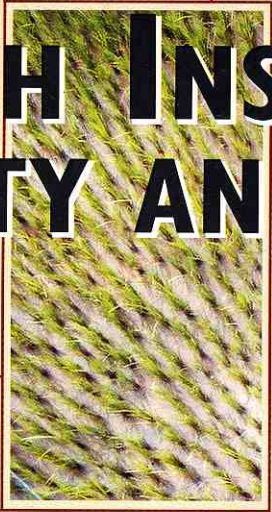
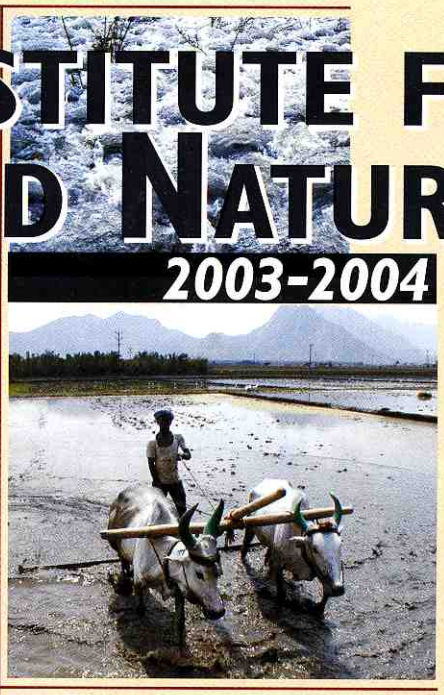
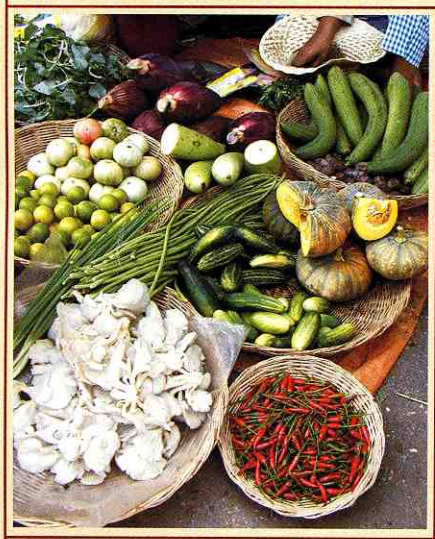







RESEARCH INSTITUTE FOR HUMANITY AND NATURE

2003-2004

Inter-University Research Institute
Ministry of Education, Culture, Sports, Science, and Technology
Japan

CONTENTS

Message from Director-General

Three years have passed since the establishment of RIHN. This innovative research institute has started to present its research results as was expected.

It is a basic understanding that the cause of the so-called global environmental problems lie 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 fulfil its mission to endevour to understand the manifold relationship between the 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. These trials and realization are truly significant challenge for the world and Japan.

HIDAKA, Toshitaka
Director-General

Mission of RIHN

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 that innovates 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 in assessing global environmental problems is that many of them have appeared across the vast regions of the earth in most unpredictable manner. There are a number of problems facing us caused by factors seemingly far removed from reality both in time and space. Moreover, recent studies show that not only natural-scientific but also economic, politic, historical, and philosophical, and other factors in the broadest sense are exerting strong influences.

The complexity of this work means that these multi-faced problems cannot be solved by conventional thinking. In fact, the measures hitherto taken are based on the idea of controlling nature, 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 man interacts with nature, an intricately complex matter. It must be hard work. However this is our primary mission.

Secondly, from such perspective we need to consider how we can sustain the global environment that has all the future possibilities 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 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.

Roles and Functions of RIHN

Integration

In recent years many studies aimed at solving global environmental problems have been conducted 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 of 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 meeting the requirements of the "project-based format."

Globalization

It is essential to build a research organization with international vision in order to take 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

promote international research projects, 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.

Human Culture Research Organization (tentative title)

It is planned that all national Inter-University Research Institutes will be privatized next fiscal year, 2004. RIHN will then become one of the member institutes of a new "Human Culture Research Organization"(tentative title) 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 intends to contribute to the solution of global environmental issues within this group, and construct an academic concept on which to base human culture.

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, the project will proceed to the full-scale study of about 5 years. In this process the evaluation of the project is given by the Evaluation Committee and approval by the Advisory Committee.

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)

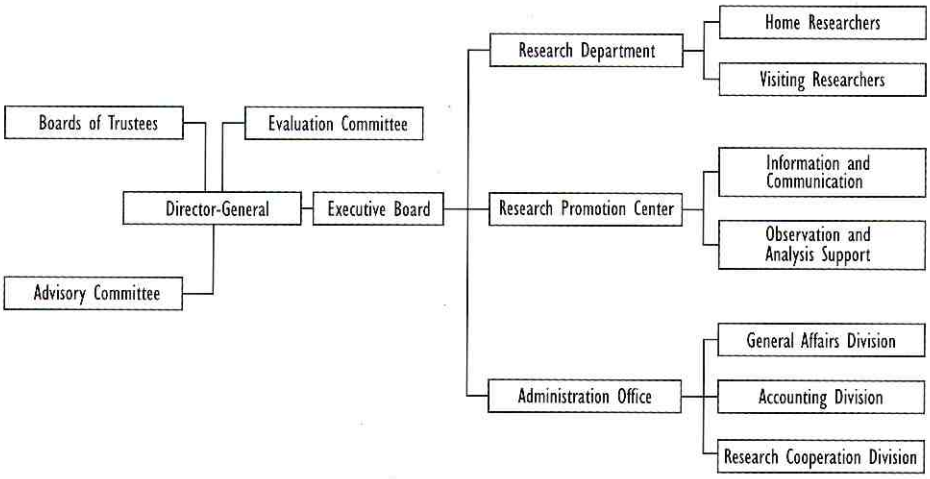
1999 • The preparation Committee of the Institute compiled a report in March 2000 and proposed the foundation of the "Research Institute for the Global Environment Sciences" (tentative) for promoting integrated research projects, by amalgamating various broad disciplines from humanity and social sciences 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.

Organization



Budget

Expenditures (Fiscal Year 2002)

Category	Amount (Yen in thousands)
Personnel Expenses	383,415
Non-Personnel Expenses	972,181
Total	1,355,596

External Sources of Funding (Fiscal Year 2002)

Category	Amount (Yen in thousands)
Fund for Promotion of Academic and Industrial Collaboration	57,460
Grants-in-Aid for Scientific Research	53,988

Boards and Committees

(in alphabetical order)

Board of Trustees

Gives advice to the Director-General for important matters relative to planning, administration and operation of the institute.

FURUSAWA, Iwao
— Professor Emeritus, Kyoto University

GOHSHI, Yohichi
— President, National Institute for Environmental Studies

HARA, Hiroko
— Professor, The University of the Air

ISHIGE, Naomichi
— Professor Emeritus, National Museum of Ethnology

KATO, Naotake
— President, Tottori University of Environmental Studies

KIKKAWA, Jiro
— Professor Emeritus, The University of Queensland, Australia

MORISHIMA, Akio
— Chair of the Board of Directors, Institute for Global Environmental Strategies

NAGAO, Makoto
— President, Kyoto University

NAGATA, Toyoomi
— Chancellor and President, Ritsumeikan University

NAKABO, Kohei
— Lawyer

NAKAMURA, Mutsuo
— President, Hokkaido University

NISHIKAWA, Koji
— President, The University of Shiga Prefecture

NIWA, Masako
— Professor Emeritus, Nara Women's University

SHIBATA, Minoru
— Vice-Chairman, Kansai Economic Federation (Chairman, Board of Directors, Toyobo Co., Ltd.)

SUZUKI, Motoyuki
— Professor, The University of the Air

TANAKA, Masayuki
— Professor, Tohoku Institute of Technology

TORII, Hiroyuki
— Professor, Research Laboratory for Nuclear Reaction,Tokyo Institute of Technology

WATANABE, Okitsugu
— Director-General, National Institute of Polar Research

YAMAORI, Tetsuo
— Director-General, International Research Center for Japanese Studies

Advisory Committee

At the request of the Director-General, deliberates on important matters including personnel affairs, budgets, and research projects.

AMANO, Akihiro
— Center Director, Kansai Research Center, Institute for Global Environmental Strategies

FUJII, Yoshiyuki
— Director, Arctic Environment Research Center, National Institute of Polar Research

KONO, Michitaka
— Dean, Graduate School of Frontier Sciences, University of Tokyo

MORITA, Tsuneyuki
— Director, Social and Environmental Systems Division, National Institute for Environmental Studies

NAKAMAKI, Hirochika
— Professor, Department of Cultural Research National Museum of Ethnology

NAKAMURA, Kenji
— Director, Hydrospheric-Atmospheric Research Center, Nagoya University

SHIRAHATA, Yozaburo
— Senior Research Coordinator, Research Department, International Research Center for Japanese Studies

TSUCHIYA, Masaharu
— Dean, School of Environmental Science, The University of Shiga Prefecture

WAKATSUCHI, Masaaki
— Professor, Institute of Low Temparature Science, Hokkaido University

YAMAMURA, Norio
— Professor, Center for Ecological Research, Kyoto University

AKIMICHI, Tomoya
— Professor, Research Institute for Humanity and Nature

FUKUSHIMA, Yoshihiro
— Professor, Research Institute for Humanity and Nature

HAYASAKA, Tadahiro
— Professor, Research Institute for Humanity and Nature

HIDAKA, Toshitaka
— Director-General, Research Institute for Humanity and Nature

NAKASHIZUKA, Tohru
— Professor, Research Institute for Humanity and Nature

NAKAWO, Masayoshi
— Professor, Research Institute for Humanity and Nature

WADA, Eitaro
— Professor, Research Institute for Humanity and Nature

Evaluation Committee

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

APPANAH, Simmathiri
— Senior Programme Advisor, Forestry Research Support Programme for Asia and the Pacific(FAO), Bangkok, Thailand

EHLERS, Eckart
— Professor, University of Bonn, Germany

HEINTZENBERG, Jost
— Director, Institute for Tropospheric Research, Germany

ICHIKAWA, Atsunobu
— Professor Emeritus, Tokyo Institute of Technology

IWASA, Yo
— Professor, Graduate School of Sciences, Kyushu University

KIKKAWA, Jiro
— Professor Emeritus, The University of Queensland, Australia

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

MORISHIMA, Akio
— Chair of the Board of Directors, Institue for Global Environmental Strategies

MURAKAMI, Yoichiro
— Professor, International Christian University

NAKANISHI, Junko
— Director, Research Center for Chemical Risk Management, National Institute of Advanced Industrial Science and Technology

SASAKI, Satohiko
— Dean, College of Bioresource Sciences, Nihon University

SAWA, Takamitsu
— Director, Institute of Economic Research, Kyoto University

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

TACHIMOTO, Narifumi
— Dean, College of International Studies, Chubu University

WATANABE, Okitsugu
— Director-General, National Institute of Polar Research

YASUNARI, Tetsuzo
— Professor, Hydrospheric-Atmospheric Research Center, Nagoya University

Executive Board

Discusses important matters in the Institute's activities

AKIMICHI, Tomoya
— Program Director, Research Institute for Humanity and Nature

FUKUSHIMA, Yoshihiro
— Program Director, Research Institute for Humanity and Nature

HAYASAKA, Tadahiro
— Program Director, Research Institute for Humanity and Nature Director, Research Promotion Center, RIHN

HIDAKA, Toshitaka
— Director-General, Research Institute for Humanity and Nature

NAKAWO, Masayoshi
— Program Director, Research Institute for Humanity and Nature

WADA, Eitaro
— Program Director, Research Institute for Humanity and Nature

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

RIHN organizes other committees if necessary, for smooth operation.

Staff Members (July 2003)

DIRECTOR-GENERAL
HIDAKA, Toshitaka

RESEARCH DEPARTMENT

Program Directors
AKIMICHI, Tomoya
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NAKAWO, Masayoshi
WADA, Eitaro

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NAKANISHI, Masami

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FUKUSHIMA, Yoshihiro
HAYASAKA, Tadahiro
NAKASHIZUKA, Tohru
NAKAWO, Masayoshi
TAKASO, Tokushiro
WADA, Eitaro
WATANABE, Tsugihiro
YUMOTO, Takakazu

Visiting Professors
BEN-ASHER, Jiftah
(Mar. 16 - Sep. 15, 2003)
Professor, Institute of Desert Research, Ben Gurion University, Israel
HARA, Toshihiko
Professor, The Institute of Low Temperature Science, Hokkaido University
HAN, Jiangkang
(Oct. 1, 2002 - Apr. 30, 2003)
Professor, Hunan Normal University, China
INOUE, Takashi
Executive Producer, NHK Special TV Program Center
VON FALKENHAUSEN, Lothar
(Jun. 11- Sep. 10, 2003)
Professor, Department of Art History, UCLA, U.S.A.

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KUBOTA, Jumpei
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NONAKA, Kenichi
OKI, Taikan
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UMETSU, Chieko
YACHI, Shigeo
YOSHIOKA, Takahito

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TAYASU, Ichiro
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USHIMARU, Atsushi

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HYODO, Fujio
MAILISHA
MATSUOKA, Kenichi
ONISHI, Hideyuki

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KAWAMURA, Mika
KITAMURA, Ayako
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IMAMURA, Akio
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NAKAGAWA, Michiko
UEDA, Atsushi

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Director
HAYASAKA, Tadahiro

Associate Professors
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SEKINO, Tatsuki
YOSHIMURA, Mitsunori

Assistant Professor
KOHMATSU, Yukihiro

Technical Assistants
IGI, Setsuko
TAKI, Chiharu
TAKAHARA, Teruhiko
TANAHASHI, Toshiyuki

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Deputy Head NAKANISHI, Masahiko

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Clerk ENOMOTO, Isao

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NINOMIYA, Mayu
HOSOGUCHI, Miyo
MORIKAWA, Akiko

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Head OKABE, Mamoru
Chief YAMADA, Tetsuya
Clerical Assistants
YAMAGUCHI, Maiko
YUMEN, Yoshie
Janitor ONISHI, Kazuma

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Head OOE, Nobuhiro

RESEARCH COOPERATION DIVISION
Head OKAMOTO, Yukitsugu
Deputy Head KOSEKI, Kenichi

• **Research Cooperation Section**
Head YOSHIDA, Ren
Clerk NAKAGAWA, Makiko
Clerical Assistants
SODEOKA, Sachiko
YANAGIDA, Kanako

• **Team Research Section**
Head OKAZAKI, Akihiko
Clerical Assistants
KONISHI, Shuko
HIROSE, Kumi
Technical Assistants
KANEMATSU, Takako
SUEZAWA, Reiko

• **International Affairs Section**
Head SUMIKURA, Mariko
Clerk KAJI, Sachiko

Partner Organizations for Fluid Association (Fiscal Year 2003)

- Center for Ecological Research, Kyoto University
- Hydrospheric-Atmospheric Research Center, Nagoya University
- Arid Land Research Center, Tottori University
- Institute of Industrial Sciences, University of Tokyo
- National Museum of Ethnology
- Graduate School of Science, Tohoku University
- Institute of Low Temperature Science, Hokkaido University
- Tropical Biosphere Research Center, University of Ryukyus

Research Axes and Research Projects

Each project will be organized through the period of incubation study (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, the project will proceed to the full-scale study of about 5 years. In this process the evaluation of the project is given by the Evaluation Committee and approval by the Advisory Committee.

AXIS 1 Environmental Change Impact Assessment

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

- 1-1 Impact of Climate Changes on Agricultural Production System in the Arid Areas
- 1-2 Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on the Environment

AXIS 2 Human Activity Impact Assessment

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

- 2-1 Emissions of Greenhouse Gases and Aerosols, and Human Activities
- 2-2 Sustainability and Biodiversity Assessment on Forest Utilization Options
- 2-3FS Human Activities in Northeastern Asia and Their Impact on the Biological Productivity in North Pacific Ocean

AXIS 3 Spatial Scale

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

- 3-1 Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed
- 3-2 Interactions between Natural Environment and Human Social Systems in Subtropical Islands

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.

- 4-1 Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes
- 4-2 A Trans-Disciplinary Study on the Regional Eco-History in Tropical Monsoon Asia

AXIS 5 Conceptual Framework for Global Environmental Issues

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

- 5-1 Global Water Cycle Variations and the Current World Water Resources Issues and Their Perspectives
- 5-2 Interactions between the Environmental Quality of a Watershed and the Environmental Consciousness: With Reference to Environmental Changes Caused by the Human Use of Land and Water Resources
- 5-3IS Reconstructing the Concept of Symbiosis: A Historical Approach to the Cases in the Far Eastern Archipelago and Surrounding Areas

Project

1-1

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

What impacts will the global warming or climate changes have on the agricultural production system in arid areas? How can the system adapt to the changes and what measures should be applied to sustain productivity? This research project aims at identifying the direction and dimension of potential impacts and adaptations in the agricultural production system, based on the projection of future regional climate changes, in the east coast of the Mediterranean Sea as the case study region. Through this approach, the basic structure and problems of the agricultural production system are to be elucidated.

Research Axis
Environmental Change Impact Assessment

Project Leader
WATANABE, Tsugihiro — RIHN

Core Members
FUJINAWA, Katsuyuki — Faculty of Engineering, Shinshu University
KIMURA, Fujio — Terrestrial Environment Research Center, University of Tsukuba
KOJIRI, Toshiharu — Disaster Prevention Research Institute, Kyoto University
TAMAI, Shigenobu — Arid Land Research Center, Tottori University
TSUJII, Hiroshi — Graduate School of Agriculture, Kyoto University
UMETSU, Chieko — RIHN
YANO, Tomohisa — Arid Land Research Center, Tottori University
YATAGAI, Akiyo — RIHN

Problems and Challenges for Agriculture in Arid Areas

As the world population grows and 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, development of agriculture and irrigation has resulted in land degradation and desertification, and has also caused serious problems in the hydrological regime with irretrievable changes in the regional hydrological cycle. The changes in agricultural land and water management practices pose serious threats to the sustainability of agriculture itself.

Moreover, future global climate change can present another challenge or constraint to the agricultural production system by bringing about substantial changes in temperature, rainfall, and evapotranspiration, which will, in turn, influence climatological and hydrological conditions in arid region. What measures are required to sustain productivity in such an environment?

Objectives of the Project

Agricultural production is intricately related to its surrounding natural elements and phenomena, such as soils, crops, and fauna and flora as well as meteorological, hydrological, geographical and geological conditions of the region. Any change in these conditions,

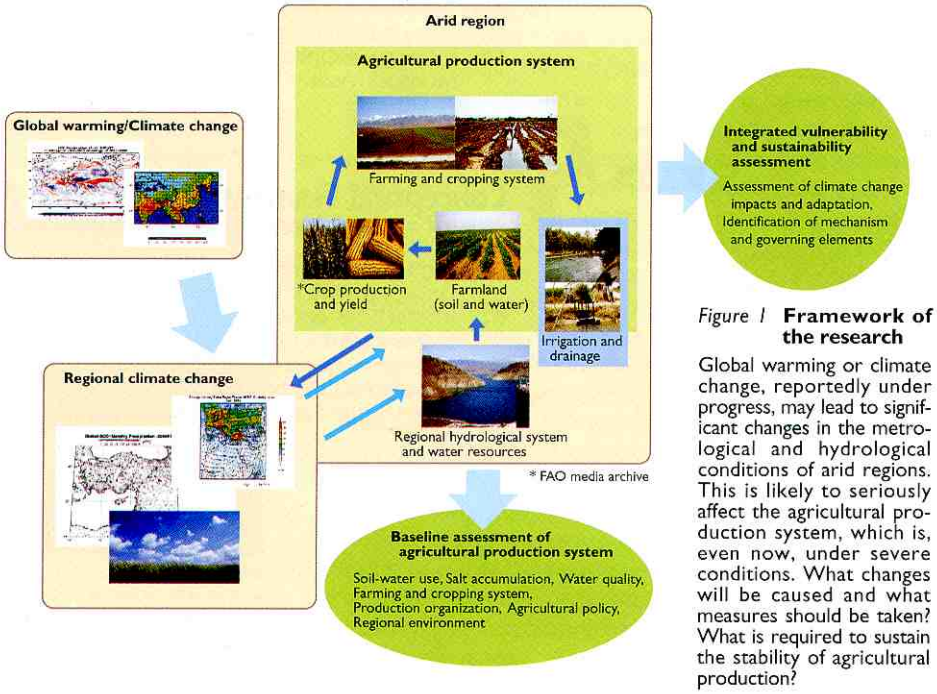


Figure 1 **Framework of the research**

Global warming or climate change, reportedly under progress, may lead to significant changes in the metrological and hydrological conditions of arid regions. This is likely to seriously affect the agricultural production system, which is, even now, under severe conditions. What changes will be caused and what measures should be taken? What is required to sustain the stability of agricultural production?

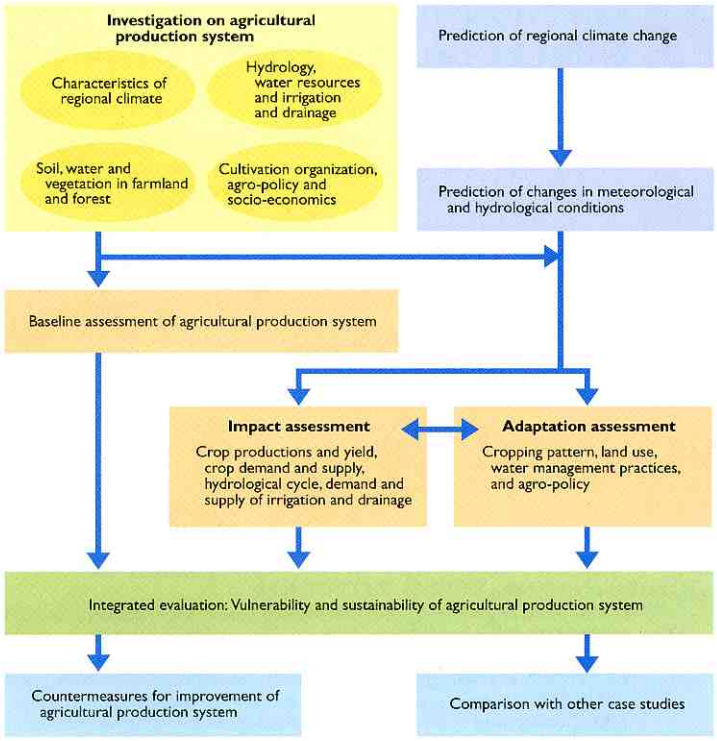


Figure 2 **Research procedure**
After the regional agricultural production system is analyzed, the impacts of regional climate change and its adaptability are assessed for integrated evaluation of the vulnerability and sustainability of the agricultural production system. This approach can comprehensively examine the relation between changes in nature and human activities.

which may result from global climate change, inevitably affects the dynamics of the agricultural ecosystem. This aspect has been the focal point of conventional assessment of climate change impacts on agriculture. However, agriculture is basically a human activity. To cope with climate and other subsequent changes in natural conditions, humans have adapted to the new environment, or taken appropriate measures accordingly. This reaction is a fundamental characteristic of agriculture. Then now, is the conventional 'wisdom' of agriculture adequate enough to overcome the future global climate change?

Transcending the traditional framework of studies, this 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.

Study Areas and Methods

The research of this project is being implemented in the arid and semi-arid areas in the east coast of the Mediterranean Sea, including the Seyhan River basin in Turkey as a main case study area, where firstly we carry out a comprehensive assessment of basic structure of agricultural production system with special reference to land and water management. Then, it attempts to predict and evaluate the impacts of future climate change and the regional adaptability, and finally through these analyses, the correlations between changes in nature and human activities are to be examined in an integrated manner.

In this process, regional climate change prediction with higher resolution is critical to precise impact assessment. Furthermore, factors such as reactions from farmers, changes in the regional land and water management methods, and the effect of the regional policy on food in relation to the global food supply will be taken into account. An integrated assessment of vulnerability of the system will be attempted to identify essential interrelations between various factors and critical values of the factors, which will determine the fate of the system.

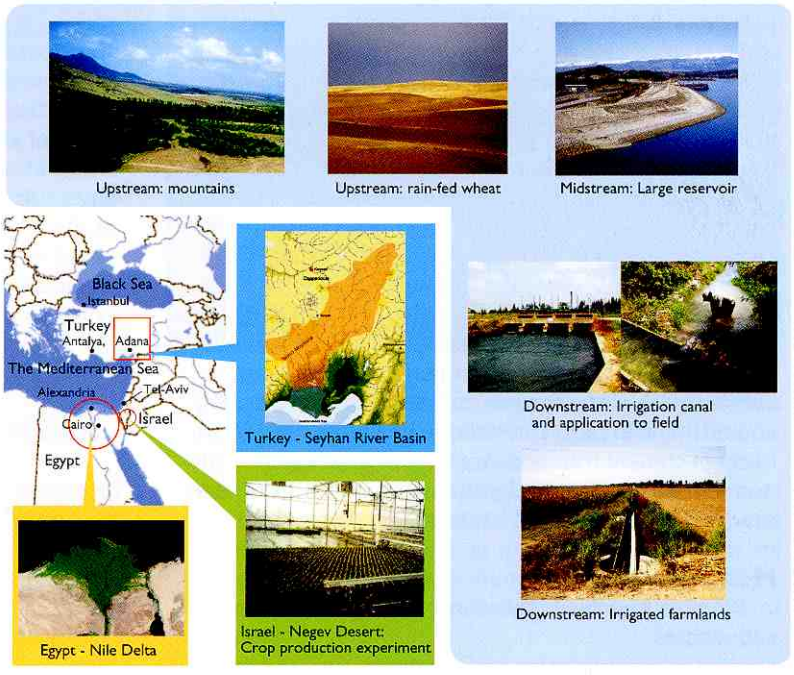


Figure 3 **Study areas**
The study area of this project is mainly the Seyhan River basin in the Mediterranean region of Turkey, and can be expanded to the Nile Delta of Egypt. The research results from Israel are introduced as reference.

Project

1-2

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

The recent crisis occurred in the Yellow River basin is complicated because natural climate fluctuation, global warming and change of land utilization may affect one another. We try to evaluate how land use changes affect to the water cycle over the Yellow River drainage basin and what kinds of effect may occur by the decreases of groundwater storage in the downstream to marine circumstance, through five years research. This study may be at the forefront of the ecological studies in the coastal zones where many people live, and we may be able to evaluate the effects on the marine products in the Sea of Japan through Bohai Sea and Yellow Sea.

Research Axis ●
Environmental Change Impact Assessment

Project Leader ● **FUKUSHIMA, Yoshihiro** — RIHN

Core Members ●
CHEN, Jianyao — RIHN
GAO, Huiwang — College of Environmental Science and Engineering, Ocean University of China
HAYASHI, Mitsuru — Faculty of Maritime Sciences, Kobe University
HIGUCHI, Atsushi — Hydrospheric-Atmospheric Research Center, Nagoya University
HIYAMA, Tetsuya — Hydrospheric-Atmospheric Research Center, Nagoya University
IMURA, Hidefumi — Graduate School for Environment, Nagoya University
LIU, Changming — Institute of Geographical Sciences and Natural Resources Research, CAS, China
ONODERA, Sin-ichi — Faculty of Integrated Arts and Sciences, Hiroshima University
SHINODA, Taro — Hydrospheric-Atmospheric Research Center, Nagoya University
TANIGUCHI, Makoto — RIHN
XIA, Jun — Institute of Geographical Sciences and Natural Resources Research, CAS, China
YANAGI, Tetsuo — Research Institute for Applied Mechanics, Kyushu University

Background and Objectives

Since 1972, the frequency which river water in the Yellow River does not reach to the Bohai Bay 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 decrease of groundwater level and increase of water pollution. Chinese Academy of Sciences is now carrying out a synthetic national project from 1999 to 2003. According to the increase in population and food demand on the earth, such a case seems to increase and to spread much more in the near future worldwide. How we can recognize and resolve this problem is the most important and urgent for human being. The recent crisis occurred in the Yellow River basin is complicated because natural climate fluctuation, global warming and change of land utilization may affect one another. This research aims at enhanced knowledge on planning countermeasures in the Yellow River drainage basin through the contribution from specific research fields under the international collaboration with Chinese Academy of Sciences and IGBP/LOICZ community.

Methods

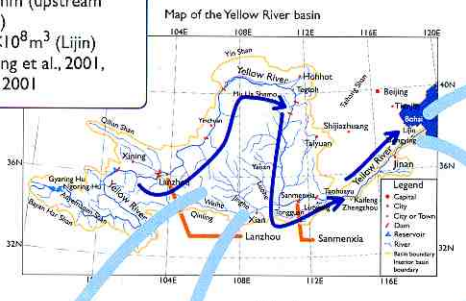
We plan to achieve this study through the following sub-studies:

(1) Field observations and analyses on land-atmo phere 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 Bay, and then,
(5) Development of an integrated model to evaluate the effects of land use change on the water circulation in the Yellow River basin.

Expected Results

We wish to get how land use change affect to water cycle over the Yellow River drainage basin and what kinds of effects may occur by the decrease of groundwater storage in the downstream to marine circumstance through five years research. This study may be at the forefront of the ecological studies in the coastal zones where many people live, and we may be able to evaluate the effects on the marine products in the Sea of Japan through Bohai Sea and Yellow Sea.

Basin area: 752,443km^2
River length: 5,464km
Precipitation: 452mm (upstream from Zhengzhou)
Discharge: 581.6×10^{8}m^3 (Lijin)
Modified from Wang et al., 2001, and Zhang et al., 2001

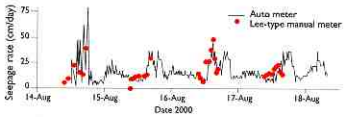


Study area: Yellow River Basin

Ecological model of the Bohai Sea

← Installation of automated seepage meters

↓ Seepage rates measured by an automated seepage meter



Interaction between groundwater, seawater and river water

Northwest China

Scarcity of water resources

Increasing water demand

Measures

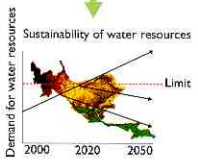
Water: a finite resource

Economic and social development

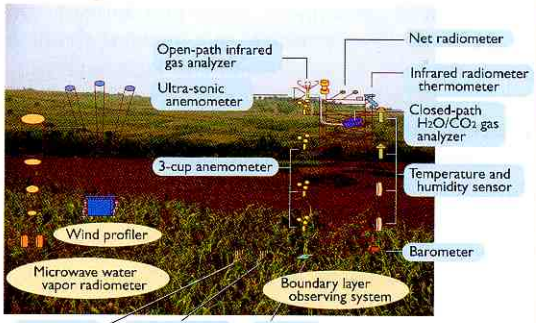
Agriculture

Industry

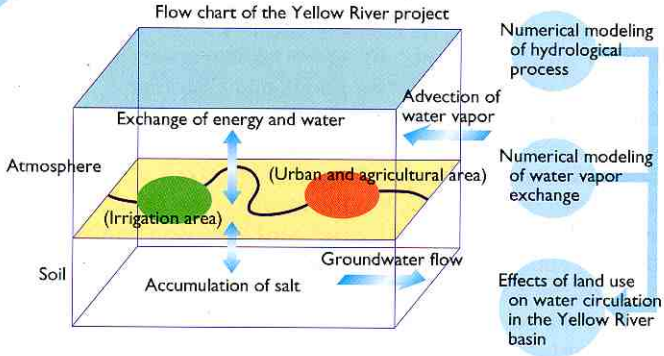
Urban life



Socio-economical model for sustainable development



Land-Atmosphere interactions



Synthesis by development of hydrological model

Project

2-1

Emissions of Greenhouse Gases and Aerosols, and Human Activities

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 is studied by socioeconomic analysts in collaboration with atmospheric scientists. This research project consists of a macro-analysis of economy, development of emission inventory, analysis of atmospheric transport using models and satellite data, and ground-based observation around Japan and China.

Research Axis
Human Activity Impact Assessment

Project Leader
HAYASAKA, Tadahiro — RIHN

Core Members
HAYASHIDA, Sachiko — Faculty of Science, Nara Women's University
IWAMI, Toru — Grasuate School of Economics, University of Tokyo
KAWAMOTO, Kazuaki — RIHN
NAKAJIMA, Teruyuki — Center for Climate System Research, University of Tokyo
NAKAZAWA, Takakiyo — Graduate School of Science, Tohoku University
SAEKI, Tazu — RIHN
SHI Guangyu — Institute of Atmospheric Physics, CAS, China

Background and Objectives

Most of human activities have been based essentially on each individual climate, culture, and social economic system, but recently they are being changed drastically by the influences of the globalization and developing market of economy and global-scale climate change. The human activities affected by various global phenomena give rise to various environmental issues and emissions of greenhouse gases and aerosols, which again bring about many problems in large area or over the world. In this research project, the atmospheric constituent is studied, taking account of global warming issues. Therefore, it is not a mere local air pollution study, but the study on the relationship between human activities and climate change through emissions of greenhouse gases and aerosols.

With the background described above, 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.

Expected Results

It will be understood how human activities in Asian region under the globalization affect not only the local change but also the global change. The synthesis of all the results are expected to show how the globalization affects human activities in a region, and how regional scale human activities are related to the global change of the atmosphere. It is helpful for developing the academic bases for policy making and future plan in enterprises.

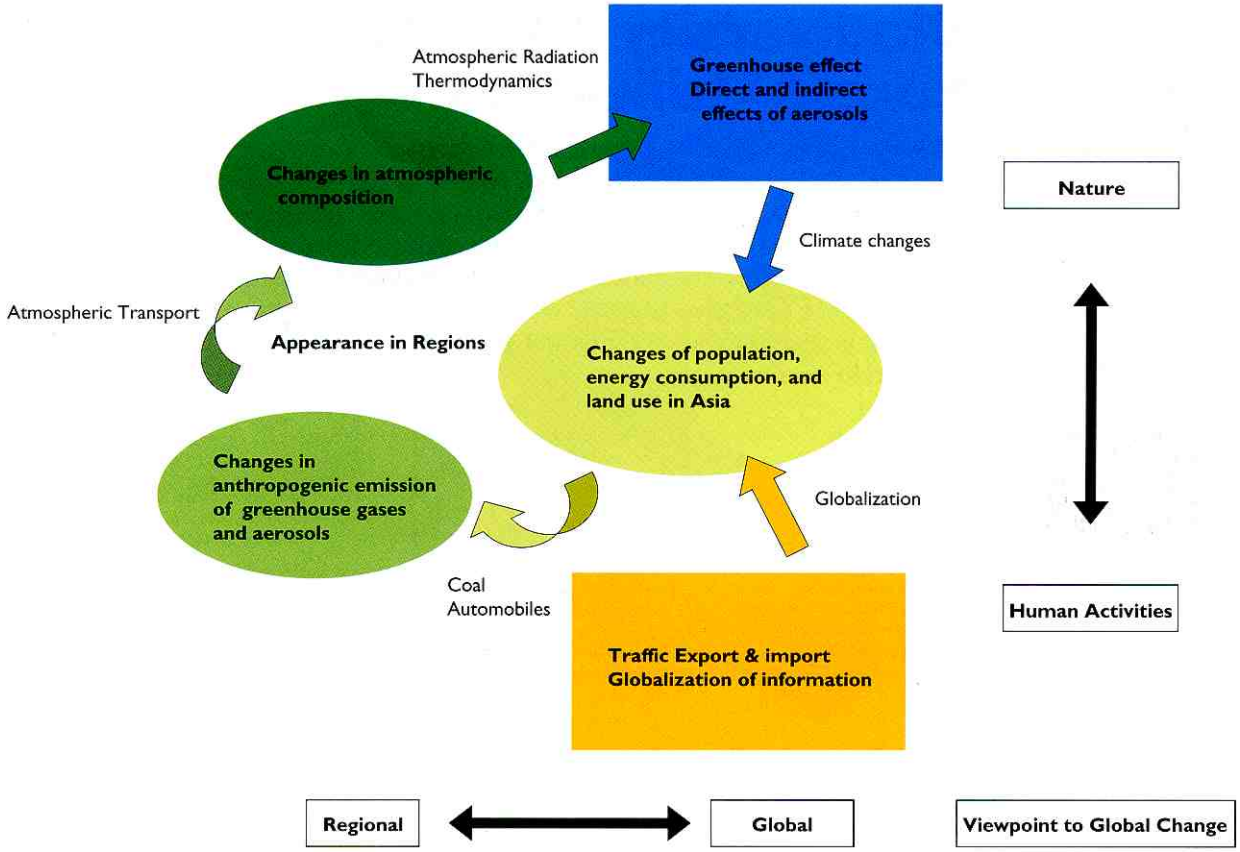


Figure 1 **Viewpoint to global change in this study**

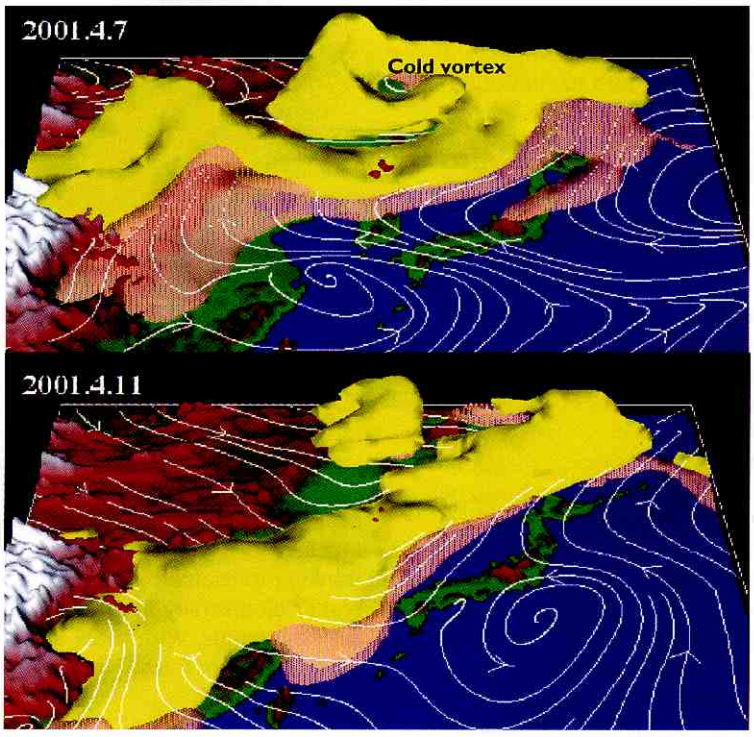


Figure 2 **Outflow of Yellow Sand dust and sulfate aerosols calculated with atmospheric transport model. (Prof. I. Uno, Kyushu University)**

Project

2-2

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 economical aspects to develop a sustainable utilization system.

Research Axis
Human Activity Impact Assessment

Project Leader
NAKASHIZUKA, Tohru — RIHN

Core Members
AIBA, Shin-ichiro — Faculty of Science, Kagoshima University
KITAYAMA, Kanehiro — Center for Ecological Research, Kyoto University
KOHYAMA, Takashi — Graduate School of Environmental Earth Science, Hokkaido University
NIIYAMA, Kaoru — Forestry and Forest Products Research Institute
SATO, Jin — Graduate School of Frontier Science, University of Tokyo

Background and Objectives

Biodiversity in terrestrial ecosystems has been lost mainly by decrease and deterioration of forest ecosystems, especially tropical rainforest ecosystems. Many natural forests have been converted into plantation for timber production or for cultivation fields from ancient times. Some traditional systems are said to be sustainable in long history of utilization. However, the recent over-use of forests caused extremely rapid forest degradation and loss in forested area without waiting for the scientific evaluation of their sustainability and ecological services. To develop the sustainable forest utilization systems, with which high biodiversity should be kept, is an urgent target to be studied.

In this project, we try to elucidate the social and economic forces that have cause the change from traditional to modern forest utilization systems, their impacts on biodiversity, and how ecosystem functions and services are lost or kept. Evaluations from the aspect of ecology and economy are assessed for forest utilization options including the traditional systems in order to obtain the insight on the future forest management systems, which would preferably be smaller in long-term costs with long-lasting yields.

Contents

The four sites which have various forest utilization types including natural systems, traditional and rather sustainable forest utilization systems, and rapidly-changing modern systems are selected: Lambir Hills National Park (Tropical Rainforests, Sarawak, Malaysia), Kinabaru National Park (Tropical Montane Rainforests, Sabah, Malaysia), Yaku Island (Sub-Tropical or Warm-Temperate Forests, Japan), and Abukuma Mountains (Temperate Deciduous Forests, Japan). We address the following objectives commonly in these selected sites.

1) To clarify historical change in forest utilization and its socio- economic backgrounds.
2) To evaluate impacts of forest utilization on biodiversity.
3) To evaluate functions and ecosystem services provided by forest biodiversity.
4) Integrated evaluation of forest utilization.

Expected Results

We evaluate the present forest utilization options and establish appropriate criteria and indices of forest sustainability according to the outcome of this project. We will be able to forecast future change in forest utilizations depending on the knowledge of the driving forces and incentives that have changed forest utilization in the past. Also, we can predict which and how ecosystem functions and services are lost with decreasing biodiversity due to inappropriate forest use. Furthermore, we will propose new criteria or way of thinking to evaluate the forest utilization systems with higher biodiversity from both ecological and economical view points. With these criteria, zoning and spatial arrangement of forest types could be modeled.

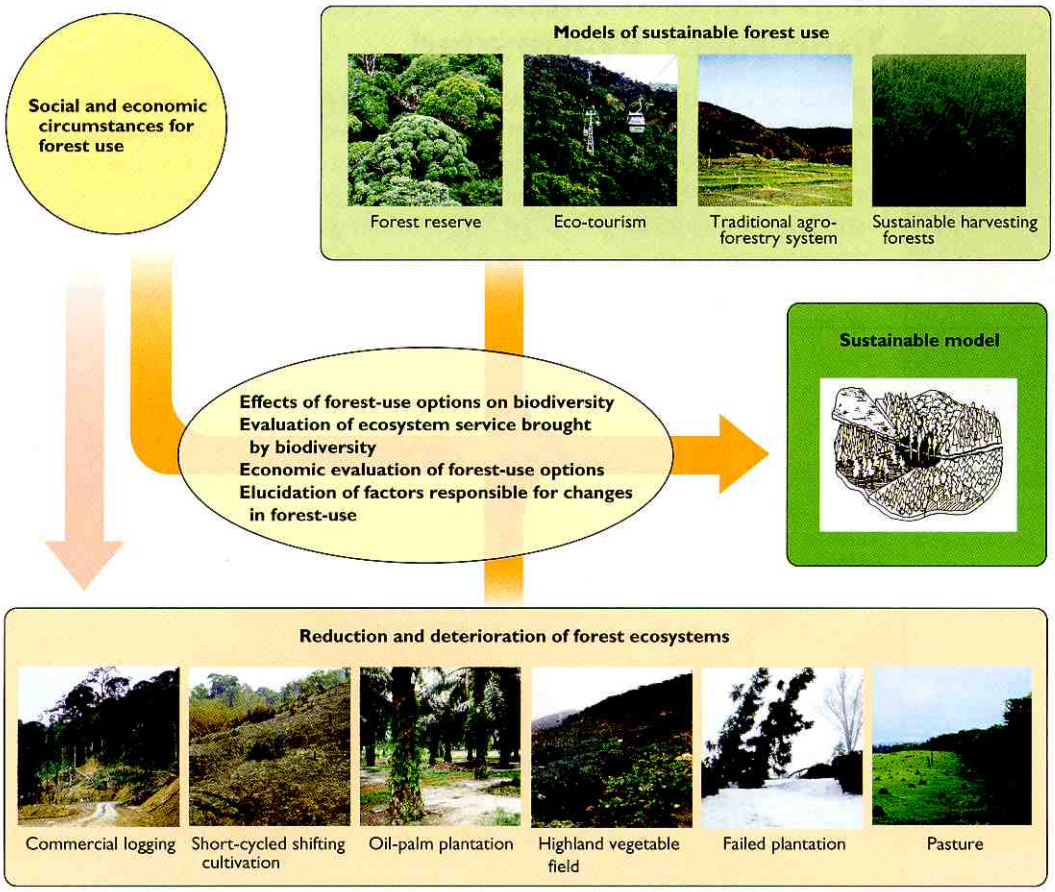


Figure 1 **Assessment of forest utilization options for sustainability and biodiversity**

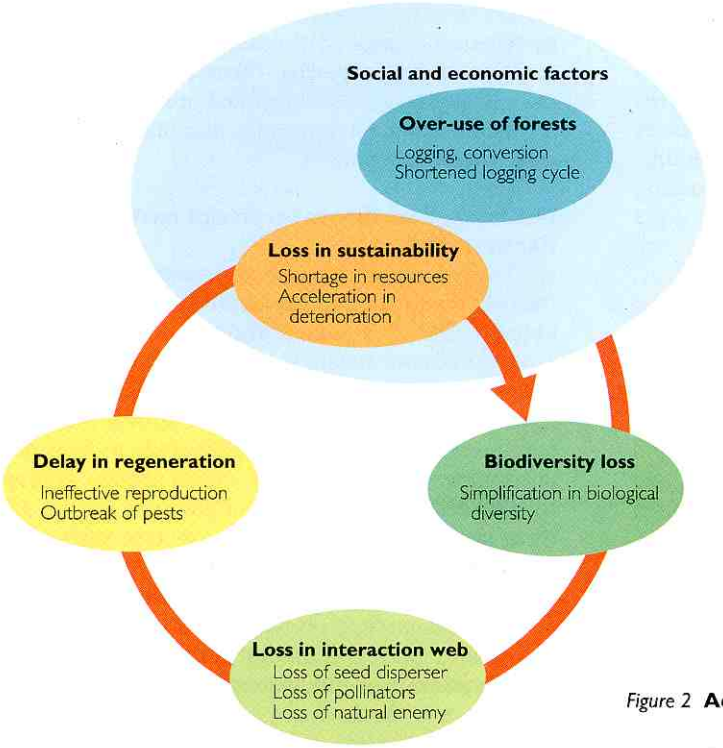


Figure 2 **Acceleration of biodiversity loss**

Project

3-1

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

Based on an interdisciplinary partnership, this project aims to develop a methodology for revealing interactions between human activities and nature in a watershed. Focusing on the characteristic spatial scales of the watershed, we develop and test a methodology for watershed diagnosis and consensus-building through field work in the Lake Biwa-Yodo River watershed. This methodology will help the residents and administration to conduct watershed management, and to elucidate possible future scenarios of the watershed.

Research Axis ●
Spatial Scale

Project Leader ● **WADA, Eitaro** — RIHN

Core Members ● **HARA, Yuuichi** — Pacific Consultants Co., Ltd.
TANAKA, Takuya — RIHN
WAKITA, Ken-ichi — Faculty of Policy Studies, Iwate Prefectural University
YACHI, Shigeo — RIHN

Background and the Aim of the Project: Why Watershed?

A watershed, or river basin is a spatial unit for water and material cyclings that is topologically easy to recognize. Since old times, humans have been developing an inherent regional culture depending upon the uniqueness of each watershed that is diverse in climate, culture and history. Today, human activities in each watershed cause not only its own regional environmental issues but also global environmental issues through the climatic processes and global economy that cross watershed spatial scale. Thus, revealing inherent environmental problems in each watershed is an important basis to understand global environmental problems.

On this background, this project aims to develop a methodology that reveals the interactions between human activities and nature in a watershed that includes urban areas. With this methodology, we focus our study on major issues on watershed management; we provide useful information for the residents and administration to conduct watershed management and to elucidate possible future scenarios of the watershed with emphasis on its sustainable management.

Research Site: the Lake Biwa-Yodo River Watershed

For this purpose, we adopt the Lake Biwa-Yodo River watershed in Japan as a model system. This watershed contains the largest lake in Japan, the Lake Biwa whose catchment area roughly coincides with the Shiga prefecture, spreads over the Osaka and Kyoto prefectures (Figure 1). It includes active urban areas of Osaka and Kyoto. The Lake Biwa is an ancient lake famous for its 400 thousand-years history and rich native species, while it is at the same time a typical "human-dominated ecosystem." It supplies water to 14 million people in the Kansai district and is influenced by land-use change of its coastline, eutrophication and invasion of exotic species. These characteristics of the Lake Biwa-Yodo River watershed prove as an appropriate field to carry out our multi-disciplinary research on watershed management.

Methods: Building Interdisciplinary Partnership

To develop total watershed management, collaboration of researchers in diverse disciplines is indispensable. In our Feasibility Study, we developed and synthesized four methods as tools for a new diagnosis methodology for water environment. They are: 1) factor diagram to find region-specific cultural factors and causal relationships that compel people to damage the environment, 2) indicators, 3) model and 4) Geographic Information System (GIS) as a platform for the above three methods and for integrating diverse kinds of environmental information.

Using and extending this diagnosis methodology, we conduct researches on water and material cyclings, ecosystem, social and cultural system in the Lake Biwa-Yodo River watershed towards total watershed management.

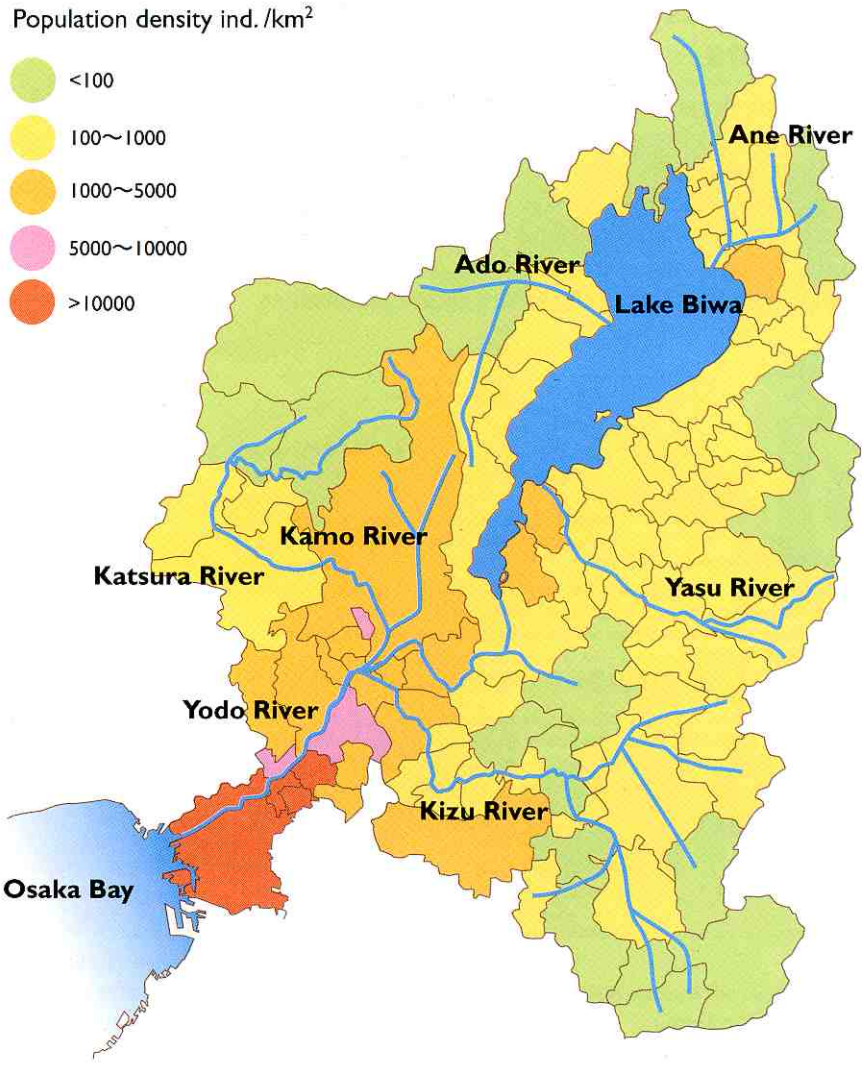


Figure 1 **Population density in the Lake Biwa-Yodo River watershed (1992)**

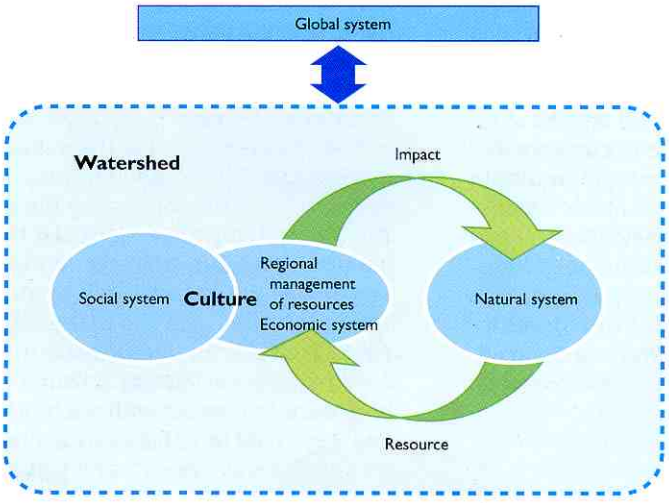


Figure 2 **Interactions between human and nature in a watershed**

Expected Results

Proposals for the management of the Lake Biwa-Yodo River watershed will be obtained. The concepts and methodology that would be obtained and tested in this project will be useful to understand watersheds which include urban regions in general.

Project

4-1

Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes

The Oasis Project is a research project aiming at reconstructing the history of interactions between people and nature for the last 2000 years in a Chinese arid region. The project adopts a trans-disciplinary approach, integrating the studies of history, archeology, ethnology, economics, hydrology, meteorology, climatology, glaciology, biology, and agriculture. In this way, we may learn something important for creating our new manner of living that could assure future possibilities.

Research Axis
History and Time Scale

Project Leader
NAKAWO, Masayoshi — RIHN

Core Members
ENDO, Kunihiko — Collage of Humanities and Sciences, Nihon University
FUJII, Yoshiyuki — National Institute of Polar Research
FUJITA, Koji — Graduate School of Environmental Studies, Nagoya University
KATO, Yuzo — RIHN
KONAGAYA, Yuki — National Museum of Ehnology
KUBOTA, Jumpei — RIHN
SOHMA, Hidehiro — Faculty of Letters, Nara Women's University
SUGIYAMA, Masaaki — Graduate School of Letters, Kyoto University
TAKEUCHI, Nozomu — RIHN
WATANABE, Tsugihiro — RIHN

Research Content

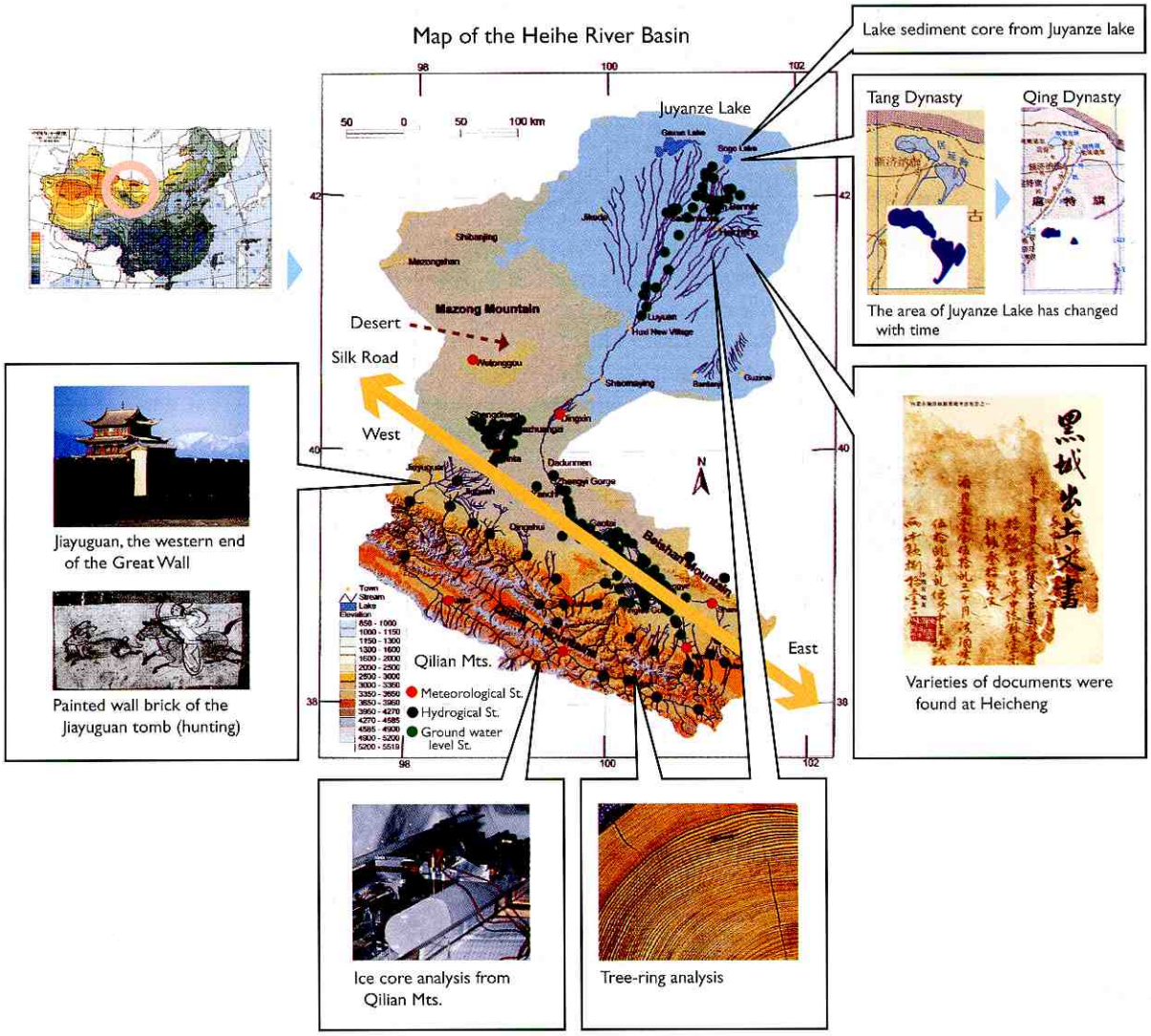
The major research field is in and around the Heihe region in central Eurasia, where outstanding human cultures have developed, for the last 2000 years. The history of the region will be reconstructed by examining historical documents, and varieties of proxies such as ice cores from glaciers, tree-ring samples, and lake sediment cores. The water circulation system in the basin: water resources and demands will also be studied, in order to interpret properly the documents and the proxies. Interviews with local people and field observations will help determine how much water is required for agriculture and the nomadic lifestyle, and the transport cycle of water from rainwater, to glaciers, rivers, ground water, and evapo-transpiration. This would enable us to understand what the "development" and the "sustainability" are, which are considered most crucial in solving the "global environmental problems."

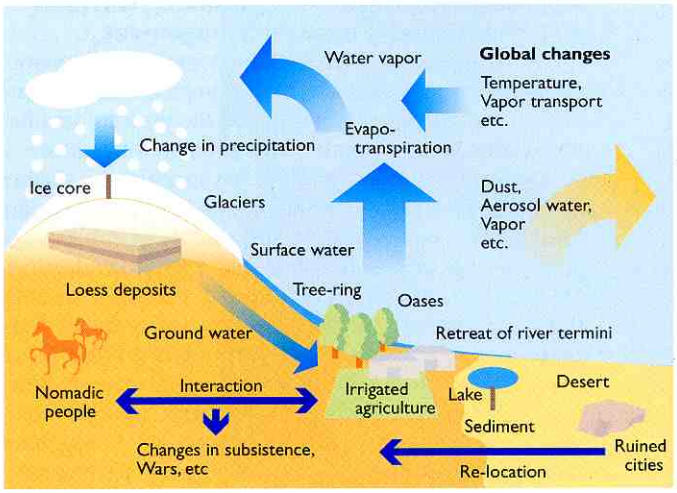
Present Issue

In the Heihe Basin, the river water has been used for irrigation quite intensively in these days, and the river discharge has decreased significantly downstream. As a result, the Juyanze Lake at the terminus of the river has dried up, and the ground water level has decreased drastically, which damaged the ecological situation near the river end, and caused a serious problem to, in particular, the nomadic people living there. Thus, the water shortage has recently become a big issue in this region. This causes the local people to move and change the traditional life style urgently. Impact of human activities (e.g. overuse of agricultural water or over pasturage) and/or climate change (e.g. global warming) could have caused the water shortage, but no firm reason is yet known. It is very important to elucidate the causes, and to keep the water resources adequately in the region. For future possibilities, however, it is more important to address the basic questions: Who possesses the water? Why is it to be used by people?

Over the History

The research field, the Heihe Basin, is located at an intersection of two ancient major trade roads: the famous Silk Road connecting the East and the West, and the nomadic route along the Heihe River, extending north to south from the Mongolian Plateau with the richest grassland down to Yunnan through the Tibetan Plateau. The water shortage like today could have taken place intermittently in the history of last 2000 years, while farming activities and nomadic activities were in conflict with each other at some times, and they could be in harmony at others. Which era was with the "development", and which era was with the "sustainability"? The construction of the perspective of the history of the interaction between humanity and nature in the region, would contribute to have a clue for human beings at present, who face serious so-called global environment problems, as to how to live with the surrounding nature, and to create potentially a new concept of the manner of living for future possibilities.





Nomadic people

Project

4-2

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

Research Axis ●
History and Time Scale

This research project aims to demonstrate human-nature interactive consequences in the tropical monsoon Asia as the regional eco-history, focusing on World War II through present-day period (1945-2005). This region is characterized by marked monsoonal seasonality and diverse ecological environments where a number of ethnic groups have retained unique life-styles and cultures. As socio-political upheavals have occurred in this region during the past several decades, modernization, development, and external impacts have affected people's life to a great deal. We conduct integrative analyses as to how local inhabitants have coped with such upheavals in terms of subsistence complex, nutrition and health, and resource use and management, and ultimately demonstrates consequence of the regional eco-history.

Project Leader ●
AKIMICHI, Tomoya — RIHN

Core Members ●
ABE, Kenichi — The Japan Center for Area Studies, National Museum of Ethnology
CHRISTIAN, Daniels — Institute for Language Study in Asia and Africa, Tokyo University of Foreign Studies
KONO, Yasuyuki — Center for Southeast Asian Studies, Kyoto University
KUBO, Masatoshi — National Museum of Ethnology
MOJI, Kazuhiko — Institute of Tropical Medicine, Nagasaki University
NAKAMURA, Satoshi — International Medical Center of Japan
NONAKA, Kenichi — RIHN

Human and Nature in Transition

Our focus of research area extends from Yunnan Province of southwestern China down to Laos and Thailand in Continental Southeast Asia. The region is located in a monsoonal climate region having distinct wet and dry seasons. A number of ethnic populations that have unique cultural traditions inhabit in diverse habitats such as coastal and riparian areas, valley basin, mountain slopes and hilly environments (Figure 1). Inhabitants have developed various types of subsistence strategies and customary practices in order to adapt to the environment and to maintain sustainable resource exploitation (Figure 2). People's interactions with the surrounding environment are reflected not only in the nature of subsistence complex and cultural practices, but also in their food life, nutrition and health.

Besides environmental factors, socio-economic and political factors onset by modernization, wars and globalization processes, have affected, to a greater extent, socio-economic and human physical conditions. Without analyses of dynamism among these complex factors, it is virtually impossible to gain a total understanding of human's interactions and transformation process with nature.

Figure 1 **Study region**
Distribution depicted among ethnic groups in tropical monsoon region of continental Southeast Asia is patchy. It is not only associated with people's adaptation to diversified environments, but also due to a series of migration history of the groups over many centuries.
○ shows major field study areas.

Approach of Subsistence Complex, Nutrition and Health, and Resource Management

Our approach is three-fold. By combining discipline-oriented analyses of subsistence complex, nutrition and health, and resource management, the project identifies consequences of human's interactions with nature in continental Southeast Asia. More specifically, several sets of proxies, quantitative and qualitative indices are chosen for the analysis. As an example of subsistence complex, pla buk fish (*Pangasianodon gigas*) endemic to Mekong River watershed, is selected. Pla buk is recently found endangered due to overfishing and owing to drastic change of freshwater environment (Figure 3). In order to scrutinize consequences and discourses relevant to pla buk fish, ecology and fishery, change of biomass of freshwater weed (*Cladophora*) as an important food item of pla buk, conservation policy, development program, economic globalization and so forth, are examined in line with how these factors play differentiated roles in the context of human-nature interactions. Similar inquiries are made on selected kinds of plants, animals and material culture in order to clarify complex nature resided in the perception and use of natural resources by the people.

In the analysis of human nutrition and health, focus is directed to analyses of animal-borne, water-borne and food-borne infectious diseases and non-infectious diseases associated with changes of life, nutritional food intake, activity study, and anthropometry (Figure 4). Through these studies, mechanisms and factors are

Figure 2 **Nature and daily life in the study areas**
▲ Cast net fishing along the Mekong river, Northern Thailand
➤ A Hani village in Yunnan Province, Southwestern China
◄ Roadside market in Vientiane, Central Lao P.D.R

specified regarding how environmental impacts affect human health and nutrition.

As to inquiries into resource management, special attention is paid to case studies. In their respective communal land plots, wildlife reserves and national parks, particular sets of legal and customary practices and resource management procedures are found. Conflicts over ownership and usufruct of natural resources and antagonism between local inhabitants and states are examined in the regional framework (Figure 5).

Towards Integrative Understanding

Dynamic relations underlying the features of subsistence complex, nutrition and health, and resource management are demonstrated in conjunction with ecological, socio-economic and political factors. The research aims at gaining an integrative understanding of people's interactions with the environment in continental Southeast Asia as a regional eco-history model.

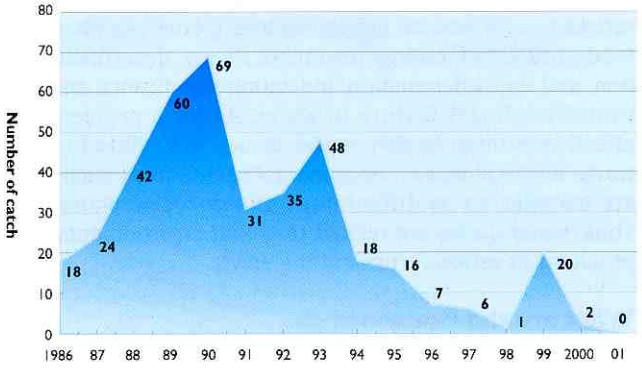


Figure 3 **Catch trend of pla buk fish in Chiang Khong, Northern Thailand**
Pla buk (*Pangasianodon gigas*) reaches 2.5-3m long, and 300kg large. This fish is known as a long-distance migrator of the Mekong river. In Chiang Khong it is caught by drift gill net. Decline of catch is probably due to overfishing and a lack of freshwater weed as food.

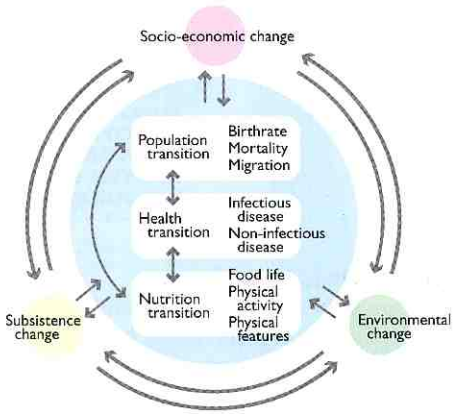


Figure 4 **Human ecology transition**
Dynamic relations among nutrition, health and population can be understood within a framework of transitional interactions between population and nature. Give the physical body as the core, and subsistence, social-economic systems, and environment as the external domains, dynamic interactions between the core and external domains, and among three external domains becomes the key for the research analysis.

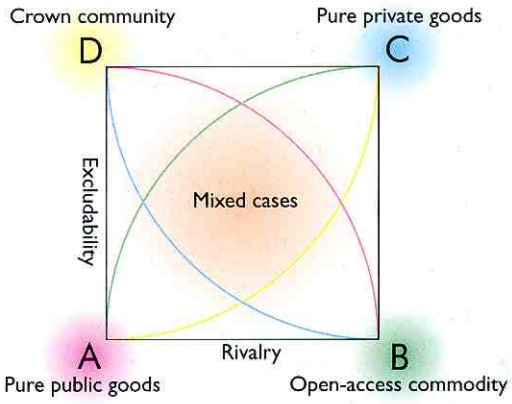


Figure 5 **Ownership and access right to resources [Based on C. Tisdell 1999]**
Types of ownership and access right over natural resources can been represented as a schematic diagram by two analytical axes; rivalry and excludability. By examining various cases in the region, sustainable resource management models may be emerging.

Project

5-1

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

It is even said that if the wars of the last century were fought over oil, the wars of this century will be fought over water. This project attempts to develop global perspectives for such water resources issues by integrating field investigations at various observational sites all over the world, by predicting natural water cycles and human water use in the future, and by establishing guidelines for sustainability development from a viewpoint of water resources issues.

Research Axis ●
Conceptual Framework for Global Environmental Issues

Project Leader ● **OKI Taikan** — RIHN

Core Members ●
ARAMAKI, Toshiya — Research Center for Advanced Science and Technology, University of Tokyo
KANAE, Shinjiro — Institute of Industrial Science, University of Tokyo
KAWASHIMA, Hiroyuki — Graduate School of Agricultural and Life Sciences, University of Tokyo
KIM, Wonsik — Global Environment Laboratory, Yonsei University, Korea
KITSUREGAWA, Masaru — Institute of Industrial Science, University of Tokyo
KURAJI, Koichiro — Graduate School of Agricultural and Life Sciences, University of Tokyo
MATSUMOTO, Jun — Graduate School of Science, University of Tokyo
MORIYAMA, Toshiyuki — Faculty of Engineering, Sojo University
OHTE, Nobuhito — Graduate School of Agriculture, Kyoto University
SATOMURA, Takehiko — Graduate School of Science, Kyoto University
SHIBASAKI, Ryosuke — Center for Spatial Information Science, University of Tokyo
SHIRAKAWA, Naoki — Institute of Engineering Mechanics and Systems, University of Tsukuba
SHIROYAMA, Hideaki — Graduate School of Law, University of Tokyo
TACHIKAWA, Yasuto — Disaster Prevention Research Institute, Kyoto University
UMETSU, Chieko — RIHN
YASUOKA, Yoshifumi — Institute of Industrial Science, University of Tokyo

World Water Resources Issues

A population increase, expected mainly in developing countries, necessitates increases in water demand for human life, food production, and industry, resulting in more intense use of water resources in the world. Not only for developing countries but for Japan and European countries, where population increase is not expected, water resources issues will be serious because water resources can be degraded due to global climatic change, such as global warming. Even in case of no change in natural water cycles, available water resources for human society will decrease where inappropriate water management is performed and when water quality is deteriorated.

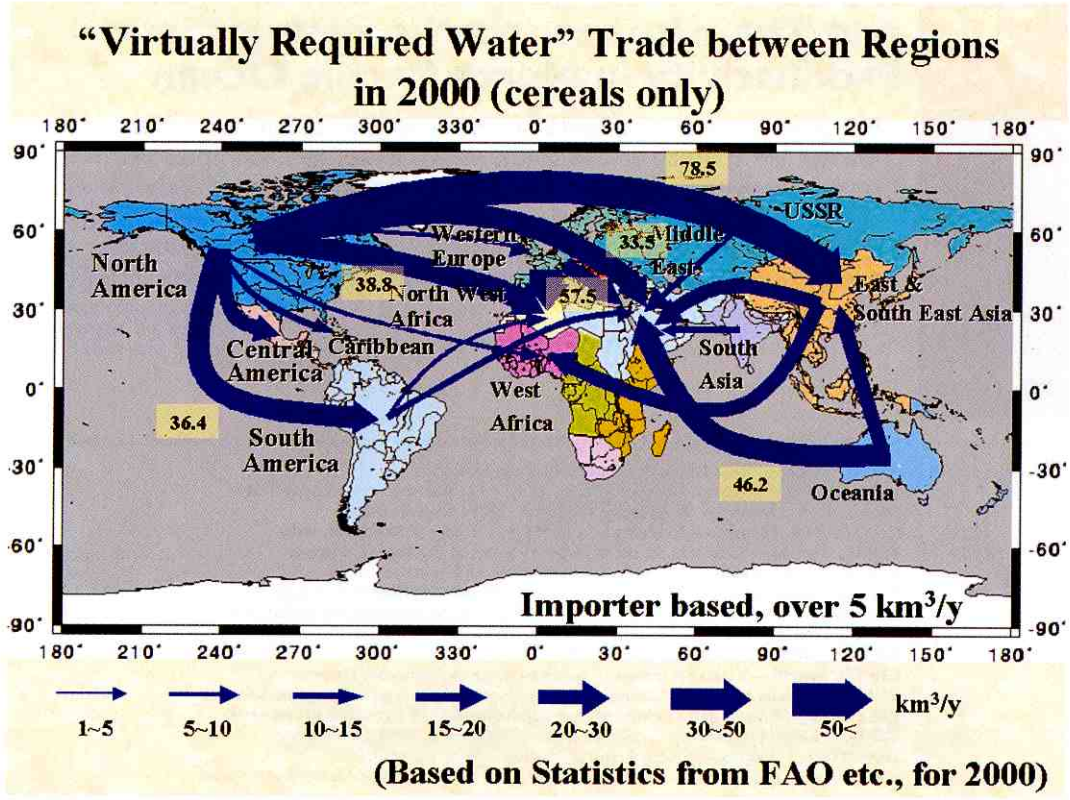
▲ *Figure 1* **Total Runoff Integrating Pathways (TRIP):** Section in South America; The whole land on the Earth is covered with 0.5 degree longitude and latitude meshes and flow direction from each mesh is given. TRIP is coupled with land surface hydrological models and used to estimate the global potential water resources.

With such anticipation on future water resources, water issues are currently considered to be one of the most critical problems in the world. For example, the United Nations declared to halve the proportion of people who has no access to safe drinking water by 2015.

In addition, water issues are closely related to other various environmental issues, such as global warming, food production, energy resources issues, desertification, and forest destruction, indicating significance and transdisciplinary feature of water. As for a problem affecting human health, water issues are related to waste disposal issues, because pollutants from waste are transferred by diffusion of underground water. Thus, water cycles are related to global environmental problems in various cross-cutting ways.

What are the Problems?

Although much information about water issues is now available, some of the information seems groundless and often emotional. Thus, one of the problems about water issues is that scientifically reliable information and groundless prejudice are distributed with confusion. Another problem is such that only a little



▲ *Figure 2* **International virtual water trade (km³/ year) in 2000:** Estimated based on statistics of grain (wheat, rice, barley, and corn) trade. The arrows indicate how much virtual water is transported among regions through grain trade.

◀ *Figure 3* **A rice paddy field in a dry-season in Thailand (Sukhothai):** This field, which suffers from flood in a wet-season, completely dries up in a dry-season because of large seasonal variation in rainfall under Asian monsoon climate.

▼ *Figure 4* **A village on the water in Cambodia (Tonresap Lake):** Villagers' lives are with water. The lake provides water for villagers not only for drinking and washing, but the lake is the source of food, and it is the major way of transportation by ship.

information is dispatched by Asian countries including Japan; most information is actually dispatched by the United States and European countries. In fact, regional characteristics should be well considered for water issues in each region, because both natural water cycles and water use interact with climatic, cultural, and historical characteristics of the region. For example, present and future water issues in Asian countries need to be considered with regard to the uniqueness of the Asian monsoon climate and farming culture of paddy.

World Water Issues as Global Environmental Sciences

This project aims at clarifying the true nature of world water issues and presenting perspectives of water management in the future. The project consists of three parts: global research part, regional research part, and integration part of global and regional research information. The project attempts to develop a scientific basis for proposing a policy and helping policy making. Such an attempt will enable to people avoid some serious problems anticipated in the future.

As a result of this project, the following products will be expected: prediction of the water resources demand in Asia, report of Asian fresh water resources for the Millennium Assessment of the United Nations, and settlement of regional water issues in Asia. Furthermore, by examining new concepts of water resources, such as "blue water", "green water", and "virtual water", we aim at increasing awareness on water issues and establishing guidelines for sustainability development in society from a viewpoint of water.

Project

2-3 FS

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.

Research Axis ●
Human Activity Impact Assessment

Project Leader ● **HARA, Toshihiko** — RIHN, Visiting Professor/Institute of Low Temperature Science, Hokkaido University

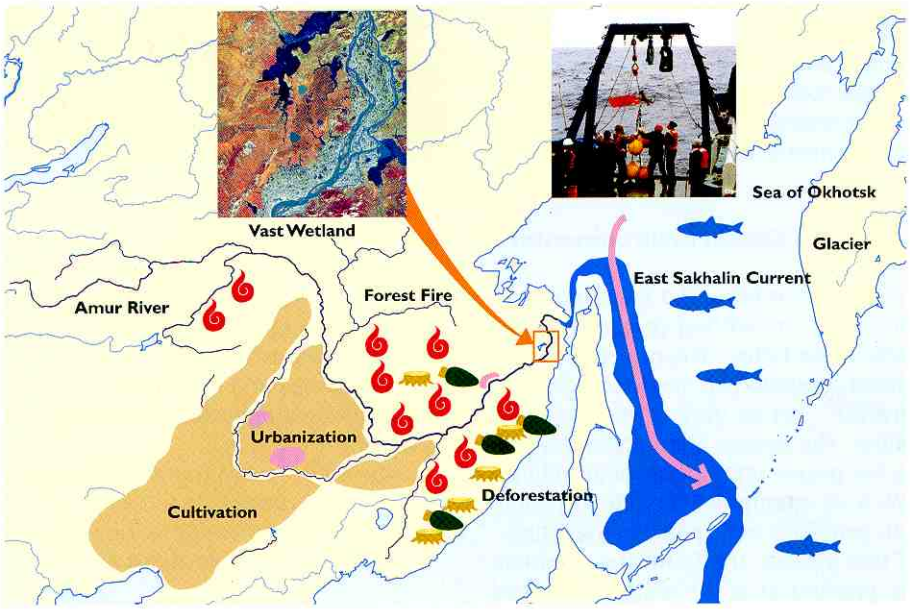
Core Members ●
ARAI, Nobuo — Slavic Research Center, Hokkaido University
HARUYAMA, Shigeko — Graduate School of Frontier Sciences, University of Tokyo
IWASHITA, Akihiro — Slavic Research Center, Hokkaido University
KAKIZAWA, Hiroaki — Graduate School of Agriculture, Hokkaido University
KUMA, Kenshi — Graduate School of Fisheries Sciences, Hokkaido University
MATSUDA, Hiroyuki — Ocean Research Institute, University of Tokyo
MATSUNAGA, Katsuhiko — Graduate School of Fisheries Sciences, Hokkaido University
NAGAO, Seiya — Graduate School of Environmental Earth Sciences, Hokkaido University
NAKATSUKA, Takeshi — Institute of Low Temperature Science, Hokkaido University
NARITA, Hideki — RIHN
SAITO, Seiichi — Graduate School of Fisheries Sciences, Hokkaido University
SHIBATA, Hideaki — Field Science Center for Northern Biosphere, Hokkaido University
SHIRAIWA, Takayuki — Institute of Low Temperature Science, Hokkaido University
TACHIBANA, Yoshihiro — Liberal Arts Education Center, Tokai University
UEMATSU, Mitshuo — Ocean Research Institute, University of Tokyo
WAKATSUCHI, Masaaki — Institute of Low Temperature Science, Hokkaido University

Background

Recent studies in the northern North Pacific have revealed that biological productivity is limited by iron availability there. 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 seawater without being a complex with humic substances created in forest and wetland. Therefore, changes in land uses on the Amur basin such as deforestation, forest fire, cultivation, urbanization and/or reduction of wetland may possibly reduce the biological productivity in the Sea of Okhotsk and the northwestern area of North Pacific Ocean.

Purposes

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 extent the iron is contributing the biological productivity in the Sea of Okhotsk. 2) What is 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 the economic and political systems around Northeast China and Far East Russia change the land uses in the Amur basin in the past, present and future. 4) How variable are the water and material cycles around the Amur basin and the Sea of Okhotsk in the natural conditions.



Project
3-2

Research Axis ●
Spatial Scale

Interactions between Natural Environment and Human Social Systems in Subtropical Islands

A variety of environmental problems are becoming apparent on islands all over the world, including water shortage, soil washout, river and ocean pollution, and disappearance of biodiversity. An urgent response is required to cope, particularly since islands are closed systems in which the problems tend to worsen at staggering rates. Environmental problems are attributable to human activities. In order to resolve the problems, it is necessary to gain an accurate understanding of interactions between human activities and the natural environment. This project focuses on research that will contribute to the resolution of environmental problems on islands, using Iriomote Island, Okinawa, as a model.

Project Leader ●
TAKASO, Tokushiro — RIHN

Core Members ●
AKIMICHI, Tomoya — RIHN
ANKEI, Yuji — Faculty of International Studies, Yamaguchi Prefectural University
ARAMOTO, Mitsunori — Tropical Biosphere Research Center, University of the Ryukyus
HIDAKA, Toshitaka — RIHN
ISHIJIMA, Suguru — Professor Emeritus, University of the Ryukyus
KINJO, Masakatsu — Tropical Biosphere Research Center, University of the Ryukyus
NAKASHIZUKA, Tohru — RIHN
SATOI, Yoichi — Faculty of Education, University of the Ryukyus

A variety of environmental problems have arisen on islands around the world, including Iriomote Island, and precious local cultures are disappearing. A thorough understanding of the interaction between the natural environment and human social systems on islands is required to resolve these issues. Since islands are closed systems with a limited geographical expanse, they display a combination of uniqueness and vulnerability in both the natural environment and human social systems. The vulnerable nature of phenomena that exist on islands is often held accountable for problems once they have occurred (perhaps opposite sides of the same coin), so deepening our understanding of island vulnerability can provide a guide to solving the problems. The natural environments of islands are vulnerable to typhoons and other natural disasters, as well as human activities associated with industry. In addition, it is recently feared that the introduction of foreign organisms and global warming will seriously impact island forest and marine ecosystems. This research project focuses on and aims to deepen our understanding of the vulnerability of the natural environment to human activities, taking into consideration the vulnerability of the human social system itself. As a model, Iriomote Island can be considered ideal for the launch of academic environmental research focusing on vulnerability since it is a typical humid subtropical island that, even today, has rich water and forest resources.

Iriomote Island (Shirahama-Sonai area): Iriomote Island is a globally rare typical humid subtropical island located at the southwestern tip of the Ryukyu island chain. This island provides a suitable place to conduct the study of the natural environment. The island's lifestyle, performing arts and rites developed uniquely despite influence from neighboring countries and regions.

Project

5-2

Research Axis ●
Conceptual Framework for Global Environmental Issues

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

This project aims at examining people's environmental consciousness, or people's sense of values associated with the environment, and elucidating the environmental qualities and the human-sociological factors that affect its formation through theoretical and empirical surveys. We will develop a conceptual device to exchange information between people and the nature (Interactive Device between Environments and Artifacts: IDEA).

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
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
TOKUCHI, Naoko — Field Science Education and Research Center, Kyoto University
ZHENG, Yuejun — Institute of Statistical Mathematics

Perception of the Environment

People's perception of the environment affects their value judgment on the environment as a basis for the people to determine their attitudes toward the environment. We define this judgment "environmental consciousness." People use or modify the environment based on their environmental consciousness. The environment has been grasped in scientific manners. Information on the environmental changes are generally obtained through scientific researches.

Relationships between Environmental Qualities and the Environmental Consciousness

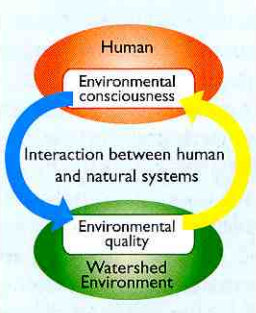
People's environmental consciousness determines the human activities to the environment. For this reason, the information on the environmental qualities must be essential for our understandings of the present and future environmental conditions. Therefore, it is important for the wise-use and better conservation of natural environment that the relationships between the environmental qualities and the environmental consciousness be elucidated.

Study area is the Lake Shumarinai watershed in Hokkaido Island, Japan. The environmental changes caused by the virtual impacts, such as forest cutting, will be predicted. The changes in the people's value judgments on the environment will be analyzed to estimate the important environmental quality for determining the values of the environment.

The temporal changes of the environment should be included in the prediction of the environmental responses to the virtual impact. Forests in Wakayama Prefecture will be used to estimate the temporal changes in the watershed environment after the clear-cutting. The bottom panels show the views of the small watershed that underwent clear-cut in 1997, 1988 and 1915 (from left to right).

Interactive Device between Environments and Artifacts (IDEA)

In this project, IDEA, a tool for information exchange between people and the nature, will be developed. IDEA predicts the environmental changes by human impacts. The attitude survey on the environment, such as questionnaires, will be conducted to estimate people's responses to these predicted environmental changes. The results from the survey are used in IDEA again to identify the relationships between the environmental changes and the changes in people's environmental consciousness. IDEA provides a method for the bilateral exchange of the information between people and the nature, and between people and researchers in order to clarify the relationships between environmental qualities and the environmental consciousness.



Interactions between people and nature include the relationship between people's environmental consciousness and the environmental quality, as a component.

Project

5-3IS

Reconstructing the Concept of Symbiosis: A Historical Approach to the Cases in the Far Eastern Archipelago and Surrounding Areas

This project is aimed at understanding symbiosis among organisms, not as a fixed relationship but as a dynamic one which has arisen and vanished ceaselessly, and making an eco-historical description of the relationships between humans and nature which have been occurred in the Japanese Islands and their surrounding areas for a million years. The results of both studies are to be taken into philosophical consideration in order to create a new paradigmatic concept of coexistence with nature.

Research Axis
Conceptual Framework for Global Environmental Issues

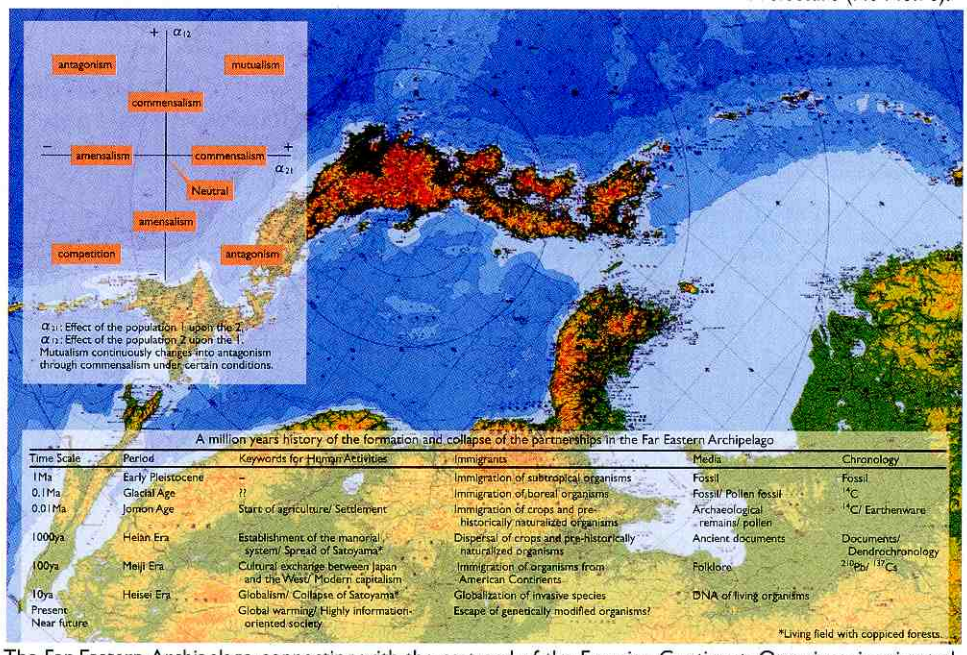
Project Leader
YUMOTO, Takakazu — RIHN

Core Members
ABE, Hiroshi — RIHN
ANKEI, Yuji — Faculty of International Studies, Yamaguchi Prefectural University
MURAKAMI, Noriaki — Graduate School of Science, Kyoto University
SHIMIZU, Isamu — Center for Ecological Research, Kyoto University
TANAKA, Hiroyuki — Primate Research Institute, Kyoto University
TSUJI, Sei-ichiro — National Museum of Japanese History
UCHIYAMA, Junzo — Faculty of Humanities, Toyama University
YAHARA, Tetsukazu — Faculty of Science, Kyushu University
YAMAGUCHI, Hirofumi — Graduate School of Agriculture and Biological Science, Osaka Prefecture University

It is often argued that the present global environmental problems are consequent upon the loss of "symbiotic" relation between humans and nature, and therefore it is the restoration of symbiosis that can solve those problems. But this opinion is questionable: Has there ever existed an ideal symbiosis between humans and nature all through our history? What on earth does "symbiosis" mean?

The Far Eastern Archipelago (Sakhalin Island, Japanese Islands, Ryukyu Islands and Formosa), facing the Eurasian Continent on the west, has accepted a numerous number of organisms from the Continent over the ages in which the climate has changed globally, so that unique flora and fauna have been formed. In particular, for the last ten thousand years, both the environment and immigrants have changed radically because of developing human activities. In this project, we undertake an investigation into symbiotic relations among organisms under the global environmental changes by elucidating the history of partnership between angiosperm and other organisms (e.g. pollination, seed dispersal, mycorrhiza) in the Japanese Islands and their surrounding areas. Furthermore, we intend to describe the relationships between humans and nature diachronically in terms of environmental archaeology and ethnosciences, and propose a desirable relationship between them through the philosophical examination.

For this purpose, we are going to develop a new system of software which is easy to overlook the region from several viewpoints (e.g. palaeogeography, palaeoclimatology, molecular biogeography, and relationships between plants and animals), by integrating existing results of various sciences into a database and GIS system. And we try to reveal the origin of immigrants by interdisciplinary synthesis of diverse proxy, including molecular analysis of archaeological remains (DNA archaeology).



The Far Eastern Archipelago connecting with the east end of the Eurasian Continent: Organisms immigrated into the archipelago through 3 paths until modern times: Primorskiy—Sakhalin; Korean Peninsula—Tsushima; Formosa—Ryukyu Islands.

Activities of the Research Promotion Center

The Research Promotion Center, in accordance with the principles of the Institute, is engaged in building the basis of finding a new research perspective beyond the scope of the existing disciplinary framework. Its activities are centered around "information", ranging from scientific data and specimens, to data and documents on history, culture, and social affairs. The Center will be the "information hub" of the global environmental studies.

Information Collection and Processing

The Center collects information on global environmental studies through the RIHN's research projects and the Center's own activities, and performs the information management necessary for the operation of RIHN and its research projects. It is engaged not only in the building of database but also in the development of new methods for the effective use of information collected, for example by creating linkages between pieces of information collected from different fields. These activities should contribute to consolidating the RIHN's integrated approach, bringing together different disciplines.

Science Communication

"The so-called global environmental problems lie behind the human culture, in the broadest sense of the words." This is the basic understanding of RIHN. Then, with this understanding, how will RIHN approach the problems? How will RIHN contribute to solving the problems? There are many such important questions.

Besides pursuing its research projects, RIHN lays emphasis on the communication with the public of what are the outcomes of its research activities and what is meant by these outcomes, to give an answer to these questions. This is called the "science communication" at RIHN, and the Center is engaged in this activity, developing effective ways of such communication. Its possible forms will be printed and electronic publishing, web pages, lectures, symposia, and others, on a national and international scale.

Observation and Analysis

Research and development of tools in field investigations will involve the GIS and remote sensing systems that utilize spatial information technology to improve efficiency of field investigations and facilitate collection and accumulation of information by each project. The Center will be equipped with a Laser profiler for measuring the three-dimensional ground surface structure and will develop their application methods. This is one of the powerful tools to be used in the field for accurately monitoring the field conditions. The data obtained will be incorporated into the computer system in the laboratory and, with help of the GIS system, will be used for the construction of a virtual field. Further, information thus accumulated will be applied to multi-temporal/spatial analysis of the phenomena and will be used effectively for the construction of the virtual globe and other models.

Research Staff Profiles

(in alphabetical order)

ABE, Hiroshi

- Assistant Professor, Project 5-3IS
- Background: philosophy and environmental thought

Having studied phenomenological philosophy, especially that of M. Heidegger, and having much to learn from the latest research results of natural sciences at RIHN, I try to reconsider and reconstruct elemental concepts of the global environmental problems, e.g. "symbiosis" and "nature."

AKIMICHI, Tomoya

- Professor, Project 4-2
- Background: ecological anthropology, ethnobiology

I have conducted ecological anthropological research so far. I intend a new approach to the environmental issues in Southeast Asia, focusing on historical relations between wildlife and indigenous populations.

BEN-ASHER, Jiftah

- Visiting Professor, from March 16 through September 15, 2003
- Professor, Institute of Desert Research, Ben Gurion University, Israel

Currently on sabbatical leave from the Ben Gurion University, to work with the ICCAP project of RIHN on impact of climate change on agricultural productivity. Most active in research on vulnerability of water resources and agricultural production due to climate change in the eastern Mediterranean ecosystems.

CHEN, Jianyao

- Research Fellow
- Background: physical geography, hydrology, GIS, isotopic hydrology

Focusing on the integration of physical and chemical processes and its application in the North China Plain and the lower reaches of the Yellow River, which have been affected greatly by human activities.

FUKUSHIMA, Yoshihiro

- Professor, Project 1-2
- Background: eco-hydrology

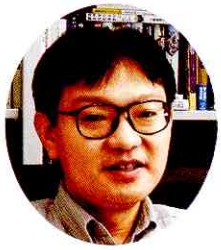
I'm very concerned with the role of biosphere on hydrological cycle in climate formation system. Actually, recent water crisis such as flood and drought events seems to occur in the region which has severe water demand. We are going to implement studies of the Yellow River in order to recognize the relationship between natural phenomena and human activities.

HARA, Toshihiko

- Visiting Professor, Project 2-3FS,
- Professor, The Institute of Low Temperature Science, Hokkaido University
- Background: plant ecology

I am developing theoretical models of vegetation dynamics of boreal forests. I wish to elucidate how global environmental changes affect the regeneration and maintenance of boreal forests.

HAYASAKA, Tadahiro



- Professor, Project 2-1
- Background: atmospheric physics

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

HIDAKA, Toshitaka

- Director-General
- Background: biology, ethology

I wish to realize in this novel institute what I was feeling and doubting during my research at the University of Tokyo, Tokyo University of Agriculture and Technology, Kyoto University and the University of Shiga Prefecture.

HOSHIKAWA, Keisuke

- Research Fellow
- Background: GIS, agricultural engineering

I will analyze and integrate hydrologic data in the Yellow River basin, China, with GIS, and try to develop a model that describes relationship of human activities and water environment in the basin more deeply.

INOUE, Mitsuyuki

- Research Fellow, Project4-1
- Background: Chinese cultural history

I have studied the daily life of Chinese intellectuals by means of their diaries, essays, paintings and calligraphies. Here, I will figure out the relationship between humanity and nature using various documentary records.

INOUE, Takashi

- Visiting Professor
- NHK Special TV Program Center Executive Producer

By making the TV programs of "The Yellow River", "Great Mongolia", and "Four Great Ancient Civilizations", I became interested in relations between the civilizations and the nature. So, I have been challenging on describing the rises and the falls of civilizations in a new point of view and a new way. I hope I could use these experiences in my studies.

KATO, Yuzo

- Assistant Professor, Project4-1
- 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 historical context, and present it in writing.

KAWAMOTO, Kazuaki

- Assistant Professor, Project 2-1
- Background: atmospheric radiation, satellite climatology

My research has focused on the study of clouds using data from satellites. I have a special interest in anthropogenic impacts on cloud and atmospheric processes. I will enjoy at RIHN, a new "lab" for earth environment investigations, a multi-disciplinary collaboration which is vital to these investigations.

KIKUCHI, Nobuyuki

- Research Fellow, Project 2-1
- Background: meteorology, atmospheric radiation

I have studied the radiation balance of cloud and cloud inhomogeneities using knowledge of atmospheric radiation. I have found a new parameter on cloud inhomogeneties, and I will investigate the characteristics of clouds quantitatively using the parameter.

KOHMATSU, Yukihiro

- Assistant Professor, Research Promotion Center
- Background: ecology, geography

I have studied the evolution of life-histories of animals which live in temporally waters. I try to develop the methods of inter-disciplinary studies based on the methods of geography which any materials and matters study focusing on spatial problems.

KOMATSU, Hikaru

- Research Fellow, Project 5-1
- Background: forest hydrology

I have investigated vegetation water cycles based on field observation data. Using this experience,I attempt to clarify effects of land use changes on regional and global water cycles, and then develop tools for proposing an appropriate land use plan.

KUBOTA, Jumpei

- Associate Professor, Project 4-1
- Background: forest hydrology

I have been involved in scientific projects for studying hydrological processes and the role of the forest in hydrological cycle. I will try to figure out interactions between humans and nature from hydrological aspects.

MATSUOKA, Masayuki

- Research Fellow
- Background: remote sensing

My research subject is the optical remote sensing of land surface.The analysis of land cover and its change over the Yellow River basin is the primary research objective in RIHN.

MOMOKI, Akiko

- Associate Professor, Research Promotion Center in charge of information and communication
- Background: biology, ethology (human ethology)

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

NAGANO, Takanori

- Research Fellow, ICCAP, Projects 1-1 and 4-1
- Background: soil hydrology, irrigation and drainage

I am especially interested in soil and water management by small scale farmers in arid and semi-arid areas. Developing an irrigation model which can interact with a socio-economic model and a basin hydrology model will be my main subject.

NAKASHIZUKA, Tohru

- Professor, Project 2-2
- Background: forest ecology (forest dynamics, biological diversity)

How extensively humans have been depending on biological diversity? What we suffer when biological diversity is lost in front of us? It is important for me to study biodiversity issue as a global environmental problem.

NAKAWO, Masayoshi

- Professor, Project 4-1
- Background: glacioclimatology, cryosphere hydrology

I wish to review the history from the viewpoint of interactions between humanity and nature. This would be a clue to creating our new manner of living that could assure future capability.

NARITA, Hideki

- Associate Professor, Projects 2-3FS and 4-1
- Background: physics of snow and ice, polar glaciology

Many records of past human activities have been hidden in ice core of middle latitude region. I analyze the core under high time-resolution and investigate the analytical results while connecting with the human activities.

NONAKA, Kenichi

- Associate Professor, Project 4-2
- Background: geography, ecological anthropology, and ethno-biology

I have been studying mutual relationship between human and nature through cognition and usage of natural resources. I wish to clarify and describe the reality and dynamism of human-nature relationship by focusing on diverse people's life as well as environmental condition.

OKI, Taikan

- Associate Professor, Project 5-1
- Background: hydrometeorology and water resources engineering

Since human activities and natural systems are closely related in water cycles, I believe there should be research topics both socially relevant and scientifically significant. I am pursuing such a research topic, going to observational fields overseas, and discussing with various people on sustainability development in terms of water.

SAEKI, Tazu

- Assistant Professor, Project 2-1
- Background: atmospheric physics

My research subject is to investigate global cycles of greenhouse gases such as carbon dioxide and methane using numerical models. I am interested in keeping up with those human and natural activities that have direct impact on observed changes in these trace gases.

SEKINO, Tatsuki

- Associate Professor, in charge of information processing, Research Promotion Center
- Background: limnology, ecology

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

TAKASO, Tokushiro

- Professor, Project 3-2
- Background: plant morphology (especially pollination and fertilization in gymnosperms)

I am interested in the study of adaptive mechanisms of subtropical plants and would like to present the results of the study to people in a manner they can enjoy plants. I would like to contribute to the study of insular environments based on our Iriomote project.

TAKEUCHI, Nozomu

- Assistant Professor, Project 4-1
- Background: glacial biology

I have been studying unique organisms living on snow and ice in Himalayas, Arctic, Patagonia, and Alaska. Here, I would like to do my best to understand the global system of humanity and nature.

TANAKA, Takuya

- Research Fellow, Project 3-1
- Background: cultural anthropology, forest ecology

I think the ways to perceive and utilize nature differ from culture to culture. I will study cultural factors of the differences and possible communication between the different groups, especially in river basins in Asia.

TANIGUCHI, Makoto

- Associate Professor, Projects 1-2 and 1-1
- Background: hydrology, geophysics, hydrogeology, natural geography

I have been studying process-oriented groundwater hydrology from global aspects. I am going to focus on the researches about Atmosphere-Land-Ocean interactions and Human-Nature interactions under the international research frameworks.

TAYASU, Ichiro

- Assistant Professor, Project 3-1
- Background: ecology (tropical ecology, soil ecology, isotope ecology)

I have been working on terrestrial ecosystems especially in the tropics. At RIHN, I am working on the Lake Biwa watershed in order to study feedbacks between environment and human activities.

UMETSU, Chieko

- Associate Professor, Projects 1-1 and 5-1
- Background: biology, international relations, environmental and resource economics, development economics

I am interested in development issues, especially environment and poverty linkages in rural areas in Asia and Africa. At RIHN, I wish to be involved in research agenda that directly deal with human and environment/resource nexus.

USHIMARU, Atsushi

- Research Fellow, Project 2-2
- Background: plant reproductive biology

Many angiosperms, which are major primary producers of terrestrial ecosystems, depend on animals for their pollen transfer and seed dispersal. I would like to study how human activities change these plant-animal interactions in nature.

VON FALKENHAUSEN, Lothar

- Visiting Professor from June 12 through September 11, 2003
- Professor, UCLA, USA

I have spent 15 years teaching and doing research on Chinese archaeology. My main period of interest is the Bronze Age (ca.2000-200BC), and I have published on the musical instruments from the period. Recently I have been co-directing a joint archaeological project in China focusing on salt production in ancient Sichuan and adjacent areas. I also co-edit the Journal of East Asian Archaeology.

WADA, Eitaro

- Professor, Project 3-1
- Background: biogeochemistry, isotope ecology

During the past 10 years, I have been working in several multidisciplinary projects concerning IGBP-MEXT, biodiversity and JSPS-Research for the future program. On the bases of these experiences, I will promote the project "Lake Biwa-Yodo River Watershed."

WATANABE, Tsugihiro

- Professor, Projects 1-1, 4-1 and 1-2
- Background: irrigation engineering, rural hydrology.

At RIHN, I am coordinating the research project on climate change impacts on agriculture in arid regions, based on diagnostic studies on land and water management.

YACHI, Shigeo

- Associate Professor, Project 3-1
- Background: theoretical ecology(modeling in evolutionary ecology, ecology of biodiversity and river-basin management)

I want to carry out inter-disciplinary studies on river-basin management issues and bridge the gap between the studies of global environmental scale by a modeling approach.

YATAGAI, Akiyo

- Assistant Professor, Projects 1-1, 4-1 and 1-2
- Background: atmospheric science, climatology, hydrology, remote sensing, physical geography

I am interested in the relationship between hydrological circulation and climate change on a global scale. I would like to approach environmental issues with my professional experiences in data analysis. I hope to approach them from the point of view of a scientist and a mother.

YOSHIMURA, Mitsunori

- Associate Professor in charge of observation and analysis, Research Promotion Center
- Background: geographic information system, remote sensing

I wish to try to develop an advanced system for field observation or measurement and approach to scale-up methodology for environmental monitoring by GIS and remote sensing technologies.

YOSHIOKA, Takahito

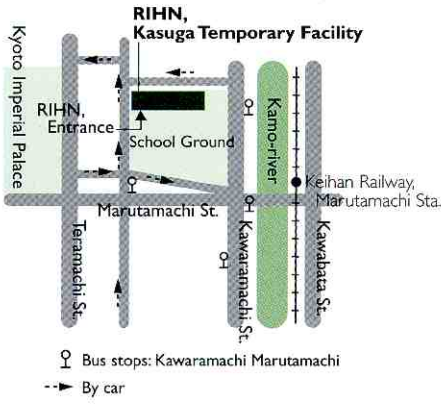
- Associate Professor, Project 5-2
- Background: biogeochemistry, limnology

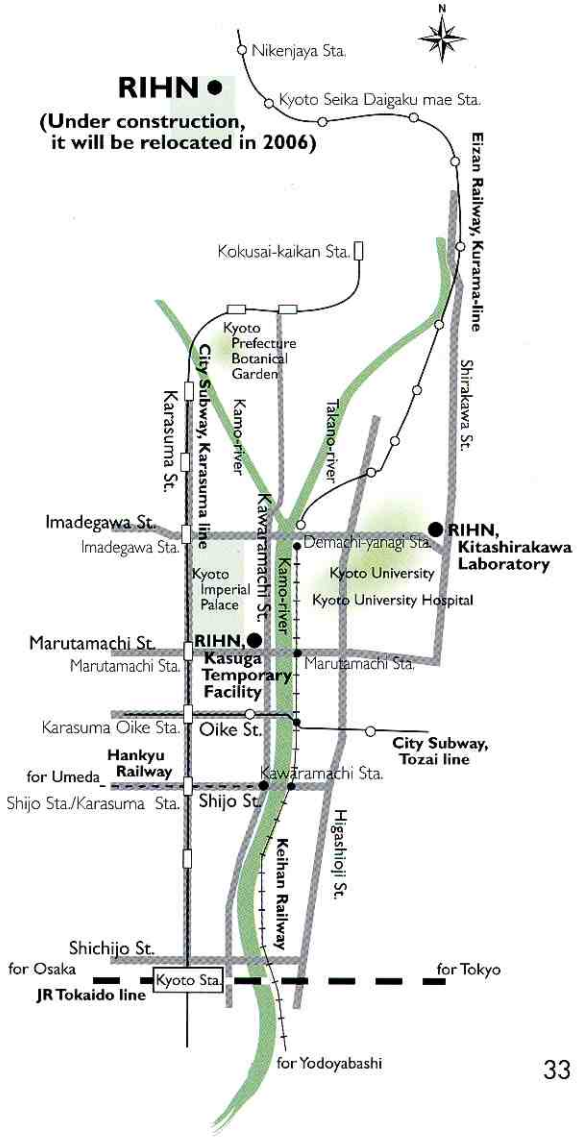
I want to elucidate the relationships between the people's environmental consciousness and the environmental quality. A method of exchanging information between people and the nature will be developed in this project.

YUMOTO, Takakazu

- Professor, Project 5-3IS
- Background: ecology (biodiversity, plant-animal interactions)

I have been studying the symbiotic relations between plants and animals in forest ecosystems and these consequences on biodiversity. In RIHN, I would like to investigate the history of symbiosis among organisms in Far-eastern Archipelago, and relationships between humans and nature, by interdisciplinary approach.





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by Subway: Take Karasuma Line to Marutamachi Station and walk 8 minutes.

by Bus: From Kyoto Station Terminal A2: Take 17 or 205 bus to Kawaramachi-Marutamachi and walk 5 minutes.

Research Institute for Humanity and Nature

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