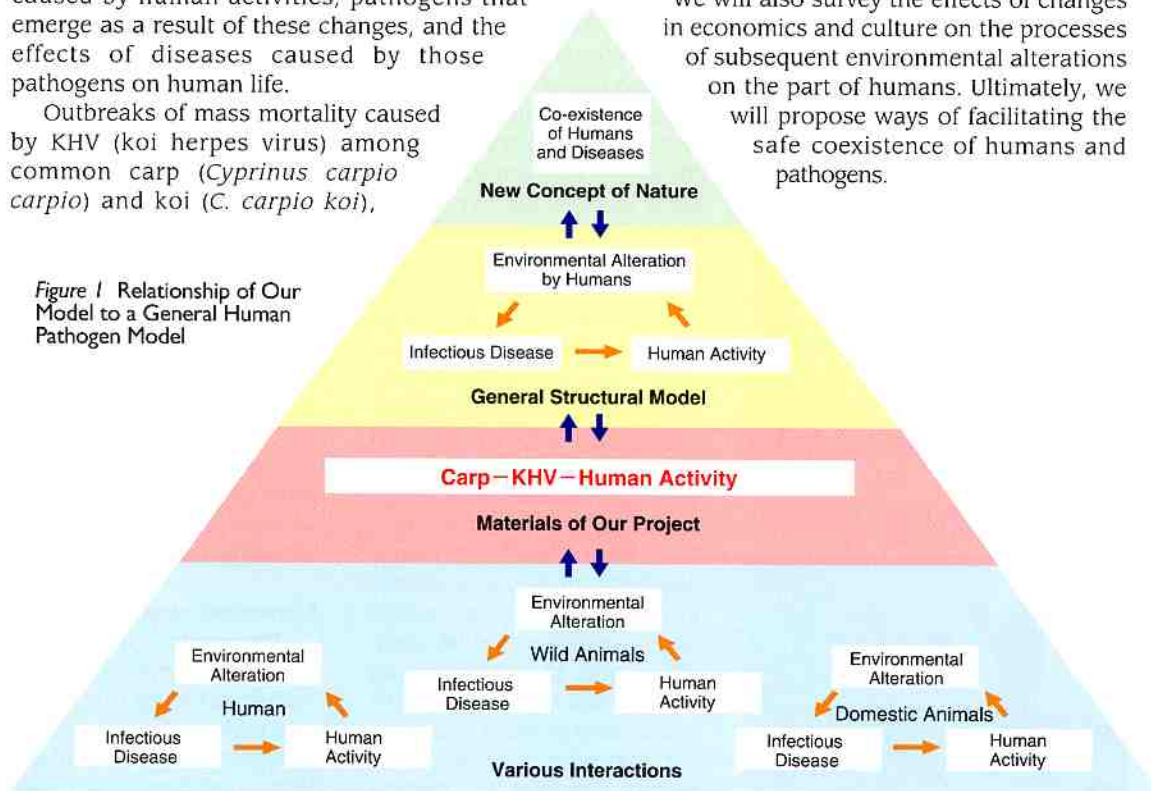
Outbreaks of mass mortality caused by KHV (koi herpes virus) among common carp (*Cyprinus carpio carpio*) and koi (*C. carpio koi*),

which have long been part of human culture, have occurred worldwide since 1998, and have resulted in enormous economic losses. We have focused on the carp-KHV-human system as a model of interactions between pathogens and humans, because this system allows us to conduct experiments to verify the model.

We intend to construct general mathematical disease models to visualize potential disease risks, as well as prediction models for preventing outbreaks and epidemics of infectious diseases.

We will also survey the effects of changes in economics and culture on the processes of subsequent environmental alterations on the part of humans. Ultimately, we will propose ways of facilitating the safe coexistence of humans and pathogens.

Figure 1 Relationship of Our Model to a General Human Pathogen Model



Research Axis 2
Human Activity
Impact Assessment

High-Precision Diagnosis and Assessment of Environmental Quality in Japan

Humans have succeeded in creating an advanced modern society by utilizing various subterranean resources but also thereby generating serious global environmental problems. Japan, which has already experienced environmental changes in its atmosphere, land surface and surrounding oceans, is no exception and there is no telling what new problems may arise. There have also been drastic, complex changes in the quality of air over China and Korea in the wake of significant economic development there, and the assessment of its effects on Japan and other downwind areas is of great interest. Even within Japan qualitative changes are becoming clear, not only in air, water, and natural life forms but also below ground, due to mass consumption of commercial goods, food and other commodities. As water is vital for maintaining life and the overall global environment, it is critical to understand the contributing factors that define water quality and changes to it.

Project Leader ■

Core Members ■

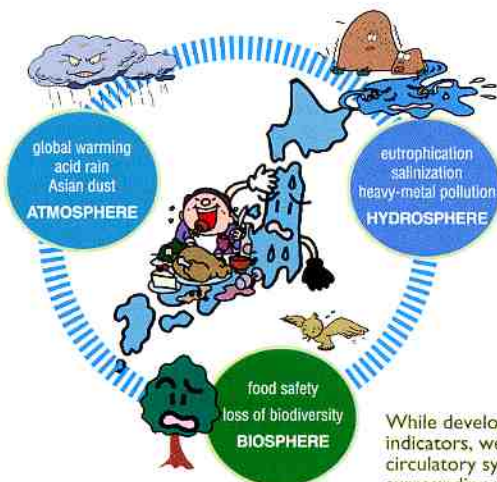
NAKANO, Takanori RIHN

KANEKO Nobuhiro Graduate School of Environment and Information Sciences, Yokohama National University
KAWANO, Yoshinobu Faculty of Culture and Education, Saga University
KAWAHATA, Hodaka Ocean Research Institute, The University of Tokyo
YURIMOTO, Hisayoshi Division of Earth & Sciences, Graduate School of Science, Hokkaido University
SHIKAZANO Naotatsu Faculty of Science and Technology, Keio University
TANAKA, Tsuyoshi Graduate School of Environmental Studies, Nagoya University
TAYASU, Ichiro Center for Ecological Research, Kyoto University
FUKUSHIMA, Takehiko Graduate School of Life and Environmental Sciences, University of Tsukuba
MATSUDA Kazuhide Faculty of Physical Sciences and Engineering, Meisei University
YANAGISAWA, Fumitaka Department of Earth and Environmental Sciences, Faculty of Science, Yamagata University
YAMASHITA, Katsuyuki Institute for Study of the Earth's Interior, Okayama University

One of the reasons why global environmental issues are difficult to grasp is that the effects of human activities present themselves in various forms in the most unexpected areas, so that measures must be taken whilst lacking a clear cause-and-effect logic. The quality of the natural environment (air, water and biological qualities and geological conditions) differs greatly according to region, so the scope and degree of change in environmental quality due to human activities also have regional characteristics. In order to accurately diagnose the quality of the entire environment and prescribe countermeasures suited to each region, a comprehensive comparison of these regions should be conducted employing common indices. Moreover, the relationship between different environmental characteristics must be assessed with high precision, and a common understanding is required for the

contribution of human activities to make changes in the quality of the environmental.

With this background in mind, our current project aims to shed light on the current state of various substances commonly found in water, as well as in air, life forms, and rocks throughout Japan. At the same time, we will use all available traceability methods to identify stable isotopes in order to pursue the sources of any substance that is instrumental in environmental issues such as acid rain, yellow sand, heavy-metal contamination, eutrophication, water salination, and food safety. By doing so, the condition of the circulation of water and gases within the overall global environment (including the atmosphere, hydrosphere, biosphere, and the geosphere) can be diagnosed with high precision from the standpoint of utilizing exhaustible resources, and assessments can be made on the safety of the overall environmental quality. This project shall be promoted through close cooperation with environmental education classes at universities throughout the country, and the results will be used to propose environmental indicators suited for each region, thereby sharing our accomplishments with society.



While developing and using various environmental indicators, we will diagnose disorders of materials circulatory systems that are emerging in Japan and surrounding regions as a result of resource binging.

Relationships between Human Activities and Atmospheric Changes, Possibilities of Harmonious Society for Environmental Issues in the East Asia

Amid atmospheric deterioration with rapid economic growth in East Asia, a new environmental cooperation system that emphasizes not political or economic but environmental and cultural contexts, is becoming more and more significant. The aim of this project is to explore the theory of fostering a harmonious society for cross-national environmental issues synthetically based on results derived from the analysis of the relationship between human activities and emissions of man-made substances, quantitative evaluation of social perception of environmental issues, and identification of social capacity for environmental management.

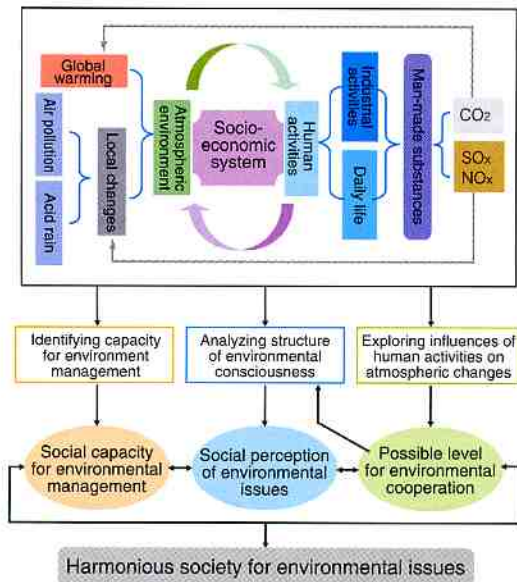
Project Leader ■
Core Members ■

ZHENG, Yuejun	RIHN
AMANO, Masahiro	School of Human Science, Waseda University
KOJIMA, Hiroshi	National Institute of Population and Social Security Research
TSUYUKI, Satoshi	Graduate School of Agriculture and Life Sciences, The University of Tokyo
HAYASAKA, Tadahiro	RIHN
MURAKAMI, Masakatsu	Faculty of Information Science, Doshisha University
YAMAOKA, Kazue	National Institute of Public Health
YOSHINO, Ryoza	Institute of Statistical Mathematics

Objectives

A new framework for an international environmental community to improve the quality of the atmosphere is indispensable to overcome the limitations of the current environmental cooperation system that is driven by political and economic profits. The aim of this project is to analyze how various human activities effect emissions of man-made substances such as CO_2 , NO_x and SO_x . We are also trying to probe the possibilities of a harmonious society for environmental issues (HOSEI) defined by diversities of environments and cultures, as well as the foundations of environmental harmony study (See Figure).

Figure Conceptual Flowchart of Research Project



Methodology

China, Japan and South Korea have been selected as the research areas and this project will proceed through three main approaches as stated below:

1) One is to analyze the influences of human activities including energy consumption and land use etc on emissions of CO_2 , NO_x and SO_x , and to predict the possible level for environmental cooperation (PLEC) for each country by means of investigating the emission inventories on both national and regional scales.

2) The second is a quantitative evaluation of social perception of environmental issues (SPEI), which will be accomplished by extracting the essence of environmental consciousness of citizens, firms and governments, and thereby developing multidimensional indicators.

3) Finally, the framework of a harmonious society for environmental issues could be explored on the basis of three essential factors, which are: the possible level for environmental cooperation, the social perception of environmental issues, and the social capacity for environmental management (SCEM).

Expected Outcome

This project will contribute to developing methodologies and essential models for analyzing the influences of human activities on emissions of man-made substances within the structural consistency between a country and its regions. Furthermore, it is expected that this project will provide necessary information concerning the social roots of environmental problems to aid decision-making.

Research Axis 2
Human Activity
Impact Assessment

Environmental Changes and Vector-borne Diseases in Tropical Asia and Oceania

This project studies the effects of human societal and environmental changes on the ecology and the epidemiology of vector-borne diseases such as malaria and dengue fever in tropical Asia and Oceania. Urbanization, deforestation, the spread of wet rice cultivation, economic development, changes in lifestyle, and population migration are factors changing the ecological relationship between humans, pathogens and vectors.

Project Leader ■

Moji, Kazuhiko Nagasaki University Institute of Tropical Medicine

Core Members ■

MOMOKI, Akiko RIHN

KANEDA, Eiko Nagasaki University Institute of Tropical Medicine

YAMAMOTO, Taro Ministry of Foreign Affairs

TAKAGI, Masahiro Nagasaki University Institute of Tropical Medicine

SUNAHARA, Toshihiko Nagasaki University Institute of Tropical Medicine

NAKAZAWA, Shusuke Nagasaki University Institute of Tropical Medicine

KANBARA, Hiroji Nagasaki University Institute of Tropical Medicine

IWASAKI, Takuya Nagasaki University Institute of Tropical Medicine

The aim of this project is to find out the relation between occurrence of vector-borne diseases and the rapidly changing environment in tropical Asia and Oceania. To be studied are: the effect of deforestation, the spread of wet-rice fields, urbanization, increase in and movement of population, and modernization of people's life on ecology and epidemiology of malaria, dengue fever, and other vector-borne diseases. The aim of the study is to offer new insights for evaluating local and global environmental changes from the viewpoint of disease ecology.

Incidence of vector-borne diseases is related to the ecology of pathogens, vectors, and humans (and of non-human reservoirs in some diseases). These ecological settings have been

changing very quickly in tropical Asia and Oceania because of man-made environmental changes. How the environmental changes have an affect on the rise and drop of the diseases is of interest. The project will clarify the impact of changes societies and the environment on vector-borne diseases, through the following five approaches:

- 1) Collecting and analyzing existing regional information on vector-borne diseases and environmental changes in Southeast Asia and Oceania.
- 2) Field studies and observation in Lao, Vietnam, East Indonesia, and Bangladesh.
- 3) Historical studies of regional development and vector-borne diseases.
- 4) Theoretical epidemiological studies using mathematical models.
- 5) Integration of studies on global environmental changes and vector-borne diseases.

International collaborations and networking are of great importance for this kind of study. The project would involve international researchers in the full-research stage.

Photo 1 Collecting Mosquito Larvae in Vietnam



Photo 2 Checking a Blood Sample for Malaria in an Ethnic Minority Community in South Vietnam



Evaluation for *on-farm* Conservation of Traditional Farming Systems and Lifestyles

After the Second World War, using chemical fertilizer and agricultural chemicals and high yield varieties increased the yield of cereals such as rice and wheat. The dramatic increase of cereal's yield is termed the "Green Revolution", despite the fact that the "Green Revolution" caused serious global environmental problems such as ground pollution, air pollution, eutrophied lakes and rivers, and shortages in irrigation water.

Project Leader ■

SATO, Tadashi Tohoku University

Core Members ■

SATO, Yo-Ichiro RIHN

ISHII, Takashige Faculty of Agriculture, Kobe University

SASANUMA, Tsuneo Yokohama City University

SUZUKI, Iwayumi Graduate school of Letters, Tohoku University

SAROM, Men Cambodia Agricultural Research and Development Institute, Cambodia

CHANPHENGXAY, Monthathip National Agriculture and Forestry Research Institute, Lao P.D.R

On-farm conservation of traditional farming-systems involves the conservation of local crop cultivars and the lifestyles of farmers in agro-ecosystems. This project will assess the biological diversity and productivity of local crop cultivars in traditional farming systems (Photo 1 and 2). An agronomist, biologist, sociologist and economist will take part in this assessment. This project deals with sustainable farming-systems and sustainable lifestyles, which are chosen to secure a certain degree of productivity. We are proceeding with the exchange of Memorandum of Agreement (MOA) on the cooperative research concerning *on-farm* conservation of rice and wheat in Southeast Asia and Southwest Asia, respectively.

The expected results of this project are 1) to contribute to the establishment of an *on-farm* conservation system, 2) to understand the contribution of biological and genetic diversity to the sustainable farming systems and sustainable lifestyles.



Photo 1 Mono-cultivar of Rice Cultivated in the Field of Advanced Agriculture



Photo 2-A and -B High Genetic Diversity of Rice Cultivated in the Field of Traditional Agriculture. A: Slash and Burn Field in Northern Laos, B: Lowland Field in Kaladan Delta, Myanmar

Better understanding of Plant Distribution and Carbon Circulation Change by Human Activities in Asia

In recent years Asia countries have continued to experience high economic growth. Therefore, Asia will play a more important role in the world in the future. Asia has 60% of the world's population. Asia will exert a great influence to the global environment and economy.

Project Leader ■

HONDA, Yoshiaki Center for Environmental Remote Sensing in Chiba University,

Core Members ■

HAYASAKA, Tadahiro RIHN
AOKI, Shuji Graduate School of Science, Tohoku University
Ito, Akihiko Frontier Research Center for Global Change
KATO, Takashi Faculty of Letters, Chiba University
OJIMA, Dennis Colorado State University, U.S.A.

Objectives

In this study, the distribution and production of plants and the origin and source of carbon dioxide density will be assessed through satellite observation and ground measurement. How this information relates to human activities will be demonstrated. It is the purpose of this project to evaluate the influence that human activities have on carbon circulation through this knowledge. It is hoped that these results can be used for mitigation policy for global warming.

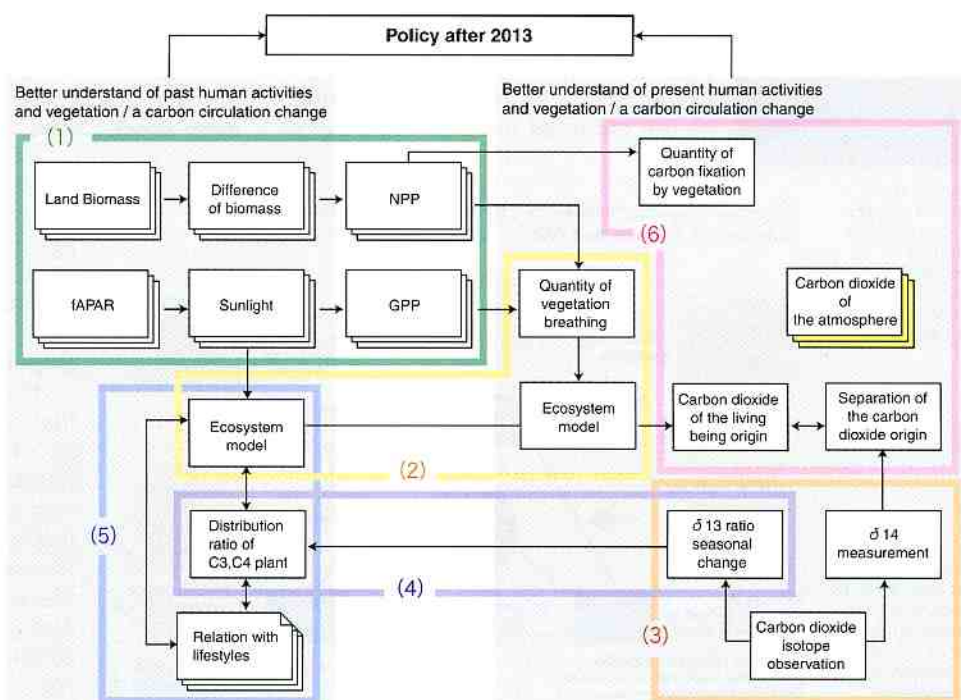
Method

The constitution of this study is shown in figure 1. Net Primary Production (NPP) will be assessed from the difference in biomass by

satellite data. Gross Primary Production (GPP) will be assessed from FAPAR and NPP. These results will show the quantity of carbon fixation and quantity of plant respiration.

Prospective results

The first stage of an action, to help curb global warming, is to be finished in 2012, and the plan is to shift to the second stage from 2013. Land vegetation contributes to atmospheric carbon fixation. These results are useful for evaluating to what degree land vegetation can contribute to the mitigation of global warming. These results are useful for depicting the relationship between human beings and vegetation in a warm climate.



Research Axis 3
Spatial Scale

High-Altitude Environments Association of Ageing, Diseases and Livelihood with Culture and Nature

High-altitude areas that cause hypoxia and have low temperatures are severe environments for the adaptation of life, and they are fragile to the influence of globalism. Even though the high-altitude areas have a diversity of nature, adaptive livelihoods and culture, problems have emerged, like environmental destruction, change of culture and livelihood, and increase in lifestyle related diseases. In this project, how humans are adaptive to high-altitude environments and how these regions are vulnerable to globalism, will be studied. The problems will be understood through the association of human ageing and diseases and livelihood with culture and nature, and solutions will be approached by the viewpoint of glocalism as the harmony of globalism and localism.

Project Leader ■
Core Members ■

OKUMIYA, Kiyohito RIHN
ANDO, Kazuo The Center for South-east Asian Studies, Kyoto University
MATSUBAYASHI, KOZO Kozo-The Center for South-east Asian Studies, Kyoto University
SAITO, Kiyooki RIHN
TAKEDA, Shinya Graduate School of Asian and African Area Studies, Kyoto University
TSUKIHARA, Toshihiro Toshihiro-Faculty of Education and Regional Studies, Fukui University
YAMAMOTO, Norio National Museum of Ethnology, NIHU

Objectives and Field Areas

Adaptable livelihoods and the human aspects of life; birth, aging, disease and death in association with the diversity of nature and culture will

be studied in the Himalaya and the Andes, compared with the northern Ethiopia and the Alps. Moreover the influences of globalism on the changes in livelihood and the human aspects of life will be studied.

Methods

●High-altitude Nature and ecology

Destruction and protection of forests and changes in climate will be studied. As there was a case where the destruction of forests was aggravated by the enforced protection strategy

(Nepal), the communities' protective functions are important.

●High-altitude livelihood

Dilemmas emerged between adaptable and steady traditional livelihoods and the competitive modern market. The interaction of resources, humans and society between low and high-altitude areas, influences of globalism, and economic sustainability will be studied.

●Human aspects of life; birth, aging, disease and death

Ageing and life style related diseases may be accelerated in high-altitude dwellers. Health and diseases are closely associated with natural environments and human cultures. In this interdisciplinary project, the original and adaptable criteria about human aging and diseases can be found in addition to the global standard.

●High-altitude Culture

Nature can be wholly understood through human cognition; the "Study of Nature". Human ageing and diseases will be discussed also in association with religion and traditional medicine.

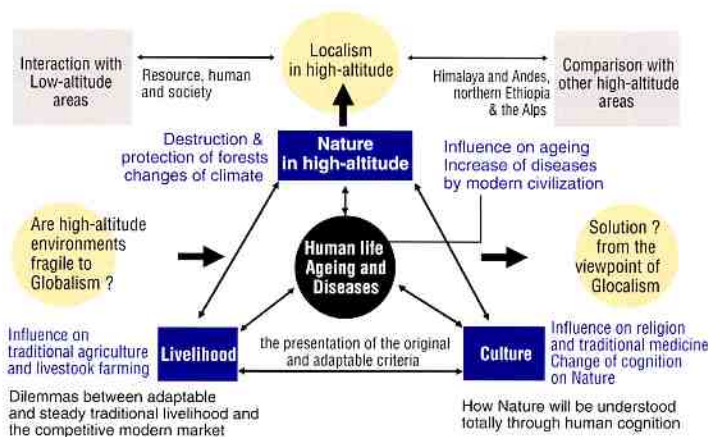
Figure 1 The Himalaya and the Andes



The regions that support sizable and permanent human populations above an altitude of 2,500 m are the Andes, the highlands of northern Ethiopia and the area of the Tibetan plateau.

The relation between spiritual life and nature will be reevaluated through an interdisciplinary study on the changes of high-altitude environments in the big wave of globalism.

Figure 2 The Interrelation of Human Ageing and Diseases with Livelihood, Culture and Nature and the Influences of Globalism



Expected Outputs

The effects of globalism on high-altitude environments will be assessed by associating human aspects of life with ecology, culture and nature. Worldwide problems of changes in the environments, livelihood and human diseases related to globalism and ageing will be demonstrated and solutions will be discussed from the viewpoint of glocalism in high-altitude environments.

Historical Interaction between Nomadic States' Activities and Environmental Transformation in the High-Latitude Asian Steppe Region

The life of nomads is sustained through resources provided by livestock and nothing is wasted. Also, the people protect the steppes that nurture their livestock. By looking at how they live, there are many things we can learn about how they utilize limited resources effectively, because people living in the modern world are facing environmental problems. From ancient time, the people on the Mongol plateau have coexisted harmoniously with nature. In this project we are considering how to reevaluate Mongolian nomad culture. It appears that we who live in modern society can learn something from the history of the vicissitudes of the nomadic states on the Mongol plateau.

Project Leader ■

SHIRAISHI, Noriyuki Niigata University

Core Members ■

MATSUDA, Koichi Osaka International University
SHINODA, Masato Tottori University
KOMIYAMA, Hiroshi Japan International Research Center for Agricultural Sciences
KATO, Yuzo Research Institute for Humanity and Nature

The Mongol plateau has been the homeland of powerful nomadic states that crossed over the Eurasian continent from olden times. For example, the Mongol Empire developed a communications and transportation network that covered the whole of Eurasia and promoted East-West exchange. It is regarded as a prelude to the later Age of Geographical Discovery and Globalization.

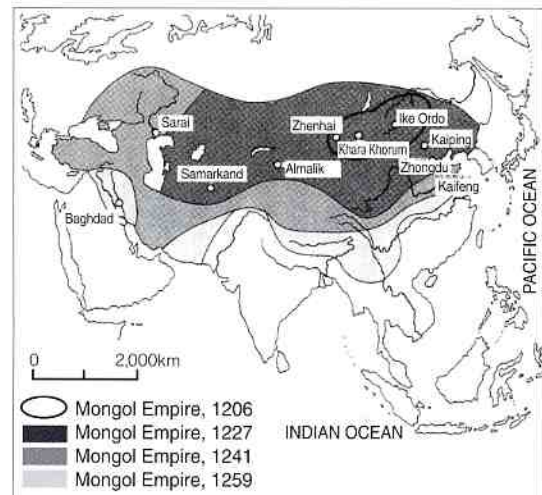
However the climate of the Mongolia is so extreme that industry and agriculture in this region cannot compete against China, Central Asia and Europe. It is known as a region that is an extreme environment for human life. Why have powerful sovereign states been formed in such a region? We are interested in this problem and in solving it. In this project, we will use not only historical methods but also the multidisciplinary approaches of the natural and social sciences.

Through the project we will be able to provide accurate results that clarify the background of the growth and downfall of the Mongol Empire and other nomadic states. Moreover superior aspects of nomadic, life from the practical use of natural resources to the adaptation to an extreme environment, will be revealed. These are, in a sense, the knowledge of nomadic cultural tradition. We will try to integrate this knowledge into hazard systems used for snow damages and droughts. By using the system, it will be possible for us to propose plans for the prevention of disasters and the reconstruction of affected areas. The results of this project will be made available to assist in the making of a sustainable society in Mongolian and for nomadic peoples all over the world.

Photo Our Japan-Mongolia Joint Team Archaeological Excavation at the Palace of Chinggis Khan.



Figure The Expansion of Territory of the Mongol Empire.



2006 Incubation Studies

A Complex Analysis of Urban Environments Based on Multiple Historical Chronologies and Its Future Impact on the Earth's Potential

Leader **Muramatsu, Shin** (The University of Tokyo)

Joint Researcher **KINOSHITA, Tetsuya** (RIHN)

Regarding the global environment as an accumulation of local urban environments on the earth, this study analyzes the complex changes in various urban environments—caused by economic growth, population increase, and other changes including that of transportation means—and how they have affected the total global environment. This historical process should be studied using multiple chronologies; long-term chronology with the beginning of human urban settlement six thousand years ago as a starting point, the mid-term chronology of the last two hundred years since the Industrial Revolution, and the short-term one to deal with the last fifty years during which urbanization has been developing in the Third World. The results of this study should benefit us all as a warning concerning the future of the earth as well as making practical contributions towards local urban environment policies.

Environmental Problems and Human Security for Children as Our Future: Asia-Pacific Children and the Environment (ACE) Project

Leader **YAMAUCHI, Taro** (University of Tokyo)

Joint Researcher **UMETSU, Chieko** (RIHN)

Children are the most vulnerable sector of the human population within the environment. There is no doubt that understanding the effects of environmental dangers on children is crucial when considering environmental problems. Nevertheless, insufficient effort is being made to assess the relationships between children and their environment.

This project seeks to determine the actual conditions relating to child security in local environments in the Asia-Pacific region, to support children's participation in community development and environmental care, and to open up new perspectives on future human capabilities.

Collapse and Restoration of Ecosystem Networks under Human Activities

Leader **YAMAMURA, Norio** (Kyoto University)

Joint Researcher **ICHIKAWA, Masahiro** (RIHN)

All ecosystems on the earth have been reduced, degraded and endangered due to the devastating effects of human activities. We will clarify the collapsing process of ecosystems from the viewpoint that an ecosystem is not a simple collection of elements, but it has a nested structure of networks within and between subsystems. Our goals are to minimize long-term and large-scale deterioration and instability of ecosystems due to human utilization, and to suggest paths towards restoration of more healthy and sustainable ecosystems with high biodiversity, strong ecosystem functioning and desirable ecosystem services.

A Study of Human Subsistence Ecosystems among Arab Societies: To Combat Livelihood Degradation

Leader **NAWATA, Hiroshi** (Tottori University)

Joint Researcher **WATANABE, Tsugihiko** (RIHN)

This research project aims to promote basic studies to examine the interaction between human and nature in drylands, for the purpose of ensuring sustainability of subsistence activities and combating livelihood degradation in local communities of the Arab people. We will clarify human subsistence ecosystems by focusing attention on human life support mechanisms and self-sufficient modes of production (hunting, gathering, fishing, herding, farming, and forestry). Based on these research results, we intend to propose a scientific framework to strengthen the subsistence productivity and rehabilitation measures for the daily lifestyles of the common people within Arab societies.

How is it Thought about Rapid Increase and Decrease of Cormorant Populations?

Leader **TAKAHASHI, Shinji** (National Institute for Environmental Studies)

Joint Researcher **SATO, Yo-ichiro** (RIHN)

Cormorants, fish-eating colonial birds, have had a symbiotic culture and history with humans since ancient Japan. This is represented by UKAI, cormorant fishing as traditional culture. However, this relationship is becoming confrontational in recent years. That is, cormorant population was decreased in 1970 because of environmental pollution from industrial activity. On the other hand, they cause friction to inland fisheries by their rapid increasing.

In this study, we will focus on the relationship between cormorants and humans, and research through the keywords such as 'culture', 'diversity' and 'ecosystem' to amass useful knowledge and techniques for a new symbiosis culture of today's problems and towards the friendly future.

Histories of Economic Activities and Environmental Protection Policies and their Impact on the Ecosystem in the Caspian Sea

Leader **KITAZAWA, Daisuke** (The University of Tokyo)

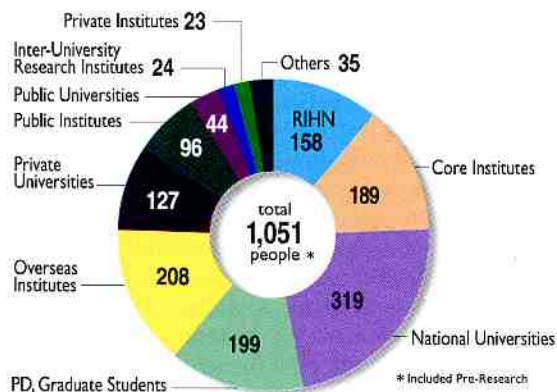
Joint Researcher **KANAE, Shinjiro** (RIHN)

Environmental problems in the Caspian Sea reflect the consequences of the historical and economic development of the Circum-Caspian countries. Moreover the future national and transnational development of the commercially attractive Caspian natural resources such as oil and gas may have negative impacts on the sea and coastal ecosystem, which includes several endemic species such as seals and sturgeons.

Environmental protection policies should be enforced in cooperation among the Circum-Caspian countries to protect the Caspian ecosystem. Therefore the effects of environmental protection policies on the future ecosystem are illustrated by analyzing the relationship between the history of economic activities and environmental protection policies and their impact on the ecosystem in the last 40 years.

External Research Collaboration

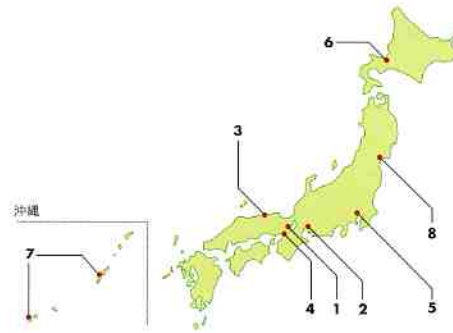
As one of the Inter-University Research Institutes, RIHN promotes integrative and cross-disciplinary joint researches in the field of global studies. For this goal, RIHN intends to collaborate with not only the universities, national agencies, public organizations, and private sectors in Japan, but also relevant overseas institutions.



Research Cooperation in Japan and Abroad

■Partner Organizations for Fluid Association

The RIHN Partner Organization Council was founded to establish global environment studies and promote related studies in Japan through joint research projects.



Partner Organization for Association	Related Projects (some examples)
1. Center for Ecological Research, Kyoto University	3-1FR Multi-disciplinary research for understanding interactions between humans and nature in the lake Biwa-Yodo river watershed
2. Hydrospheric-Atmospheric Research Center, Nagoya University	4-1FR Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes
3. Arid Land Research Center, Tottori University	1-1FR Impact of Climate Changes on Agricultural Production System in the Arid Areas
4. National Museum of Ethnology	4-2FR A Trans-Disciplinary Study on the Regional Eco-History in Tropical Monsoon Asia: 1945-2005
5. Institute of Industrial Sciences, University of Tokyo	5-1FR Global water cycle variation and the current world water resources issues and their perspectives
6. Institute of Low Temperature Science, Hokkaido University	2-3FR Human activities in Northeastern Asia and their impact to the biological productivity in North Pacific Ocean
7. Tropical Biosphere Research Center, University of Ryukyus	3-2FR Interactions between natural environment and human social systems in subtropical islands
8. Graduate School of Science, Tohoku University	2-1FR Emissions of greenhouse gases and aerosols, and human activities in Eastern Asia

■Memoranda and Research Cooperation Agreements

RIHN has signed memoranda with overseas research institutes such as Nankai University, Hohai University, Cold and Arid Regions Environmental and Engineering Research Institute (Chinese Academy of Sciences), Institute of National Studies (Chinese Academy of Social Sciences), and Far Eastern Branch of Russian Academy of Sciences as well as leading national research organizations such as the Scientific and Technical Research Council of Turkey and the National Research Council of Thailand. Furthermore, research cooperation agreements have been signed at project leader level with many research institutes and organizations such as Yunnan University, Ministry of Public Health (Lao People's Democratic Republic), and Chiang Mai University. An agreement with La Fondation Maison des Sciences de l'Homme is scheduled for signing in 2006.

■International Symposium

RIHN will hold its first international symposium on November 6 through 8, 2006, as described below. A pre-symposium was held in June and October of 2005.



Greetings by Director-General Hidaka at the pre-symposium held in November 2005 (above).

Session (below).



RIHN First International Symposium

Title: Water and Better Human Life in the Future

Date: Mon., November 6 to Wed., November 8, 2006

Venue: Kyoto International Conference Hall

Outline: Global environmental issues are fundamentally a problem of human lifestyle or culture in the broadest sense of the word. With a keen awareness of this, the first international RIHN symposium on water, which is a critical factor of the global environment, will be held. The symposium will clarify: the interactions that form the links between mankind and nature and environmental sustainability in order to review the source of water issues as a global environmental problem. Academics are being invited from all over the world. In addition, other invitees are the Executive Director of the International Human Dimensions Programme on Global Environmental Issues (IHDP), Coordinator of the UNESCO World Water Assessment Programme, persons associated with the Stockholm Water Prize, editors in chief of international scientific journals, and officers in charge of science/culture at diplomatic missions to Japan. The symposium will be a conference of the world's highest level and will disseminate new findings and study results concerning the global environment through academic exchanges and meetings.

Mon., November 6, 13:30-16:30

Keynote Speech 1: Gordon Young, Coordinator of the UNESCO World Water Assessment Programme

Keynote Speech 2: HIDAKA Toshitaka, Director-General, Research Institute for Humanity and Nature

Tue. November 7, 9:00-17:30

Session 1: Water Imbalances (Conveners: M. Taniguchi, K. Saito)

Wed., November 8, 9:30-17:00

Session 2: Dynamic Interactive System Involving Humans and Nature around Water (Conveners: Y-I. Sato and T. NAKANO)

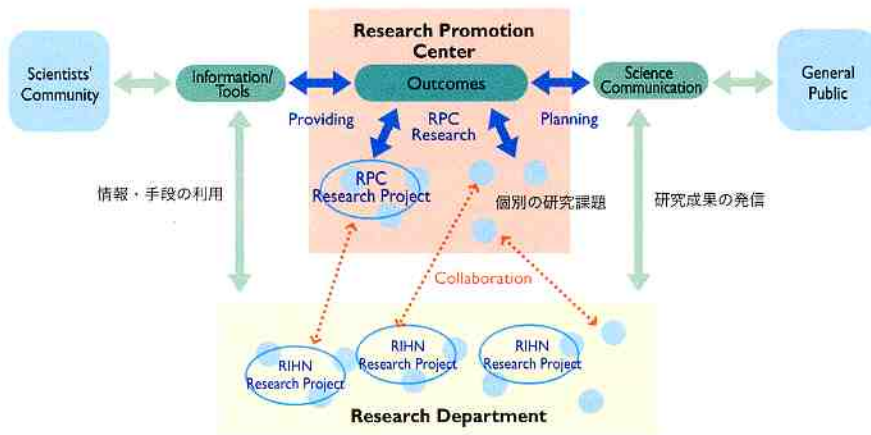
Activities of Research Promotion Center

The Research Promotion Center, in accordance with the principles of the Institute, has been engaged in building the basis for finding a new research perspective beyond the scope of the existing disciplinary framework.

The Institute organizes its activities in the framework of the newly established National Institutes for the Humanities, whose Medium-term Action Program stipulates that "Research Institute for Humanity and Nature will make necessary arrangements to consolidate the Research Promotion Center for activities including information collection and processing, science communication, and relevant basic research, in relation to the global environment studies." Accordingly, the Research Institute has set up the Committee for the Operation of the

Research Promotion Center.

The Center, in such framework, will take further steps in its own research for promoting the "global environment studies." Such research will constitute the basis for "planning science communication" to the public (for example, RIHN Forum), related to the RIHN's research activities, and for "providing information and its processing tools" (databases, observation technologies, etc.) for promoting the "global environmental studies."



RPC(Research Promotion Center) Research Project

■ How to archive and reuse the results of interdisciplinary studies? – Toward continuous study for environmental issues

RIHN undertakes research projects through interdisciplinary approaches. The Research Promotion Center archives research methods and results to establish a methodology for the next generation to make the most of them in drawing inspirations and formulating research programs. In other words, RIHN, as its distinctive characteristics, takes innovative and comprehensive approaches integrating different study fields. RPC aims at forming the basis for accumulating such approaches.

■ Research study for planning science communication of RIHN

RPC explores how it is possible to disseminate the significance of RIHN's studies and the results of its researches to the public as well as to scholars in Japan and abroad for increased understanding. RPC desires to present detailed communication programs and strategies after reviewing available dissemination measures.

Furthermore, RPC conducts incubation studies on the relationships between academic activities and society and on global environmental problems examined in terms of combined effects.

Planning science communication

■ Humanity & Nature Newsletter

This newsletter provides scholars and society with information such as the profile of the institute and its activities. The first issue being published in April 2006, the A4-sized, 12-page newsletter is issued bimonthly, the number of copies reaching 3,000.

■ Publications

These publications provide scholarly yet easy-to-understand introductions to the researches conducted at RIHN and the study results.

Volume 1, "Biodiversity, Why it is important?" (Japanese), Showado (April 2005).

Volume 2, "Ecological Immigration" (Japanese), Showado (July 2005).

Volume 3, "The Water and Green of Silk Road. Disappeared to where?" (Japanese), Showado (March 2006).

■ RIHN Public Seminars

The staff members of the institute hold public lectures for the general public as a simple introduction to the research activities conducted at RIHN. The first seminar being held in November 2004, eleven seminars had been offered by the end of fiscal year 2005. Seven seminars are scheduled for fiscal year 2006.



Humanity & Nature Newsletter



RIHN Series

RIHN Forum and Public Seminars

■RIHN Forum

RIHN Forum is organized, based on the principles and outcomes of RIHN's research activities, and understanding that "the so-called environmental problems are fundamentally problems of human culture," with the aim to raise questions and animate discussion about up-to-date topics around these problems, to help find answers to the fundamental questions to the global environmental problems.

No.	Title	Date	Venue
1st	The global environmental problems – Toward an integrated approach	17 May, 2002	Kyoto International Conference Hall
2nd	Global warming – Nature and culture	13 June, 2003	Kyoto International Conference Hall
3rd	What comes after biodiversity loss?	10 July, 2004	Kyoto International Conference Hall
4th	Extinguished water	9 July, 2005	Kyoto International Conference Hall
5th	Forest Governance in the Making	8 July, 2006	Kyoto International Conference Hall

■RIHN Public Seminars

This seminar aims to provide the opportunity to share with citizens in Kyoto as to various topics concerning the environmental problems related to human lifestyles.

No.	Title	Date	Speaker
1st	The fascination and the reality of the Silk Road Region	5 November, 2004	NAKAWO, Masayoshi (Professor, RIHN)
2nd	A Multi-disciplinary challenge towards the lake Biwa watershed management	3 December, 2004	YACHI, Shigeo (Associate Professor, RIHN) NAKANO, Takanori (Professor, RIHN)
3rd	Iriomote island with its subtropical nature and life	4 February, 2005	TAKASO, Tokushiro (Professor, RIHN) Mr. KOMI etc.
4th	World water issues in the 21st century	4 March, 2005	KANAE, Shinjiro (Associate Professor, RIHN)
5th	Global warming, is it real?	1 April, 2005	HAYASAKA, Tadahiro (Professor, RIHN)
6th	Impacts of climate change on life and environment	3 June, 2005	WATANABE, Tshugihiro (Professor, RIHN)
7th	Kamo river and Hwang Ho – The blessing and misfortune	3 September, 2005	FUKUSHIMA, Yoshihiro (Professor, RIHN)
8th	Fish and food culture in Southeast Asia	7 October, 2005	AKIMICHI, Tomoya (Professor, RIHN)
9th	Species rich forests are necessary for sustainable human life.	2 December, 2005	NAKASHIZUKA, Tohru, (Professor, RIHN)
10th	Narrative theory of environment ? Environmental quality and environmental consciousness	3 February, 2006	YOSHIOKA, Takahito (Associate Professor, RIHN)
11th	New environmental hypothesis entitles "Megascala Fish Feeding Forest" applied to Amur River, the Sea of Okhotsk and the World Nature Heritage SHIRETOKO	3 March, 2006	SHIRAIWA, Takayuki (Associate Professor, RIHN)
12th	A prologue to environmental history in Eurasia –from Monsoon Asia to Silkroad	14 April, 2006	SATO, Yo-ichiro (Professor, RIHN)

Research Project Presentation and seminars

■Research Project Presentation

The leaders of the research projects overview the on-going process in an interim report, in which A Total of 450 joint researchers take part as discussants. This annual meeting plays an important role of providing the opportunity for sharing through discussions and practically, for the academic evaluation of research activities of RIHN. (Scheduled: December 13-15, 2006)

■RIHN Seminars

RIHN Seminars are organized to provide opportunities for RIHN's scientists to share the latest topics and research trends in different fields of global environment research with speakers invited from Japanese or foreign institutes, and to get inspired for new directions of research. (Eleven seminars were held in 2005.)

■Luncheon Meeting (Danwakai)

At RIHN, the luncheon meetings provide an unique opportunity for mutual inquiry and exchange of opinions among institute members, as well as visiting professors, part-time researchers, foreign researchers and so on. It will be held on a biweekly basis. (Eleven meetings were held in 2005.)

■Evening Seminars

The evening seminars are intended to promote the free exchange of opinions and to stir up discussion. Ordinarily these study meetings will be held on a monthly basis, beginning at five p.m. and lasting for approximately two hours. (Seven seminars were held in 2005.)

Research Staff Profiles

(in alphabetical order)



**AKIMICHI,
Tomoya**

- Professor, Project 4-2FR
- Background: Ecological anthropology, Ethno-biology

We are continuing to clarify the eco-historical consequences that are manifesting due to human-environmental interaction of these the past several decades, in tropical monsoon Asia. We also expect to publish an illustrated book this year.



**HASHIMURA,
Osamu**

- Researcher, Project 4-2FR
- Background: Historical geography, Folklore, Fishery social history

I have studied Fishery social history in Asia, especially sea tenure, the technical methods of fishing, and the social structure in fishing villages. I aim to develop a methodology of eco-history, of the relation between humanity and nature.



ANDO, Atsushi

- Research Associate, Project 2-6FS
- Background: Geology, Paleontology, Isotope geochemistry, Paleoceanography

I wish to promote multidisciplinary and original research of the Earth's environments here at RIHN, by using stable isotopes as an integrative means for understanding nature.



HATADA, Aya

- Senior Researcher, Project 2-2FR
- Background: Environmental education, Tropical ecology, Population ecology

Making full use of my experience in a museum, I aim to develop teaching materials on biodiversity, in a way that is interesting and easy to understand for undergraduate students.



**ARIMURA,
Makoto**

- Research Associate, Project 2-5FR
- Background: Near Eastern Archaeology

The aim of these studies is to consider the appearance and developments of early farming communities in western Asia, which is the first example of controlling nature, through the analyses of archeological data.



**HAYASAKA,
Tadahiro**

- Professor, Project 2-1, 2-10FS
- Background: Atmospheric physics

I am interested in global warming issues, particularly the relationship between the globalization of socio-economic activities and emissions of greenhouse gases and aerosols, and the effects on climate change.



ENDO, Takahiro

- Assistant Professor, Project 5-1FR
- Background: Political science

I am trying to look at water problems by focusing on the role of government. I am concerned with the role of government in head-water conservation and water right market.



HAYASHI, Naoki

- Researcher, Project 5-2FR
- Background: Rural planning, Irrigation engineering

I have been studying the maintenance of ponds and the activation of rural areas. People's awareness of the environment may be a double-edged sword. I would like to elucidate this carefully.



FUKUNAGA, Kenji

- Senior Researcher, Project 2-5FR
- Background: Crop evolution, Plant genetics

I am investigating historical relationships between agriculture and environments based on genetic data of cultivated plants and archaeological, historical and ethnological records.



**HONDA,
Yoshiaki**

- Visiting Associate Professor, Associate Professor of Center for Environmental Remote Sensing in Chiba University, Project 2-10FS
- Background: Global environment evaluation engineering, Satellite botany

My main study theme is the development of global biomass estimation methodology using satellite data including satellite data processing, ground observation and satellite observation plans.



**FUKUSHIMA,
Yoshihiro**

- Professor, Project 1-2FR
- Background: Hydrology

A Hydrological model was built for estimating the effect differences in forest coverage have on river flow formation in a mountain watershed. In the Yellow River, the effects of human activities are to be evaluated within an expanded model.



**HOSHIKAWA,
Keisuke**

- Researcher(PR), Project 1-1FR, 1-2FR
- Background: Agricultural engineering, Regional planning

Irrigated agriculture is the largest consumer of fresh water in the world. I aim to clarify how water is used in irrigated agriculture in order to solve water shortage problems.



**HARRISON,
Rhett Daniel**

- Invited Research Fellow, Project 2-2FR
- Background: Tropical forest ecology

I am interested in tropical forest ecology and conservation, and teach an annual graduate fieldcourse for SE Asian students, as well as publish popular articles on tropical forests in local magazines and newspapers. I am especially interested in popularizing natural history.



HOSOI, Mayumi

- Research Associate, Project 5-3FR
- Background: Landscape design

I will facilitate the communication among researchers, and researchers and society, based on experiences of NPO activities.



HIDAKA, Toshitaka

- Director-General
- Background: Ethology

I think RIHN's greatest mission is to find out the way for our future prosperity on the Earth.



HYODO, Fujio

- Researcher, Project 5-3FR
- Background: Ecology

I wish to deepen the understanding of the relationship between environments and organisms, including human beings by utilizing my previous experience.



IBUKI, Naomi

- Research Associate, Project 5-4PR
- Background: Plant breeding

How does the destruction of nature change our lives? Do we sense that we are missing something. I want to research the relationship between humans and nature from a naturalistic point of view.



ICHIKAWA, Masahiro

- Associate Professor, Project 2-2FR
- Background: Area study

I have studied the use of natural resources by native people of Sarawak, Malaysia. Has the effect of the market economy and development policies changed the usage of resources considerably or has this usage remained the same in its core? This is my area of interest to further the studies of RIHN.



IGETA, Akitake

- Researcher, Project 3-1FR
- Background: Limnology, Marine chemistry

My research interest is in rice paddy pollutant measurement, the identification of factors in forming water quality in drainage basins comprising mixed farm land and residential areas, and the establishment of basin diagnosis using isotope ratios.



INOUE, Mitsuyuki

- Researcher, Project 4-1FR
- Background: Oriental history

I will do my best to yield fruitful results, in the final year of the Oasis Project, on the historical changes of the relation between people and water in the Heihe Basin.



INOUE, Takashi

- Visiting Professor, Project 4-1FR
- NHK Special Program center, Executive Producer

I am interested in the relations between civilization and nature. I hope to use the experience of having made several NHK TV programs.



ISHITOBI, Tomotoshi

- Research Associate, Project 2-4FR
- Background: Hydrogeology

I have been studying submarine groundwater discharge (SGD), which is the end of the groundwater flow system. In this study, I will not only include water transport but also material transport such as contaminants.



JAGO-ON, Karen Ann Bianet

- Research Associate, Project 2-4FR
- Background: Socioeconomics

Meta-data on natural and social sciences in Asia will be analyzed to evaluate environmental problems in cities from a socioeconomic point of view.



KANAE, Shinjiro

- Associate Professor, Project 5-1FR
- Background: Civil engineering, Hydrology, Climate system

Bearing in mind that scholars tend to be criticized for not offering solutions that can be applied in the real world, I hope to make efforts to find something new, which is both socially and environmentally relevant.



KASHIO, Tamaki

- Researcher, Project 3-1FR
- Background: Agricultural economics, Rural sociology, Environmental sociology

I wish to throw light on changes in the rural living environment from historical and socio-structural perspectives and also from ordinary people's point of view.



KATAGIRI, Shuichiro

- Senior Researcher, Project 2-1FR
- Background: Atmospheric physics

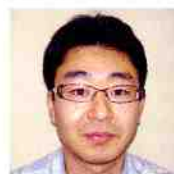
I am studying how radiation and climate relate, using satellite and ground-based data.



KATO, Yuzo

- Assistant Professor, Project 4-1FR, 4-5PR, 4-6FS
- Background: Chinese legal history

I am interested in studies that are out of existing structures. I intend to reconstruct the "environment" including the social milieu in a historical context, and present it in writing.



KATSUYAMA, Masanori

- Senior Researcher, Project 5-2FR
- Background: Forest hydrology

To build scenario questionnaires, I will apply our Response-Prediction model, which describes responses in forest, river, and lake environments to some impacts or disturbances.



KAWABATA,
Zen'ichiro

- Professor, Project 5-4PR, 3-1FR
- Background: Microbial ecology, Aquatic ecosystem ecology

I will try to clarify the interactions between pathogens and humans and pathogens in degraded freshwater ecosystems in order to promote aquatic environments which ensure the well-being of humans and wild life organisms.



KAWAGUCHI,
Tamaki

- Research Associate, Project 2-3FR
- Background: Fine art, Web design

My task in the Amur-Okhotsk Project is to develop a web site in order to compile and present the results of the project. I will make the web site as user-friendly as possible so that people can utilize our results efficiently.



KAWAMOTO,
Kazuaki

- Assistant Professor, Project 2-1FR, 2-4FR, 2-6FS, 3-3PR
- Background: Atmospheric physics

I want to perform original research on the interactions globally between aerosols, clouds, precipitation, wind and radiation through collaboration with other researchers at RIHN.



KAWAMURA,
Mika

- Research Associate, Project 2-1FR
- Background: Information processing

I will contribute to research activities of the project 2-1 by supporting general management of the project like communicating with collaborators, collecting information at observation sites, data analyses and so on.



KIMOTO,
Yukitoshi

- Senior Researcher, Project 3-2FR
- Background: Plant morphology, Plant anatomy, Plant phylogeny

I am interested in the diversity and functions of external/internal structures of reproductive organs in angiosperms - flowers and fruits (seeds) -, as well as the relationships between plants and animals.



KINOSHITA,
Tetsuya

- Professor, Project 1-2FR
- Background: History of Chinese philosophy

I want to investigate the role human thought has played and is playing in the relationship between human and nature.



KOHMATSU,
Yukihiro

- Assistant Professor, Research Promotion Center
- Background: Ecology, Geography

I aim to develop a methodology for interdisciplinary studies based on the methods of geography by which any study of materials and matters focuses on spatial problem.



KUBOTA, Jumpei

- Associate Professor, Project 4-5PR, 4-1FR
- Background: Forest hydrology

I will to clarify historical interaction of human activities and natural systems in arid to semi-arid regions of Central Eurasia, focusing on man-made trans-boundary problems through hydrological aspect.



KUME, Takashi

- Senior Researcher, Project 1-1FR
- Background: Soil hydrology

I am thinking about environmental changes and how knowledge provides a way for humans to coexist with nature through discussion with researchers of other disciplines.



KURATA, Takashi

- Researcher, Project 2-5FR
- Background: Philosophy, Environmental thought, Theory of arts and crafts

Based upon modern phenomenological thought, I'd like to investigate philosophically what the ideal relationship between human beings and matter or nature in our time, is.



LINDASTRÖM,
Kati

- Research Associate, Project 4-4PR
- Background: semiotics, cultural anthropology

Using historical materials and anthropological data, I am researching changes in landscape perception and the use of landscape imagery during the epochs of abrupt cultural change.



MATSUI, Kazuaki

- Senior Researcher, Project 5-4PR
- Background: Microbial ecology, Aquatic ecosystem ecology

In our project we focus on a lethal viral disease in wild fish as a model system for understanding how human activities are involved in the emergence of pathogenic intruders in wild life.



MATSUKAWA,
Taichi

- Researcher, Project 5-2FR
- Background: Sociology, Social research methodology

The sociologist's role in this institute is, I think, to investigate the social dimensions of the interaction between human society and the natural environment.



MATSUMURA,
Ayako

- Research Associate, Project 5-2FR
- Background: Forest policy

For my Master's thesis, I have conducted interview surveys in rural areas. I want to contribute to 5-2 project research using this experience.



MIYAJIMA,
Toshiaki

- Research Associate, Project 4-5PR
- Background: Systems engineer for production control, Physics

I have been loving watching animals and plants outside. In the last 3 years, I have analyzed glacial ice-cores with the aid of a computer. Based on the experience, I would contribute to the Illi project as well.



MIYAZAKI,
Chihiro

- Senior Researcher, Project 5-IFR
- Background: Climatology, Geography

I have studied climate change as affected by natural variations in the global atmosphere and ocean mainly. In this project, I am interested in developing the data set of water resources of a high quality.



MIYOSHI Takao

- Senior Researcher, Project 2-IFR
- Background: Atmospheric chemistry

The East Asia region is the source of large amounts of anthropogenic pollutants. I will observe atmospheric trace gases and aerosols in remote areas, in order to tackle environmental problems.



MOJI, Kazuhiko

- Visiting Professor, Professor of Institute of Tropical Medicine, Nagasaki University, Project 2-8FS
- Background: Human ecology, Population health in the tropics

Vector-borne diseases occur as a result of integrated ecology of pathogens, vectors, and hosts in their environments. The project evaluates the effects of local and global environmental changes on the diseases in Asia and Oceania.



MOMOKI, Akiko

- Associate Professor, Research Promotion Center
- Background: Biology, Ethology (especially human)

My experiences in human ethology research, a discipline in which all aspects of "humanity" are studied, will contribute to the RIHN's research activities and science communication with the public.



MORI, Wakaha

- Senior Researcher, Project 3-3PR
- Background: Sumerology, linguistics

I am interested in the ancient Mesopotamian civilization in the late third millennium BC. I aim to reveal more about the ancient social environment from the cuneiform texts.



MORIYA, Kazuki

- Researcher (part-time), Project 4-IFR
- Background: Chinese social history

So far I have studied what human beings have thought and done. At RIHN, I am going to do research on the relationship between human and nature, and its impact on social systems.



MURAKAMI,
Yumiko

- Researcher, Project 5-3FR, 4-4PR
- Background: Archaeology, Historical botany

I am interested in wooden artifacts excavated from archaeological sites and used for daily life in present times. This is a continuation of my research on the relationship between human beings and wood in the Japanese Archipelago.



MURATA, Fumie

- Senior Researcher, Project 5-IFR
- Background: Tropical meteorology

I aim to understand the mechanism of rainfall, and hope that our study will improve flood forecasting in the tropical Asian region.



NAGATANI,
Chiyoko

- Researcher, Project 4-2FR
- Background: Cultural anthropology, Religious studies

So far, I have studied the religious practices of an ethnic group in China. I will use this opportunity to review religions in the context of ecology.



NAKAGAWA,
Masato

- Researcher, Project 3-2FR
- Background: Plant ecology, Plant taxonomy

I am trying to analyze the geographical distribution of plants in the Ryukyu Islands based on herbarium data, and will investigate the genetic diversity of plant species in Iriomote Island.



NAKANO,
Takanori

- Professor, Project 2-6FS, 2-4FR, 3-1FR, 5-3FR
- Concurrent Professor, Research Promotion Center
- Background: Resource geology, Isotope geochemistry

I am tracing the route of materials in the earth's environment in order to achieve sound earth environmental studies, which considers the relationship between humans and nature.



NAKATSUKASA,
Michiko

- Research Associate, Project 5-2FR
- Background: European art history

I hope to contribute to the 5-2 project research with my English skill as well as experiences of cultural comparison. I would like to learn various things at RIHN.



NAKAWO,
Masayoshi

- Professor, Project 4-IFR
- Background: Glacioclimatology, Cryosphere hydrology

I wish to review history from the viewpoint of interaction between people and nature. This would yield clues towards creating our new manner of living that could assure future capability.



NISHIMOTO, Futoshi

- Researcher(part-time), Project 4-2FR
- Background: Social anthropology, Ethnography

My current research focuses on the modern history of local religious practices in mainland Southeast Asia, which mediate in the interaction between people and the environment.



ONISHI, Akio

- Senior Researcher, Project 1-2FR
- Background: Environmental system

China has been experiencing rapid economic growth through excessive use of natural resources. I am researching the impact of socio-economic development on water resources in the Yellow River basin.



NOMURA, Naofumi

- Researcher, Project 3-2FR
- Background: Plant ecology

Ecophysiological characteristics of the invasive and the endangered plants on Iriomote Island are investigated. Results of studies will suggest an adequate way for conservation of the endangered plants and for management of the invasive plants.



ONISHI, Hideyuki

- Researcher, Project 4-4 PR, 4-2 FR
- Background: Anthropology, Archaeology

My research focus is indigenous knowledge and technologies related to subsistence activity. Such human knowledge and technologies are composed of socio-cultural factors as well as biological factors. With these perspectives, I will attempt to explain the relationship between human behavior and the socio-ecological system.



NONAKA, Kenichi

- Associate Professor, Project 4-2FR
- Background: Environmental geography, Ecological anthropology and Ethno-biology

I have been studying human use of natural resources as food and environmental cognition. I have conducted fieldwork in Japan, Southeast Asia and Southern Africa.



ONISHI, Takeo

- Senior Researcher, Project 2-3FR
- Background: Hydrology

Water relates with human activities, forming a complex hydrological system. I am investigating the principles of this complex through studying the dissolved iron transport in the Amur River.



OGAWA, Akiko

- Researcher, Project 5-2FR
- Background: Ecological informatics, Biogeochemistry

I am exploring the methods of information management for ecology to make maximum use of valuable research and monitoring data in environmental studies that are large-scale in time and space.



OSADA, Toshiki

- Professor, Project 3-3PR
- Background: South Asian Studies, Linguistics

I have spent more than six years in India. The aim of our project is to know what is the Indus civilization which is a substratum of Indian culture.



OISHI, Taro

- Researcher, Project 5-2FR
- Background: Environmental economics, Economic theory, Econometrics

I'm exploring the role of citizenship in environmental problems by using the rational choice theory which provides the basis for modern microeconomics.



SAEKI, Tazu

- Assistant Professor, Project 2-1FR
- Background: Atmospheric physics

My research subject is the investigation of global cycles of greenhouse gases using numerical models. I am interested in tracking those human and natural activities that have a direct impact on observed changes in these trace gases.



OKITA, Hiroko

- Research Associate, Project 2-5FR
- Background: Japanese literature

I am interested in descriptions of environmental problems that appeared in Japanese literature. Especially, literatures written in the middle Ages seemed to be useful for thinking about environmental problems in that time.



SAITO, Haruo

- Researcher, Project 4-2FR
- Background: Forestry, Ethno-mycology, Ethno-botany

I am working to understand the interaction between human society and natural environment and its historical dynamics by analyzing people's use of plants and fungi.



OKUMIYA, Kiyohito

- Associate Professor, Project 3-4FS, 4-2FR
- Background: Field medicine, Geriatrics, Neurology

The human aspects of life; birth, aging, disease and death in association with the diversity of nature and culture in Asia, and the interrelationship of humans and nature in high-altitude environments will be studied.



SAITO, Kiyooki

- Professor, Research Promotion Center
- Background: Journalism, Study of nature

I have thought about how nature should be caught. I wish to pile new alcohol in a new leather bag at RIHN.



SASAKI, Naoko

- Researcher, Project 5-3FR
- Background: Vegetation history, Forest history, Palaeoecology

I seek to understand the history of human-vegetation interactions in the last several thousands years, using palaeoecological methods, such as pollen and charcoal analysis, with archaeological and historical records.



SASAKI, Noriko

- Research Associate, Project 1-1FR
- Background: English literature, Management

I will gather information and materials useful for our project so that our research activities, domestic as well as overseas, can be facilitated effectively.



SATO, Tadashi

- Visiting Associate Professor, Associate Professor of Graduate School of Life Sciences in Tohoku University, Project 2-9FS
- Background: Genetic Ecology

I have been studying the variation and evolution of crops on farmlands. I wish to investigate the *on-farm* conservation sites of the traditional farming system, and to explore the sustainable agriculture and future lifestyles.



SATO, Yo-ichiro

- Professor, Project 2-5FR
- Background: Plant genetics

I am interested in the domestication of crop species, and have been studying the origin of rice using the tool of DNA archaeology. In the research at RIHN, I started a research project entitled: When agriculture destroys the environment.



SATO, Yoshinobu

- Senior Researcher, Project 1-2FR
- Background: Forest hydrology

I wish to develop a hydrological model for the Yellow River Basin, China, which takes not only the climate change but also the influence of human activities into consideration.



SEKINO, Tatsuki

- Associate Professor, Research Promotion Center
- Background: Limnology

I have applied information technology to my limnological and ecological studies. With this experience, I will try to construct a knowledge base which is required for the activities of RIHN and its projects.



SEO, Akihiro

- Researcher, Project 5-3FR
- Background: Plant taxonomy, Plant geography

Using molecular information, the change in distribution of plants 10,000 years ago in the Japanese Islands that accompanied environmental change, is being clarified.



SHIMIZU, Hiromi

- Research Associate, Project 1-2FR
- Background: International relations

My task is to provide varied administrative support for the research project on the Yellow River, and to disseminate information of the project through the publication of research results.



SHINDE, Vasant Shivram

- Invited Research Fellow, Project 3-3PR
- Background: Decline of the Harappan civilization and the climatic factor

"Harappan Civilization", suddenly declined after the flourishing time. The exact causes are not known but climate is considered to be responsible. The main focus of this project will be to reconstruct the climate of that period and study its impact. It is a study of man-land and environment.



SHIRAIISHI, Noriyuki

- Visiting Professor, Professor of Center for Transdisciplinary Research, Project 4-6FS
- Background: Archaeology

The severe environment of the Mongol Plateau has been the motherland of powerful nomadic states. The aim of our project is to clarify the background of the growth of the nomadic states. I am interested in the process of the rise and fall of the Mongol Empire.



SHIRAIWA, Takayuki

- Associate Professor, Project 2-3FR
- Background: Physical geography, Glaciology

The essential role of environmental scientists is to unveil unknown processes in the earth's environmental system in which human beings are involved. I wish to clarify such a system occurring in the circum Okhotsk region.



SUGIMOTO, Takashige

- Visiting Professor, Professor of Ocean Research Institute in Tokai University, Project 3-1FR
- Background: Coastal oceanography, Fisheries environmental oceanography

I study environmental and ecological dynamics of the estuary of the Yodo River and the inner part of the Osaka Bay and hydro-ecotechnology for sustainable use of coastal areas and environmental conservation.



TAKAHASHI, Atsuhiro

- Senior Researcher, Project 1-2FR
- Background: Meteorology (boundary layer)

I am studying the development of the atmospheric boundary layer and turbulent fluxes of heat, water, and carbon dioxide in a wheat field in Loess plateau in China.



TAKAHASHI, Keiko

- Research Associate, Project 5-3FR
- Background: Informatics

I will help to manage the project, based on my experience as a librarian and in an academic society secretariat.



TAKASO,
Tokushiro

- Professor, Project 3-2FR
- Background: Plant morphology

I have studied relationships between the morphological structures and their functions of plants growing in subtropical regions, especially pollination mechanisms in mangrove plants and sea grasses.



TAKEUCHI, Yayoi

- Researcher, Project 5-3FR
- Background: Forest ecology, molecular ecology

I have studied patterns of current and past gene flow of plant populations using molecular techniques.



TANAKA,
Katsunori

- Researcher, Project 2-5FR
- Background: Plant cell genetics, Plant breeding, Ethnobotany

I am analyzing endemic crops in East Asia by means of genetic markers, and historical and ethnobotanical records, to reveal migrations of peoples and various materials.



TANAKA, Takuya

- Researcher, Project 3-1FR
- Background: Forest ecology, Cultural anthropology

In the environmental management of a river basin, communication among residents, researchers, and policy makers is essential. I am studying methods and favorable conditions that support this, at our study site.



TANIGUCHI,
Makoto

- Associate Professor, Project 2-4FR, 1-1FR, 1-2FR
- Background: Hydrology, Geophysics, Hydrogeology, Natural geography

I undertake studies of the invisible underground environment in cooperation with international research institutions to elucidate human activities and changes in nature in an integrated manner.



TANNO, Kenichi

- Senior Researcher, Project 2-5FR
- Background: Archaeobotany, Crop evolution

Using archaeology and genetics, the origin of agriculture and crop evolution, especially in West Asia and past environmental changes caused by agricultural activities, are being studied.



TERASHIMA,
Motoki

- Researcher(part-time), Project 2-3FR
- Background: Environmental chemistry, Analytical chemistry

I study the role of aquatic humic substances as a carrier of iron from rivers to the sea, especially, the fate of iron in estuaries.



UCHIYAMA, Junzo

- Associate Professor, Project 4-4PR
- Background: Zooarchaeology, Cultural anthropology

On the basis of the analysis of faunal remains from archaeological sites, my research mainly focuses on the reconstructions of prehistoric land use systems and socio-economic structures in the Jomon era in Japan. Recently I started a new project aimed at reconstructing the historical landscape change on East-Asian inland seas.



UEKI, Masaya

- Researcher, Project 5-4PR
- Background: Limnology, Microbial ecology

Pathogens are also components of ecosystems in nature. I would like to develop a relationship that is satisfactory both to the ecosystem and human society, through the viewpoint of pathogen's behavior in natural environments.



UMETSU, Chieko

- Associate Professor, Project 1-3PR, 1-1FR
- Background: Biology, International relations, Resource and environmental economics, Development economics

I am interested in development issues, especially the link between environment and poverty in rural areas in Asia and Africa. I wish to work on a research agenda that deals directly with the human and environment/resource nexus.



WATANABE,
Mitsuko

- Researcher, Project 4-5PR
- Background: Physical geography, Geomorphology, Quaternary science

Remote sensing and field observation provide interesting information about the ground surface. I wish to investigate actual changes of the earth's surface from the viewpoints of both the "bird's eye" and the "insect's eye".



WATANABE,
Tsugihiro

- Professor, Projects 1-1FR, 1-2FR, 4-1FR, 4-5PR
- Background: Irrigation engineering

I am studying water management and the regional environment in rural areas. My recent research interests are in what the implications of irrigation and drainage in arid regions are.



YACHI, Shigeo

- Associate Professor, Project 3-1FR
- Background: Theoretical ecology (modeling in evolutionary ecology, ecology of biodiversity and watershed management)

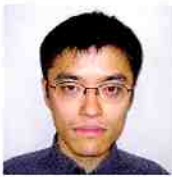
I want to elucidate a methodology to help mutual understanding between people in watershed management, through interdisciplinary research with an emphasis on spatial scale.



YAMAGUCHI,
Kensuke

- Researcher, Project 5-1FR
- Background: Natural resources management

My research in Thailand focuses on: watershed management within a decentralized policy environment, multi-ethnic institutions of water conflict in catchments, and the impact of WTO and other agreements on water use.



YAMASHITA,
Satoshi

- Senior Researcher, Project 2-2FR
- Background: Forestry, Ecology

Fungi play an important role in forest ecosystems as decomposers. I plan to reveal the effects of human activities on fungal communities in tropical regions.



YASUDA, Keiko

- Research Associate, Project 3-2FR
- Background: Biogeography

I am engaged in fieldworks on Iriomote Island, such as water balance and forest ecological research. I have also identified animals and plants making voucher specimens.



YATAGAI, Akiyo

- Assistant Professor, Project 1-1FR, 4-1FR, 1-2FR
- Background: Atmospheric science, Climatology, Hydrology, Remote sensing

One of my research motivations is to teach my son, who shows a lot of interest toward the nature around him, how interesting science is and how important it is to protect the global environment. I am still looking forward to seek my dream.



YOSHIMURA,
Mitsunori

- Associate Professor, Research Promotion Center
- Background: Geographic information system, Remote sensing

Measurement has been my primary research interest. Putting this experience to use, I wish to study human-nature relationships with spatial scale in mind.



YOSHIOKA,
Takahito

- Associate Professor, Project 5-2FR
- Background: Biogeochemistry, Limnology

I have considered the way information is exchanged among human, social and natural scientific communities from the viewpoints of environmental consciousness, environmental values and functions. I want to develop a methodology for contributing substantial solution of environmental issues.



YUMOTO,
Takakazu

- Professor, Project 5-3FR
- Background: Ecology

I will clarify the interaction between ecological processes and human activities, which have formed the "natural environment" in Japan, in order to consider what the natural environment with the highest potential for future sustainability, would be.



ZHENG, Yuejun

- Associate Professor, Project 5-2FR, 2-7FS
- Background: Environmental statistics, Environmental economics, Social survey

My interest is to explore the possibilities of a harmonious society regarding environmental issues, through analyzing the relationship between human activities and environmental changes, structures of environmental consciousness and the main factors, based on objective data.

■ A Guide to New Facilities



← Project Room

A row of five large spaces can each accommodate three projects. There are skylights in the ceiling, designed to make the most of natural light.

↓ Hanare

A Japanese-style common room that floats on the Water Garden.



The construction of the Institute's new campus has been completed and RIHN has moved to the new facilities, to be used as the Institute's base and research activities have reached full swing.

Our conception is that the root of global environmental problems lies in human 'culture' in the widest meaning of the word; and that solutions can be found through a culture of improved communications. RIHN aims to elucidate the complex and varied relationships linking humanity and nature. We are trying to synthesize new approaches beyond the existent, formal disciplines of natural, social, and human studies. This requires communication, which the new campus architecture enables, on a face-to-face basis.

Research rooms on the new campus are designed to provide a sense of openness. The design concept is to allow projects implemented to be loosely interconnected by them occurring in one large curved space 150 m in overall length. The facilities will facilitate external researchers as well as RIHN research staff to meet one another, since they are designed with the maximization of shared use in mind. In other words, this particular layout enables joint research while maintaining the independence of individual projects. On the basement floor, a cluster of fully-functioning laboratories has been designed with emphasis on convenience for shared use, as with the research rooms.

The RIHN House is a guest house. The assembly hall and a dining lounge located to the left of the house entrance serves as a meeting space for the RIHN staff as well as for guests.

The vision for the new campus is as a venue for activities implemented to foster a new discipline of studies.

Campus Facility Layout



Assembly Hall, RIHN House

Visiting researchers can stay in the RIHN House from a few days to an extended period of time. The house has communal space to nurture friendships between guests and RIHN staff.



RIHN Main Building

The exterior blends perfectly with the landscape.

2F: Administration Floor

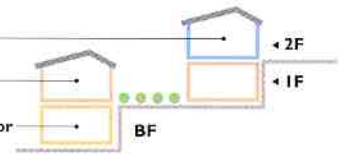
Entrance Hall
Exhibition Hall
Conference Hall
Administration Office
Seminar Rooms
Dining Hall

1F: Research Floor

Project Rooms
Research Rooms
Research Promotion Center
Library

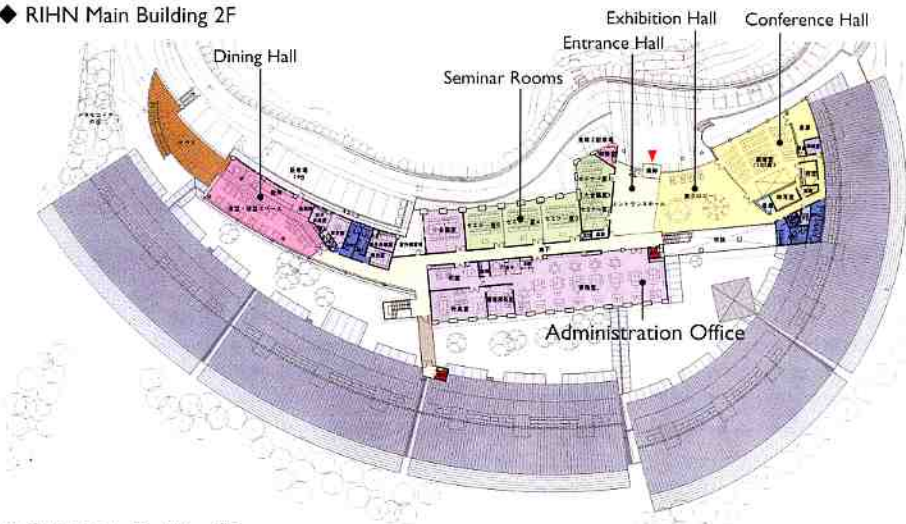
BF: Laboratory Floor

Experimental Laboratories
Library Stacks
Utilities



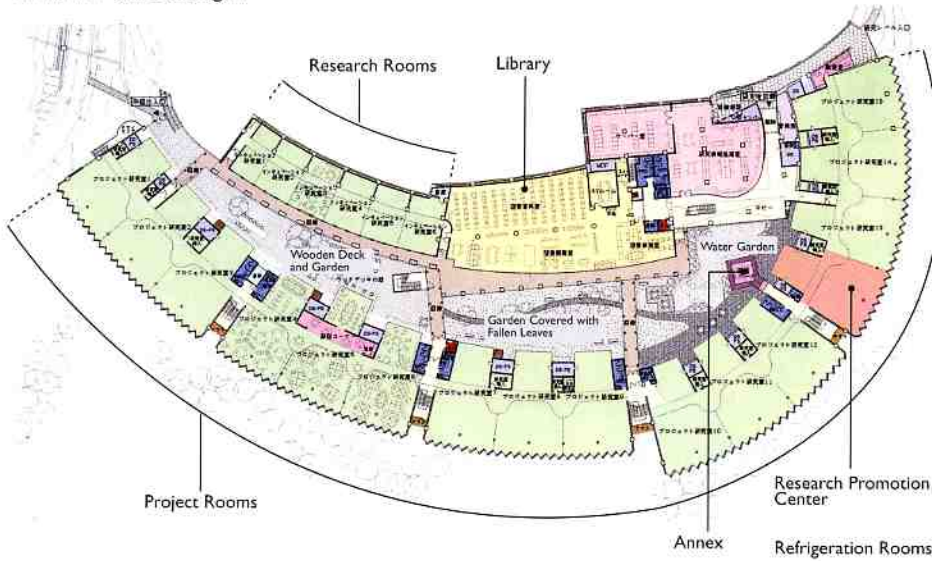
■ 総合研究棟平面図

◆ RIHN Main Building 2F



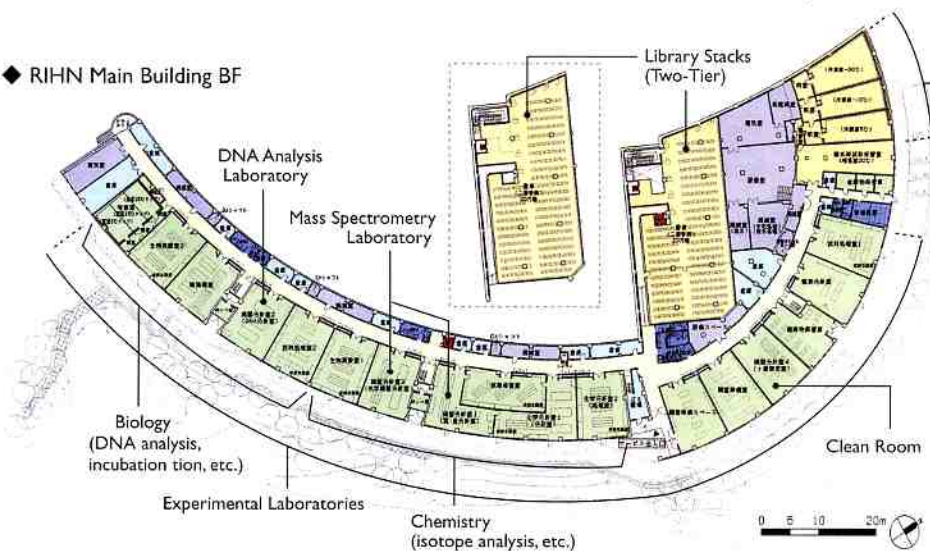
Entrance Hall and Exhibition Hall
Exhibitions are held to provide information about RIHN activities.

◆ RIHN Main Building 1F



Dining Hall
The RIHN staff can relax in this bright and open space, which has a wooden deck.

◆ RIHN Main Building BF



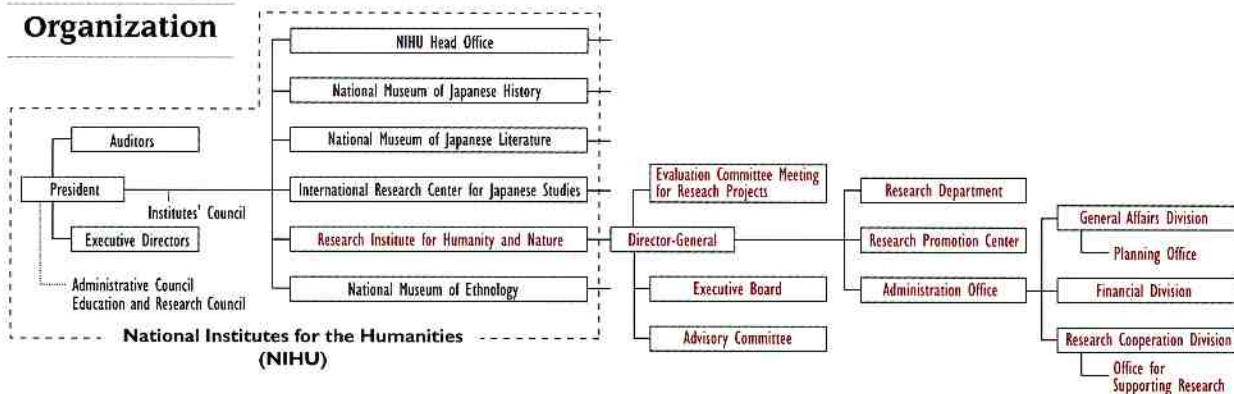
Experimental Laboratories
The laboratories are designed for the performance of various advanced experiments and are being furnished with equipment such as a state-of-the-art mass spectrometer (see photo) to support research projects.

History

Fiscal Year

- 1995** ● A proposal of Japan Science Council of Ministry of Education, Science, Sports and Culture: "On the promotion of the global environmental sciences" (April). "It is necessary to examine the founding of a central research organization that will promote integrated cooperative research toward the solution of global environmental problems."
- 1997** ● Investigation of the possible forms that the proposed research organization for the global environmental sciences may take. The Ministry of Education, Science, Sports and Culture established the Chosa-kyoryokusha-kaigi (Committee of Investigation Collaborators) for the establishment of a central research organization and made a budget for the concrete investigations.
 - The Ministerial Council for the global environmental conservation made an agreement on the "Provisional measure for global environmental conservation," in preparation for the UN General Assembly's Special Session on the Environment and Development (June). "The Council will investigate the means of possible adjustments necessary for the research organization to carry out integrated research in broad academic fields in addressing global environmental problems."
- 1998** ● Preparatory work for the establishment of the "Research Institute for the Global Environment Sciences" (tentative).
- 1999** ● The preparation Committee of the Institute compiled a report in March 2000 and proposed the foundation of the "Research Institute for the Global Environment Sciences" (tentative) for promoting integrated research projects, by amalgamating various broad disciplines from humanity and social sciences to natural sciences and using a network to be formed among workers in universities and research institutes within and outside the country.
- 2000** ● Investigation for the founding of the "Research Institute for Humanity and Nature" (tentative). Report "On the Fabric of the Research Institute for Humanity and Nature" (tentative) was completed in February.
- 2001** ● Foundation of the Research Institute for Humanity and Nature. Following the execution of the government ordinance (No.151 of the year 2001) amending part of the ordinance on the law concerning the establishment of national schools (Kokuritsu-gakko-settchi-ho-shikorei), the Research Institute for Humanity and Nature was founded (Director-General: Professor Toshitaka Hidaka). The Institute commenced its research activity on the campus of Kyoto University.
- 2002** ● The Institute moved to the site of the old Kasuga Primary School of Kyoto City.
- 2004** ● Inter-University Research Institution Corporation, National Institutes for the Humanities (NIHU) established on April 1st based on the National University Corporation Law. RIHN became one of the member institutes of the NIHU.
- 2005** ● The new facilities will be completed by December. The move is planned during February 11-19, 2005.
- 2006** ● RIHN New Facilities Inaugural Ceremony was held on May 26, 2006.

Organization



Budget

■ Expenditure (Fiscal Year 2005)

●Category	●Amount (Yen in thousands)
Personnel Expenses	591,623
Non-Personnel Expenses	2,185,770
Total	2,777,393

■ External Sources of Funding (Fiscal Year 2005)

●Category	●Amount (Yen in thousands)
Fund for Promotion of Academic and Industrial Collaboration	85,018
Grants-in-Aid for Scientific Research	96,430
Donation for Research	6,598

Board and Committees

(in alphabetical order)

Advisory Committee

■ Deliberates on important matters relative to personnel, planning, administration and operation of the institute.

FUJII, Yoshiyuki

— Vice-Director, National Institute of Polar Research, Research Organization of Information and Systems

FURUSAWA, IWAO

— President, Tottori University of Environmental Studies

IWAKASA, Yasunobu

— Professor, Institute of Natural and Environmental Technology, Kanazawa University

SHIRAHATA, Yozaburo

— Professor, Research Department, International Research Center for Japanese Studies, International Research Center for Japanese Studies, NIHU

TACHIMOTO, Narifumi

— Dean, College of International Studies, Chubu University

UEDA, Hiroshi

— Director, Hydrospheric Atmospheric Research Center, Nagoya University

YAMAMURA, NORIO

— Professor, Center for Ecological Research, Kyoto University

WASHIDA, Kiyokazu

— Vice-President, Osaka University

AKIMICHI, Tomoya

— Program Director, Research Institute for Humanity and Nature

FUKUSHIMA, Yoshihio

— Program Director, Research Institute for Humanity and Nature

HAYASAKA, Tadahiro

— Program Director, Research Institute for Humanity and Nature

NAKAWO, Masayoshi

— Program Director, Research Institute for Humanity and Nature

SAITO, Kiyooki

— Director, Research Promotion Center, Research Institute for Humanity and Nature

SATO, Yo-Ichiro

— Program Director, Research Institute for Humanity and Nature

Evaluation Committee for Resarch Projects

■ Undertakes evaluation of the feasibility studies and selects research projects to be forwarded to full-scale research; interim and post-evaluation of the research subjects under full-scale research.

EHLERS, Eckart

— Professor Emeritus, University of Bonn, Germany

FURUSAWA, IWAO

— President, Tottori University of Environmental Studies

HEINTZENBERG, Jost

— Director, Institute for Tropospheric Research, Germany

IKAWA-Smith, Fumiko

— Former Associate Vice Principal, McGill University, Canada

IWASA, Yoh

— Professor, Graduate School of Sciences, Kyushu University

IWASAKA, Yasunobu

— Professor, Institute of Natural and Environmental Technology, Kanazawa University

KIKKAWA, Jiro

— Professor Emeritus, The University of Queensland, Australia

LEGENRE, Louis

— CNRS Research Professor, Director, Director Villefranche Oceanography Laboratory, France

MURAKAMI, Yoichiro

— Professor, Division of Comparative Culture, International Christian University

NIWA, Masako

— Professor Emeritus, Former President, Nara Women's University

OHMURA, Atsumu

— Professor, Swiss Federal Institute of Technology, Switzerland

OTSUKA, Ryutaro

— President, National Institute for Environmental Studies

SAWA, Takamitsu

— Professor, Ritsumeikan University

SASAKI, Toshihiro

— Journalist, Senior Assistant to Environment, The Asahi Shimbun Company

SUN, Honglie

— Professor, Institute of Geographical Science and Natural Resources Research, Chinese Academy of Science, China P. R.

TANAKA, Koji

— Director, Center for Integrated Area Studies, Kyoto University

TANAKA, Masayuki

— Vice-President, Tohoku Institute of Technology

Executive Board

■ Discusses important matters of the institute.

AKIMICHI, Tomoya

— Program Director, Research Institute for Humanity and Nature

FUKUSHIMA, Yoshihiro

— Program Director, Research Institute for Humanity and Nature

HAYAKAWA, Tadahiro

— Program Director, Research Institute for Humanity and Nature

HIDAKA, Toshitaka

— Director-General, Research Institute for Humanity and Nature

NAKAWO, Masayoshi

— Program Director, Research Institute for Humanity and Nature

SAITO, Kiyooki

— Director, Research Promotion Center, Research Institute for Humanity and Nature

SATO, Yo-Ichiro

— Program Director, Research Institute for Humanity and Nature

FURUYA, Isamu

— Director, Administration Office, Research Institute for Humanity and Nature

RIHN organizes other committees, if necessary, for smooth operation.

Staff Members

DIRECTOR-GENERAL HIDAKA, Toshitaka

RESEARCH DEPARTMENT

Program Directors

AKIMICHI, Tomoya
FUKUSHIMA, Yoshihiro
HAYASAKA, Tadahiho
NAKAWO, Masayoshi
SATO, Yo-Ichiro

Professors Emeritus

NAKANISHI, Masami
WADA, Eitaro

Professors

AKIMICHI, Tomoya
FUKUSHIMA, Yoshihiro
HAYASAKA, Tadahiho
KAWABATA, Zen'ichiro
KINOSHITA, Tetuya
NAKANO, Takanori
NAKAWO, Masayoshi
OSADA, Toshiki
SATO, Yo-Ichiro
TAKASO, Tokushiro
WATANABE, Tsugihiko
YUMOTO, Takakazu

Visiting Professors

INOUE, Takashi
MOJI, Kazuhiko
SHIRAIISHI, Noriyuki
SUGIMOTO, Takashige

Visiting Associate Professors

HONDA, Yoshiaki
SATO, Tadashi

Invited Research Fellows

HARRISON, Rhett Daniel
SHINDE, Vasant Shivram

Associate Professors

ICHIKAWA, Masahiro
KANAE, Shinjiro
KUBOTA, Junpei
NONAKA, Kenichi
OKUMIYA, Kiyohito
SHIRAIWA, Takayuki
TANIGUCHI, Makoto
UCHIYAMA, Junzo
UMETSU, Chieko
YACHI, Shigeo
YOSHIOKA, Takahito
ZHENG, Yuejun

Assistant Professors

ENDO, Takahiro
KATO, Yuzo
KAWAMOTO, Kazuaki
SAEKI, Tazu
YATAGAI, Akiyo

Senior Researchers

FUKUNAGA, Kenji
HATADA, Aya
KATAGIRI, Shuichiro
KATSUYAMA, Masanori
KIMOTO, Yukitoshi
KUME, Takashi
MATSUI, Kazuaki
MIYAZAKI, Chihiro
MIYOSHI, Takao
MORI, Wakaha
MURATA, Fumie
ONISHI, Akio
ONISHI, Takeo
SATO, Yoshinobu
TAKAHASHI, Atsuhiko
TANNO, Ken-ichi
YAMASHITA, Satoshi

Researchers

HASHIMURA, Osamu
HAYASHI, Naoki
HYODO, Fujio

IGETA, Akitake
INOUE, Mitsuyuki
KASHIO, Tamaki
KURATA, Tadashi
MATSUKAWA, Taichi
MURAKAMI, Yumiko
NAGATANI, Chiyoko
NAKAGAWA, Masato
NOMURA, Naofumi
OGAWA, Akiko
OISHI, Taro
ONISHI, Hideyuki
SAITO, Haruo
SASAKI, Naoko
SEO, Akihiro
TAKEUCHI, Yayoi
TANAKA, Katsunori
TANAKA, Takuya
UEKI, Masaya
WATANABE, Mitsuko
YAMAGUCHI, Kensuke

Researchers (RR)

HOSHIKAWA, Keisuke

Researchers (Part-time)

MORIYA, Kazuki
NISHIMOTO, Futoshi
TERASHIMA, Motoki

Visiting Researchers

CHEN, Zhi
FUJIWARA, Yoichi
HOSONO, Takahiro
MARCHANT, Adam
MORISHITA, Akiko
NAGANO, Takanori
NAKAGAWA, Michiko
SATAKE, Shinsuke
SHIBAUCHI, Sachiko
TSUJINO, Ryo
YOSHIDA, Takehito

Research Associates

ANDO, Atsushi
HOSOI, Mayumi
IBUKI, Naomi
ISHITOBI, Tomotoshi
JAGO-ON, Karen Ann Bianet
KAWAGUCHI, Tamaki
KAWAMURA, Mika
LINDSTRÖM, Kati
MATSUMURA, Ayako
MIYAJIMA, Toshiaki
NAKATSUKASA, Michiko
OKITA, Hiroko
SASAKI, Noriko
SHIMIZU, Hiromi
TAKAHASHI, Keiko
TAKINO, Kayoko
YASUDA, Keiko

Clerks

AKEDO, Masako
FUKETA, Yoshimi
HASE, Noriko
ICHIDA, Ko-Ichiro
IWATA, Atsuko
KOBORI, Masako
KUDO, Aiko
NAGAOKA, Kumiko
SUGIYAMA, Chikako
TAIRA, Hiroyo
YOSHIOKA, Tomomi

Technicians

KAWAGUCHI, Hiromi
NISHI, Megumi
OGURA, Asayo
UENO, Aki

ADMINISTRATION OFFICE

Director FURUYA, Isamu

GENERAL AFFAIRS DIVISION

Head INOUE, Akio

Deputy Head

ISHII, Koji

• General Affairs Section

Head MURATA, Satoshi

Clerk OKITA, Masaki

Secretary

MURATA, Chiyo

• Personnel Section

Head MIZUTANI, Yukihiko

Chief NAKANISHI, Seiji

Clerks IKEDA, Yasuyo

IWASAKI, Rie

SETA, Yoriko

• Planning Office

Head ISHII, Koji

• Planning and Assessment Section

Head OOSUGI, Akira

• Information Section

Head ISHII, Koji

Clerks KANEMATSU, Takako

MATSUDA, Kaeko

Technician FUJITA, Masanobu

ACCOUNTING DIVISION

Head MORI, Takashi

Deputy Head

NISHIGAKI, Soji

• Budgeting Section

Head URASHIMA, Shinji

Clerks SHINTANI, Tomohiro

KIMURA, Minako

• Accounting Section

Head SATO, Fumiaki

Chief MATSUKI, Toshiyuki

Clerk TAMEISHI, Miki

Janitor ONISHI, Kazuma

• Facility and Managements Section

Head SHINO, Ayumi

RESEARCH COOPERATION DIVISION

Head MATSUDA, Mitsunori

Deputy Head

MAENO, Masayo

• Research Cooperation Section

Head MATSUURA, Yukihiko

Chief OSHIMA, Minako

Clerks HORIGOSHI, Kanako

SUZUKI, Rieko

• International Affairs Section

Head SUMIKURA, Mariko

• Office for Supporting Research

Head MAENO, Masayo

• Section for Supporting Research

Head TANAKA, Yoshiro

Clerks IMAI, Masatoshi

ISEMOTO, Takashi

ARAKI, Keiko

MORI, Masayo

OHMOTO, Emi

OMAE, Yoko

RESEARCH PROMOTION CENTER

Director, Professor

SAITO, Kiyooki

Concurrent Professor

NAKANO, Takanori

Associate Professors

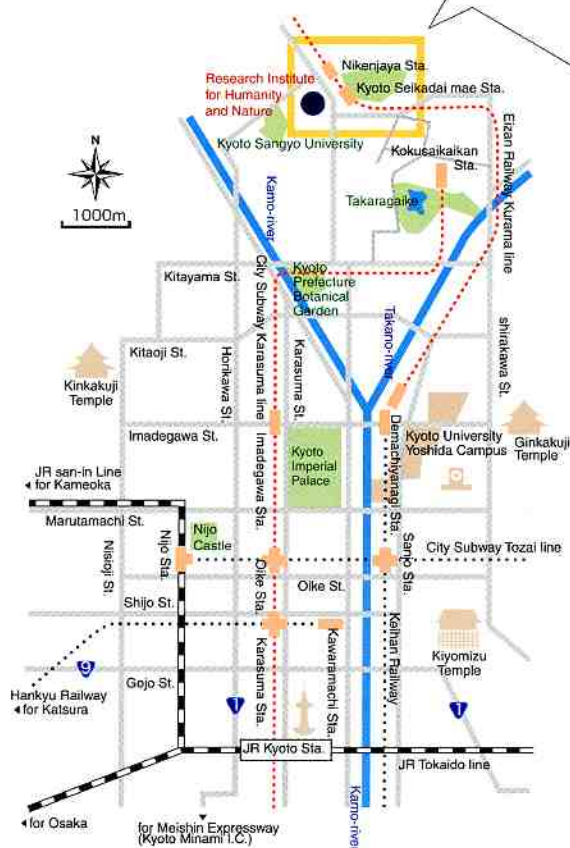
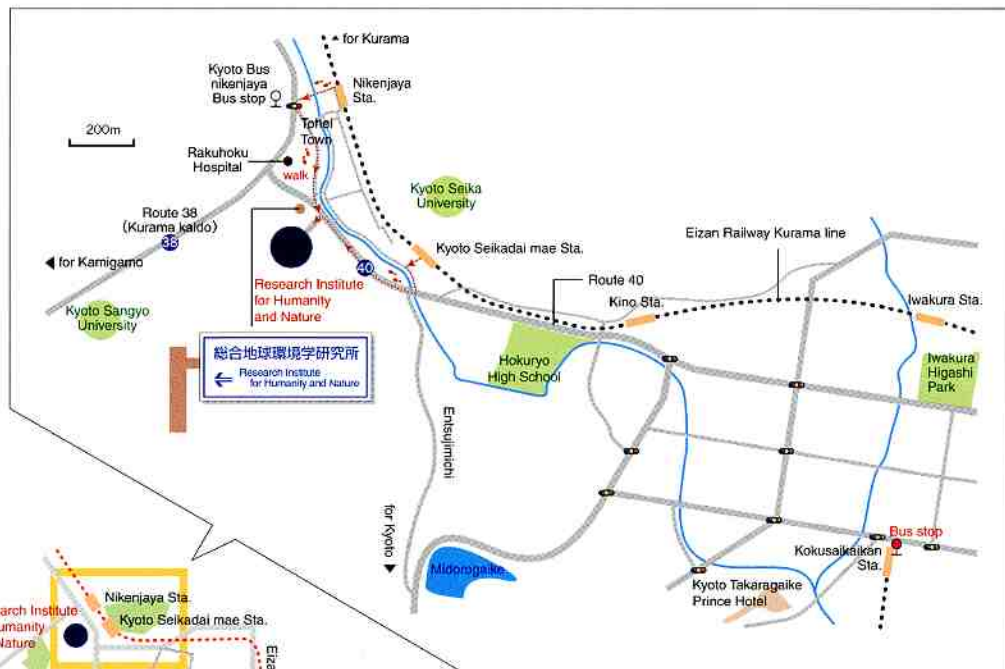
MOMOKI, Akiko
SEKINO, Tatsuki
YOSHIMURA, Mitsunori

Assistant Professor

KOHMATSU, Yukihiko

Technicians

IGI, Setsuko
KOBAYASHI, Toshinori



Access

By Car, Taxi

From Kyoto International Conference Hall, in Route 40, to Nikenjaya.

By City Subway

From Kyoto Station, Take subway Karasuma line to Kokuzaikaikan Station, and Transfer to the bus.

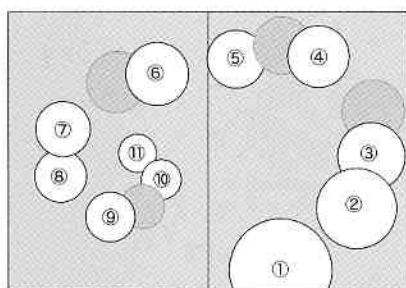
By Eizan Railway

From Demachiyana station, Take railway Kurama line to Nikenjaya Station and walk 15 minutes.

By Kyoto Bus

From Kyoto International Conference Hall, Take No.40 to Chikyuken-mae.

Notes of cover page photos



1. Heihe city in China as viewed from Blagoveshchensk in Russia. This city, located at the middle of Amur River, is developing rapidly and becoming a trading base between China and Russia.

2. Mango vendors at the open market of central Petauke in the Eastern Province of Zambia. The market is full of energetic women vendors.

3. In the Central Province of Zambia, farmers start sowing maize seeds in November when the rainy season arrives. When the first rain arrives, the whole family goes out into the field and helps with the sowing.

4. The Great Wall, a famous tourist site near Beijing, extends westwards, reached the northern edge of the Hexi Corridor in the Gansu Province. A highway crosses the ruins of the wall, which makes us think of the old days, when the nomads and the agrarians have had a long fight in history.

5. Upper-air meteorological observation at Padang, West Sumatra, Indonesia. This is important for El Niño forecasting to develop an understanding of tropical meteorology.

6. The local residents fish in the drainage canal in Sangjiang plain, China. There the immense swamp land has expanded at the junction of the Ussuri River, Songhuajiang River and Amur River. However after the large-scale paddy field development in approximately

the 20-year-period from 1980 to 2000, the swamp area has been reduced by half.

7. A field trip to a glacier in Tien Shan Mountains of Kirgizstan. Ice cores from glaciers provide precious information about climate change. All the equipment is carried by horses, which is the only way to reach mountain glaciers.

8. Sampling of pore water from seabed sediment is done to evaluate material transports to the ocean in the Philippines.

9. Loess Plateau is located to the north off Xi'an city, Shanxi, China. The top of the plateau is sufficiently flat that people can engage in agriculture, while the gullies are so deep and steep that they act as significant sources of the Yellow river in the Loess.

10. There used to be small rivers in this area 70 years ago. Shells of amber snails (dated to 5000 B.P.) were also found here. These facts indicate that the climate of Taklamakan Desert was much wetter in the past than now.

11. Interviews in the lower reaches of Ili river; People who live on irrigated farmlands developed in the delta of the Ili River of Kazakhstan, have been suffering not only from land degradation caused by salinization, but also due to the economic slump caused by the transition from a planned economy to market economy.



**RESEARCH INSTITUTE FOR
HUMANITY AND NATURE**

457-4 Motoyama, Kamigamo, Kita-ku, Kyoto, 603-8047, JAPAN
Tel.+81-75-707-2100 Fax.+81-75-707-2106
<http://www.chikyu.ac.jp>
e-mail: kokusai@chikyu.ac.jp