



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

RESEARCH INSTITUTE FOR HUMANITY AND NATURE

2007-2008



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Message from the Director-General

TACHIMOTO, Narifumi

The Research Institute for Humanity and Nature (RIHN) was founded in 2001. This inter-university research institute, under the Japanese Ministry of Education, Culture, Sports, Science, and Technology, was established to carry out integrated research for innovative solutions to problems related to the global environment. In 2004, parallel to corporatization of Japanese national universities, RIHN became one of the member institutes of the National Institutes for the Humanities (NIHU). In 2006, the number of institute staff reached the initially planned regular lineup. Provided with research and education staff from diverse academic areas, RIHN is ready to take innovative steps and make great progress as a world-class research institute, establishing its own identity.

Since the foundation of RIHN it has been our basic understanding that the root of the so-called global environmental problems lies with human culture in the broadest sense of the word, that is, the way of living in which humans wish to control nature. To reach solutions to global environmental problems, it is essential to elucidate human-nature interactions and to forge a new paradigm. Hence, symbolically, the institute's name is the Research Institute for Humanity and Nature.

The research project system employed at RIHN, in which researchers take part on the basis of a fixed-term, is intended to identify the true nature of global environmental problems. Projects conducted at RIHN have been strictly evaluated and selected by the Evaluation Committee for Research Projects, comprised solely of external parties including foreign researchers. This project system guarantees that RIHN, as a core inter-university research institute, has universal, international, and fluid characteristics.

RIHN is a unique research organization as mentioned above and intends to contribute to society by actively disseminating its research results. This inter-university research institute explores every possibility to achieve its fundamental goals, making full use of its corporate character. We welcome your constructive criticism as well as your understanding and support.

Aim and Purpose of Establishment

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

A major focus of studies in modern science has been the environment. The mission of RIHN is to elucidate the true nature of environmental problems and present a preferred human attitude toward nature. It is important to understand the following three aspects of environmental problems.

The first aspect has to do with environmental problems immediately associated with daily life, including those that must be solved for a harmonious relationship between the environment and humans, since these problems are related to the human body and lifestyle. The second aspect reveals itself in problems related to anthropogenic factors, such as global warming, biodiversity loss, and depletion of water resources, which are known as global environmental problems. For this aspect, it is important to identify social (political/economic) systems contributing to environmental problems. Stemming from the third aspect are “true” environmental problems, including those related to the mechanisms of and changes in the global system, concerning the air, water, land, and climate, primarily dealt with in natural science and geoscience.

Environmental studies should be carried out constantly as an ongoing process for survival of the human race in the future, rather than an a priori completed system of knowledge. The researchers should synthesize an ever-changing dynamic system.

RIHN views environmental problems as issues for the entire planet, and not only for mankind at the present but also for all other living things on the earth both present and future. RIHN pursues global environmental studies in an integrated manner. The phrase “integrated manner” refers to methodological integration of study fields on the one hand, and to activities intended to look at phenomena as a whole on the other hand.

If it is appropriate to say that global environmental problems originate from problems of human culture, global environmental studies should be a science investigating human lifestyle, or humanics. In this regard, RIHN believes that global environmental studies should return to the origin of environmental studies dealing with problems of the human or humanity.



Special Features of RIHN

Integration

In recent years many studies aimed at solving global environmental problems have been conducted in various ways in the world. RIHN is aware of the need for basic research conducted in a comprehensive framework encompassing relationships between human life and environmental problems rather than basic research involving geo-scientific monitoring and observation. Studies focused on human lifestyle and cultural problems are originally based on humanities and social scientific methods and viewpoints. RIHN believes it is important to combine such methods and viewpoints with natural scientific methods and standpoints. Global environmental studies can be integrated when conducted through an interactive approach, combining both natural and human/social sciences.

Fluidity

Professors, associate professors, and assistant professors at RIHN take part in research projects on the basis of a fixed-term system. Researchers leave the office when their project has been completed. Projects are organized to guarantee personnel fluidity. Research activities progress from incubation study (IS), through feasibility study (FS), to full research (FR). This step-wise research system makes it possible to take measures concerning research subjects and organizations in a flexible manner at each of the three research stages. Fluidity is also brought about by the constant exchange of persons among the eight domestic partner organizations. Participation by researchers from a wide range of fields allows RIHN to pursue construction of integrated global environmental studies in an evolutionary manner.

International Network

RIHN promotes research projects encouraging participation by foreign researchers, as well as domestic researchers, by means of collaborative agreements with international research organizations. The institute also positively takes part in the planning and operation of research projects organized by overseas research institutes and invites foreign researchers as visiting professors or research staff. Furthermore, RIHN held an international pre-symposium in 2005, the RIHN First International Symposium in 2006, and four satellite symposiums in 2006, inviting 32 researchers in total from within Japan (22) and abroad (10). The RIHN Second International Symposium is scheduled for October of 2007. The institute will invite over ten researchers from Japan and foreign countries for the symposium.

Leadership

To ensure integration, fluidity, and international networking, each project should be implemented under strong leadership provided by a dedicated leader. Furthermore, the Director-General and Program Directors shall play a central role in organizing research activities for the construction of global environmental studies at RIHN. The Executive Board shall also provide leadership when holding an international symposium, reviewing and assessing the institute's performance, and responding to evaluations made by outside parties.

← Rice shoot planting in rural areas of Nanking, China. The remarkable resemblance of the practice to the rice shoot planting once seen in every part of Japan suggests that the agricultural practice of rice shoot planting was brought from China to Japan. Since rice-planting machines have become popular in China in recent years, the practice as shown in the photo is expected to become extinct in China too.

Research Project System

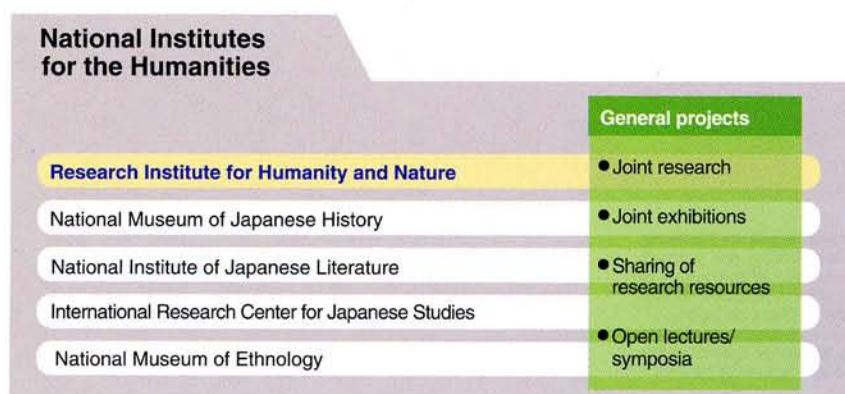
Research conducted at RIHN is organized on a five-year term basis as with projects under the 21st Century COE Program currently underway and the Global COE Program. RIHN's research project system incorporates several evaluation stages and completely differs from continuous five-year systems in style of research approach. More specifically, research seeds are planned through Incubation Study (IS). Six to twelve months later, the seeds become candidates for Feasibility Study (FS). If a research seed is permitted to proceed, FS is conducted for about one year. If then judged to be qualified by the Evaluation Committee for Research Projects and approved by the Advisory Committee, the FS proceeds to Full Research (FR). FR starts after a one-year pre-research (PR) period and is conducted for about five years. FR is subject to interim evaluation at the end of the second year and strict post-project evaluation after its completion (see page 15, Process Leading to FR Project Implementation).

The system ensures that a research plan is appropriate, and the plan's feasibility and accountability are reviewed and assessed repeatedly, so as to avoid adding just a plain stack of studies, while respecting the autonomy of each research project.

RIHN as a Member of National Institutes for the Humanities

National Institutes for the Humanities (NIHU) was established on April 1st, 2004 based on the National University Corporation Law. RIHN became one of the member institutes of NIHU along with the following institutes, National Museum of Ethnology, International Research Center for Japanese Studies, National Museum of Japanese History, and National Institute of Japanese Literature. RIHN undertakes its own research projects on the one hand and is actively engaged in various projects, on the other hand, organized by NIHU and the Inter-University Research Institutes, including joint research, research resource-sharing projects, new area studies projects, open lectures, and symposia. Regarding specifically the collaborative research project "Comprehensive Studies on Exchange between Eurasia and Japan," RIHN promotes "An Integrated Study of Water and People in Humid Asia" as the core organization.

Most members of National Institutes for the Humanities are humanities and social scientific research institutes. As an institute that conducts integrated global environmental studies as a humanities subject through a natural scientific approach, RIHN can facilitate collaborations between the other member institutes of National Institutes for the Humanities, domestic universities and research organizations.





Symposium "Water and Civilization" held under the collaborative research project "Water and People" of National Institutes for the Humanities



Research journal *Water and People* reporting on the National Institutes for the Humanities collaborative research project "Water and People." Volumes 0 to 2 have been published, each featuring a different topic.

The Mid-term Targets and Plans

Since 2004, RIHN has conducted research projects setting six-year midterm targets and plans as a member of National Institutes for the Humanities. Each team has made its efforts in accordance with the mid-term goals and plans of National Institutes for the Humanities and has inspected its own performance, compiling a report every fiscal year.

Achievements concerning the midterm targets are evaluated as requested by the National University Corporation Evaluation Committee of the Japanese Ministry of Education, Culture, Sports, Science, and Technology (the Corporation Evaluation Committee). The National Institution for Academic Degrees and University Evaluation evaluates the education/research-related part of achievements made during the mid-term period. Evaluation results are submitted to the Corporation Evaluation Committee for publication.

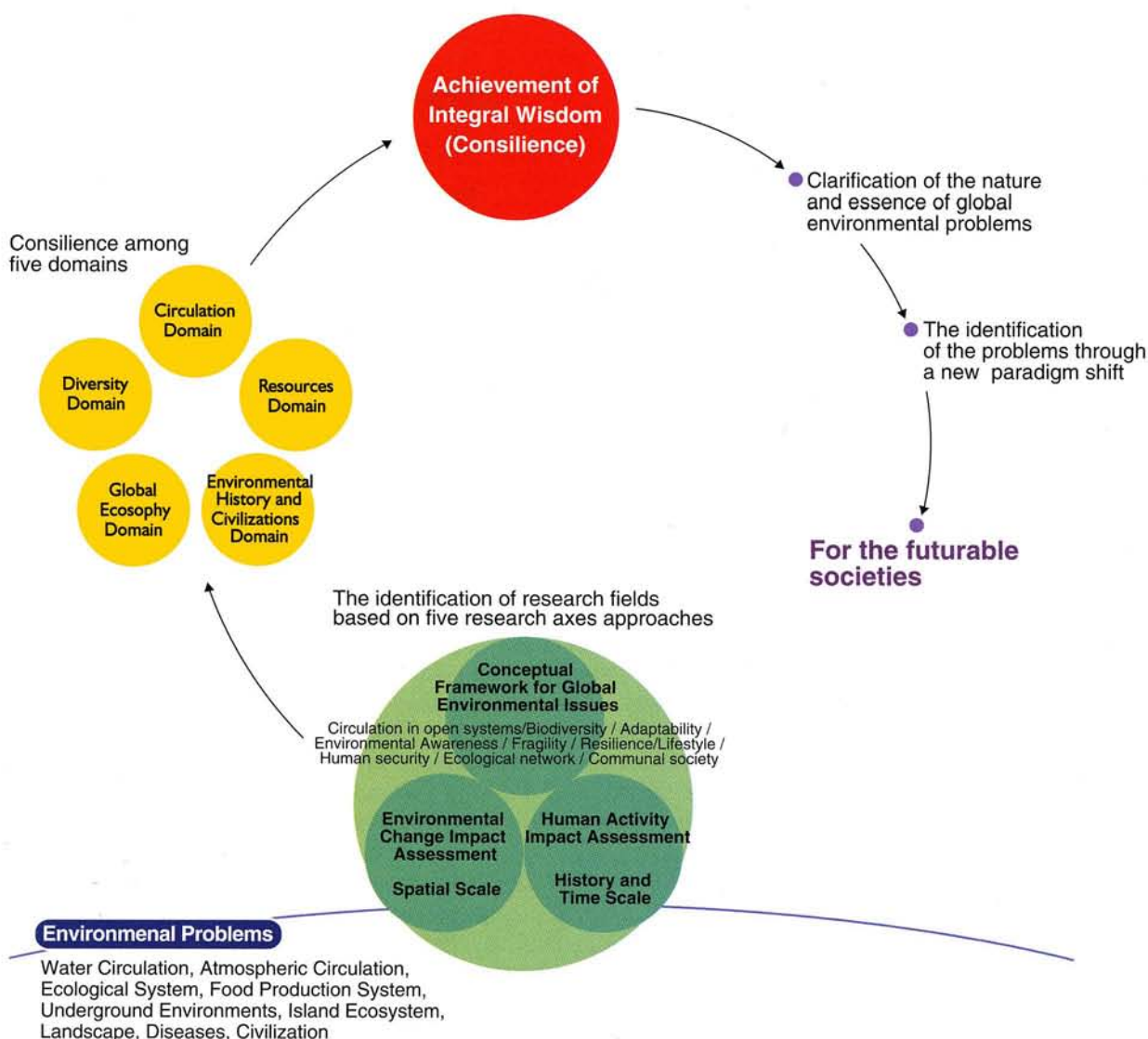
In fiscal year 2007, RIHN is preparing for provisional evaluation of the institute's achievements for the midterm period, as a preliminary step towards final evaluation. The institute will review and evaluate the status of its research activities in a proper and effective manner as a basis for the final evaluation. Furthermore, it will additionally receive feedback from an external party. Taking these steps, RIHN will compile an achievement report concerning the evaluation of the institute's educational and research performance.

The Goal of RIHN: Constructing the Integral Wisdom as Consilience

Through various research projects, RIHN studies the interactions that form the links between human and nature. Study areas and time spans are diversified. The institute believes it important to indicate a direction of integration for individual research projects. Our past research experience and opinions presented through discussions held within and outside the institute have indicated the following direction and guidelines for RIHN to follow.

RIHN's research projects have investigated environmental problems under diverse themes including: water circulation, atmosphere, climate, oceans, underground environments, island ecosystems, ecological systems, food production systems, diseases, landscapes, and civilization. These individual research projects have been divided according to specific research categories.

With these in mind, we consider it is an important mission for RIHN to achieve consilience in the area of global environmental problems. The true nature of global environmental problems becomes apparent through consilience, presenting a new paradigm to view problems. It will then become possible to draw up a plan for building a futable society.



● Programs and Research Projects ●

In actually conducting research activities in the new area of global environmental studies, basic methodology is of prime importance. In this regard, it is necessary to define research domains and create a new paradigm using acquired data.

To integrate research results based on the idea of consilience, it is essential to newly set domains as “programs” grouping individual projects into clusters. Program directors are responsible for compiling the results of programs.

This year RIHN has begun to formulate comprehensive strategies to rearrange results of research projects for consilience under the following programs.

Circulation Domain

Dealing with various kinds of problems as to the circulation of substances such as water, oxygen, carbon, and nitrogen in the human sphere and their imbalance and inappropriate uses

Diversities Domain

Dealing with global environmental problems derived from the loss and degradation of genetic-specific and ecological biodiversity, as well as cultural diversities related to language, social structure, religion, and cosmology.

Food and Resources Domain

Dealing with global environmental problems associated with food and energy resources and with the relevant economic activities (agriculture, forestry, fishery, and animal husbandry) for human survival.

Environmental History and Civilization Domain

Dealing with historical consequences of human-nature interactions, particularly of civilization as global environmental history.

Interdisciplinary Domain

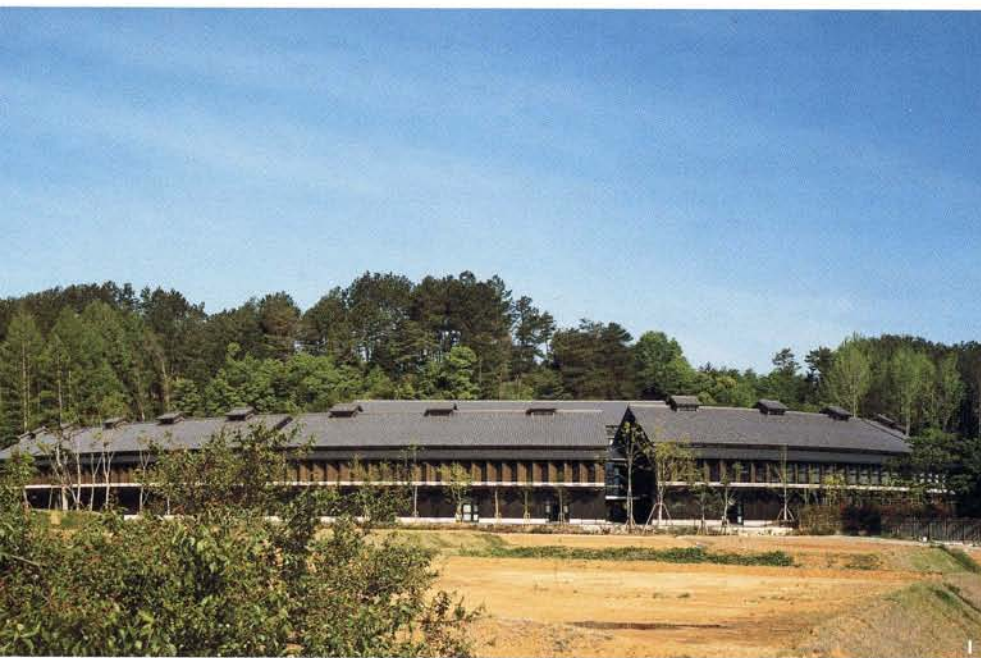
Seeking new approaches and methodologies to study global environmental problems.

A Guide to the Facilities

Our concept is that the root of global environmental problems lies in human 'culture' in the widest meaning of the word; and that solutions can be found through a culture of improved communications. RIHN aims to elucidate the complex and varied relationships linking humanity and nature. We are trying to synthesize new approaches beyond the existent, formal disciplines of natural, social, and human studies. This requires communication and encouragement among researchers. The RIHN campus is designed to provide an environment for that purpose.

Research rooms on the RIHN campus are designed to provide a sense of openness. The design concept is to allow projects implemented to be loosely interconnected as they occur in one large curved space 150 m in overall length. The facilities will help external researchers as well as RIHN research staff to meet one another, since they are designed with the maximization of shared use in mind. In other words, this particular layout enables joint research while maintaining the independence of individual projects. At the center of the main building, a library and computer room is located for the convenience of many users, plus three lounge-like spaces are provided for casual discussions. On the basement floor, a cluster of fully functional laboratories has been designed with emphasis on convenience for shared use, as with the research rooms.

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



1 RIHN Main Building

The exterior blends perfectly with the landscape.

2 Project Room

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

3 Assembly Hall, RIHN House

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

4 Detached Room "Hanare"

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

2F: Administration Floor

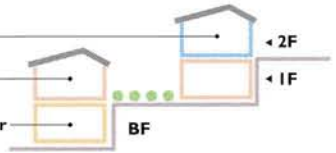
Entrance Hall
Exhibition Hall
Conference Hall
Administration Office
Seminar Rooms
Dining Hall

1F: Research Floor

Project Rooms
Research Rooms
Research Promotion Center
Library

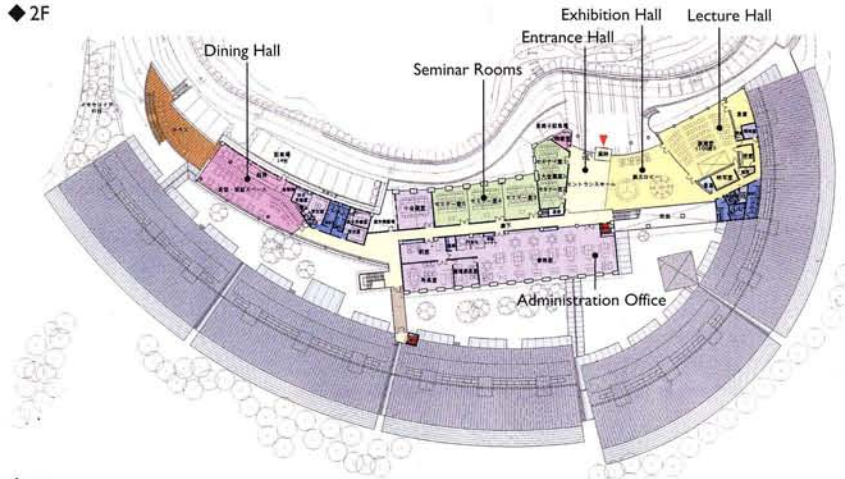
BF: Laboratory Floor

Experimental
Laboratories
Library Stacks
Utilities

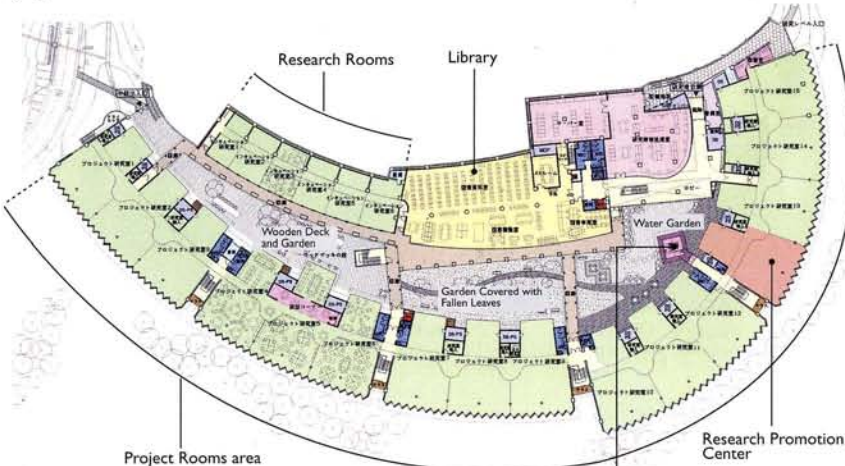


Floor Plan of PIHN Main Building

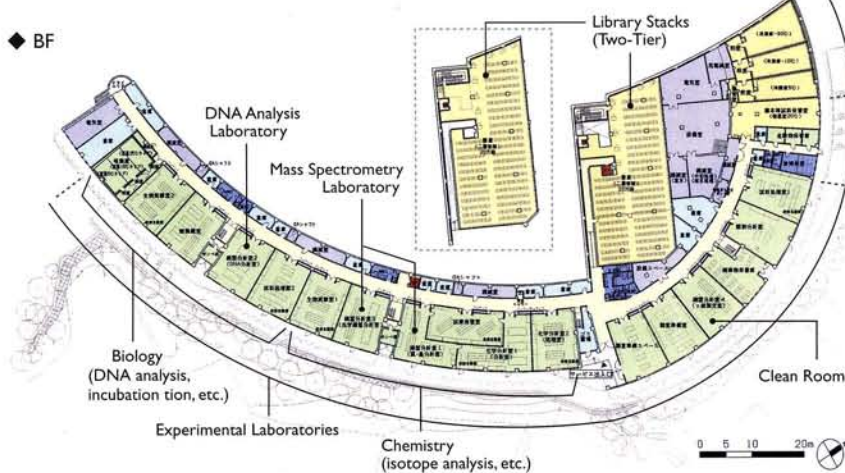
◆ 2F



◆ 1F



◆ BF



5 Entrance Hall and Exhibition Hall
Exhibitions are held to provide information about RIHN activities and completed research

6 Patio (Wooden Deck and Garden)
The patio comprises the Water Garden, the Garden Covered with Fallen Leaves, and the Wooden Deck and Garden to create a space in which humans, buildings, and nature are in harmony. Research rooms, project rooms, and the computer room are arranged on both sides of the patio.

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

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

Dissemination of Research Results

International Symposium

RIHN held its first international symposium on November 6th through 8th, 2006 under the title of "Water and Better Human Life in the Future." On November 6th, Gordon Young, Coordinator of the UNESCO World Water Assessment Programme and Hidaka Toshitaka, former Director-General of RIHN presented open lectures for an audience of about 1,300. On November 7th and 8th, researchers from throughout the world had lively discussions in two sessions, "Water Imbalances" and "Dynamic Interactive Systems Involving Humans and Nature around Water." The symposium was reported in English (RIHN 1st International Symposium Proceedings). Prior to the international symposium, we held two pre-symposia in 2005 and gained valuable experience.

RIHN's second international symposium is scheduled for October 29th through 31st, 2007 under the title "Asian Green Belt — Past, Present and Future."



Satellite symposium "World Heritage, Water and People" held in sync with the RIHN First International Symposium



Keynote speech presented by HIDAKA Toshitaka, former Director-General

Forum

RIHN has held the RIHN Forum for the general public once every year. During the period from 2002 to 2006, the forum has been organized five times and reports have been published. Since 2004, forum achievements have been compiled and issued as a book. Easy to understand, RIHN Publications have been offered to gain the understanding of the general public and have attracted many readers. In fiscal year 2007, the RIHN Forum will feature "Food as a Global Environmental Problem." Discussions will be held from a broad perspective on the impact of present-day food production/consumption on the global environment, self-sufficiency ratio imbalance, and what the Japanese food production/consumption should be in the future.



2006 RIHN Forum

No.	Title / Date / Venue
1st	The global environmental problems – Toward an integrated approach 17 May, 2002 Kyoto International Conference Hall
2nd	Global warming – Nature and culture 13 June, 2003 Kyoto International Conference Hall
3rd	What comes after biodiversity loss? 10 July, 2004 Kyoto International Conference Hall
4th	Water Exhaustion 9 July, 2005 Kyoto International Conference Hall
5th	Forests and People in Asia – Eco-historical Perspective 8 July, 2006 Kyoto International Conference Hall
6th	Food as a Global Environmental Problem 7 July, 2007 Kyoto International Conference Hall



At the venue of a Public Seminar held for the general public

Seminars

RIHN provides seminars for the general public. The regular Public Seminar is held on a monthly basis, while the RIHN Area Seminar visits a venue outside the Institute and is focused on specific local nature and culture with participants including local researchers and citizens.

Public Seminars

The first seminar being held in November 2004, eighteen seminars had been offered by April 2007. The Public Seminar explains global environmental problems in plain terms using concrete examples. In every session, we receive enthusiastic questions from the audience.

No.	Title	Date	Speaker
1st	The fascination and the reality of the Silk Road Region	5 November, 2004	NAKAWO, Masayoshi (Professor, RIHN)
2nd	A Multi-disciplinary challenge towards the Lake Biwa watershed management	3 December, 2004	YACHI, Shigeo (Associate Professor, RIHN) NAKANO, Takanori (Professor, RIHN)
3rd	Iriomote island with its subtropical nature and life	4 February, 2005	TAKASO, Tokushiro (Professor, RIHN) Mr. KOMI etc.
4th	World water issues in the 21st century	4 March, 2005	KANAE, Shinjiro (Associate Professor, RIHN)
5th	Global warming, is it real?	1 April, 2005	HAYASAKA, Tadahiro (Professor, RIHN)
6th	Impacts of climate change on life and environment	3 June, 2005	WATANABE, Tshugihiko (Professor, RIHN)
7th	Kamo river and Hwang Ho — The blessing and misfortune	3 September, 2005	FUKUSHIMA, Yoshihiro (Professor, RIHN)
8th	Fish and food culture in Southeast Asia	7 October, 2005	AKIMICHI, Tomoya (Professor, RIHN)
9th	Species rich forests are necessary for sustainable human life	2 December, 2005	NAKASHIZUKA, Tohru, (Professor, RIHN)
10th	Narrative theory of environment ? Environmental quality and environmental consciousness	3 February, 2006	YOSHIOKA, Takahito (Associate Professor, RIHN)
11th	New environmental hypothesis entitled "Megascale Fish Feeding Forest" applied to Amur River, the Sea of Okhotsk and the World Nature Heritage Shiretoko	3 March, 2006	SHIRAIWA, Takayuki (Associate Professor, RIHN)
12th	A prologue to environmental history in Eurasia — from Monsoon Asia to Silkroad	14 April, 2006	SATO, Yo-ichiro (Professor, RIHN)
13th	How wil become Japanese nature? How should we plan Japanese land?	9 June, 2006	YUMOTO, Takakazu (Professor, RIHN)
14th	Why did the Indus Civilization decline?	22 September, 2006	OSADA, Toshiki (Professor, RIHN)
15th	Global environmental problems under the ground	20 October, 2006	TANIGUCHI, Makoto (Associate Professor, RIHN)
16th	Landscape is alive!	1 December, 2006	UCHIYAMA, Junzo (Associate Professor, RIHN)
17th	Different types of illness — Doctors for humans and doctors for the environment	9 June, 2006	KAWABATA, Zen'ichiro (Professor, RIHN) OKUMIYA, Kiyohito (Associate Professor, RIHN)
18th	The Silk Road — Historical Interactions between Human and Nature	20 April, 2007	KUBOTA, Jumpei (Associate Professor, RIHN)

RIHN Area Seminars

The RIHN Area Seminar began in 2005. The first session was held in Toyama under the title "Snow and People — Sustaining Life in the Japan Sea Area." Three researchers each from RIHN and Toyama Prefecture participated in the seminar and had animated discussions on the functions of snow. The second session titled "Rethinking Volcanoes, Water and Food in Kagoshima Area" was held in Kagoshima in 2006. Three RIHN researchers and three from Kagoshima Prefecture had enthusiastic discussions on the indigenous nature and food of the Kagoshima area. The third RIHN Area Seminar for fiscal year 2007 is scheduled to be held in Ito, Shizuoka Prefecture.

Research Project Presentation

The leaders of the research projects at RIHN present for discussion a report on the progress of each research project to an audience comprising RIHN education/research staff, the institute's administration staff, and external joint researchers. Over 500 people take part in the three-day presentation. These institute-wide efforts and lively exchanges of views constitute an important part of research activities at RIHN, facilitating the institute's self examination and evaluation. (Scheduled: December 13th-15th, 2007)

Other Meetings for Research Exchange

In order to increase communications among the RIHN staff, the institute holds the following meetings and seminars for research exchange on a regular basis.

RIHN Seminars

RIHN Seminars are organized monthly, as a rule, to provide opportunities for RIHN's scientists to share the latest topics and research trends in different fields of global environment research with speakers invited from Japanese or foreign institutes, and to find inspiration for new directions of research.

Luncheon Meeting (Danwakai)

At RIHN, the luncheon meetings provide a unique opportunity for mutual inquiry and exchange of opinions among institute members, as well as visiting professors, part-time researchers, foreign researchers and so on. Participants have discussions on diverse research areas and methods. Like RIHN Seminars, the Danwakai plays an important part as a casual place for research exchange. It is held on a biweekly basis.

Evening Seminars

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

Publications/Newsletter



Publications

These publications provide the general public with easy-to-understand introductions to RIHN's study results.

- Volume 1, "Biodiversity, why it is important?" (Japanese), Showado (April 2005)
- Volume 2, "Ecological Immigration" (Japanese), Showado (July 2005)
- Volume 3, "The Water and Greenery of the Silk Road. Where did they disappear to?" (Japanese), Showado (March 2006)
- Volume 4, "Who claims forests ownership?" (Japanese), Showado (March 2007)



RIHN Library

RIHN has also published academic books dealing with the research activities of the RIHN staff, including: *Kusunoki to Nihonjin* (History of Japanese camphor trees), Yasaka Shobo; *Sekai Isan o Shika ga Kuu* (World heritage eaten by deer), Bun-ichi Sogo Shuppan; *Himaraya to Chikyu Ondanka* (Himalayan glaciers under global warming), Showado; *Indus Civilization-Texts and Contents*, Manohar; and *Hito wa Naze Hana o Mederu noka* (Origin of human beings' love for flowers — Why do humans love flowers?), Yasaka Shobo.



Mori wa Dare no Mono ka (Who claims forests ownership?).

Edited by HIDAKA Toshitaka and AKIMICHI Tomoya.

This book on the achievements of the 2006 RIHN Forum describes the complex historical consequences of human interactions with forests in Asia, including Japan, and sheds light on appropriate guideline for the future.

Hito wa Naze Hana o Mederu noka (Origin of human beings' love for flowers — Why do humans love flowers?).

Edited by HIDAKA Toshitaka and SHIRAHATA Yozaburo.

A good source book for ideas and thoughts on the origin of human's love of flowers from pre-historic archaeology, Japanese history, anthropology, art history, and the cultural history of plants, based on the open symposium and lectures provided by National Institutes for the Humanities in fiscal year 2006.

Himaraya to Chikyu Ondanka (Himalayan glaciers under global warming).

Edited by NAKAWO Masayoshi.

Reports on the rapid shrinking of Himalayan glaciers using latest observation data and discusses the causes.

■ Humanity & Nature Newsletter

This newsletter provides the research community and society with information such as a profile of the institute and its activities. The first issue was published in 2006. The A4-sized, full-color newsletter issued bimonthly offers readable articles.



■ Other Publications

Future of the Earth: Narrative for Children published in 2006 by Kodansha describes global environmental problems for readers who have children. This book is based on achievements by projects conducted at RIHN.

Results of RIHN research projects have been successively published beginning with the five projects completed in fiscal year 2006, including *Journal of Regional Oasis History — A Sketch of 2000 Years of the Heihe River Basin* (Shokado) and *Anthropological and Environmental Studies Dealing with Khara Khoto* (Proceedings of the International Symposium on the Environment and History of Khara Khoto) (Renmin University of China Press). Furthermore, *A Study of Eco-Historical Anthropology* (in Chinese) (China Social Sciences Press) and *An Illustrated Eco-History of the Mekong Basin — History and Ecology* (Koubundou Publishers) report on projects still underway.

Additionally, RIHN takes the initiative in publishing *Water and World Heritage Sites* (Shogakukan) as part of the National Institutes for the Humanities collaborative research project “An Integrated Study of Water and People in Humid Asia.”



Future of the Earth: Narrative for Children.

Edited by HIDAOKA Toshitaka and Research Institute for Humanity and Nature.

This book provides basic ideas and views on global environmental problems for future generations.

Journal of Regional Oasis History.

Edited by INOUE Mitsuyuki, KATO Yuzo, and MORIYA Kazuki.

A result of the Oasis Project, this book is a collection of papers on the 2000-year history of the Heihe River Basin based on literature and archaeological data.

Anthropological and Environmental Studies Dealing with Khara Khoto.

Edited by SHEN Weirong, NAKAWO Masayoshi, and SHI Jin-Bo.

A collection of papers presented at the international symposium held in Ejina in September 2006, containing abstracts in English. Almost half the book is papers from the Oasis Project.

A Study of Eco-Historical Anthropology.

Edited by YIN Shaoting and AKIMICHI Tomoya.

This is the first contribution by scholars from Yunnan, China who have been involved in the Eco-History Project (FR4-2) and contains results of a three-year joint study conducted in various parts of Yunnan Province.

An Illustrated Eco-History of the Mekong Basin.

Edited by AKIMICHI Tomoya.

Describes regional eco-historical consequences in the Mekong Basin during the past few decades. Fifty-five items are included from various academic disciplines with full-color illustrations.

Water and World Heritage Sites.

Edited by AKIMICHI Tomoya.

An outcome of the International Symposium “World Heritage, Water and People” held in November 2006. Focusing on water, this book deals with various environmental, cultural, and social issues in World Heritage Sites in Japan and Asia.

Research Activities

2007 Research Projects

Completed Research

Leader	Theme
1-1 CR WATANABE, Tsugihiro	Impact of Climate Changes on Agricultural Production System in the Arid Areas Emissions of Greenhouse Gases and Aerosols, and Human Activities in East Asia Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives
2-1 CR HAYASAKA, Tadahiro	
3-1 CR YACHI, Shigeo	
4-1 CR NAKAWO, Masayoshi	
5-1 CR KANAE, Shinjiro	

Full Research

5 th year		
1-2 FR FUKUSHIMA, Yoshihiro	Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on Environment Sustainability and Biodiversity Assessment on Forest Utilization Options A Trans-Disciplinary Study on the Regional Eco-History in Tropical Monsoon Asia: 1945-2005	
2-2 FR ICHIKAWA, Masahiro		
4-2 FR AKIMICHI, Tomoya		
4 th year		
3-2 FR TAKASO, Tokushiro	Interactions between Natural Environment and Human Social Systems in Subtropical Islands Interaction between Environmental Quality of the Watershed and Environmental CONSCIOUSNESS: With Reference to Environmental Changes Caused by the Use of Land and Water Resource	
5-2 FR NAKAWO, Masayoshi		
3 rd year		
2-3 FR SHIRAIWA, Takayuki	Human Activities in Northeastern Asia and Their Impact on the Biological Productivity in North Pacific Ocean	
2 nd year		
2-4 FR TANIGUCHI, Makoto	Human Impacts on Urban Subsurface Environments Agriculture and Environment Interactions in Eurasia: Past, Present and Future —The ten-thousand-year history	
2-5 FR SATO, Yo-Ichiro		
5-3 FR YUMOTO, Takakazu	A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago	
1 st year		
3-3 FR OSADA, Toshiki	Environmental Change and the Indus Civilization Vulnerability and Resilience of Social-Ecological Systems	
1-3 FR UMETSU, Chieko		
4-4 FR UCHIYAMA, Junzo	Neolithisation and Modernisation: Landscape History on East Asian Inland Seas	
4-5 FR KUBOTA, Jumpei	Historical Interactions between the Multi-cultural Societies and the Natural Environment in a Semi-arid Region in Central Eurasia Effects of Environmental Change on the Interactions between Pathogens and Humans	
5-4 FR KAWABATA, Zen'ichiro		

Pre-Research

2-8 PR MOJI, Kazuhiko	Environmental Changes and Infectious Diseases in Tropical Asia
3-4 PR OKUMIYA, Kiyohito	Human Life, Aging, and Disease in High-Altitude Environments: Physio-medical, Ecological and Cultural Adaptation in the Three Great "Highland Civilizations"
3-5 PR YAMAMURA, Norio	Collapse and Restoration of Ecosystem Networks with Human Activity

Feasibility Study

2 nd year		
2-7 FS ZHENG, Yuejun	Relationships between Human Activities and Atmospheric Changes, Possibilities of Harmonious Society for Environmental Issues in the East Asia Sustainable Food Production Concept Based on Evaluation of Traditional Agricultural Practices	
2-9 FS SATO, Tadashi		
1 st year		
2-10 FS MURAMATSU, Shin	Migration, Sojourn, and Possibilities in Cities Environmental Problems and Human Security for Children as Our Future: Asia-Pacific Children and the Environment (ACE) Project	
2-11 FS YAMAUCHI, Taro		
3-6 FS NAWATA, Hiroshi	A Study of Human Subsistence Ecosystems among Arab Societies: To Combat Livelihood Degradation	
3-7 FS KITAZAWA, Daisuke	The Effects of Economic Activities on the Ecosystem in the Caspian Sea and Cooperative Environmental Protection System	

Incubation Study

Process Leading to FR Project Implementation

In project-type research, RIHN research staff must be joined with the team as a co-researcher in order for the applicant becomes well aware of RIHN's mission and is able to propose an appropriate research project.

Project-type research is a type of research collaboration where researchers from various disciplines work together for a particular research theme that will realize a mission of RIHN

*Excerpted from the Policies on Implementation of Research Projects at RIHN

Incubation Study

Outline: Incubation Studies are proposed by individuals, which then become joint studies that serve to discover new seeds and aims for the development into research projects. Research themes are solicited from both inside and outside the institute.
Period: 6 or 12 months

Feasibility Study

Outline: Stepping up from an incubation study, a Feasibility Study (FS) is the preparatory research stage before Full-Research. Period: 6 or 12 months

Pre-Research

Outline: Based on the result of Feasibility Study, Pre-Research is conducted as a transition from FS to FR. The Pre-Research is so called since it is in the budget request stage. Period: 1 year

Full Research

Outline: Full-Research is a project promoted with the aim of gaining study results within five years. Concrete targets are set with the aim of finding solutions. Period: 3-5 years

Completed Research

Outline: A research project is complete when its results have been evaluated by the Evaluation Committee after the 5-year study period.

IS Application

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

IS Implementation

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

FS Implementation

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

PEC for Research Projects (Assessment)

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

PR Implementation

PEC for Research Projects (Recommendation)

FR Implementation

PEC
Interim repeat, evaluation one year prior to the end, final evaluation

CR

Two years after the completion of the completion of the project, PRT is held in cooperation with the Strategic Center for Research Promotion to evaluate the project.

■ Project Review Task Committee (PRT)

Member: Director-General, Deputy Director-General, Program Directors (5), Strategic Center for Research Promotion (a few members)
Governed by: Evaluation Committee Rules and Evaluation Guide
Project Review Task Committee Rules and Evaluation Guidelines

■ Project Evaluation Committee (PEC)

6Member: All are external members. (14)
Governed by: Research Project Procedural Manual

■ Executive Board

Member: Director-General, Deputy Director-General, Program Directors (5), Director of the Strategic Center for Research Promotion, and Director of the Administration Office
Governed by: Executive Board Rules

■ Advisory Committee

Member: 14 committee members
Governed by: RIHN Advisory Committee Rules

Evaluation of Completed Research

The five research projects pursued since RIHN's founding have concluded this year. These first research projects will determine the future of RIHN and its research activities. The project achievements are attracting attention both from within and outside the institute.

The five projects differed in study field, research technique, and the global environmental problem studied. However, a common feature was that specialists from diverse fields of study conducted each project, in other words, they were crossdisciplinary research projects, as represented by the term "integration." Each research project has undergone post-project evaluation carried out by the RIHN Evaluation Committee for Research Projects, as required by the institute's policies. The evaluation results are shown below. For detailed information on the evaluation results of each project, you can visit RIHN's Website.

Information on these research projects is available as individual reports. In addition, some of them have published books targeted at the general public.

The five research projects were all strongly related with water, although it was not intended at the initial stage to hold a presentation under a common theme. Consequently, last November, RIHN held its first international symposium "Water and Better Human Life in the Future" and shared the research results with researchers from other countries. The symposium was reported in a specialized publication titled "RIHN 1st International Symposium Proceedings." A readable book in Japanese on the symposium achievements is currently planned.

1-1CR Impact of Climate Changes on Agricultural Production System in the Arid Areas

Project Leader: WATANABE, Tsugihiko

The research objective was in line with the RIHN Guidelines. Objectives of the initial research project have been fairly well achieved.

2-1CR Emissions of Greenhouse Gases and Aerosols, and Human Activities in East Asia

Project leader: HAYASAKA, Tadahiro

The research objective was in line with the RIHN Guidelines. Objectives of the initial research project have been fairly well achieved.

3-1CR Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed

Project Leader: YACHI, Shigeo

The research objective was well in line with the RIHN Guidelines. Objectives of the initial research project have been almost completely achieved.

4-1CR Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes

Project Leader: NAKAWO, Masayoshi

The research objective was in line with the RIHN Guidelines. Objectives of the initial research project have been fairly well achieved.

5-1CR Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives

Project Leader: KANAE, Shinjiro

The research objective was well in line with the RIHN Guidelines. Objectives of the initial research project have been almost completely achieved.



Poster session at RIHN 1st International Symposium



Enthusiastic discussions held in the conference hall at RIHN 1st International Symposium

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

This research project aimed at identifying the direction and dimensions of the potential impacts of climate changes and ensuing adaptations in the agricultural production systems of arid regions, where water resources are limited, based on the projection of future regional climate changes on the eastern coast of the Mediterranean Sea, the case study region. While the relationship between climate and agriculture in the past and present was analyzed, the impact of climate changes, including rise in air temperature, decrease in precipitation and sea-level rise, on agricultural production systems were assessed. The project was implemented as an international joint project in cooperation with the Scientific and Technological Research Council of Turkey.

Project Leader ■ **WATANABE, Tsugio** RIHN

Summary of Research Outcomes

Climate change in the 2070s in the Seyhan River Basin was projected by using the latest climate model, and impacts of climate change on the condition of the river basin and agricultural production were assessed through generated climate change scenarios. The results showed the possibility of temperature increases of 2 to 3.5 degrees throughout the year and decreases in precipitation of about 20% except during summer.

The developed crop model predicts future increased wheat yields, which is a main crop in the region, with higher temperature and increased CO₂ in the 2070s. The projected decrease in precipitation will not affect the yield of wheat significantly. And, a decrease in precipitation will cause a decrease of water resource availability, resulting in water shortages and crop damage according to selection of crops and the expansion of the irrigated area.

“Projection” or prediction is a discussion with piling up probable conditions and available information, and it could be recognized as a kind of thought experiment. An adaptive management approach like “Mitameshi” (watching and trying-out) is essential to account for the uncertainty of a human-nature system, when its resultant changes can not be simulated and predicted precisely since repeated experiments are not possible.

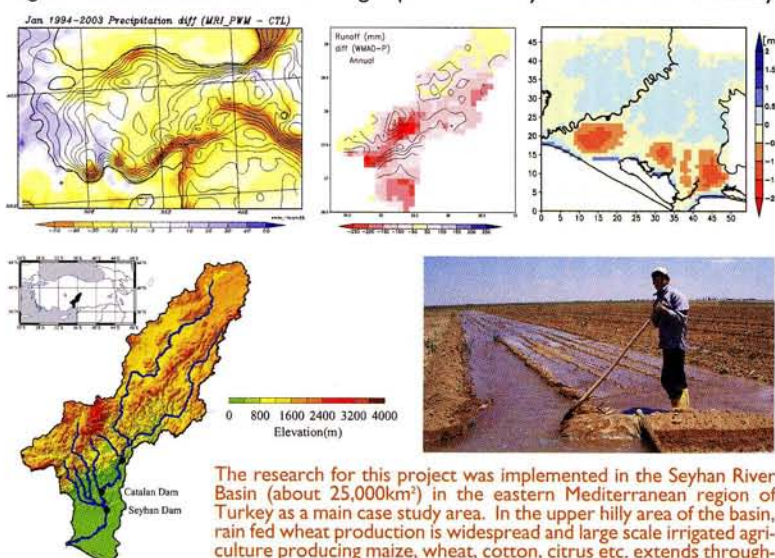
Contribution to Better Solutions for Global Environment Problems

Climate change due to global warming will affect the natural conditions for agriculture like land and water resources and consequently impacts agricultural production. With these impacts, humans may act to adapt to the changes or to mitigate the damage caused by climate change. These human reactions may result in other changes in the environmental problems. Therefore, for better solutions to the problems, it is essential to understand and project the impacts of climate change on agricultural production, and to let local knowledge and systems react to the changes. In this project, a method to diagnose the problems of land and water use and identify the crucial points was developed. In Turkey, where the case study area was located, the project provided the opportunity to establish new research organizations and a cross-disciplinary approach to the problem, and promoted enhanced consciousness of the importance of impact assessment of global warming on basin hydrology and agriculture.

Disseminations of the Project Outcomes

The outcomes of the project are disseminated to the public, in the shape of books, lectures, reports, etc., inside and outside Japan. The project participants have published scientific papers on the research results in academic journals and international conferences, and will continue to do so as well. In Turkey, the project held a symposium on land and water management, and provided a television program with the research outcomes. In addition, the method developed by the project and the results are being supplied to international organizations and research initiatives.

Figure Assessment of Global Warming Impacts in the Seyhan River Basin of Turkey



The research for this project was implemented in the Seyhan River Basin (about 25,000km²) in the eastern Mediterranean region of Turkey as a main case study area. In the upper hilly area of the basin, rain fed wheat production is widespread and large scale irrigated agriculture producing maize, wheat, cotton, citrus etc. extends throughout the lower plain, which depends on the water supply from the reservoirs that receive run-off of winter precipitation in upper mountainous areas. The climate scenarios for the 2070s were generated by using the developed local climate model. (Top-left: an example of the future precipitation change in January. Blue shows increases and brown shows decreases). The basin model predicted the future changes of the hydrological regime along with the climate scenarios. (Top-center: predicted changes in annual runoff yield. Blue shows increases and red shows decreases). The future crop growth and water balance in the farmland were predicted based on these conditions. (Top-right: change of average groundwater table in the lower basin. Blue shows future rise and red shows decline).

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

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

Project Leader ■ HAYASAKA, Tadahiro RIHN

The present study focused on East Asia, especially China, for the past few decades to investigate (1) the relationship between changes in human activities such as economy and industry and the change in emissions of anthropogenic gasses and aerosols, and (2) the influence of the emitted gases and aerosols on climate change and air pollution.

The macroanalysis of economy was performed as planned. The economic development in East

Asian countries led by industrialization brought increases in energy consumption and emissions of CO₂, SO₂ and others. However, SO₂ emissions have not increased as much as expected. The emission density of CO₂ has not increased or has decreased due to an improvement in energy efficiency.

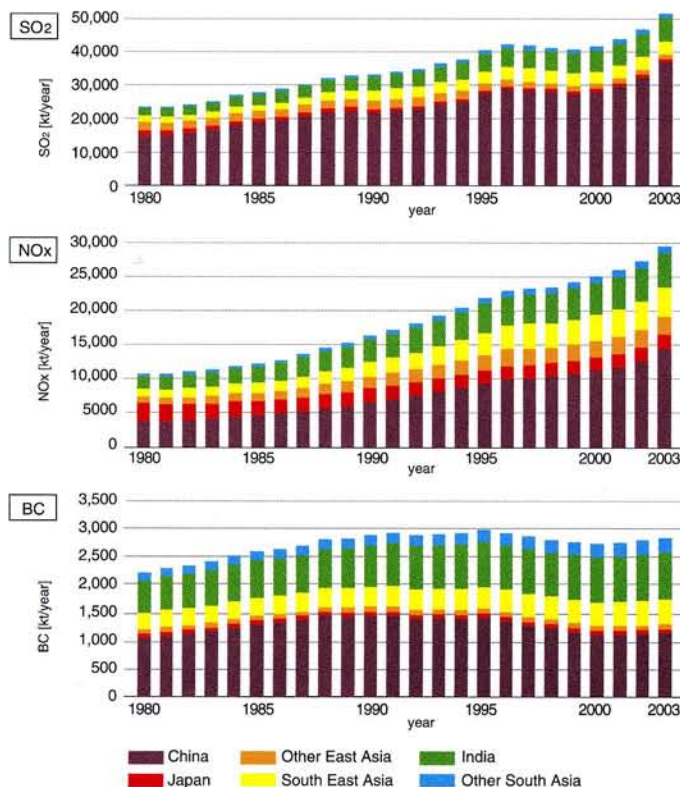
The emission inventory was developed according to the initial plan, which includes anthropogenic greenhouse gases, aerosols, and precursors of aerosols for the period, 1980-2003.

Figure 1, for example, shows changes in the amounts of emitted SO₂, NO_x, and Black carbon (BC) in Asia.

The analysis of emitted anthropogenic gases and aerosols was performed with observations and atmospheric transport models. The observations of greenhouse gases were carried out in China and around Japan. The observations of aerosols were carried out mainly in Japan. The results of those observations were consistent with the emission inventory.

The results show that aerosol loading increased with an increase in fossil fuel consumption in China and other Asian countries and air pollution also increased, and thus surface shortwave irradiance decreased. However, the surface air temperature increased in almost all regions of China for the past 40 years, because of increasing greenhouse gases and a complicated climate system.

Figure 1 Changes in the Amount of the Emission of SO₂, NO_x, and Black Carbon (BC) in Asia



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

The differences in problem consciousness among various stakeholders occurring from “hierarchy” of a watershed could be a major hindrance to governance, leading to conflicts between top-down and bottom-up Management. We proposed a system of “hierarchical watershed management” to overcome the restrictions derived from these hierarchical characteristics (Figure). Based on this idea, we conducted research on the agricultural turbidity problem in the Lake Biwa watershed to develop a methodology for environmental diagnosis and consensus building with an emphasis on communication. Our project is unique in 1) developing a new methodology to promote governance and participation of residents by 2) our transdisciplinary approach to natural science and social science 3) practiced in three scales in the Lake Biwa watershed (Shiga prefecture as macroscale, Inae district as mesoscale, local communities in Inae district as microscale, 4) moving towards practical watershed and global environmental studies.

Project Leader ■ YACHI, Shigeo RIHN

Specific Research Findings

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

The results of newly developed watershed diagnosis methods including stable isotope ratios and rare elements indicate that agricultural activities related to smaller rivers flowing into the eastern part of the lake have a large potential impact on the water quality and eutrophication of Lake Biwa, and that fine-tuned water management and water channel cleaning by local residents through a bottom-up approach is both effective and necessary for the environmental preservation of Lake Biwa.

(2) Clarification of an integrated picture of the agricultural turbid water problem and establishment of a communication methodology to support local residents' voluntary environmental preservation activities

In the background of the agricultural drainage issue, lies a drastic change of Japan's agricultural policy and agricultural community structure, which caused an increase in part-time farmers and decrease in young farmers. A workshop method was developed to support residents themselves

discussing the local water environment and its future prospects using maps. Practical workshops were held to confirm how the provision of information related to the current status of the water environment or measures for water environmental preservation would affect the farmers' awareness of environmental considerations or their actions. These results indicate the need to develop a communication method based on the assumption of the individuality of the community and the importance of conditions such as social capital that allow such a method to work effectively.

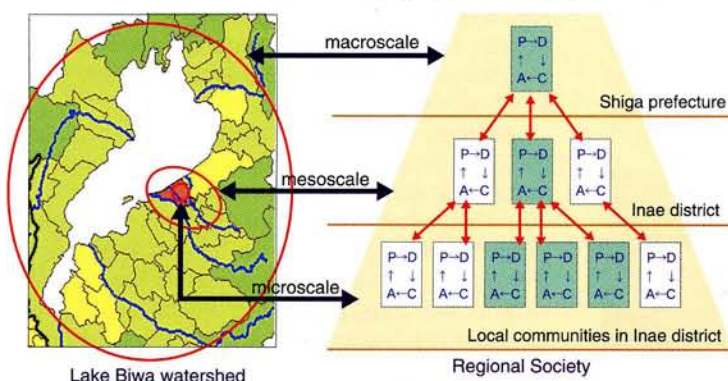
Contributions to Global Environmental Studies

There are two important issues that must be dealt with if we are to solve global environmental problems: (1) a watershed area is important in terms of scale. Dealing with it not only solves regional environmental problems but also constitutes a test bed for specific solutions to global environmental problems; and (2) It is essential to appropriately coordinate various stakeholders with various patterns of involvement in the environment that are deeply rooted in the area. Although this project has the methodology for watershed management as its main theme, we believe the project provided a prototype methodology which can contribute to the way we consider and solve global environmental problems.

Communication of Research Findings

The project final report (in Japanese, ISBN 4-902325-11-X) is now available at University libraries in Japan and at the libraries of cities and towns in the Shiga prefecture. In it, 5-year transdisciplinary research on watershed management is compiled as a first step to “watershed environmental studies” with close connection to global environmental problems. Readers will find not only the new research findings but also the message and dynamism of the project emphasizing the importance of practice in regional societies, the social meaning of transdisciplinary collaboration, and academic and social issues to be challenged.

Figure Hierarchical Watershed Management System Applied to Lake Biwa Watershed in the Case of Agricultural Turbidity Problem



Shiga prefecture, Inae district (region colored ■) and local communities in Inae district indicated by red circles (left) and green boxes (right) are regional stakeholders concerning the agricultural turbid water problem, however, their consciousness of the problem is not the same. The hierarchical watershed management system is a mechanism to promote watershed management by governance of the various stakeholders in the region by building 1) feedback mechanism (PDCA cycle) consisting of monitoring with diagnosis indicators at each scale, and 2) mechanisms to promote communication between hierarchies (indicated by red arrows).

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 the interaction 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. The major research field has been in and around the Heihe region in central Eurasia, where outstanding human cultures have developed for the last 2000 years.

Project Leader ■ NAKAWO, Masayoshi RIHN

Research Content

The history of the region has been reconstructed by examining historical documents, and a variety 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 placed on them has been also studied.

The Outline of the Research Results

The Heihe Basin is a region where farming was developed by numerous colonial soldiers sent there to confront the Huns during the Han Dynasty 2000 years ago. At that time, the area of the Juyanze Lake was as large as 1600 km². The lake area started decreasing thereafter, and this is considered to be due to the development of irrigated farmland. Thereafter, the region's population fell temporarily, but increased during each of the following dynasties: Tang, Xixia and Yuan.

Three-dimensional views helped identify the geographical extent of the agricultural lands around Kara Khoto during the Xixia and Yuan Dynasties in the period when Kara Khoto flourished. It was approximately twice the size of the modern Ejina Oasis.

Ice core analysis showed that the air temperature from the end of the Yuan through the early Ming dynasties gradually fell. In other words, the volume of river flow per annum became less than the total annual precipitation concomitant with the growth of the glaciers due to the cooling effect.

Also, it became clear that many large-scale water routes were constructed during the Yuan Dynasty, and were used to develop vast tracts of agricultural land. This development of farmland definitely increased the volume of water drawn from the river around the

oases, and consequently the downstream region of Kara Khoto was visited with water shortages.

At present, water shortages are again evident. Nearby vegetation is on the verge of crisis. Juyanze is also a shadow of its former self. The cause, basically, is the increase in the volume of water drawn from the river for irrigation farming at the oases, since water supply from the mountains has increased lately.

Two countermeasures to this problem have been established: forestation, and limits to the water drawn from the river in the mid-flow basins. Accordingly oasis farmers, for whom the volume of water they can take has been reduced, have come to dig wells to use the subterranean aquifers to augment their shortages in order to maintain their arable land. For forestation, a policy of "Ecological Relocation", in which herdsmen from the foothills of the mountains are moved to the area around the oasis, has been adopted. The displaced herdsmen, however, have to develop fresh arable land to graze their animals. Although only natural, their new farming regions need water. Hence, the oases need more water now than ever, and shallow wells in the downstream area and even around the midstream region of Zhangye have started to dry up. To supplement this, an abundance of deep wells are now being dug. The water, however, has started to be used in abundance. This is considered the major problem at the moment.

In the Heihe Basin, people have solved the problem of water shortages caused in the region (system) where they live, by expanding the area of the system. Drawing irrigation water from upstream of the Heihe River expands the area on which their livelihoods depend.

Recently, however, surface water has all been used up, and the system has been expanded to include the subterranean world as well. This fact also means that the range of the system on which people's livelihoods depends has expanded to a global scale. That is to say, our system has expanded as far as it can go, and it can only be said that we have now reached an era in which existing methods for solving problems by expanding the range of a system can no longer be used.

We have to find, therefore, completely different methods for solving problems that do not rely on solutions based on expanding the existing system. We are living in just such an age.



The river bed on the Heihe in 2002, where no water is flowing at all.

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

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

Project Leader ■ KANAÉ, Shinjiro RIHN

Specific Research Findings

Regarding the primary goal, which is, “showing perspectives and making projections”, we have succeeded in positioning our research on the cutting-edge, with the finest estimation and projection of global water cycles and resources in the world. For example, we successfully reproduced the daily fluctuation of land hydrological cycles through the past 100 years for the first time in the world. At the same time, we made a projection of land hydrological cycles for the next 100 years. Moreover, by estimating current and future water demands through an integration of all the estimations above, we have calculated current and future water stress on a global scale.

Contribution to “Earth-Environment Study”

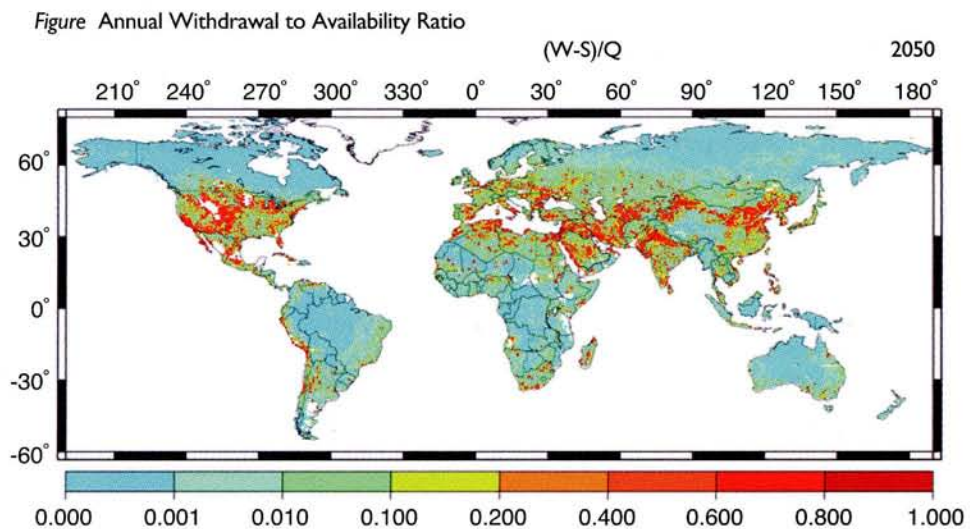
We have succeeded in making an estimation and projection of global water cycles and resources paying attention to the interaction between humans and nature. It is, however, on a local scale that such an interaction is considered in the study

of water circulation and water budgets. This interaction, especially on a global scale, has been overlooked. In this sense, our results can be a model of “Earth-Environment Study.” Besides, we also carried out research that dealt with specific areas with water problems, such as Thailand and California.

Studies that analyzed policy tools for preventing water conflict and water shortage are additional examples of an interdisciplinary analysis.

Communication of Research Findings

Dr. Taikan OKI, the former leader and currently a core project member, was chosen as the lead author of the IPCC AR4 and the Millennium Assessment. Also our paper in Science has effectively promoted the achievement of this project. Moreover, our achievement on virtual water has been widely disseminated in domestic society through multiple media and a “White Book” on water resources made by the Japanese government. We hope our research results (Figure 1) become a seed for ideas for coming water-related projects.



The map shows the quotient obtained by dividing (expected water consumption for 2050) by (water availability forecast for 2050) of each geographic area. The quotient is high in areas painted red or yellow, in which available water is expected to be almost used up. In other words, red and yellow areas are candidate water crisis “hot spots.”

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

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

Project Leader ■ **FUKUSHIMA, Yoshihiro** RIHN

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

Background and Objectives

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

Methods

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

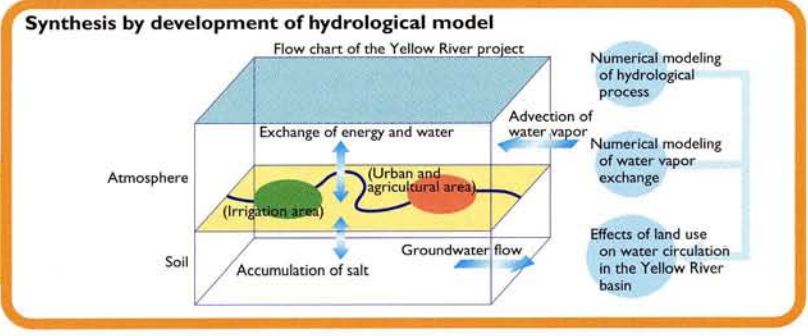
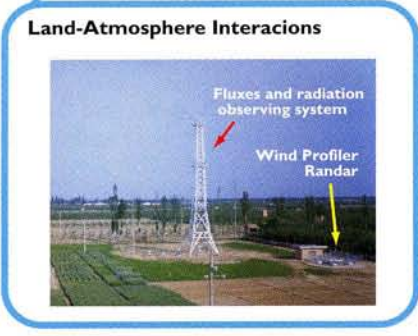
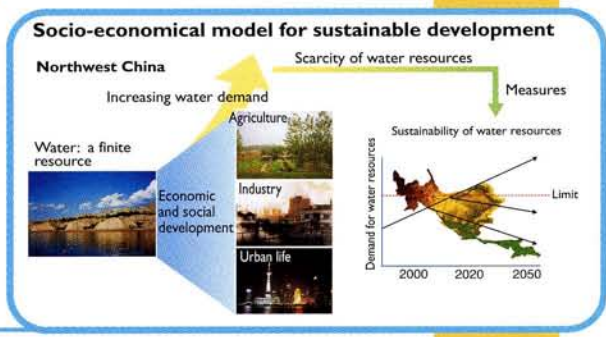
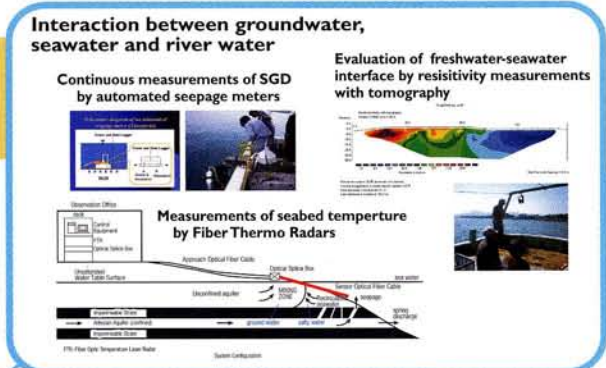
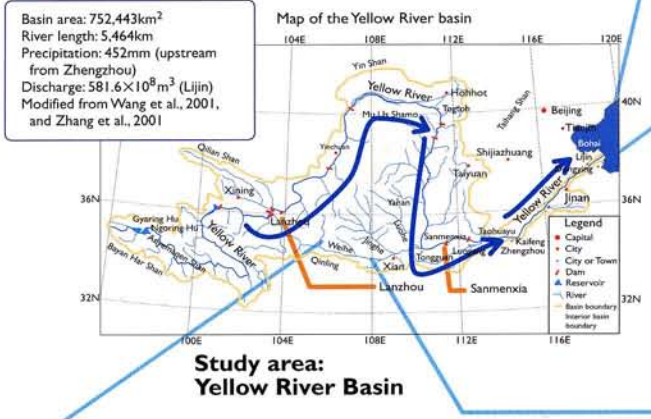
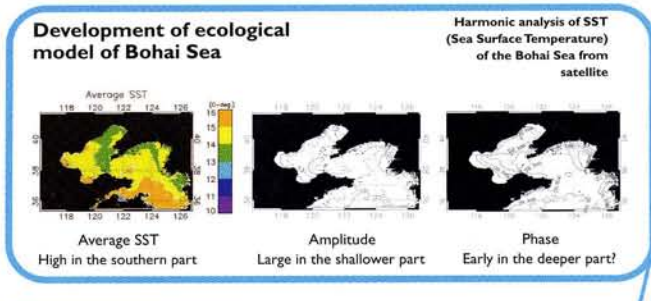
(1) Field observations and analyses on land-atmosphere interactions in the Loess Plateau

- (2) Field observations and analyses on interactions between river water, groundwater, and seawater in the Yellow River delta,
- (3) Development of a socio-economical model for sustainable development,
- (4) Development of an ecological model of the Bohai Sea,
- (5) Development of an integrated model to evaluate the effects of land use change on the water circulation in the Yellow River basin, and
- (6) Analyses of Chinese ideas and knowledge of water management.

Sub-study (6) has been started from 2005. And Sub-study (5) will integrate the results obtained by each sub-study team.

Expected Results

We aim to understand how land use changes affect the water cycle over the Yellow River drainage basin and what kind of effect relevant to the decrease of groundwater storage will have on the downstream to marine environment over the five year course of this research. This study may prove to be at the forefront of ecological studies in the coastal zones where many people live, and we may also be able to evaluate the effects on marine products in the Sea of Japan through studying the Bohai Sea and Yellow Sea. We will evaluate the problems under consideration, which if unchanged could cause worse environmental damage, by use of written documents more than 3000 years old and recent data from the Yellow River basin.



Attained Results

The dry-up of the Yellow River has mainly occurred during the 1990's due to over-use of river water from upstream to downstream for maintaining irrigated areas, coupled with a slight decrease of precipitation. Remarkable decreases of river discharge were not detected in the upstream area during the 40 years from 1960 to 2000. The reason why a severe dry-up occurred between 1970-1990, and particularly in 1997, was analyzed by the hydrological water budget method. With simulated discharge using land classifications from 2000, it became clear that almost 15 billion m³ was lost between year of 1960 and 2000 in those 40 years in the midstream area, in spite of annual water budgets in the upstream area satisfying the observed discharge. It was an unexpected result, in the beginning. But, we became aware that previously the Loess Plateau might have been deforested. We experienced increased annual river discharge from deforested mountains in Japan, and the magazine "People's China" published on June 1973 described deforested slopes and reforestation work done on the Loess Plateau. If these considerations are true, high discharge in 1960-1980 and low discharge in 1980-2000 can be easily understood. Finally, it was conclusive against the dry-up of the Yellow River that low amount of pre-

cipitation has continued during 1990s.

Thanks to a new Water Law promulgated in 2002, dry-ups no longer occur in the downstream region of the Yellow River. It is because the Yellow River Commission (YRC) became able to completely control water use from provincial matter. The YRC has asked each province to save water and has arranged intake periods in order to avoid drying up of the river. However, total water diversion from the Yellow River still seems not to have changed. Furthermore, sediment transportation energy seems to decrease as flood discharge is controlled in reservoirs. Therefore, the riverbed in the downstream region continues to rise up. It will increase the danger of disastrous floods downstream.

Meanwhile, recent satellite data and numerical simulation models show the decrease of water exchange between the Bohai Sea and the Yellow Sea. We will evaluate the relationship between the decrease of Yellow river discharge and the decrease of water exchange between the Bohai Sea and the Yellow Sea. The observed results of interaction between the land surface and atmosphere at the Loess Plateau show a drastic vertical exchange of air between the land surface and atmosphere. We will develop a model to explain this unexpected new phenomenon.

Sustainability and Biodiversity Assessment on Forest Utilization Options

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

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Background

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

A sustainable management system to conserve biodiversity should be developed.

Purposes of the Project

- To clarify historical change in forest utilization and its social- and economic backgrounds.
- To assess impacts of forest utilization on biodiversity.
- To evaluate function and ecosystem service provided by forest biodiversity.
- To develop integrated evaluation systems for sustainable forest utilization.

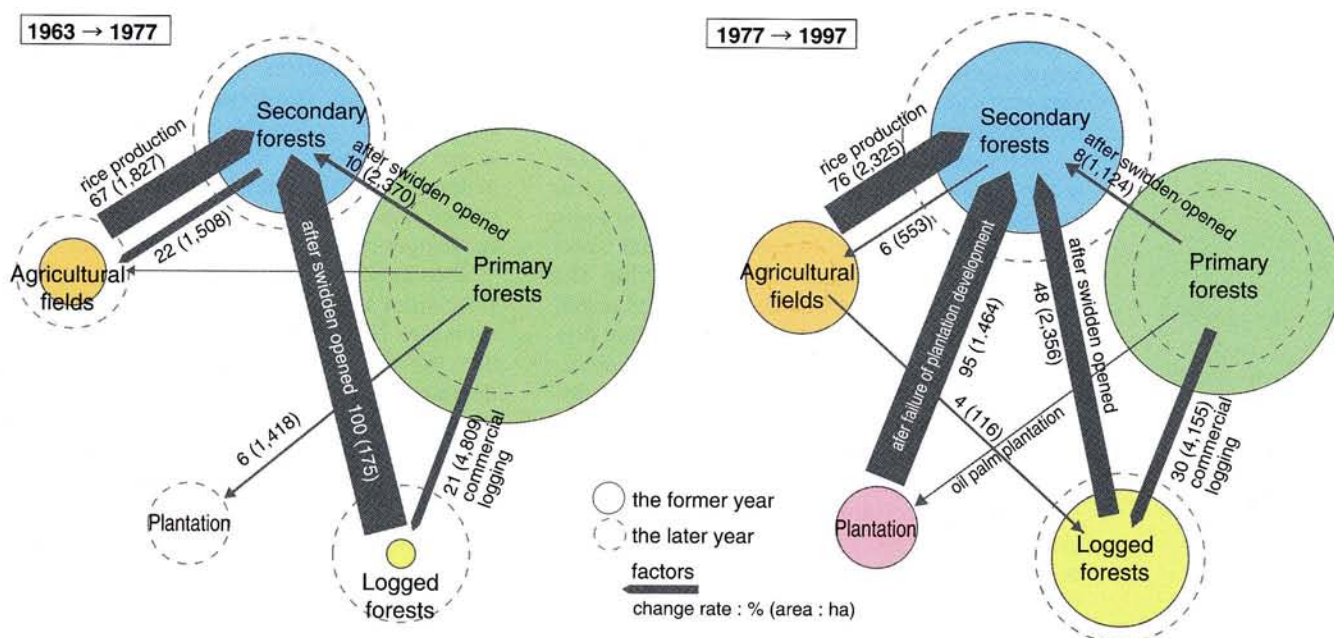
Research Sites

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

Expected Results

- Basic information applicable for criteria and indices of sustainable forest management.
- Evaluation methodology for ecological services that will be lost by biodiversity decrease.
- Elucidation of socio-economic causes that brought forest deterioration and their global comparison.

Figure 1 Factors of Changes in Land Use in Lambir



- 4) Models to predict the change in forest-use and biodiversity in the future and criteria to design spatial arrangement of forest-use.
- 5) A power-point slide set (11 volume, in Japanese) as education material for under graduate students will be developed (Fig. 3)

Outcome up to the present

- 1) The change in forest utilization and its driving factors have been analyzed for the past 40-100 years (Fig. 1).

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

Figure 2 Spatial Assessment of Biodiversity Changes

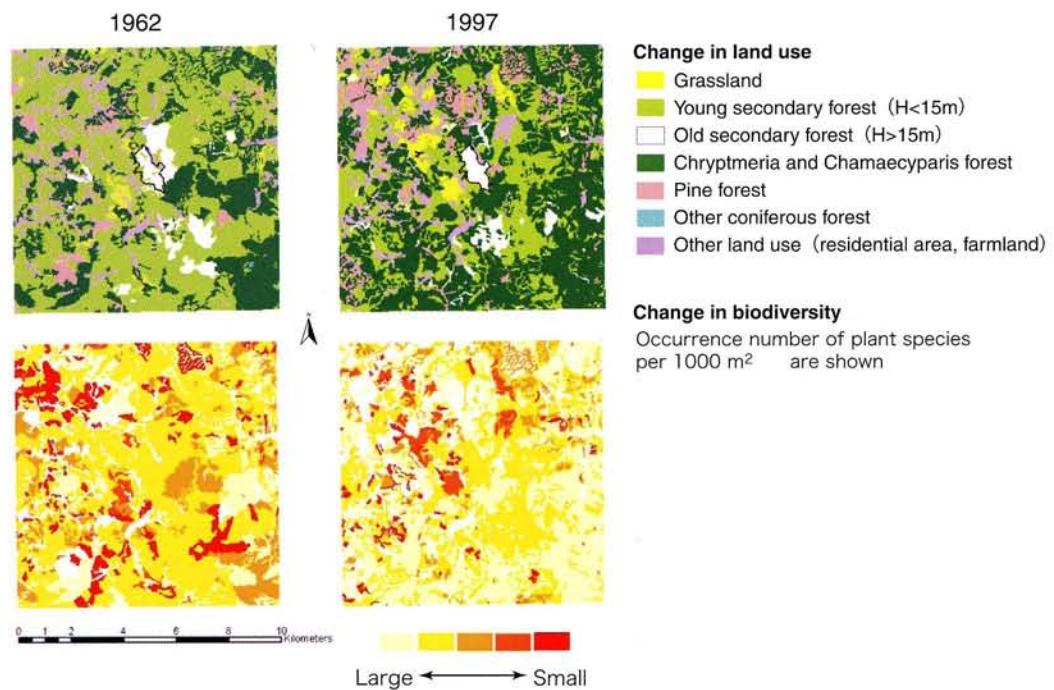


Figure 3 Some Slide Examples of the Slide Set as Teaching Material (11 volumes)

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

This research project aims to study interactions between people who inhabit the tropical monsoon Asia region and their surrounding environments during the past several decades since WW II. The reforms in political regimes, devastating wars, infiltration of modernization, economic globalization, and population growth that swept this region, have had serious impacts upon both local environments and human populations. In this project, we examine how people have coped with these external impacts, how they have survived during these upheavals, and the eco-historical consequences.

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Aim of the Research Project

This project aims to study interactions between local populations and their surrounding environments, in the region of Yunnan of southwestern China, northern Thailand and Laos, focusing on the post-war period up until the present to form a regional eco-history. In this region, a large number of ethnic groups live in diverse ecological habitats such as wetlands, plains, valleys, and mountain slopes. Major historical events that have been witnessed there during the past 50-60 years, such as revolutions and reform in political regimes, the second Indo-China War, and the infiltration of the global market economy, have caused great upheaval in the region as a whole. Indeed, these external influences have overwhelmed not only people's health, subsistence, and social life, but also

the surrounding environment. Our research focuses on how people have continuously struggled, coped with, and adapted to the changing environmental, economic, and socio-political conditions.

Methodology and Study Areas

In this project, we address three eco-sensitive domains: subsistence complex, nutrition and health, and resource management. To date, in order to demonstrate interactive consequences between the three analytical domains, we have conducted intensive fieldwork with collaboration between six project research groups. The study groups and their study areas are (1) Agro-Forestry Group (Northern Laos), (2) Plains Ecology Group (Central Laos), (3) Human Ecology Group (Central-South Laos), (4) Northern Thailand Group (North Thailand), (5) China Group (Yunnan Province, Southwestern China), (6) Material Culture and Information Retrieval Group. The China Group is further divided into three; (5-1) History Group, (5-2) Forestry Group, and (5-3) Eco-History Group, the last being lead by Chinese scholars at Yunnan University.

Present Status, Results and Future Prospects

We have already presented some of our research results as publications. First, *An Illustrated Eco-History in the Mekong Basin* (in Japanese) describes the particular eco-historical consequences regarding some sixty items that represent natural resources, subsistence complex, food, health, and resource management in tropical monsoon Asia.

For instance, in terms of cultivation of millet in Laos, the introduction of a land reform act in 1996 has induced a decline of shifting cultivation. The cropping pattern has also changed from a multi-species cultivation type to monocultures of upland rice, or cash crops. This change has led to a loss of bio-diversity in local varieties of millet. Since around the 2000s, an economic boom in northern Laos, triggered by Chinese investors has drastical-

Figure 1 An Eco-history of Millet Cultivation in Northern Laos [Ochiai 2007]*

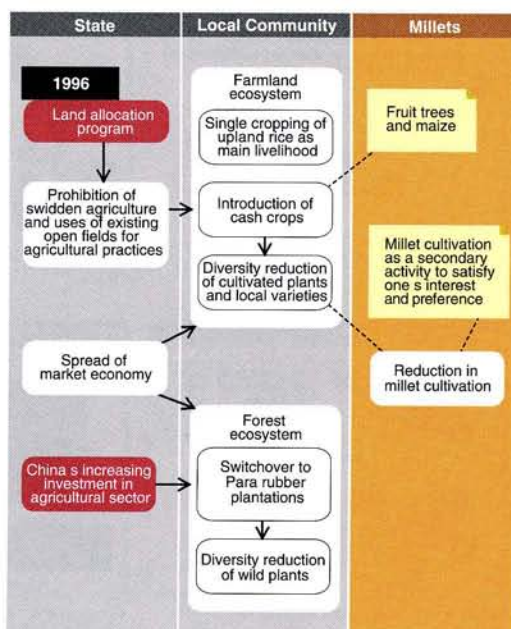


Figure 2 Rubber and Water Buffalo in a Tai Lue Village, Northern Laos [Theapkaysone 2007]*

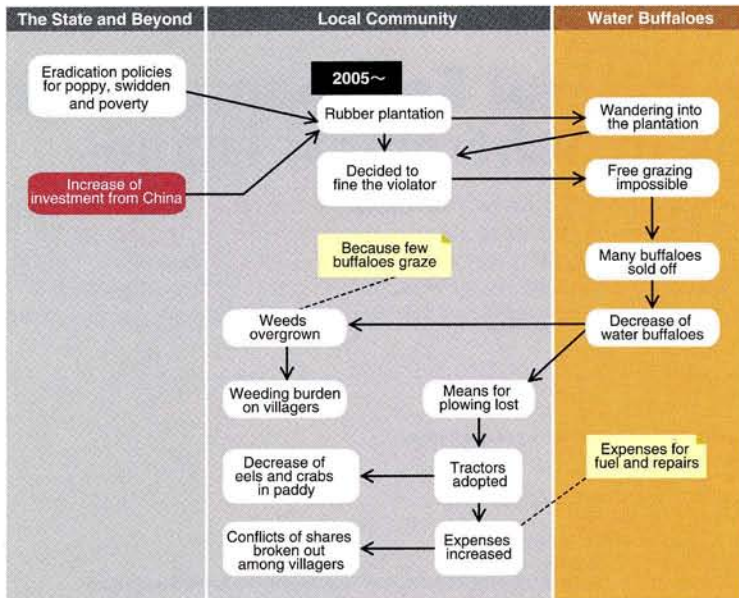
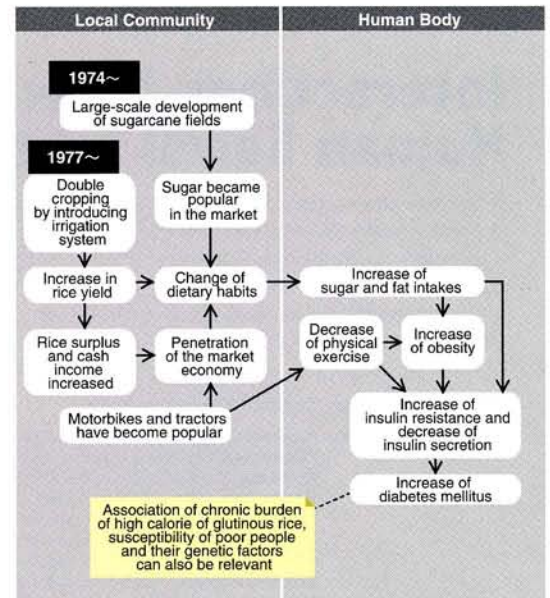
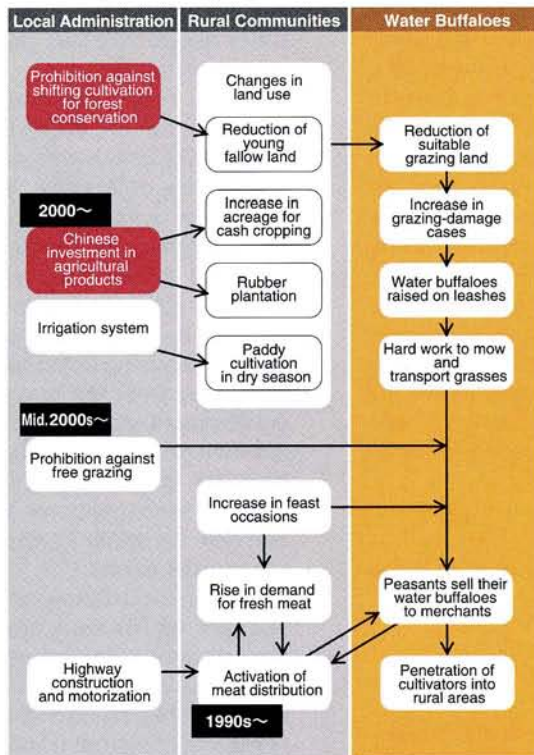


Figure 4 Eco-history of Diabetes in Songkong, Central Laos [Okumiya 2007]*



* See T. Akimichi ed. 2007 *An Illustrated Eco-History in the Mekong Basin*, Kobundou.

Figure 3 Water buffalo and People in Northern Laos [Takai 2007]*



ly changed the local landscape of monsoon forests into rubber plantations (Fig. 1). Introduction of rubber plantations has also brought about conflicts between Chinese investors and local farmers who raise water buffaloes as these animals often intrude into rubber gardens to feed on young rubber plants (Fig. 2). Since the introduction of farm tractors, the water buffalo has lost its role in local subsistence. Water buffalo have come to be butchered for meat consumption (Fig. 3). Agricultural reforms such as

the introduction of high yield rice, mechanization, and irrigation systems, have produced surplus rice stock, and subsequently altered labor patterns and eating habits. The change has critically been detected as a significant increase of diabetes even among local populations (Fig. 4).

By linking each set of flow charts together, showing the particular historical processes of millet, water buffalo, rubber, and diabetes, it is expected to obtain an overview of certain aspects of the eco-historical consequences in the region. The challenge is to combine various sets of flow charts and draw more extensive and detailed figures of the eco-historical consequences. An English version of this book will be published this year by the White Lotus publishing company in Thailand.

Other than this, *A Study of Eco-History in Anthropology* (in Chinese), consisting of eighteen articles submitted by Chinese co-researchers; *Lao Food Book for Dietary Assessment*, a field guide for nutritional and dietary analysts; and *The biodiversity of vegetables in Vientiane*, a booklet for the area around Vientiane, have been published. This year, we plan to publish a book of three volumes on *The Eco-history in the Asian Monsoon Region*, "Inscribed Eco-History", and "Vientiane Plains Eco-History". A special exhibition on life in the Lower Mekong Basin is planned in autumn at Oyasato Museum of Tenri University.

In September, we will have an international workshop in Vientiane on the future of health in Southeast Asia, and in November a workshop in Luang Nam Tha on the sustainable agriculture on the hillsides in Laos. In October, we will also participate in the 2nd International symposium on "the Asian Green Belt" organized by the RIHN. These efforts are expected to give a comprehensive aspect to the research project goal.

Interactions between Natural Environment and Human Social Systems in Subtropical Islands

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

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The Purpose of the Project

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

Research Methods

1) We will build a water balance model of Iriomote

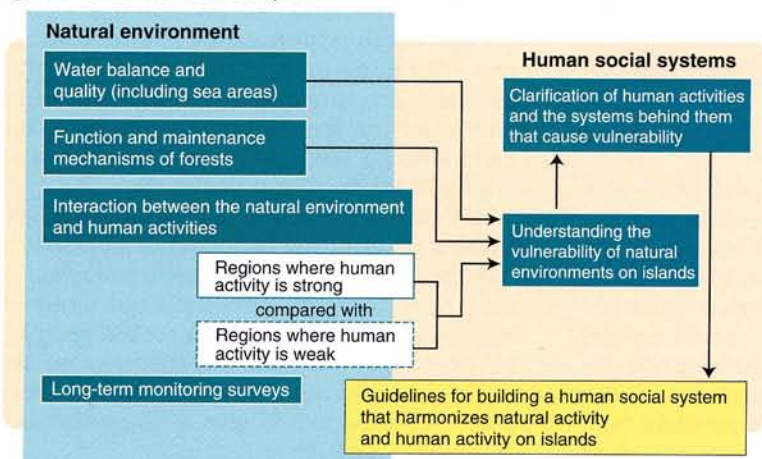
Island based on the estimated amount of precipitation, river flow, and evapotranspiration. The model will be used as a standard for future water usage. We will also assess the human impact on rivers.

- 2) We will clarify functions and maintenance mechanisms of evergreen and mangrove forests, while studying biodiversity and interaction among organisms. We will take a closer look at the dynamism of forests and assess the human impact on forests. As for the research materials gathered, we will use them as references for global warming issues.
- 3) We will look into the background of human activities causing deterioration of natural environments, from the perspectives of industrial development, demographic structure and government policies. In particular, we will explore how the main industry of the island has changed from traditional agriculture to tourism and how the social system has changed during the transfer period.
- 4) Regarding the decision-making process in communities, we will study how local people should understand the impact of human activities on the natural environment and how local common rules should be modified according to changes in the use of natural resources.

Progress Status, Achievements, and Future Challenges

1) To clarify the water balance on Iriomote Island, we have installed a monitoring device on the island. A database is being built up to help us make more accurate predictions about the quantity and quality of water that will be available in the future. Our observations have indicated that rain on the island is acidic throughout the year. We will identify the origins of the substances that cause the acid rain, estimate the total amount of such substances falling on the

Figure 1 Overview of the Project



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

Photo 1 Schichi Festival (Hoshidate Area)



Photo: Fumio Sakuma, Nature Image Inc.

Photo 2 Water Balance on Iriomote Island



Photo: Watanabe Suimon Kikaku

Photo 3 Industries as Bases of Life for the Islanders



Photo: Fumio Sakuma, Nature Image Inc.

island, and monitor the impact. We will also identify substances that are carried down rivers into the sea, especially to coral reef areas along coasts, and assess the impact.

- 2) Our studies have shown that typhoons affect turnover in broadleaved evergreen forests. In forests including those of mangroves, we have been keeping track of production/circulation of substances, while monitoring the impact of human activities. We will provide information on effective maintenance and management of

forests in the near future.

- 3) We have gathered a variety of reference materials including demographic statistics, administration policies and information on local industries, and categorized them for further analysis. We will use these materials to develop measures to promote networking of small-scale industries from the viewpoint of island economics. In this process, we will focus on tourism, agriculture, health and education.
- 4) We have been in close contact with the islanders by participating in various local events and educational programs designed for schools and communities. As a result, we learned that community centers on the island play a large role in the communities' decision-making processes.

To solve environmental problems on Iriomote Island, local people need a solid economic infrastructure to build self-esteem and become independent. To achieve this, it is important to share useful information with the islanders. We will proceed with this project so that the findings can contribute to promoting local industries and growing new ones. We will take part in education at schools and in communities from the planning stage, and would like to help locals promote the island's traditional culture and smooth handover of its performing arts to younger generations.

※ <http://www1.gifu-u.ac.jp/~kawakubo/iriomote/index01.html>

Photo 4 Function and Maintenance Mechanism of Forests



Photo: Fumio Sakuma, Nature Image Inc.

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

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

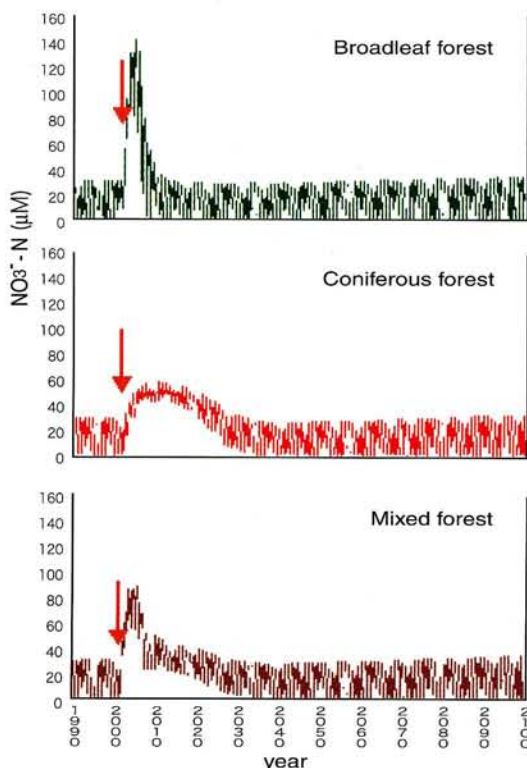
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Purpose of the Project

How do we perceive the environment? People's attitudes toward the environment are based on their various value judgments on it. We define this

Figure 1 Calculation Results of Stream NO_3^- -N Concentration after Forest Logging



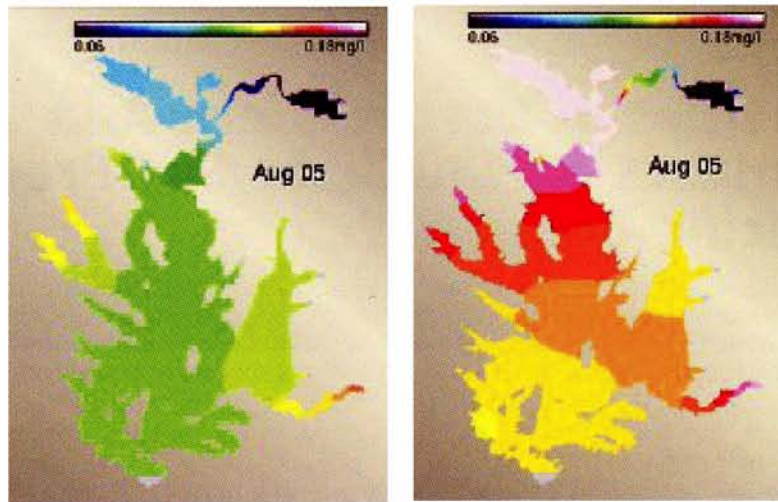
value judgment system as "environmental consciousness." What kinds of changes in environmental qualities affect the formation of people's environmental consciousness? We need quantitative evaluation of the changes in the environment to understand its present status and to predict its future. On the other hand, clarifying the relationships between the environmental quality and the environmental consciousness is important for wiser use and conservation of the natural environment. In this project, we will develop a set of response-prediction models to simulate environmental changes as well as a methodology to analyze people's value judgments when they are presented with the predicted environmental changes. Although the project is conducted mainly in the Lake Shumarinai watershed, Hokkaido, Japan, the methodology will be developed to be applicable to other environments.

Methods and Research Area

In this project, several virtual scenarios of environmental changes are assumed. People's value judgments on those changes will be elucidated. The method developed in this project requires three functions: (1) quantitative prediction of

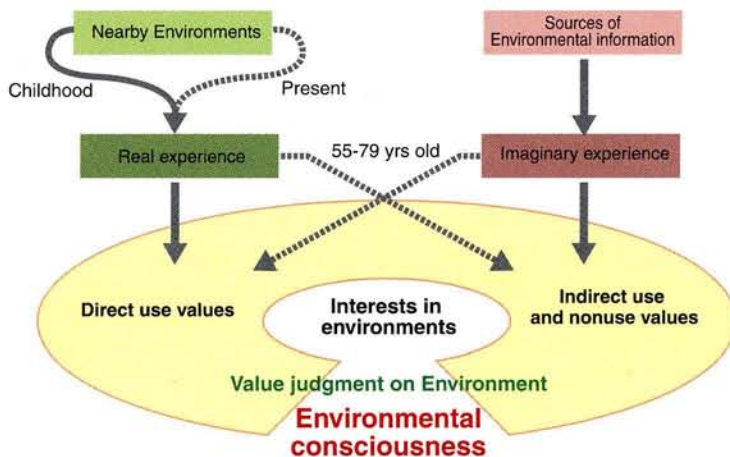
In calculation experiments, the year of forest logging is 2001 (red arrows). The stream NO_3^- -N concentration remarkably increases 5 years after logging of broadleaf forest, then rapidly decreases to the original level (top panel). In the case of the logging in coniferous forest, though the peak concentration is low in comparison with the broadleaf forest, the effect of logging continues for about 30 years (middle panel). Mixed forest logging causes mixed effects (bottom panel). Oscillation indicates the seasonal variation in NO_3^- -N concentration.

Figure 2 Calculation Results of the Distribution of NO₃⁻-N Concentration at the Lake Surface



The left panel is the calculation result for the present state, the right panel is that for 5 years after logging in the watershed. Forest logging causes an increase in NO₃⁻-N concentration in the lake. Both panels show the distribution on August 5. The program can display the temporal changes as an animation.

Figure 3 Relationship between Individual Experience and Interest in Environment



changes in environmental elements caused by virtual environmental modifications, such as logging and dairy farming, (2) comprehensively informing people of the environmental changes and (3) analysis of the relationship between changes in the people's value judgments and in the environmental elements. The method is composed of a response-prediction model for the environment and tools to develop and analyze the attitude surveys. The main research area is the Lake Shumarinai watershed in northern Hokkaido, Japan. However, we are developing the method to be applicable not only to this particular watershed environment, but also to other environments. Attitude surveys are conducted through interest questionnaires and scenario questionnaires.

Progress to Date

The response-prediction model includes several sub-models that simulate the biogeochemical material cyclings in forest, river and lake environments, respectively. Reviews of those sub-models have been published in the Japanese Journal of Limnology (Vol. 67, 2006) and as a project report No.1 (ISBN-4-902325-07-1). The forest model can simulate effects of forest logging on stream hydrochemistry (Fig. 1). There are some difficulties when

connecting these sub-models due to the differences in the scales of time and space that each of them assumes. These problems were solved by calculating the water input from the rivers to the lake using a forest hydrologic model. A detailed lake mesh model that simulates lake water movement, biogeochemical material (such as carbon and nitrogen) cycles, and plankton population dynamics was developed (Fig. 2). Since the execution of this detailed model takes a large amount of time, a simpler box model assuming 8 boxes in the lake has also been developed.

We conducted a survey to study people's interests in the watershed environment (Fig. 3). It indicates that those people who lived near forests in their childhood, show high interest in direct use values of the forest (forestry production), and those who collect information about the environment from a wide range of sources such as newspapers, TV, or the Internet, show high interest in indirect use values and nonuse values, such as places for recreations and CO₂ sinks. These findings suggest that real experience from the nearby environment and virtual experience from the information media may relate to people's interest in the environment. In the case of people who are more than 55 years old, both relationships - relationship between real experience and indirect use and nonuse values, and that between imaginary experience and direct use values - have been elucidated.

Plan Hereafter

A nation-wide questionnaire survey on forest management for the next generation was conducted in February 2007. People's preferences on the methods of forest logging were surveyed in this questionnaire. Analyses of differences among the respondents' preferences are currently in progress. We will use the people's interests elucidated from the results of this survey to select the type of virtual impacts to apply to the watershed environment. Scenario questionnaires will be conducted using environmental changes simulated by the response-prediction model, in order to estimate environmental qualities that affect people's value judgments on the environment.

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 breeding fish in oceans. In this study, we will investigate how the Amur River transports dissolved iron from forests to the Sea of Okhotsk and the Oyashio area and supports primary production. We will also 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.

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Background and Objectives

Recent oceanological studies have revealed that biomass productivity was limited by iron availability in the northern North Pacific. Because iron can hardly dissolve 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 and the Oyashio area, probably due to the sufficient supply of iron from the Amur River. Riverine iron cannot remain dissolved in the seawater without forming a complex with humic substances created in forest and wetland. Therefore, changes in land uses on the Amur River basin such as deforestation, forest fires, cultivation, urban-

ization and/or reduction of wetland may reduce the primary productivity in the Sea of Okhotsk and the Oyashio area.

In this study, we try to answer the 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 to the primary production in the Sea of Okhotsk and the Oyashio area; 2) What are the factors controlling the release of materials such as iron from the land to the Amur River in the natural and/or artificially altered land surface conditions in the Amur basin; 3) To what extent the economic and social systems around Northeast China and Far Eastern Russia change the land uses in the Amur basin in the past, present and future; 4) How can we conserve the system? The system is now named "Kyodai Uot-sukirin (Giant Fish-Breeding Forest)" which includes both physical and human processes. We will try to establish this concept and find ways for the conservation of the system.

Progress and Tasks

We succeeded in conducting a Russian-Japanese joint research cruise in the Sea of Okhotsk in the summer of 2006. The cruise clarified distribution of iron concentrations from the mouth of the Amur river to the Kuril islands. It was found that the dissolved iron from the Amur river was deposited in the estuary area and then transported offshore by thermohaline circulation and tidal movement. The iron was then transported in the intermediate layer to the south by the East Sakhalin current and mixed vertically at the straits of the Kuril islands becoming available at the surface of the ocean. Our hypothesis is thus more or

Figure 1 Study Area. Human Activities in the Amur River Basin and the Transport of Dissolved Iron to the Sea of Okhotsk and the Oyashio Area

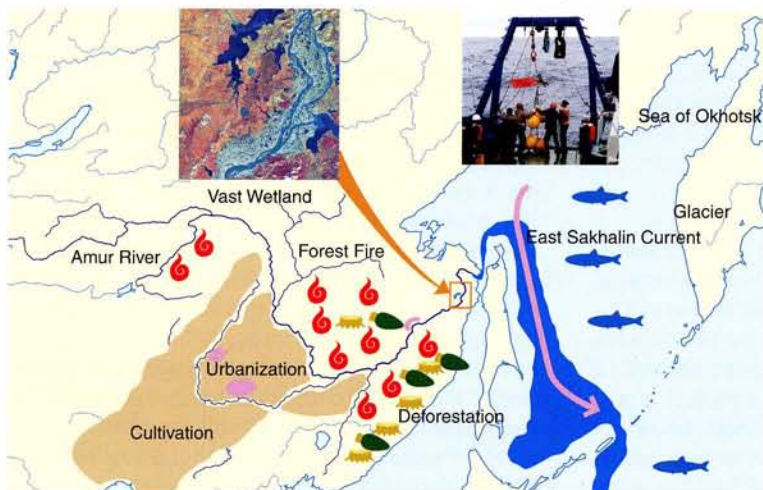


Figure 2 Oceanological Observation by R/V Khromov in the Sea of Okhotsk



Figure 3 Ice Core Drilling on the Summit of Mount Ichinsky, Kamchatka, Russia

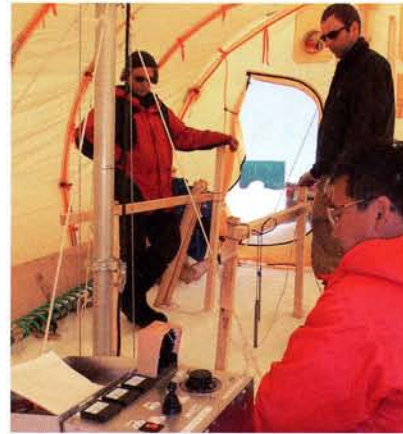


Figure 4 Sampling of Interstitial Soil Water at Sanjiang Plain, China



Figure 5 Seasonal Changes in Dissolved Iron Concentration for Different Land-use Types at Sanjiang Plain, China

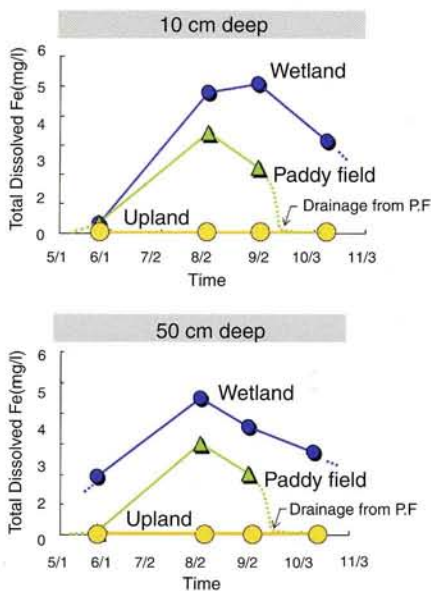
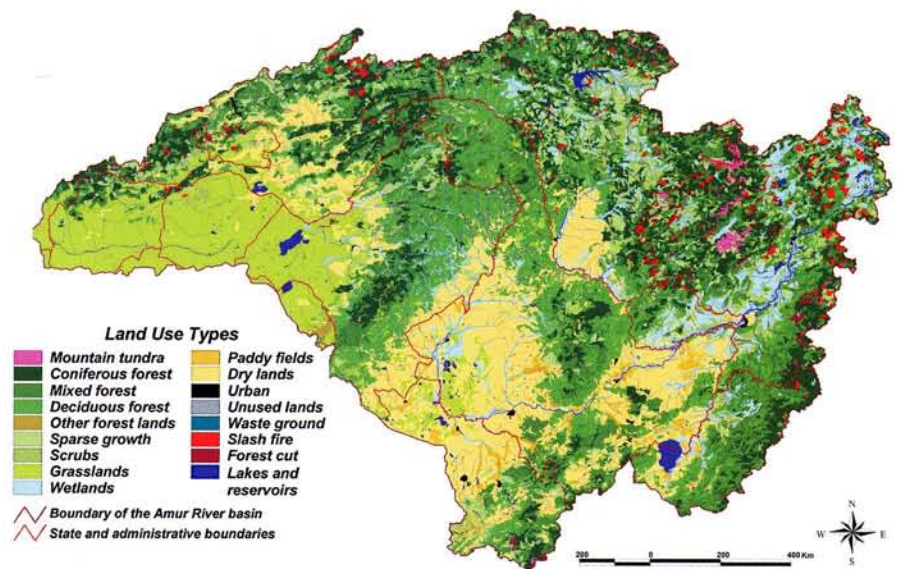


Figure 6 Present-day Land-uses in the Whole Amur River Basin



less validated by the cruise.

Atmospheric transport of the iron was monitored by an automatic high-volume aerosol sampler installed at Oktyabrsky, Kamchatka Peninsula. Reconstruction of the time-series of iron deposition was also attempted by drilling ice cores in a summit glacier of Mount Ichinsky, Kamchatka. The samples are currently being analyzed in various laboratories and atmospheric contribution to the primary production of the study area will be clarified in the near future.

Do human activities in the Amur river basin really affect the iron flux to the Sea of Okhotsk? We have not obtained any definite answer yet. Our 2006 field investigation in the Sanjiang plain revealed, however, that the concentration of dissolved iron in the soil pore water was the highest in natural wetlands, depleted in paddy fields and almost negligible in upland areas. This indicates that land-use changes will surely affect the concentration of iron in the Amur river basin. Our GIS data indicates that 7% of the Amur river basin is

currently occupied by natural wetland and that portion has been reduced by farming in the later half of the 20th century. We will quantify the impact of land use changes on the flux of iron by numerical model in the latter half of this project.

The Giant Fish-Breeding Forest system is much larger than what we call the "Uotsukirin (Fish-Breeding Forest)". The proposed system spans international boundaries such as Russia, China, Mongolia and Japan. People living in and depending on the system have different perspectives on their natural environment. It is an asymmetrical system having two independent stakeholders: farmers and foresters in the upstream and fishermen in the downstream. There seems to be no direct connection between the stakeholders. Our project will seek a way in which we can conserve this vast linkage by studying the various flows in the system, which include economic exports and imports, cultural interactions, information, and governmental regulations.

Human Impacts on Urban Subsurface Environments

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

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YAMANO, Makoto Earthquake Research Institute, The University of Tokyo

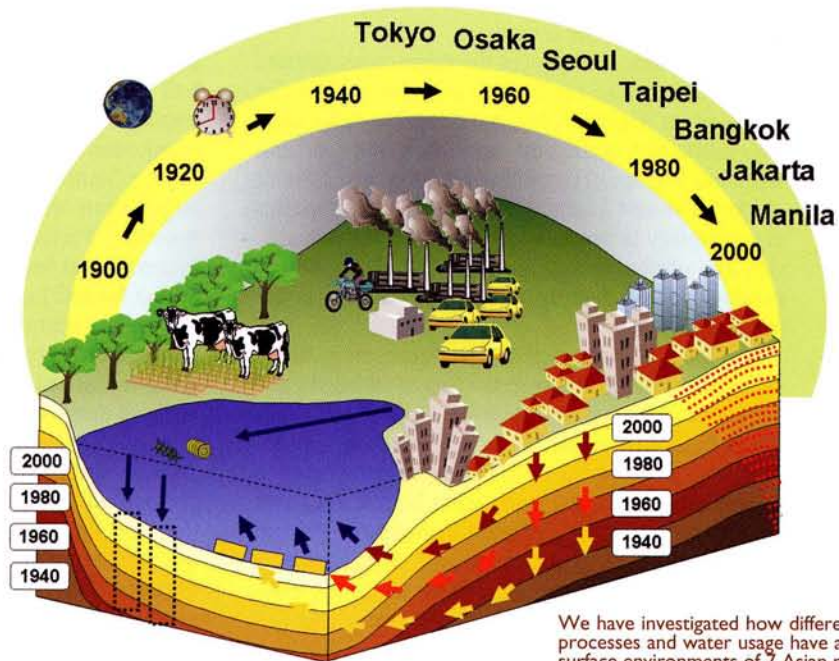
Objectives of this Project

Most global environmental studies have long been focused on the environmental issues above ground such as air pollution, global warming, sea-water pollution, and decrease in biodiversity. Sub-surface environmental issues are also important for human life in the present and future, but have been largely ignored because of the invisibility of the phenomena and difficulty of the evaluations. Subsurface environmental problems such as subsidence due to excessive pumping and groundwater contamination, have occurred repeatedly in Asian major cities with a time lag depending on the

development stage of urbanization. Therefore, we may be able to assess future scenarios if we can evaluate the relationships between subsurface environmental problems and the development stage of the city.

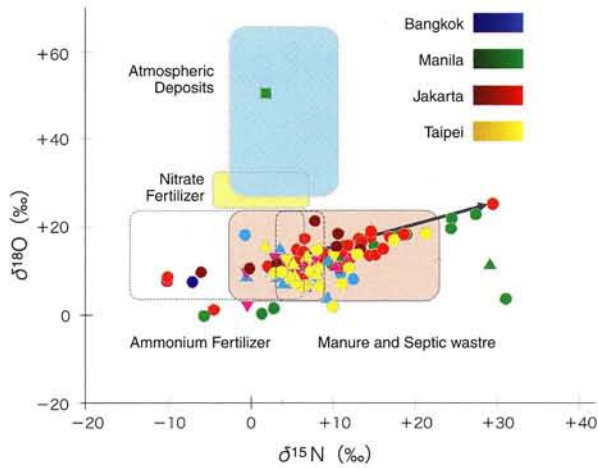
This project deals with: (1) Relationships between the development stages of cities and subsurface environmental problems which will be assessed by socio-economic analyses and reconstructions of urban areas using historical records; (2) Serious problems in subsurface environment and changes in reliable water resources which will be studied after evaluation of groundwater flow

Figure 1 Schematic Model of this Project



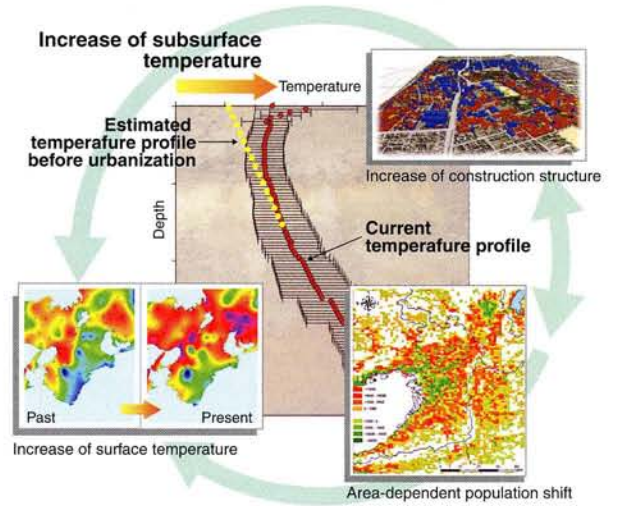
We have investigated how different development processes and water usage have affected the subsurface environments of 7 Asian megacities.

Figure 2 Distribution of Nitrate N and O Isotopes in Groundwater at Each Asian Megacity



The sources of nitrate pollution and their pathways have been investigated using stable isotope signatures and various statistical data.

Figure 3 Model of Collaboration Studies



Increases of construction and energy consumption associated with population increase brought surface temperature increases. The historical change of surface temperature is recorded as a profile of subsurface temperature.

Photo 1 Children Drawing well Water in Manila



Why don't we save valuable water resources for children in the future?

water flow systems and changes in groundwater storage using hydrogeochemical data and in-situ/satellite-GRACE gravity data; (3) Evaluation of accumulation of materials (contaminants) in the subsurface and their transport from land to ocean, including groundwater pathways using chemical analyses of subsurface water, sediments and tracers; and (4) Evaluation of subsurface thermal contamination due to the "heat island" effect in urban areas by reconstruction of surface temperature history and urban meteorological analyses.

Progress of the Project

- Field surveys on the subsurface environment in targeted cities have been made (6 times in 2005 and 9 times in 2006), and monitoring of subsurface environments has started.
- Assessments of natural and social data in each city have been made, and the structure of the project database based on GIS has been made for future work.

- Preliminary models such as GRACE, groundwater flow, and DPSIR have been established in each sub theme.
- In order to evaluate the origin and process of material loads to the subsurface, isotopes and chemical analyses of water samples have been made, and new tracers (CFC, Kr etc.) techniques have been introduced.
- Subsurface thermal signals can be used to reconstruct the history of urbanization.

- The International Symposium on "Human Impacts on Urban Subsurface Environment" was held, and the proceedings were published. Co-operation with international research agencies (UNESCO- GRAPHIC, GWSP-Asia etc.) has begun.

Future Work and Challenges

- The 2nd international workshop will be held in Indonesia in December 2007 to evaluate the interim results and find additional themes and problems in the project.
- In order to present the interim results of the project, a special issue of STOTEN (Science of Total Environment, Elsevier) will be prepared.
- New approaches to the relationship between groundwater and religion will be launched.
- A new observation system using CFC, Kr and absolute gravity measurement will be tested, and cross-comparison with different observation methods will be undertaken.

Agriculture and Environment Interactions in Eurasia: Past, Present and Future —The Ten-thousand-year History

Our project aims to understand the history of interaction between agriculture and environment in three major types of agricultural environment in Eurasia, namely the “*mugi*”, “monsoon” and “tuber crop” zones, from an interdisciplinary perspective. Through this, we will attempt to make recommendations about some future directions for agriculture. As a means to reach this goal, we seek to reconstruct the history of the ten-thousand-year relationship between agriculture and environment, with “the loss of genetic diversity” as a guiding concept.

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The Project Goal

Agriculture has largely modified and destroyed or damaged the ecosystems in which it is practiced, and it has been said that the beginning of agriculture entailed the beginning of environmental destruction. In present day Eurasia there are large differences in both agricultural productivity and the extent of environmental deterioration between the Central Asian desert, where it is now almost impossible to conduct any agricultural activity, and the Monsoon region where vegetation and water are still plentiful. Our project focuses on different aspects of environmental deterioration associated with the ten thousand year history of agriculture. We seek to deepen our understanding of the role that “the loss of genetic diversity” has had over this long time span of interaction between agriculture and environment.

Research Aim and Methods

There are three major different types of agricultural system in Eurasia defined by crop type: rice, *mugi* (winter annual crops), and tuber crops. The background ecosystems (human habitation = “*sato*”) of these agricultures, and their histories, also differ greatly. We therefore divide Eurasia into three broad regions, namely the *mugi*, monsoon, and tuber crop zones respectively. We have research groups for each of these regions (Fig. 1).

Our research methods include the following:

- i) DNA analysis and observation of morphological variation in organic plant remains (Fig. 2) excavated from archaeological sites. This allows an assessment of genetic diversity using statistical genetic methods (Shannon’s formula etc.).
- ii) Carbon dating of macro botanical remains.

Figure 1 Regions Included in our Research Project

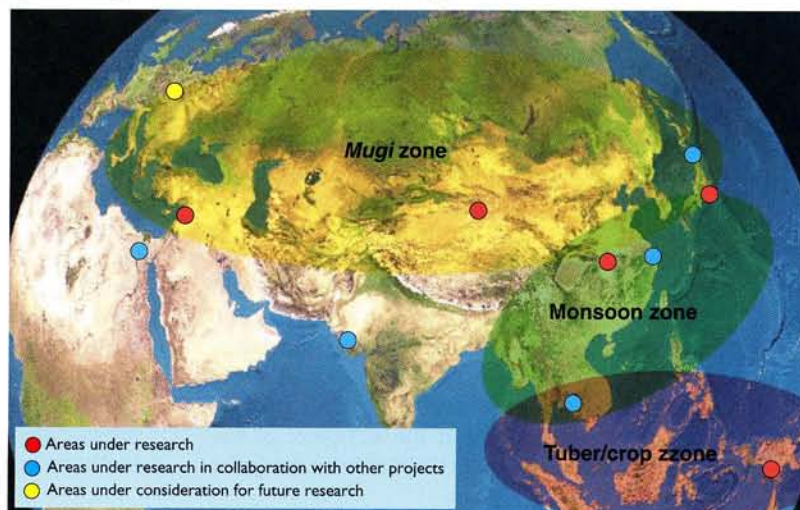


Figure 2 Diversity of Rice Cultivars from Ancient to Modern Times



Example of genetic diversity among samples found in a current rice field in Laos



Diversity of the size of carbonized rice grains from Sasai site, Fukuoka, Japan

Figure 3 Archaeological Excavation in the Mugi Zone



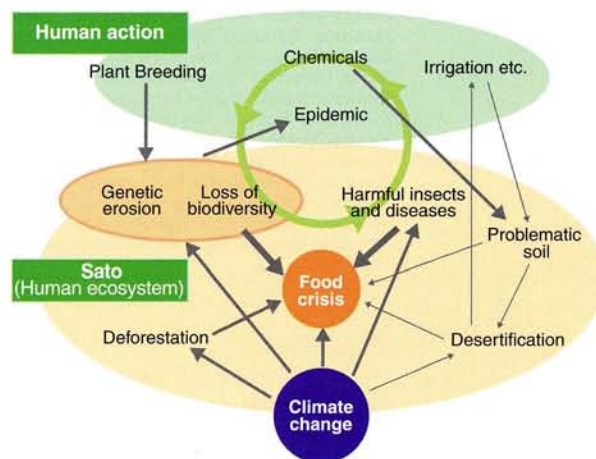
Sasai Cami Yani Site, Turkey, directed by Miyake, Univ. of Tsukuba

Figure 4 Salt Accumulations in the Desert (Xinjiang Uygur Province, China)



The white material covering the land now is salt. Three thousand years ago, this region appears to have been agriculturally fertile.

Figure 5 Model of the History of Relationships between Agriculture and Environment



- iii) Characterization of plant seeds and animal tissues by stable isotope analysis.
- iv) Analysis of pollen, phytolith, diatom and wooden pieces extracted from soil samples. This provides an understanding of environmental history (especially that of the local ecosystems).
- v) Ecological assessment of "sato" (human habitation) using historical documents, ethnographical and ethnological materials.
- vi) Research on the history of agricultural technology, including the hydrological balance and fertilizer use, employing both ethnobotany and economic research (on issues such as the circulation of agricultural products, etc.).

Present Results and Future Research

- 1) We have obtained the following results to date.
 - i. The analysis of botanical and faunal remains excavated at the Xiaohe site in the Xinjiang Uygur Region of China show that, in that period, agriculture and pastoralism were practiced.
 - ii. Contrary to previous views, the domestication of wheat required a longer time frame than previously believed (Tanno & Willcox 2006, Science 311).

- iii. We have confirmed that rice paddy cultivation in Japan was often affected by accidental flooding, triggering a loss of biodiversity and the destruction of sato.
 - iv. We have established the importance of indigenous knowledge in maintaining the environment of slash-and-burn agriculture and other traditional activities.
- 2) We plan to continue our research on the following topics.

In the *mugi* zone, we are studying the soil salinity problem (Fig. 4), in relation to declining agricultural production.

In the monsoon zone, we intend to extend our understanding of the history of agricultural systems and their surrounding ecosystems.

Our previous research underlines the significance and complexity of the interrelationships between agriculture and environmental deterioration. The details vary according to climate and historical period. Fig. 5 shows an outline theoretical model of contemporary agriculture, and we would like to modify and refine this model during the remaining four years of the research period.

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

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

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Objectives

The objective of the present project is to reconstruct human-nature relationships as historical processes. It will examine: first, how the natural environment has been changed since the late Paleolithic Age, when human beings are first known to have existed in the Japanese Archipelago; second, how the biota has changed during that process; and third, what kind of perceptions, knowledge and skills the humans possessed, concerning both nature in general, and specific life

forms. Our aim is to present a foundation for contemplating how human-nature relations should be developed, and to suggest concrete measures for preventing further extinction of species in the near future.

Study Area and Methodology

The project will elucidate the historical process of change in human-nature relationships under the global and/or local climate changes in these six regions: Hokkaido, Tohoku, Chubu, Kinki, Kyushu

Table 1 Characteristics of the Core Site in Each District

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

Photo 1 Archaeological Excavation (Kyushu WG, Mutaguchi Ruin)



Photo 1 Sen-cho Muta in Kuju Town, Ohita Prefecture was described as for the foundation and abandonment of paddy fields in Bungo-fudoki. Excavation was carried out to prove the description related to the evidences of volcanic activities and flood.

Photo 2 Old documents are abundant in Sakae Village, Nagano Prefecture. Among all, Osutaka-Yama (hawk-rearing mountains) has been targeted to study inter-disciplinary, with collaboration of ecology and historical sciences.

Photo 3 In 1940s, detailed aerial photography was made by US Army in Setouchi Town, Kagoshima Prefecture. Changes of land use and life style were interviewed for elder people using aerial photos.

Photo 2 Finding Old Documents (Chubu WG, Sakae-mura)



Photo 3 Interview Using Arial Photos (Amami-Okinawa WG, Kakeroma-jima)



and Amami-Okinawa, with the addition of Sakhalin; using biological remains that contain pollen samples, archaeological remains, old documents and folkloric materials. In addition, we intend to examine the change of the historico-economic background and the knowledge and skills concerning nature and living organisms, with special emphasis on their relation to the disappearance, or thriving, of organisms. The main approaches are: 1) the analysis of ancient vegetation and changes in the distribution of plants and animals; 2) reconstruction of human ecology based on population estimates and diets; 3) reconstruction of human-nature relations in the past, and the analysis of the social systems behind them; and 4) theoretical modeling of human-nature relations.

Progresses, Organizing Working Groups and Targeting Core Sites in Six Districts

We have re-organized six district-based working groups targeting core sites (shown in parentheses), Hokkaido (Shiribeshi), Tohoku (Kitakami), Chubu (Akiyama), Kinki (Kyoto-Tanba), Kyushu (Kuju-Aso), Okinawa (Okinawa Island and Amami-oshima Island), with the addition of Sakhalin, each of which possesses characteristic climate, vegetation, flora and fauna, and traditional lifestyles of people (Table), and includes ca. 100 km×100 km area of agricultural and forestry villages, and mountains. Also, we organized three method-

based working groups targeting paleo-ecosystems, plant-geography, and old human bones. We have not organized a working group on animal-geography because several research projects are underway in the 21st Century COE program at Kyoto University, Ryukyu University and Hokkaido University; nor human population estimates which have already been carried out by a project of the International Research Center for Japanese Studies. Each working group held several meetings to review the pre-existing information and to discuss the approaches, expected results and timeline of the project.

Publications and Symposium

- 1) "What does the conservation of nature mean?" (By T. Yumoto) In: *Our Earth in the Future: What to Tell Children and How to Tell Them* (Ed. T. Hidaka), Kodan-sha, published on 20 July 2006 (in Japanese).
- 2) "History of human-forest relationships over the past 10,000 years" (by T. Yumoto) In: *Who claims forests ownership?* (Eds. T. Hidaka and T. Akimichi), Showa-do, published on 10 March 2007 (in Japanese).
- 3) "Environmental history and human activities in the Kyoto basin: from several different approaches" Symposium at the Annual Meeting of The Japanese Society of Ecology, held on 22 March 2007, Matsuyama (in Japanese).

Environmental Change and the Indus Civilization

Human beings have always created dwelling spaces with sustainable food supplies by modifying their surrounding natural environment. In this project, we research the impact of environmental change on the Indus civilization. That is one of the four great ancient civilizations. Indus sites spread over 100,000 sq. km. of the northwestern part of the Indian subcontinent. Indus people established cities and an urban lifestyle from 2600 BC to 1900 BC. The urban phase of this civilization lasted for a much shorter period than the other ancient civilizations. Our methodology is based on human sciences as well as scientific approaches. Our project aims to find out the reason for the decline of the Indus Civilization, shedding light on the relations between humanity and nature since ancient times.

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Objectives

Our project aims to understand the formation, development and decline of the Indus Civilization by means of an interdisciplinary approach. Especially, we attempt to evaluate the impact of environmental change on the subsistence economy and the trade network, which sustained the urban system.

Our project team is divided into four research groups, focusing respectively on the environmental changes, the material cultures, the inherited cultures, and the subsistence system.

The paleo-environment research group studies the environment surrounding the Indus Civiliza-

tion. Two main research tasks are to be conducted: (i) the reconstruction of the lost course of the Sarasvati river that seems to have played an important role in the Indus Civilization through geographical analyses using satellite images and remote sensing; (ii) core-boring from lakes with the aim of reconstructing long-term environmental change.

The material culture research group studies excavated materials from archaeological sites to reconstruct the society and culture in the Harappan period. We have been excavating at Kanmer, in the Rann of Kachchh, Gujarat, India in collabo-

Figure 1 Concept of the Project



By using GIS, various data are being integrated.

Figure 2 Distribution of Sites of the Indus Civilization

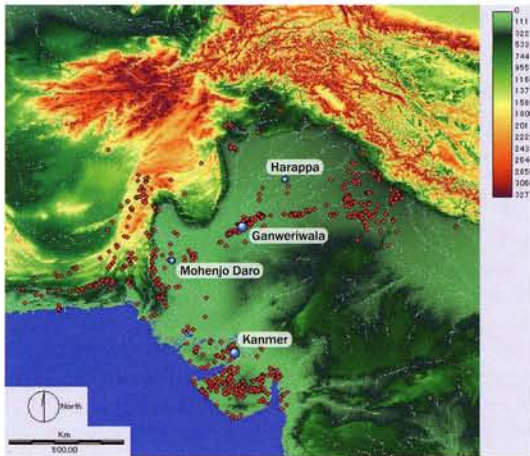
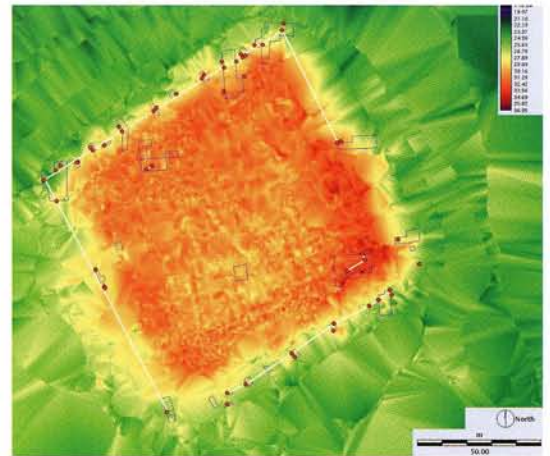


Figure 3 DEM of Kanmer, Gujarat, India



Interdisciplinary research is being conducted by the international team.

Figure 4 Scene of the Excavations at Kanmer



Figure 5 Sampling of Plant Residues at Kanmer



ration with Indian archaeologists.

The inherited culture research group studies Indian cultures for the purpose of reconstructing the historical significance of the Indus Civilization through Vedic studies by Indologists and fieldwork by cultural anthropologists.

The subsistence system research group deals with botanical and zoological evidence both from archaeological sites and from the present fauna

Figure 6 Steatite Microbeads from Kanmer



Various artifacts of precious materials have been discovered at Kanmer. Among them is a large number of steatite microbeads that were contained in an earthen pot.

and flora in order to reconstruct the subsistence system of the Indus Civilization.

Results and Future Task

In the last two-seasons' excavations at Kanmer, a large-scale fortification wall of stone masonry was found to enclose the central mound of the site. The discoveries of semi-precious and shell lapidary industries indicate that the site functioned as a center of production and trade in the Rann of Kachchh during the Harappan period. Furthermore, the analysis of botanical evidence such as wheat, barley and rice, and animal bones such as cattle and buffalo provides a clue to understand the relations between the natural environment and human activities around the site.

In this fiscal year, we will commence geological research on sites in the Sarasvati area and excavation at Ganweriwala, supposed to be one of major sites of the Indus Civilization, in Pakistan in collaboration with Punjab University.

Vulnerability and Resilience of Social-Ecological Systems

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

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Purpose of the Research Project

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

communities to environmental shocks, and the role of institutions on strengthening social-ecological resilience. By analyzing the factors influencing social-ecological resilience, it is possible to introduce policy interventions for enhancing human security in developing countries.

Research Methods and Target Areas

The method for comprehensive assessment of resilience is organized in four research themes as highlighted in Figure 1. Theme I focuses on soil and forest resources for analyzing ecological resilience. In theme II, we will conduct intensive interviews of farm households/communities and identify the factors affecting social resilience. Theme III considers historical changes in land tenure systems made by government policies and their effects on natural environment as well as social political factors of increasing vulnerability and the process of collapse and recovery of resilience in different communities. Theme IV cov-

Figure 1 Close Relationship of Social and Ecological Resilience

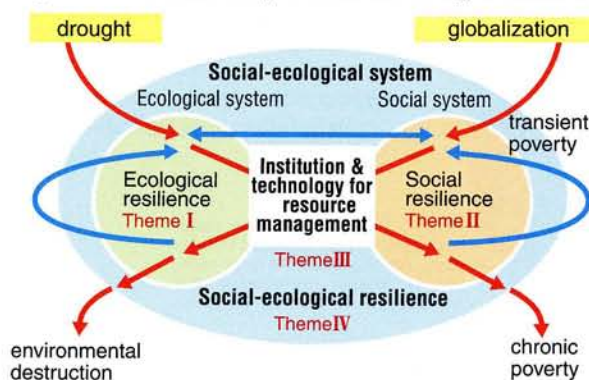


Figure 2 Zamiba, the Main Field Site



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

Figure 3 Meeting with Villagers in Petauke District, Eastern Province, Zambia



Figure 4 Comparison of NDVI Distribution Before and After Drought

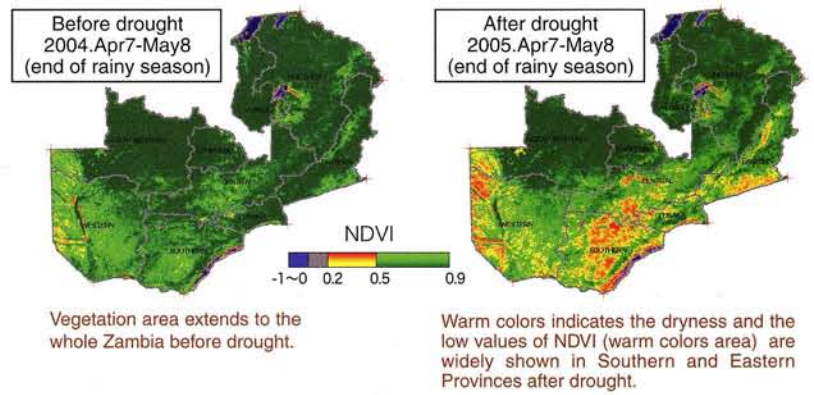
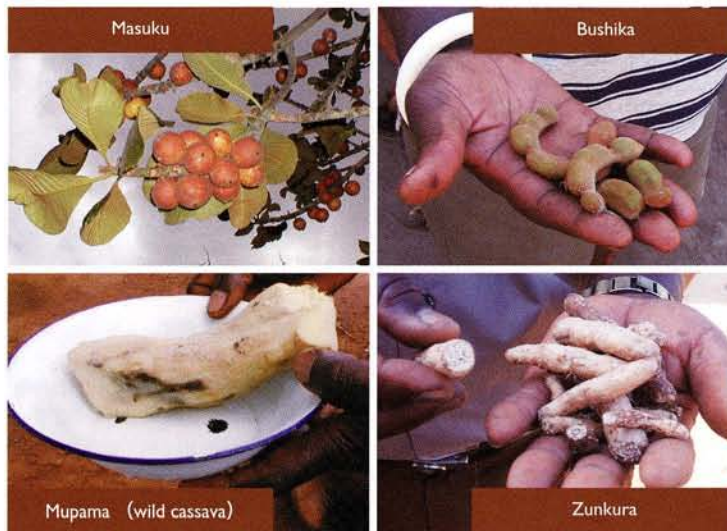


Figure 5 Emergency Food as Ex-Post Coping Measures to Drought



ers larger areas utilizing statistics, remote sensing imageries and aerial photographs to help trace long-term changes in land cover in addition to the analysis of data on rainfall and temperature. By utilizing the information provided by themes I, II and III, we will develop comprehensive and integrative methods for assessing social-ecological resilience.

The main field site is located in the semi-arid tropics (SAT) including Zambia (Figure 2) and other areas in sub-Saharan Africa and South Asia where the resource base is critical for livelihood. People in these areas largely depend on vulnerable rain-fed agricultural production systems. Increasing food security, resilience of livelihood and reducing poverty are acute issues in these areas. This project thus aims at identifying the ways in which subsistence farm households can become resilient to environmental variability by developing a method to assess resilience of social-ecological systems.

Research Outcomes to Date and Expected Results

During the field trip to Zambia in 2006, we identified the field experiment site near Petauke in Eastern Province and obtained permission for the use of fallow land from the District Commissioner as well as the villagers (Figure 3). Also, a preliminary soil analysis was conducted in order to map spatial distributions of soil characteristics. Since August 2006,

two project members have been residing in two different villages in Southern Province for their interview surveys on labor migration, drought response and others. They will continue to stay in the respective villages until the end of the cropping season in June 2007. In order to understand typical patterns of land use changes in past years, we analyzed multi-temporal satellite imageries as our preliminary analysis. Using Normalized

Difference Vegetation Index (NDVI), which was generated by the combination of visible and near infrared bands, we extracted information on areas of typical land cover changes caused by drought (Figure 4). We then conducted a ground survey to verify the results of satellite imagery readings with actual ground conditions. Furthermore, we used rainfall data from national meteorological stations in Zambia to identify the specific rainfall patterns during drought years. We also visited a local hospital, and health center. Reportedly, the rate of underweight newborn infants below 2.5 kg significantly increased during the drought year. The effects of drought on humans are captured especially in the status of infant health and nutrition. Information related to the weight, height and arm circumference of children under five will be used to assess short- and long-term impacts of droughts on human capital and labor productivity. For the human dimensions of human security, we surveyed global food security issues as well as institutions for food aid and early warning systems. After we start the extensive and intensive agricultural household interview surveys, we will obtain further information on the resilience of farm households based on the analysis of detailed data. We continue to organize the Resilience Seminars at RIHN in order to disseminate the latest findings in this field.

Neolithisation and Modernisation: Landscape History on East Asian Inland Seas

This project aims at reconstructing and understanding historical landscape change to offer new insights into the concept of “cultural landscape”. Focussing on the Japan Sea and East China Sea, our research concentrates on two periods of revolutionary landscape change, Neolithisation and Modernisation. The present project aspires to explicate the formative history of the present-day landscape through a holistic analysis from the human sciences’ perspective.

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Background and Aims

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

the cultural processes and mechanisms of landscape formation, change and evaluation. Landscape research that focuses on cultural aspects in the same measure with the physical geographical ones, is still rare in East Asia.

Landscape

Landscape is a holistic phenomenon, combining the elements of the natural environment as well as human actions, mental landscape images and traces of cultural processes. An image of landscape held by a society influences largely their way of working on the physical landscape. The newly born landscape in its turn creates a new image, which is then again applied on physical reality, creating thus an ever-continuing spiral of change. As such, the concept of landscape allows us to interpret not only the biological or physical processes behind the modern environmental problems, but also the mental and cultural processes behind the humans’ destructive behaviour towards their natural environment.

Inland Seas

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

Neolithisation and Modernisation

Present-day landscape elements can be traced back to different historical layers. The NEOMAP

Figure 1 East Asian Inland Seas and Eight NEOMAP Research Areas



Figure 2 Concept of Landscape

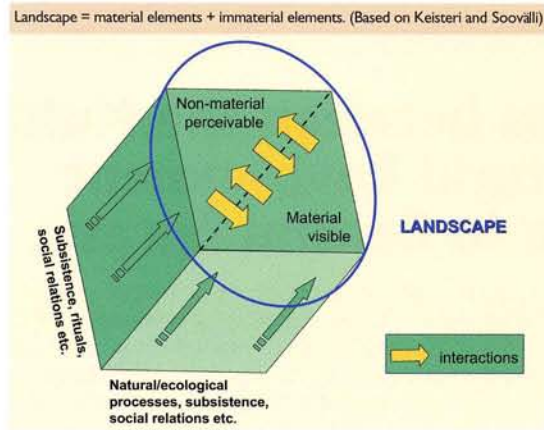


Figure 4 Shirakawa Village, Japan



Landscape once created on the crossroads of mountain products' trade, has itself become an object of consumption.

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

Results up to Now

The project is divided into eight research groups according to the eight research areas defined on the collision points of cultures and natural environments. Up to now, each workgroup has defined its major topics and areas of interests and carried out preliminary fieldwork to determine the feasibility of the project research.

To guarantee maximum integration, each project member has to belong to at least two workgroups. The interregional and historical comparison is further facilitated by the creation of GIS database uniting basic historical, archaeological and environmental data from each research area.

Figure 3 Project Members Looking at Ancient port Remains at the Early Neolithic Tienluoshan site in China



To promote international collaboration with Europe and pave the way for the comparison with North Sea and Baltic Sea, discussions have been held with scholars from Estonia, Belgium, Holland, England, Germany and elsewhere.

For a deeper understanding of landscape research inside the institute, the project has opened two seminar series, "Landscape Research" and "Wild Boar and Landscape". Project has participated in, organised and co-organised several workshops and seminars in Japan (at Suita City Museum, Society of Biosophia Studies, Lake Biwa Museum etc) and abroad (SISJAC, PECSRL).

Plans for 2007

On the basis of the main research themes agreed on in each workgroup and individual research plans, and making maximal use of the project organisation that allows for considerable interaction between specialists on different areas, fields and periods, we hope to start full-scale research from April 2007.

The topics that will be addressed by the individual researchers in all the eight research groups can be divided into four major common themes. First, the birth and expansion of the archetypal East Asian landscape, which includes research on rice paddy system, migratory waterfowl hunting, raised floor stock houses on one hand and on archetypal urban planning and Feng Shui on the other. Second, we will be investigating water-fronts, i.e. the system of the inner/outer sea, rivers and lakes as a source of living and an object of worship, but also the function of waterways as a passage for trade of local produce. Third major theme is migration and colonisation as a major force of landscape change, including the change of settlement patterns inside one culture, as well as colonisation and immigration as a forced landscape shift from indigenous/traditional landscape systems to introduced ones. Lastly we will be addressing the issue of travelling and creation of mental landscape images with topics like Eight Ômi Landscapes, the landscape imports in colonisation (ghosts and spirits transferred to new areas) and the role of temples as a landscape axis.

Historical Interactions between the Multi-cultural Societies and the Natural Environment in a Semi-arid Region in Central Eurasia

The project highlights man-made trans-boundary problems between countries or ethnic groups, religions, agriculture and nomadism, or between cities and the surrounding areas. People in the semi-arid region of Central Eurasia, once lived a nomadic lifestyle. After the long transition of the rise and fall of various ethnic groups and countries, a tight and well-defined border divided the region between Russia and Qing. Both sides of the border used to be the same but have developed differently. This project aims to study and clarify the historical interaction of human activities and natural systems in the semi-arid region of Central Eurasia, with particular emphasis on the meaning of boundaries in the context of environmental issues. This project should provide important keys not only for evaluating the effects of projected human activities on ecosystems in semi-arid regions, but also for elucidating fundamental perspectives to examine a desirable mode of living in multi-cultural regions.

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Background and Objectives

With the exception of those people who lived in oasis areas, people of the semi-arid region that extends across Central Eurasia once lived a predominately nomadic lifestyle. After the long transition marked by the rise and fall of various ethnic groups and countries, the Yuan Dynasty governed the whole of Eurasia as a loosely controlled unity during the 13th and 14th centuries. In the 18th century, however, a tight and well-defined border divided the region between Russia and Qing. At the same time, the people of this area experienced a great change in their lifestyle, caused by the migration of farmers, settlement of nomads and development of agriculture in association with the

expansion of Russia and Qing. For nomadic people living in semi-arid regions, relocation was one of the major means for adapting to environmental changes, demographic expansion and political conflicts between groups. Settlement policies and borders prevented these people from following their way of adaptation. Finally, with the weakening of the Soviet Union, the Russian side was divided into many republics. Man-made trans-boundary issues, between countries or ethnic groups, religions, agriculture and nomadism, or between cities and the surrounding areas, commonly lie behind the various environmental problems in the world. This project aims to study and clarify the historical interaction of human activities

Photo 1 The Yuldus steppe in the Tian Shan Mountains



A semi-arid region, to the north of the Tian Shan Mountains, has been used for both agriculture and nomadic pastoralism. How did the people in this region adapt their life style to changes of the natural system? What is a desirable mode of living in future? The project will tackle these questions.

Photo 2 The Kazakh Steppe on the north of the Balkhash Lake, Kazakhstan



Figure 1 Study Areas

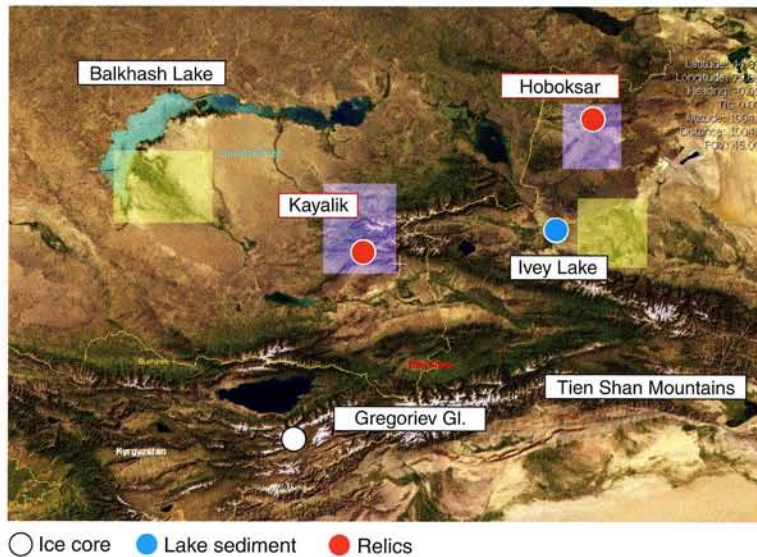
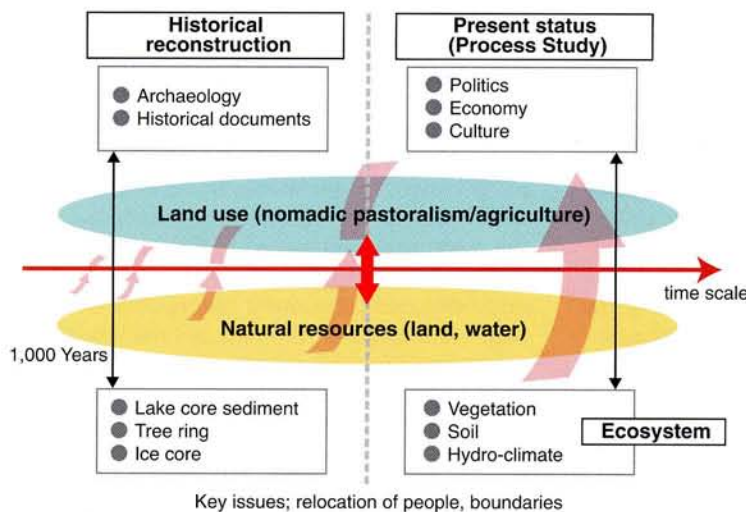


Figure 2 Outline of the Project



and natural systems in the semi-arid region of Central Eurasia, with particular emphasis on the meaning of boundaries in the context of environmental issues. This project should provide important keys not only for evaluating the effects of projected human activities on ecosystems in semi-arid regions, but also for elucidating fundamental perspectives to examine a desirable mode of living in multi-cultural regions

Contents and Methods

1) Research area

The area of study is the Ili River watershed, which flows from China to Kazakhstan, terminating at Lake Balkhash, as well as the surrounding areas, including Kyrgyz and Uzbekistan. Geographically, the Ili River watershed is recognized as a fertile area with relatively high precipitation, lying to the north of the Tien Shan Mountains. Within an historical context, the Ili River watershed and the surrounding areas have been a key area of East-West interaction in which many ethnic groups and countries have risen and fallen.

Also, the region has areas with current environmental problems due to modern development under socialism.

2) Research groups

The project consists of two research groups: one will set out to clarify historical changes in both human activities and natural systems through the analysis of historical documents as well as a variety of natural proxies, and the other group is to investigate the current processes of human activities and natural systems for the purpose of interpreting the historical information.

3) Contents

- A) To clarify historical changes, the rise and fall of nomadic groups and countries, their removal, changes in subsistence, the use of natural resources, and climate change through the analysis of historical documents and archaeological investigations as well as various natural proxies such as ice cores, lake sediment samples, tree rings and wind-blown deposits.
- B) To investigate the present status of the area and the effects of human activities on the natural environment, with particular emphasis on their social, religious and cultural background.
- C) To compare both sides of the border within the context of historical changes and their current status, examining areas that were previously similar but that have subsequently developed differently, to understand the meaning of boundaries in the context of environmental issues.

Present Status of the Project

Preliminary field trips have been made in 2006. In July to August, the present status analysis group made a preliminary field trip to Kazakhstan and China for general surveying. They found several field sites potentially suitable for the evaluation of the impact of human activities on local ecosystems. A large amount of basic information concerning vegetation, soil, meteorological and hydrological conditions was gathered during the field trip with regard to the present status of the study area. The ice-core research group made a field trip to the Gregoriev Glacier in the Tien Shan Mountains in Kyrgyz in August. They surveyed the area and decided on drilling sites. They confirmed the availability and accessibility of the sites. The historical research group traveled from Uzbekistan, Kazakhstan and China for a general survey of the historical remains in the area. The lake sediment coring group visited Lake Ivey in China during winter, in the hope of drilling from its ice-bound surface.

Also agreements for conducting joint research with universities and research institutes in China and Kazakhstan have been prepared.

Based on these preliminary field trips and preparations for cooperative studies in 2006, we will accelerate our research activities in 2007. This project should provide important keys not only for evaluating the effects of projected human activities on fragile ecosystems in semi-arid regions, but also for proposing fundamental perspectives to examine a desirable mode of living in multicultural regions.

Effects of Environmental Change on the Interactions between Pathogens and Humans

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

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Research Aims

The spread of emerging infectious diseases is becoming a serious global environmental problem. To predict outbreaks of infectious diseases and to prevent epidemics, it is essential not only to conduct pathological studies but also to understand the interactions between humans and environments that generate infectious diseases.

The objectives of this study are to clarify the relationships between anthropogenic environmental changes, pathogens that emerge under these environmental changes, and the effects on humans of diseases caused by those pathogens. Our project is based on the hypothesis that anthropogenic environmental changes mediate the spread of disease. Outbreaks of mass mortality in carp, which have long been part of human food resource and culture, caused by the koi herpes virus (KHV) disease have occurred worldwide since 1998. Specifically, we will focus on the relationships between environmental changes in a freshwater ecosystem, KHV, common carp (*Cyprinus carpio carpio*), KHV disease and humans. We

regard this system as a model of interactions between pathogens and humans (Fig. 1), because parameters common to other diseases are involved in the system and also this system allows us to conduct experiments to verify the interactions. We will then establish a general model for the emergence and spread of diseases (Fig. 2).

This study could help deal with emerging infectious diseases proactively, before they become a major health threat, through an understanding of the nature of disease, and contribute to the safe coexistence of humans with pathogens to realize long-term societal security.

Research Organization and Methods

Fields surveys are conducted at Lake Biwa, Japan, and Lake Chau-hu, China.

Our project is organized into five research groups, an executive group, and an advisory group. The role of each group is as follows:

Environmental alteration by humans (Group 1): revealing the effects of anthropogenic environmental alteration on the emergence and spread of a pathogen (KHV) and on the behavior of its host (common carp, *Cyprinus carpio carpio*).

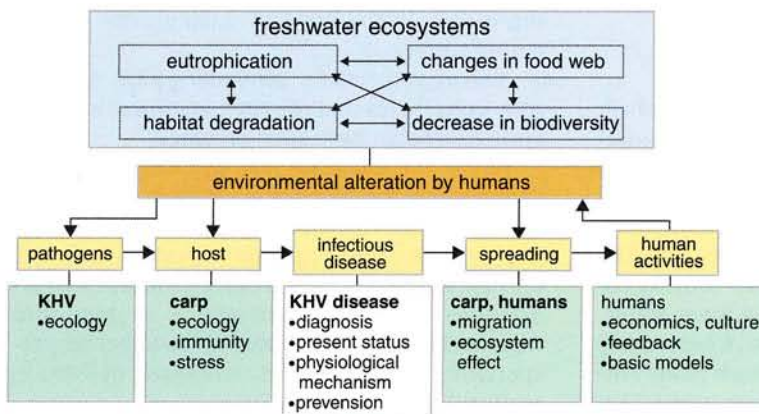
Ecology of pathogens and their hosts (Group 2): clarifying the dynamics of a pathogen (KHV) and its host (common carp) in relation to environmental factors, thereby defining the environmental factors involved in KHV infection.

Infection process and ecosystem effects (Group 3): revealing the infection process and the effects of KHV disease on ecosystem process and functions such as material cycling.

Economics and culture (Group 4): clarifying losses in terms of ecosystem services, economics and culture as a result of environmentally increased diseases, and the compensation process for those losses.

Feedback (Group 5): clarifying the effects of those losses on subsequent environmental alter-

Figure 1 Interactions between KHV Disease and Humans



■: research fields with many unrevealed subjects

Figure 2 Relationship of our Model to a General Human Pathogen Model

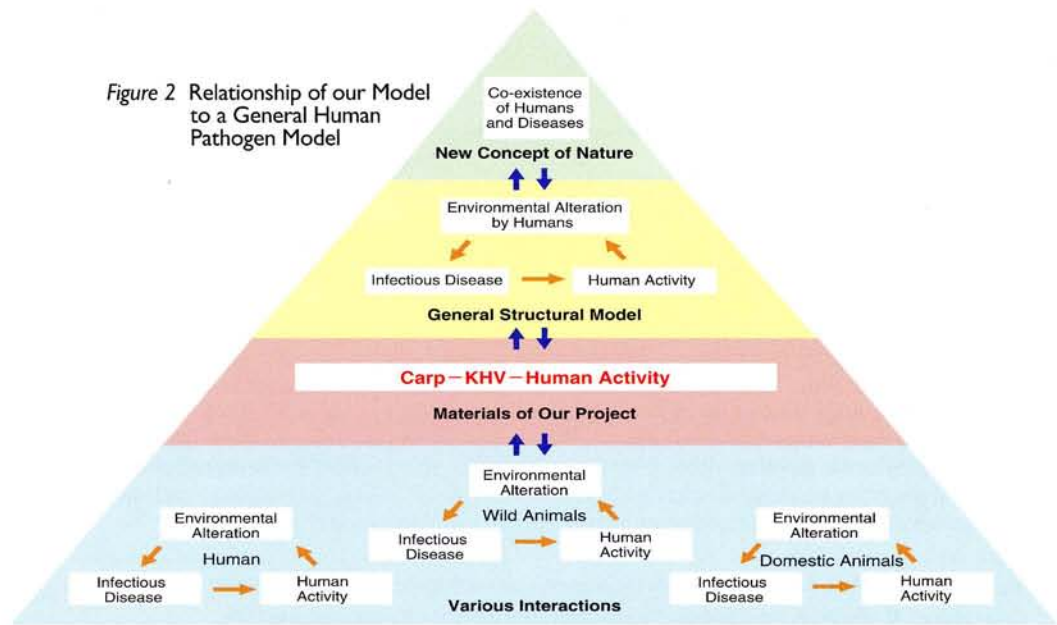
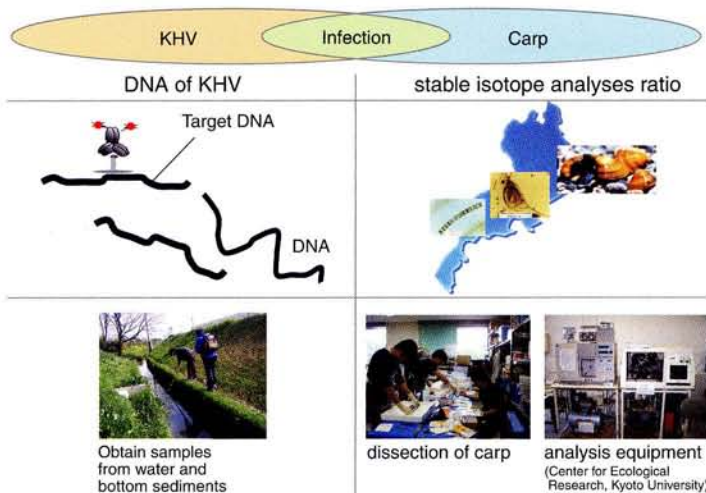


Figure 3 Survey of Distribution of KHV and behavioral Range of Carp to Predict the Outbreak of Infectious Diseases



ation by humans.

Executive: coordinating the activities of each group to connect the research subjects to attain our objective. Applying our model to other infectious diseases.

Advisory: giving us suggestions to improve our project from the viewpoint of international experts.

Results in 2006

- 1) We surveyed the topology, bottom quality, and water quality of four satellite lakes of Lake Biwa that seemed to be important habitat for common carp. We found heterogeneous environments in this lake. These environments may affect the behavior of common carp. A mathematical model, based on the hypothesis that common carp migrate between the satellite lakes seeking better habitats, predicted that lower connectivity among satellite lakes increases the stress carp experience and enhances the spread of KHV.
- 2) A pre-survey was conducted in Lake Chau-hu, China, with a Chinese collaborator.
- 3) We developed a method to detect KHV in lake water and bottom sediments. We collected carp

from seven sites in Lake Biwa to obtain materials for stable isotope analyses to identify their behavioral range (Fig. 3). We studied a method to measure cortisol as a stress-induced hormone. We installed breeding tanks for common carp with a controlled water temperature for the stress experiment.

- 4) We collected blood samples from common carp, to measure antibodies against KHV.
- 5) We began our study of the effect of common carp extinction on humans.
- 6) We exchanged information about some infectious diseases with other research groups to find common parameters involved in infectious disease outbreaks.
- 7) We have established the research topics for each group and have integrated them into the basic structure of the interactions between pathogens and humans.

Scheduled Research Activities in 2007

- 1) Clarify the behavior of the *C. carpio* (common carp) according to the presence of a KHV antibody that reveals the history of KHV infection, and shows the places where the infection is likely to occur.
- 2) Reveal the distribution of KHV in Lake Biwa.
- 3) Clarify the environmental characteristics of places where KHV and the carp are both present.
- 4) Reveal the relationship between environmental factors and stress through experiments.
- 5) Try to assess the economic impact of the disappearance of the carp.
- 6) Create an outline model of the effect of environmental change on the interactions between KHV and humans.
- 7) Analyze cases of other infectious diseases from the viewpoint of their interaction with humans.
- 8) Provide multidimensional assessment of environmental change on the interactions between pathogens and humans from the perspective of the local residents.
- 9) Collaborate with an international program of biodiversity science (DIVERSITAS).

Environmental Changes and Infectious Diseases in Tropical Asia

This project is to clarify the relationship between various environmental changes and the rise and fall of infectious diseases in tropical Asia. The project studies the effects of human societal and natural environmental changes on the ecology, epidemiology, and endemiology of infectious diseases such as malaria, dengue fever, opisthorchiasis (liver fluke infection), and water-borne diseases. Population increase, urbanization, deforestation, spread of wet rice cultivation, economic development, changes in lifestyle or so-called modernization, and population migration are the factors changing the ecological relationships among human beings, pathogens, and vectors. The project also investigates the relationship between climate changes and some infectious diseases.

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Background and Objectives

The study aims at offering new disease-ecological insights for evaluating the relation of infectious diseases with local and global environmental changes. Unlike conventional medical control programs/projects, which usually aim at short-term problem-solving approaches towards infectious diseases, this project tries to understand the fundamental relationships between human life and the ecology of pathogens and vectors, through a transdisciplinary and integrated approach (Figure 1).

Methods

The project will clarify the impacts of changes in societies and the environment on infectious diseases, through the following five approaches (Figure 2):

- 1) Collecting and analyzing existing regional information on changes in climate, environment and infectious diseases (in selected countries in tropical Asia)
- 2) Field studies and observation in Laos, Vietnam, and Bangladesh
- 3) Historical studies of regional development and health/disease transition
- 4) Theoretical epidemiological studies using mathematical models
- 5) Integration of studies on global environmental changes and infectious diseases

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

Implications for Mitigating Global Environmental Issues

This project will provide us with deeper understanding of the relation between environmental changes and occurrence of tropical infectious diseases. This project will show that there are no magic bullets to eradicate all the infectious diseases from this world. We can learn through this study that the most of the infectious diseases can't be eradicated, that human beings must cope with these diseases by keeping a good balance with the environment, and that the "good balance" differs disease by disease and area by area. The project leader believes that this kind of understanding is the key for the betterment of the long-term health of the population.

Figure 1 Scheme of the Occurrence of Vector-borne Infectious Diseases by Interactions between Environments and Populations of Hosts (human beings), Vectors, and Pathogens

Incidence of vector-borne diseases such as malaria is related to the ecology of pathogens, vectors, and humans.

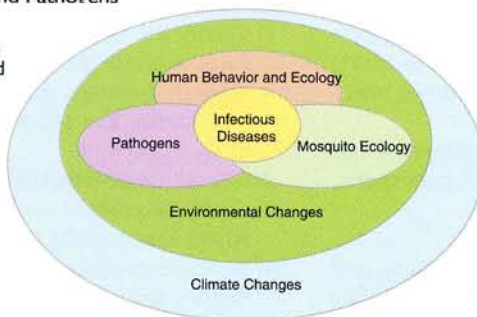
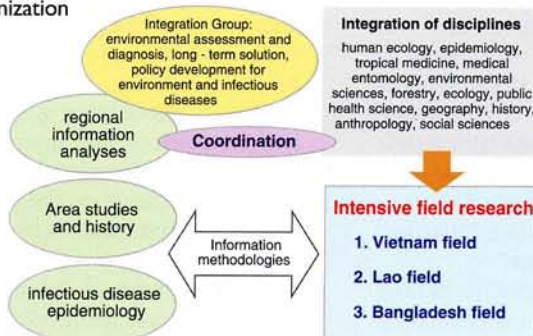


Figure 2 Project organization



Human Life, Aging, and Disease in High-Altitude Environments: Physio-medical, Ecological and Cultural Adaptation in the Three Great “Highland Civilizations”

Human life in highlands and its association with natural and socio-economic environments will be clarified through the comparative study of the three major highland zones: the Andes, the Himalaya and Tibet, and the Ethiopian Highlands. With the new perspective of “Highland Civilizations”, the human-environmental relationship will be verified by studying human life, aging, and disease in local life and the effects of globalization on highlands.

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Objectives

The four great ancient civilizations of the world arose on the banks of great rivers and are thus called the “Great River Civilizations”. The viewpoint

of “Highland Civilizations”, sustained by both common characteristics and local inherence, was realized by comparison of the three major highlands. The objective of the project is to understand the relationship between people and the highland environment. This will be accomplished by verification of the extent and limitations of local knowledge regarding adaptation to high-altitude environments. Furthermore, we intend to find new perspectives on the study of global environmental issues.

environmental exploitation such as agriculture and animal husbandry in the livelihoods of the three major highland zones. Those common features are probably what enabled inhabitants of the highlands to establish the highly cultured “Highland Civilizations”. Sustainable ways to exploit environments will be clarified so they can be applied towards the solution of global environmental issues.

The theme of how the “Sub-Systems” have supported the “Highland Civilization” will be discussed from the viewpoint of agro-ecosystems, transition of environmental exploitation and “highland-lowland interaction”. It is known that, not only self-sufficiency but also complicated “highland-lowland interaction” is needed in order to maintain isolated highland communities and lifestyles for more than a few hundreds years.

Nature and ecology in “Highland Civilizations”

The relationship, and the change of the relationship, between human activities and livelihoods and land and forest use will be disclosed. Environmental issues in fragile upper mountain forests and the area along the timberline will be also discussed. High altitude environments, especially the association of climate and its change with the development of “Highland Civilizations” will be clarified.

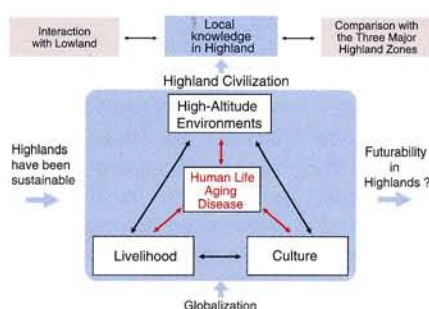
Culture in highlands

“Highland Civilizations” will be understood through the perspective of “Study of Nature”. Human ageing and diseases will also be discussed in association with high spiritual religion and traditional medicine.

Expected Outcomes

The common characteristics and unique local factors in the highlands will be understood. The “futurability” of “Highland Civilizations” will be proposed, after evaluating the effects of globalization and the problems it causes. It is expected that unique models and wisdom will come to light from local highland knowledge. This knowledge can be applied toward the solution of global environmental issues caused by the, mainly lowland, modern civilizations.

Figure Outline of the Project



Human life, aging, and disease in high-altitude environments will be studied by the verification of physiological, ecological and cultural adaptation of peoples in the three great “Highland Civilizations”. “Futurability of the highlands” will be discussed in terms of the influence of such factors as socio-economic globalization and global warming.

Methods

Human life, aging, and disease in highland people

Diseases specific to high altitudes, those that are closely associated with a hypoxic environment, are one of the environmental issues that affect the human body. Highland peoples have escaped from infections, such as malaria; however, lifestyle-related diseases increasing quickly, with extended life spans and changes in lifestyle, and are regarded as diseases related to modern civilization. The actual features of the disease and human aging phenomena among highland peoples will be clarified with special reference to high-altitude ecology and its socio-economic backgrounds.

Environmental exploitation and livelihood in “Highland Civilizations”

There are common features of

Photo A village on the Tibetan Plateau



In the highlands, not only crops for the people but also feed for the domesticated animals are important for the existence of life.

Collapse and Restoration of Ecosystem Networks with Human Activity

Most ecosystems on the planet have been seriously degraded by human activities and are now in a critical situation. Nevertheless, most research on the problem has focused only on the direct consequences. The project aims to clarify the mechanisms resulting in the collapse and deterioration of ecosystems, and then pave the way to restore and maintain healthier ecosystems with high biodiversity and ecological functions while minimizing instability and uncertainty in the long term over a wide area.

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Objectives

Degradation of ecosystems, which has led to the loss of biodiversity and ecosystem function, is widely accepted as one of the most serious global environmental problems. Nevertheless, most research on the problem has focused only on the direct consequences. The collapse and deterioration of ecosystems caused by human activities via interactions within the ecosystem network, including indirect and cascade effects, have rarely been considered. In addition, few studies take a social science perspective, although environmental problems are one of the consequences of the interactions between nature and human society.

The recent boom in theoretical studies on complex networks (complex system sciences, complex adaptive systems) and the remarkable progress in computer performance have dramatically increased our capacity to deal with complex systems such as ecosystems and social interactions. Complex system sciences are now a practical and important tool in various fields of sociology, economics, and ecology.

This project takes advantage of the interdisciplinary nature of network sciences to consider environmental problems, especially the problem of

ecosystem deterioration, by linking sociology, economics, and ecology. The project aims to clarify the mechanisms resulting in the collapse and deterioration of ecosystems, and then pave the way to restore and maintain healthier ecosystems with high biodiversity and ecological functions while minimizing instability and uncertainty in the long term over a wide area.

Research Sites

The research sites for this project are a tropical rainforest in Southeast Asia and grassland in Central Asia. At both sites, the terrestrial ecosystems are being devastated by the surge in the Asian economy associated with the recent dramatic economic growth of China. Nevertheless, the lives of many people depend on natural ecosystems and the destruction of these ecosystems directly results in dramatic changes in their lives.

Expected Achievements

This project is expected to achieve the following three main points:

1. Clarification of the relationships between human activities and ecosystem networks at two research sites that have common characteristics and marked differences. At the two research sites we will investigate the extant ecological networks and their transitions over the past 100 years as human activity intensified dramatically.
2. Development of models for projecting and evaluating future ecological networks based on different scenarios. We will construct simulation models for both regions based on the structure of the observed ecological networks and present a set of assumed conditions and projections as scenarios.
3. Provision of new approaches for investigating global environmental problems by introducing network sciences. We will generalize the analysis from case studies at the two sites to investigate which network structures are likely to lead to environmental problems and how we can restore ecological networks to solve the problems.

Photo Top: Mongolia, Healthy Grassland (left) and Degraded Pasture (right)
Bottom: Sarawak, Rainforest (left) and Plantation (right)

In Mongolia, livestock have grazed the grasslands extensively for the long time. In recent years, overgrazing by livestock, especially by the increased number of goats for the production of cashmere for export, has caused a serious problem in the region. In Sarawak, the ecosystem has changed dramatically over the last 100 years; land use has shifted from extensive agriculture in forests by aboriginal people to logging in natural forests as a source of timber for export, and then to oil-palm plantations.



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

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

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Core Members ■ **AMANO, Masahiro** School of Human Sciences, Waseda University
HAYASAKA, Tadahiyo RIHN
KOJIMA, Hiroshi School of Social Sciences, Waseda University
MURAKAMI, Masakatsu Faculty of Information Science, Doshisha University
TSUYUKI, Satoshi Graduate School of Agriculture and Life Sciences, The University of Tokyo
YAMAOKA, Kazue National Institute of Public Health
YOSHINO, Ryoza Institute of Statistical Mathematics

Objectives

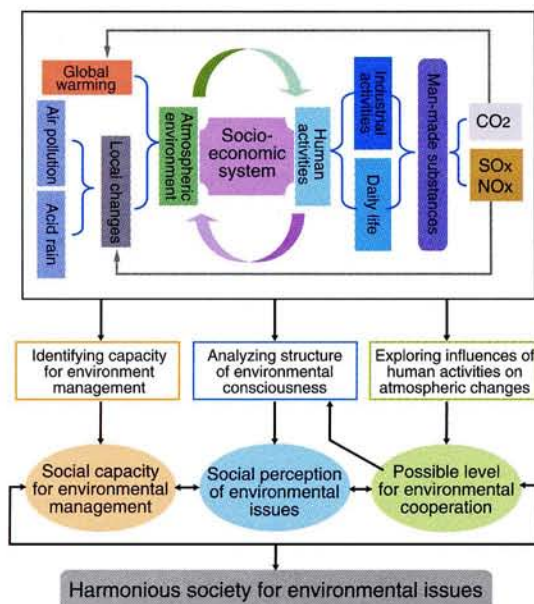
A new framework for the international environmental community to improve atmospheric quality is indispensable to overcome the limitations of the current environmental cooperation system that is driven by political and economic profits. This project aims to analyze how various human activities affect the emissions of man-made substances such as CO_2 , NO_x and SO_x . It also tries to probe the possibility of a harmonious society for environmental issues (HOSEI) defined by a diversity of environments and cultural links, as well as the foundations of environmental harmony study (See Figure).

Methodology

This project selected East Asia as the research area and will proceed with the three main approaches below:

- 1) One of the approaches is to analyze the influences of human activities, including energy consumption and land use etc., on emissions of CO_2 , NO_x and SO_x , and to predict the possible level for environmental cooperation (PLEC) for each research area by means of investigating the emission inventories at both national and regional scales.
- 2) The second approach is a quantitative evaluation of social perception of environmental issues (SPEI), which will be accomplished by extracting the essence of environmental consciousness of citizens, firms and governments, and thereby develop multidimensional indicators.
- 3) Finally, the framework of a harmonious society for environmental issues will be explored based on three essential factors, which are: the possible level for environmental cooperation, the social perception of environmental issues, and the social capacity for environmental management (SCEM).

Figure Conceptual Flowchart of Research Project



Expected Outcome

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

Sustainable Food Production Concept Based on Evaluation of Traditional Agricultural Practices

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

Project Leader ■ **SATO, Tadashi** Graduate School of Life Science, Tohoku University
 Core Members ■ **KASAHARA, Yasuhiro** Institute of Low Temperature Science, Hokkaido University
MATO, Toru Institute of Agriculture, Kyoto University
SATO, Yo-ihiro RIHN
SUZUKI, Iwayumi Graduate School of Arts and Letters, Tohoku University
YAMADA, Goro Historical Museum of Hokkaido
YUMOTO, Takakazu RIHN

Purpose of Research

This research is intended to investigate the following. Merits of traditional agriculture are evaluated from various viewpoints such as biology, agronomics, ethnicity, religious studies, and economics in managed cultivated fields and surrounding regions. Sustainable futuristic modes of agriculture are proposed under conditions in which the environment shall be preserved and a certain productivity level shall be secured. This research was undertaken based on the viewpoint that global environmental problems associated with agricultural practices that have spread since the "Green Revolution" are caused by: the use of large volumes of chemical fertilizer and agrichemicals; the use of crop species and varieties that depend on those chemicals; the socioeconomic structure of advanced countries, which provide such breeds of crops; and popular consciousness. Therefore, to solve problems of the global environment attributable to modern agriculture, it is necessary to build up cultivated fields in which a certain level of productivity can be secured without using large

amounts of fertilizer and agrichemicals and to revolutionize the socioeconomic structure and people's consciousness. This research is intended to elucidate a route by which a future mode of agriculture can be realized for sustainable food production, based on clarification of "an interactive cyclical system including humans and nature" related to agriculture and food.

Method for Research

The investigation targets of this study are fields, mainly in Japan and tropical Asian regions, in which traditional agriculture and advanced agriculture are managed. The following preliminary investigations have preceded planning of this research: agricultural investigations concerning genetic diversity of crops and the dynamic state of elemental nutrients such as carbon, nitrogen, and phosphoric acid; biological examination of biodiversity such as companion planting, insects, soil microbes, and symbiotic microbes; ethnic and religious studies investigating consciousness of traditional farming systems and diet; and socioeconomic investigation of productivity and economic efficiency. For agricultural and biological studies, not only field observations but also analytical technologies have been applied using molecular biology and examination of stable isotopic elements. Social-scientific investigations have included not only studies based on the scientific literature, but also interviews and field investigations.

Expected Subjects

Expected subjects based on the research described above are given as follows: (1) clarification of environmental pollution of a cultivated field and the ecosystem surrounding it attributable to the use of large amounts of agrichemicals and chemical fertilizer in advanced agriculture and its implied "vicious circle"; (2) the structure of sustainable agriculture through preservation of biodiversity and genetic diversity of crops used for traditional agriculture; and (3) studies of natural perspectives related to production and consumption of food in developed and less-developed countries.

Photo 1 Traditional Farming Systems in Slash and Burn Fields of Northern Laos



Various kinds of crops including upland rice are cultivated in slash and burn fields. After cultivation for 2 or 3 years, the farmland is left for 10 or 20 years.

Photo 2 Advanced Farming Systems in Paddy Fields



Mono-cultivar of rice requiring a lot of chemical fertilizer and agrichemicals is cropped in paddy fields, which are irrigated and arranged in an orderly pattern.

Migration, Sojourn, and Possibilities in Cities

Currently, more than half the human activities on earth occur in cities. We propose to observe the migration and sojourn phenomena of people, commodities, capital, and information, analyzing such transformational processes while adopting different academic methods with their various time-space measures. We thus would like to propose a model for sustainable urban regeneration.

- Project Leader ■ **MURAMATSU, Shin** Institute of Industrial Science, the University of Tokyo
- Core Members ■ **FUKAMI, Naoko** Institute of Oriental Culture, the University of Tokyo
KAGOTANI, Naoto Institute for Research in Humanities, Kyoto University
KATO, Hironori Department of Civil Engineering, the University of Tokyo
KIMURA, Takeshi Graduate School of Humanities and Social Sciences, University of Tsukuba
KINOSHITA, Tetsuya RIHN
WIDODO, Johanness School of Design and Environment, National University of Singapore
YAMASAKI, Seiko Dentsu Communication Institute
YAMASHITA, Yuko Graduate School of Commerce and Management, Hitotsubashi University
YASUOKA, Yoshifumi Institute of Industrial Science, the University of Tokyo

The Background and the Purpose of the Research

Currently, more than half the human activities on earth occur in cities. The urban concentration of people, commodities, capital, and information has been accelerating. This phenomenon is not only a result of global-scale mobility but also of migration from rural and suburban areas to the urban centers. People, commodities, capital, and information, once concentrated in a city, are amplified, consuming and wasting natural resources — water, wood, farmland, and air — and as a result, rubbish, discarded lumber, carbon dioxide, and waste water are discharged.

Many of the environmental problems on this earth are caused by such urban consumption and discharge, which in turn should adversely affect the environment of the city itself. However, urban activities consist of so many different elements, and these various phenomena, while being bound by historical and civilization related factors, travel across urban and national borders, making it

difficult for us to grasp them, let alone control them. This study is an attempt to grasp and analyze such phenomena of urban migration and sojourn, which have been too complicated for any investigation so far, by means of various academic approaches.

The Research Methods and the Expected Tasks

We have chosen Southeast Asia as the focus of our study — particularly Jakarta, Bangkok, Manila, and their respective migration spheres — as this is the area where the struggling forces of globalization converge and whose urban environments are being heavily degraded. We are planning to investigate the urban migration mechanism of people, commodities, capital, and information during the period from the end of the eighteenth century, when a great change was caused by the British Empire's making inroads into the region, to the present. We will study our subjects over the long-term (across a span of about 100 years), mid-

term (across a span of about 30 years), short-term (across a span of about 10 years), and very short-term (within a span of one year). We will conduct these studies cross-disciplinarily, including various academic fields such as economic history, urban history, transportation engineering, religious studies, and the history of ideas. Finally, we will also examine which elements are responsible for the degradation of the earth's environment. Based on our results, we would like to contribute to the improvement of such problems by constructing an environmentally friendly model for sustainable urban regeneration that will lead to future-oriented and practical urban policies.

Photo Urban Landscape, Jakarta, 2006



Here, people, commodities, capital, and information flow in from all over the world and transform the city, these factors will be historically investigated.

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

Children are the most vulnerable sector of the human population within the environment. There is no doubt that understanding the effects of environmental dangers on children is crucial when considering environmental problems. Nevertheless, insufficient effort is being made to assess the relationships between children and their environment. This project seeks to determine the actual conditions relating to child security in local environments in the Asia-Pacific region, to support children's participation in community development and environmental care, and to open up new perspectives on future human capabilities.

Project Leader ■ **YAMAUCHI, Taro** School of Medicine, Hokkaido University

Core Members ■ **UMETSU, Chieko** RIHN

NAKAZAWA, Minato Graduate School of Medicine, Gunma University

WATANABE, Chiho Graduate School of Medicine, The University of Tokyo

YAMAKOSHI, Gen Graduate School of Asian and African Area Studies, Kyoto University

YOSHITOMI, Tomoyasu Field Studies Institute for Environmental Education, Tokyo Gakuji University

OEKAN, Abdoellah Institute of Ecology, Padjadjaran University, Indonesia

BUDHI, Gunawan Institute of Ecology, Padjadjaran University, Indonesia

Objectives

We focus on the risk of environmental chemicals (e.g., environment disrupting chemicals, agricultural pesticides and food additives) and aim to assess their health impact on children comprehensively in terms of biological, socioeconomic, and cultural-psychological aspects. In addition, we support participation of the children in local environmental protection and aim to reveal how children recognize their surrounding environment and hold environmental protection awareness not only on a local scale but also in terms of the global environment.

Photo 1 Spraying with Pesticide



Neither gloves nor mask are worn and the sprayer is unprotected

Photo 2 Landscape of a Village



Located in Citarum River watershed, West Java, Indonesia

shed were selected as intensive research sites. The field sites include diverse environmental problems such as eutrophication due to the influx of domestic and industrial wastewater, dam reservoirs, and agricultural pesticides.

Methods

1. Exposure to chemicals and health risk

To assess the exposure to chemicals and risk to children's health, measurements of anthropometric indices (body weight, height, etc), dietary surveys, direct observation of daily behavior, collection of satellite data, and measurement of physical activity using accelerometers are conducted.

2. Children's participation in the community

Detailed observations and analyses are performed in the following sequence: finding problems, research of the environment, presentation, alteration of awareness and behavior, influence of the results on the community. The whole process, from understanding the environmental problems to carrying out some sort of action, is compiled as a unit for analysis.

Expected Outcomes

Further understanding of the process by which children understand both local and global environmental problems and carry out actions related to them. How and to what extent adults and the local society will change due to influence by children's actions. We try to extract generally applicable theories and possible scenarios from accumulated case studies and observing and recording the process in detail.

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

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

Japan and oil-rich countries of the Middle East have excessively promoted exploitation of irreplaceable resources such as fossil fuel and fossil water, because they put first priority on economic prosperity for their own benefit. Their attitude also furthers social differences among the people of the Middle East. Therefore, we need to break the existing framework of scientific understanding and deadlock of social systems, by building a direct relationship between Japanese and international scientists and the common people in Arab societies. These efforts would open up a road to solve problems both scholarly and social.

Project Leader ■ **NAWATA, Hiroshi** Arid Land Research Center, Tottori University
 Core Members ■ **KAWAMOTO, Mutsuo** Research Institute for Islamic Archaeology
KOBORI, Iwao United Nations University
MIYAMOTO, Chiharu Action for Mangrove Reforestation
SUGIMOTO, Yukihiko Graduate School of Agricultural Science, Kobe University

Objectives

This research project aims to promote basic studies to examine the interactions between human and nature in dryland areas, for the purpose of ensuring sustainability of subsistence activities and combating livelihood degradation in local communities of the Arab people.

How have the Arab people survived more than a thousand years in the uncertainty in ecological systems of drylands, which are determined by non-linearities in the system of variability in time and heterogeneity in space (ex. a high fluctuation of annual precipitation and an uneven distribution of rich rainfall)? What was the basis of their livelihood and survival strategies, and what were the characteristics of its sustainability and weakness? We clarify human subsistence ecosystems by focusing attention on human life support mechanisms and self-sufficient modes of production (hunting, gathering, fishing, herding, farming, and forestry). Based on these research results, we intend to propose a scientific framework to strengthen their subsistence productivity and to rehabilitate the daily life of the common people in Arab societies.

on keystone species, (2) inspection of sustainability and fragility of Arab societies, (3) examination of the futurability of traditional knowledge. Field surveys will be conducted in four countries such as Algeria, Sudan, Egypt and Saudi Arabia, so that we can compare a combination of keystone species, ecotones and traditional knowledge, and examine differences in sustainability of subsistence economies particularly under site-specific conditions.

The exact targets of keystone species, ecotones and traditional knowledge are as follows: (1) Algerian Sahara oasis/ date-palms/ wadi-beds/ rehabilitation of a wise traditional way of water use, *foggara*, and redevelopment of oasis agriculture in Sahara; (2) Butana area in the Sudan/ camels/ river-sides/ building comprehensive measures to control exotic invasive species, mesquites, *Prosopis* and strengthening a stable food production system centering on pastoralism; (3) Sinai peninsula in Egypt/ coral reefs/ mountain-sides/ elucidation of material culture and promotion of studies on relationships between Arabs and nature, focusing on the dynamic systems of their social and complex networks; (4) Red Sea coasts in Saudi Arabia/ mangroves/ sea shores/ integrated land management applying traditional natural resource management, *hema*, and conservation of biodiversity.

Expected Results

In the 1980s, international organizations promoted planting exotic species of mesquites. However, this invasion not only changed regional ecosystems, but also caused livelihood degradation among local communities. Nowadays, the IUCN has put mesquites on the list of "100 of the World's Worst Invasive Alien Species". We will submit comprehensive measures to control this invasive species, by constructing research teams connecting various backgrounds, specializations and crossing different fields of science: scientists in universities and institutions, representatives of NGOs and consulting companies, project managers of international organizations and development institutions, and local people playing various social roles such as tribal leaders, technicians and villagers.

Research Methods and Areas

Our research methods consist of three main pillars: (1) analysis of subsistence ecosystems focusing

Photo 1 Assessment of Environmental Affects by Development Programs in Coastal Zones of the Arid Tropics



The coastal zones, in which fresh water can be converted from seawater, became a big development frontier and may cause environmental degradation by releasing highly concentrated saline water into the sea. On the other hand, this area is rich in biodiversity, so it has high potential for seafood and pastoral food production through reforestation of mangroves as fish nurseries and forage safekeeping. We are compiling scientific knowledge to prevent a new outbreak of environmental problems in coastal area development.

Photo 2 Supporting Local Peoples' Decision Making by Sharing Information from Research Results



We are conscious of the necessity to provide universal and equitable access to scientific data, making use of these for local peoples' decision making as well as nations' policy making, by information dispatch through printing and digital devices in Japanese (bridge between Japanese and Arab societies), English (scientific language for scientists communities) and Arabic (local common language for local communities).

The Effects of Economic Activities on the Ecosystem in the Caspian Sea and Cooperative Environmental Protection System

It is feared that a large-scale development of sea resources such as oil and natural gas has negative impacts on the ecosystem in the Caspian Sea. An environmental protection system should be enforced with cooperation between the circum-Caspian countries. In this project, in order to create an environmental protection system a future Caspian ecosystem will be demonstrated by analyzing the relationship between the history of economic activities and the unique ecosystem.

Project Leader ■ **KITAZAWA, Daisuke** Institute of Industrial Science, The University of Tokyo
Core Members ■ **KUMAGAI, Michio** Lake Biwa Environmental Research Institute
TANABE, Shinsuke Center for Marine Environmental Studies, Ehime University
TABETA, Shigeru Graduate School of Frontier Sciences, The University of Tokyo
VOLODYMYR, Myroshnychenko Caspian Sea Program
YAMANAKA, Ryoichi Graduate School of Advanced Technology and Science, The University of Tokushima

Objectives

The Caspian Sea is a closed sea with no outflow of water through rivers and a unique ecosystem has formed over a hundred thousand years. Recently the development of oil and natural gas resources has been proceeding rapidly as they rise in cost. All the pollutants from the development are accumulated in the water or in the sediment since the Caspian Sea is closed. It is therefore feared that such pollutants have negative impacts on the unique ecosystem, which includes several endemic species such as seals and sturgeon. An environmental protection system should be enforced with cooperation between the circum-Caspian countries, whose nationalities, social systems, and economic conditions are quite different from each other. In this project, the future Caspian ecosystem will be demonstrated by analyzing the relationship between the history of economic activities and the unique ecosystem. Then an environmental protection system will be proposed, taking into account the differences in the nationalities, social systems, and economic conditions among the surrounding countries.

Methodology

In order to propose the environmental protection system, this project integrates: 1) field investigations of the Caspian ecosystem, 2) model analysis for prediction of the future ecosystem, and 3) investigation of the environmental consciousness of citizens and governments.

One example of field investigation of the Caspian environment is examination of transportation of pollutants and their concentrations in marine organisms to reveal the environmental impacts across borders. The future ecosystem will be predicted by numerical simulation of oil and natural gas development at a more accelerated pace than the present. Furthermore, investigation will reveal the differences in environmental consciousness of citizens and governments of the surrounding countries. These results will be integrated to propose a total system of environmental protection in the Caspian Sea.

Expected Outcome

In the future, the offshore development of renewable energy and resources will accelerate as demand for energy increases. It is therefore very important to protect the common environment of the countries surrounding the Caspian Sea. This project will contribute to illustrating how the environment can be protected by cooperation between the surrounding countries if their nationalities, social systems, and economic conditions are quite different from each other.

Figure Conceptual Flowchart of the Project

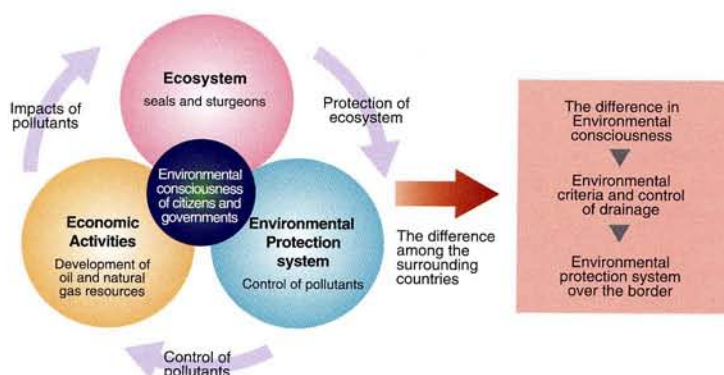


Photo Oil wells off Baku in the Republic of Azerbaijan



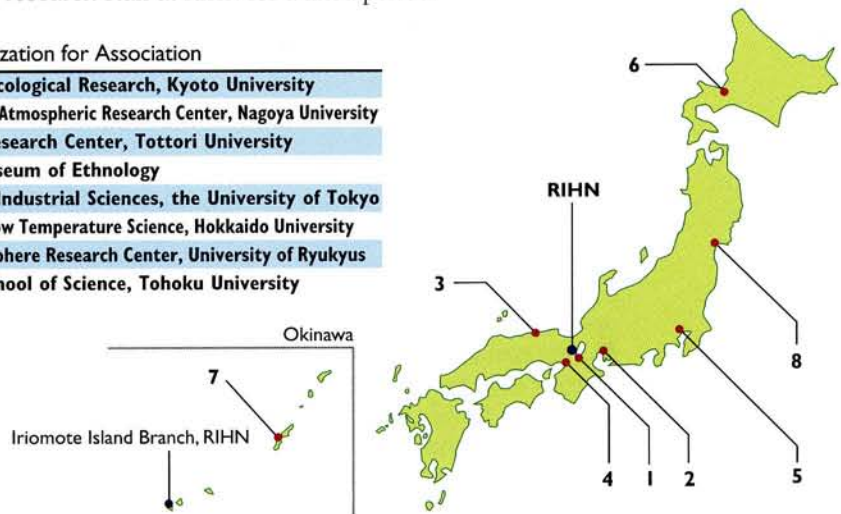
Research Cooperation in Japan and Abroad

Partner Organizations for Fluid Association

RIHN has promoted research in collaboration with the following eight domestic institutions, including university research institutes. We receive more than one teaching staff member from each of these research institutes in accordance with our agreement. They work as teaching and research staff at RIHN for a fixed period.

Partner Organization for Association

1. Center for Ecological Research, Kyoto University
2. Hydrospheric-Atmospheric Research Center, Nagoya University
3. Arid Land Research Center, Tottori University
4. National Museum of Ethnology
5. Institute of Industrial Sciences, the University of Tokyo
6. Institute of Low Temperature Science, Hokkaido University
7. Tropical Biosphere Research Center, University of Ryukyus
8. Graduate School of Science, Tohoku University

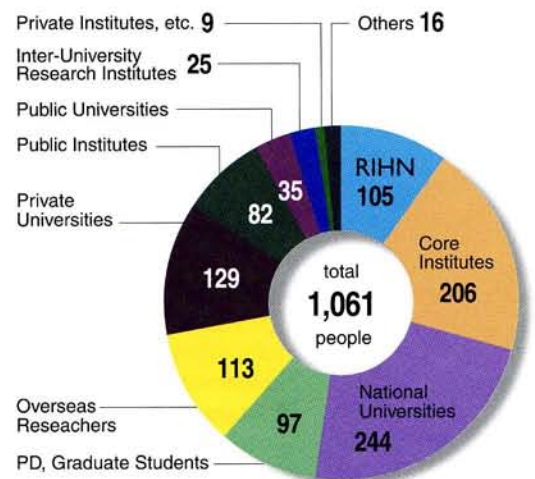


Memoranda and Research Cooperation Agreements

RIHN has signed memoranda with overseas research institutes such as Nankai University, Hohai University, the Cold and Arid Regions Environmental and Engineering Research Institute (Chinese Academy of Sciences), Institute of National Studies (Chinese Academy of Social Sciences), and the Far Eastern Branch of the Russian Academy of Sciences as well as leading research organizations from these and other countries. Furthermore, research cooperation agreements have been signed at project leader level with many research institutes and organizations such as La Fondation Maison des Sciences de l'Homme, Yunnan University, the Ministry of Public Health (Lao People's Democratic Republic), and Chiang Mai University. RIHN also signed agreements with the University of the Punjab in October 2006, Zambia Agricultural Research Institute, the Ministry of Agriculture and Co-operatives of Zambia in March 2007, and CARDI of Cambodia in June 2007.

External Research Collaboration

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



* As of April 9, 2007, researchers from the core institutes on joint research projects account for the largest part of the staff working on projects. (Core institutes include our partner organizations).

Activities of the Research Promotion Center

The Research Promotion Center, in accordance with the principles of the Institute, was established to build the basis for finding a new research perspective beyond the scope of the existing disciplinary framework.

The Medium-term Action Program of the National Institutes for the Humanities stipulates that it is “to consolidate the Research Promotion Center for activities including information collection and processing, science communication, and relevant basic research, in relation to global environment studies.”

The Research Promotion Center plans science communication, and provides information and processing tools as concrete activities for the sake of RIHN and global environmental studies.

■ Dissemination

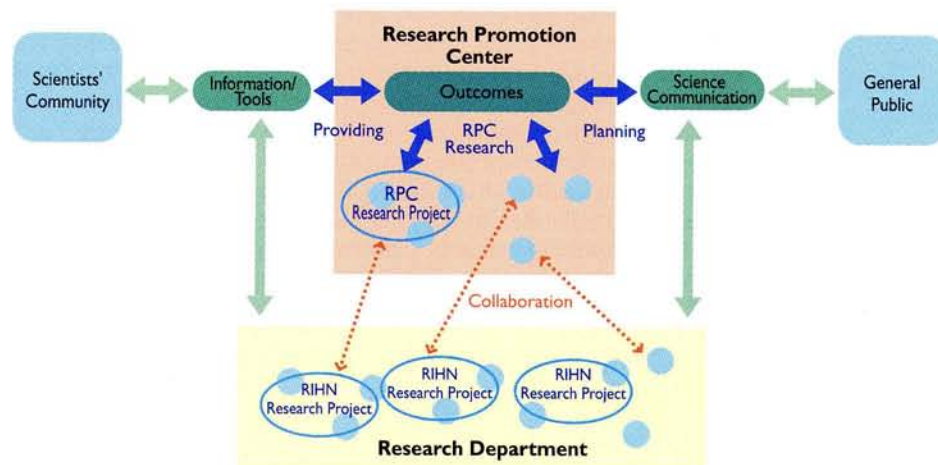
The Center develops programs for widely disseminating the results and significance of research activities conducted at RIHN. It plans and organizes the RIHN Forum, RIHN Public Seminars, Publications of RIHN Series and RIHN Library. Last fiscal year, the Center began publishing RIHN’s “Humanity & Nature Newsletter” and has published it every other month up to volume 6.

■ Information Processing

The Center provides databases and other information required for studies to RIHN research projects and other bodies within and outside RIHN. At the same time the Center collects a variety of information.

■ Facilitates for Research

The purposes of this activity are to provide observation and analysis systems and to enable their advanced use. The Center is also in charge of running laboratories.



RPC (Research Promotion Center) Research Projects

The Center has undertaken the RPC Research Projects shown below as joint studies conducted with RIHN’s research projects and researchers within and outside the Institute, in order to enhance the above-mentioned activities.

■ Development of Methodology to Archive and Reuse the Results of Interdisciplinary Studies

The RPC established a methodology to archive research methods and results of interdisciplinary environment-related studies for the next generation, in order to make the most of them in producing inspiration and formulating research programs. Furthermore, the Center examines various problems associated with interdisciplinary research methods to form a basis for implementing the established methodology, and verifies its applicable scope and validity.

■ Research for Dissemination Measures

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

Director-General



TACHIMOTO, Narifumi

- Background: Southeast Asian area studies, socio-cultural eco-dynamics, sociology and anthropology
- Current Topics: Global humanics of the environment

I have been involved in area studies concerning Malaysia, Indonesia, and other Southeast Asian countries since the 1960s. Defining area studies as the science of space design based on socio-cultural eco-dynamics, I have directed my efforts toward the integration of natural, social, and cultural sciences. I have also been searching for a solution to the question of why the concept of 'area' is given theoretical precedence in setting up the aforementioned research field. Although my subject area has been limited to Southeast Asia, I try to keep other parts of the world in sight, viewing Oceania needless to say, and China, India, Africa, Europe, and Americas, as extensions of Southeast Asia. As a summation of area studies, I intend to strive to construct global humanics of the environment as a discipline.



AKIMICHI, Tomoya

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

This is our final year of the research, which has been conducted in Yunnan, southwestern China, Thailand and Laos. By the end of March 2008, we expect to release several books on our overall research outcomes in Japanese, English and Chinese.



CHENG, Zhi

- Senior Researcher, Project 4-5FR
- Background: Central Eurasia history

I will try to clarify historical interactions of human activities and natural systems in arid to semi-arid regions of Central Eurasia, focusing on man-made trans-boundary issues, which are relevant to current environmental issues.



ANDO, Atsushi

- Researcher
- Background: Geology, Paleontology, Isotope geochemistry, Paleoceanography

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



ENDO, Takahiro

- Assistant Professor, Project 2-4FR
- Background: Political science

I am trying to look at water problems by focusing on the role of government. I am concerned with the role of government in water rights markets and groundwater management.



BAUSCH, Ilona

- Invited Research Fellow, Project 4-4FR
- Background: Japanese studies, Archaeology, History

My research focuses on interaction and trade around the Japan Sea and East China Sea coastal areas in East Asia, which have had a strong impact on society, environment and landscape perception from prehistoric until modern times.



FUKUNAGA, Kenji

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

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



BORRÉ, Caroline

- Researcher, Project 4-4FR
- Background: Japanese ethnology

Using fish folklore, I want to examine the meaning of "water" within Japanese culture and how it has changed throughout time. By doing this, I hope to clarify the interrelationship between mental and physical landscapes in Japan.



FUKUSHIMA, Yoshihiro

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

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



- Researcher
- Background: Earth system sciences, Mathematical modelling

Driven by my belief, "Do our Science within non-Science" I am interested in mathematical modelling of the earth-system processes such as the interactions between anthropogenic activities and climate dynamics.

HANDOH, Itsuki C.



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

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

HASHIMURA, Osamu



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

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

HATADA, Aya



- Professor, Project 2-7FS
- Background: Atmospheric physics

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

HAYASAKA, Tadahiyo



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

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

HAYASHI, Naoki



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

In our project we try to reveal the relationships between environmental changes caused by human activities and spread of infectious diseases. I want to reveal the environmental factors affecting viral dynamics and survivability in freshwater environments.

HONJO, Mie



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

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

HOSOI, Mayumi



- Researcher, Project 2-5FR
- Background: Archaeobotany, Ethnoarchaeology

Studying how people organize agricultural activities reflecting the social structure, in prehistoric contexts (incipient agricultural society) and in modern contexts such as Bali, Papua New Guinea.

HOSOYA, Leo Aoi



- Invited Research Fellow, Project 2-4FR
- Background: Geothermics, Climate change

I am a scientist with broad research interests around temperature. In addition to climate change, urban heat islands, terrestrial heat flow, and the lunar thermal environment, I am even curious as to whether cherry blossom season is more sensitive to soil temperature than to air temperature.

HUANG, Shaopeng



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

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

HYODO, Fujio



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

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

IBUKI, Naomi



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

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

ICHIKAWA, Masahiro



- Visiting Professor, NHK Special Program center, Executive Producer, Project 2-5FR

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

INOUE, Takashi



- Research Associate, Project 1-3FR
- Background: English literature, Home economics

I make the most of the knowledge and experience that I have cultivated, aiming at smooth administration of this project. I will positively assist the Resilience Project.

IRYIE, Yuki



ISHITOBI, Tomotoshi

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

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



KIMOTO, Yukitoshi

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

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



JAGO-ON, Karen Ann Bianet

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

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



KINOSHITA, Tetsuya

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

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



KATO, Yuzo

- Assistant Professor, Project 4-5FR
- Background: Chinese legal history

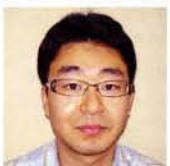
I am interested in studies that are out of existing structures. I intend to reconstruct the “environment” including the social milieu in a historical context, and present it in writing.



KOHMATSU, Yukihiro

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

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



KATSUYAMA, Masanori

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

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



KUBOTA, Jumpei

- Associate Professor, Project 4-5FR, 2-3FR
- Background: Forest hydrology

I will try to clarify historical interactions of human activities and natural systems in arid to semi-arid regions of Central Eurasia, focusing on man-made trans-boundary issues, which are relevant to current environmental issues.



KAWABATA, Zen'ichiro

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

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



KURATA, Takashi

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

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



KAWAGUCHI, Tamaki

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

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



KUROKAWA, Shoko

- Research Associate
- Background: Environmental sociology

I work to accurately measure the outcomes of a variety of projects and manage the correspondence that may be applied for such projects. By leveraging my experiences, I am looking forward to contribute to managing better and better project developments.



KAWAMOTO, Haruko

- Researcher
- Background: Radar meteorology, Low temperature physics

I draw the grid map of Asia from rain gauges. In terms of precipitation, I am engaged in creating some dataset to carry out climate variation analysis.



LEKPRICHAKUL, Thamana

- Senior Researcher, Project 1-3FR
- Background: Health, Demographics, Development and Managerial Economics

I am currently investigating issues relating to socio-economic-ecological resilience, adaptive capacity building and poverty reduction strategies of African economies under variable agro-climatic environment.



LINDASTRÖM, Kati

- Researcher, Project 4-4PR
- Background: Semiotics, Cultural anthropology

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



MOMOKI, Akiko

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

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



MALLAH, Qasid Hussain

- Invited Research Fellow, Project 3-3FR
- Background: South Asian archaeology

During the Indus period two rivers flowed independently. Indus is still alive and Hakra dried up. What happened to it? This will be investigated through this project by record studying the remains left by ancient people within the catchment area of Hakra River.



MORI, Wakaha

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

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



MATSUKAWA, Taichi

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

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



MURAKAMI, Yumiko

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

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



MATSUMURA, Ayako

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

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



MWALE, Moses

- Invited Research Fellow, Project 1-3FR
- Background: Soil and water management

I am interested in sustainable agricultural systems to maximize productivity especially in the marginal areas of the semi arid areas of the tropics. Inorganic fertilizers should be combined in appropriate amounts with organic fertilizers in such practices as agroforestry and conservation agriculture for maximum benefit to small scale farmers.



MINAMOTO, Toshifumi

- Senior Researcher, Project 5-4FR
- Background: Ecology, Animal physiology, Chronobiology

My interest is the relation between environments and the dynamics of pathogenic organisms. I would like to enjoy research in the laboratory and outdoors both expanding and narrowing the field of view.



NAGATANI, Chiyoko

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

I have studied the mutual influences between the cultural policy of Chinese government and the life style of ethnic minorities. At present, I am engaged in the production of the Yunnan eco-history Database.



MIYAZAKI, Hidetoshi

- Researcher, Project 1-3FR
- Background: Soil science

I am currently investigating soil fertility maintenance of subsistence farming villages in Southern Africa. I am also interested in comparing the results with those of my previous studies in West Africa.



NAKAGAWA, Masato

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

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



MOJI, Kazuhiko

- Visiting Professor, Professor of Nagasaki University Institute of Tropical Medicine, Project 2-8PR, 4-2FR
- Background: Human ecology, population health in the tropics

Our project studies the effects of human societal and natural environmental changes on the ecology of infectious diseases such as malaria, dengue fever, opisthorchiasis, and water-borne diseases in tropical Asia.



NISHIMOTO, Futoshi

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

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



NAKANO,
Takanori

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

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



NAKAWO,
Masayoshi

- Professor, Project 5-2FR
- Background: Glacioclimatology, Cryosphere hydrology

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



NOMURA,
Naofumi

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

Evolution, adaptation, and ecophysiological function of wild plants under various environmental stresses. Objective of the study is to evaluate plant susceptibility to human activity and climatic change.



OGAWA,
Akiko

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

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



OISHI,
Taro

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

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



OKITA,
Hiroko

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

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



OKUMIYA,
Kiyohito

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

I intend a new approach to study the association among human health, ageing, nature and culture fully in the three great Highland Civilizations.



ONISHI,
Akio

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

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



ONISHI,
Hideyuki

- Senior Researcher, Project 4-4FR, 4-2FR
- Background: Anthropology and Archaeology

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



ONISHI,
Masayuki

- Senior Researcher, Project 3-3FR
- Background: Linguistics

I specialise in the descriptive and typological study of South Asian languages. I intend to contribute to the reconstruction of linguistic and socio-cultural environment of the Indus Civilisation.



ONISHI,
Takeo

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

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



OSADA,
Toshiki

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

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



SAEKI,
Tazu

- Assistant Professor, Project 1-3FR
- Background: Atmospheric physics

My research subject is to investigate global cycles of greenhouse gases using numerical models and to analyze meteorological fields. I am interested in keeping up with those human and natural activities that have direct impact on observed changes in these atmospheric factors.



SAITO,
Haruo

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

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



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

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

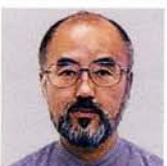
SAITO, Kiyooki



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

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

SASAKI, Naoko



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

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

SATO, Tadashi



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

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

SATO, Yo-ichiro



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

I wish to develop an integrated hydrological model for the Yellow River basin in China, which addresses not only the climate factors but also the impact of human activities.

SATO, Yoshinobu



- Associate Professor, Research Promotion Center
- Background: Limnology

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

SEKINO, Tatsuki



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

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

SEO, Akihiro



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

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

SHIMIZU, Hiromi



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

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

SHIRAIWA, Takayuki



- Invited Research Fellow, Project 2-4FR
- Background: Sedimentology, Marine geology

I am using sediment cores from Manila Bay, Laguna de Bay and La Mesa Reservoir to trace the history of metal and organic pollution brought about by the urbanization of Metro Manila, Philippines.

SIRINGAN, Fernando Pascual



- Research Associate, Project 3-3FR
- Background: Modern history of Japan

I'm a beginner about the Indus civilization. Actually I only have a stereotypical knowledge of India, like hippies, Beatles, and spiritualism. So I enjoy learning everyday. I manage our Project.

SONIDA, Takeru



- Researcher, 2-8PR
- Background: Literary representation

I am much interested in finding the correlation of culture with historical phenomena. By studying literary documents on human culture and environment I would like to contribute to our project.

TAKAGI, Mayumi



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

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

TAKAHASHI, Atsuhiko



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

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

TAKASO, Tokushiro



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

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

TAKAHASHI, Keiko



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

I studied forest tree distribution patterns in relation to topography, seed dispersal by monkey, and feeding pressure by sika deer.

TSUJINO, Ryo



- Research Associate, Project 2-7FS
- Background: Linguistics, Pedagogy

I hope to contribute my experience with data analysis, collecting and arranging the literature, references or information toward the smooth progress of the research project.

TAKEZAWA, Fumika



- Researcher, Project 5-4FR
- Background: Microbial ecology, Ecology

In our project, we investigate a lethal viral disease in freshwater fish. We aim to understand how human activities induce the emergence and expansion of infectious diseases.

UCHII, Kimiko



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

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

TANAKA, Katsunori



- Associate Professor, Project 4-4PR, 2-5FR, 3-3FR, 5-3FR
- Background: Zooarchaeology, Cultural anthropology

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

UCHIYAMA, Junzo



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

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

TANIGUCHI, Makoto



- Researcher, Project 3-3FR
- Background: Archaeology

My concern is the process of development of complex societies and formation of urban societies/culture in South Asia, in terms of the bilateral relations between natural environment and societies.

UESUGI, Akinori



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

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

TANNO, Kenichi



- Associate Professor, Projects 1-3FR, 2-1IFS
- Background: Biology, International relations, Resource and environmental economics, Development economics

I am studying environment and poverty linkages in rural areas in Asia and Africa through considering resilience of people. I wish to work on a research agenda that deals directly with human and environment/resource nexus.

UMETSU, Chieko



- Researcher, Project 3-3FR
- Background: Archaeology, Cultural properties

My research focuses on the location of ancient archaeological sites by using GIS. Studying the relationship between the spatial distribution of archaeological sites and the change in some factors, such as topographical features, will lead to an understanding of the dynamism of ancient society.

TERAMURA, Hirofumi



- Senior Researcher, Project 2-4FR
- Background: Marine biogeochemistry, Marine biology

I'm interested in the effects of anthropogenic nutrient loading on the coastal ecosystems. I'll carry out my study based on the combination of field surveys and experiments results, and the collaboration with people from different backgrounds.

UMEZAWA, Yu



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

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

TERASHIMA, Motoki



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

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

WATANABE, Mitsuko



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

Based on the results of completed project 1-1, I will especially concentrate on "wisdom" of regional environment and water management in agriculture and rural areas.

WATANABE, Tsugihito



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

I am writing a book and papers to move forward a new synthesis of watershed management and global environmental studies based on a watershed management project (2002-2006) with an emphasis on spatial scale at RIHN.

YACHI, Shigeo



- Visiting Professor, Center for Ecological Research, Kyoto University, Project 3-5PR
- Background: Mathematical ecology, Evolutionary biology

We are starting the research, Collapse and Restoration of Ecosystem Networks with Human Activity. I have worked in theoretical ecology but will enjoy collaboration with social researchers.

YAMAMURA, Norio



- Researcher, Project 5-4FR
- Background: Ecology, Fisheries science

I will try to clarify the interactions between artificial modifications of waterfront environment and the life history of freshwater fish from the view of physiological ecology.

YAMANAKA, Hiroki



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

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

YAMASHITA, Satoshi



- Research Associate
- Background: Economics

I will support the project in overall administration of research activities, coordination between the project members and communicating the research results to the public.

YAMASAKI, Kahori



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

I am engaged in field work on Iriomote Island, such as water balance and forest ecological researches. I have also identified animals and plants and am making voucher specimens of flora.

YASUDA, Keiko



- Assistant Professor, Project 3-4PR, 4-5FR, 1-3FR, 1-2FR
- Background: Climatology, Meteorology and hydrology

From the viewpoint of global-scale climatological and hydrological circulation, I am participating in several RIHN projects. On the other hand, I am responsible for an out-source project of developing daily precipitation dataset for assessing the environmental problems throughout Asia.

YATAGAI, Akiyo



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

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

YOSHIMURA, Mitsunori



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

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

YUMOTO, Takakazu



- Researcher, Project 4-4FR
- Background: Urban planning, Architecture

My research interest has been particularly related to the sustainable development of waterfront areas. I have also worked on development of Geographical Information Systems and participated in several multi-disciplinary projects related to the preservation of heritage and environmental management.

ZEBALLOS VELARDE, Carlos Renzo



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

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

ZHENG, Yuejun

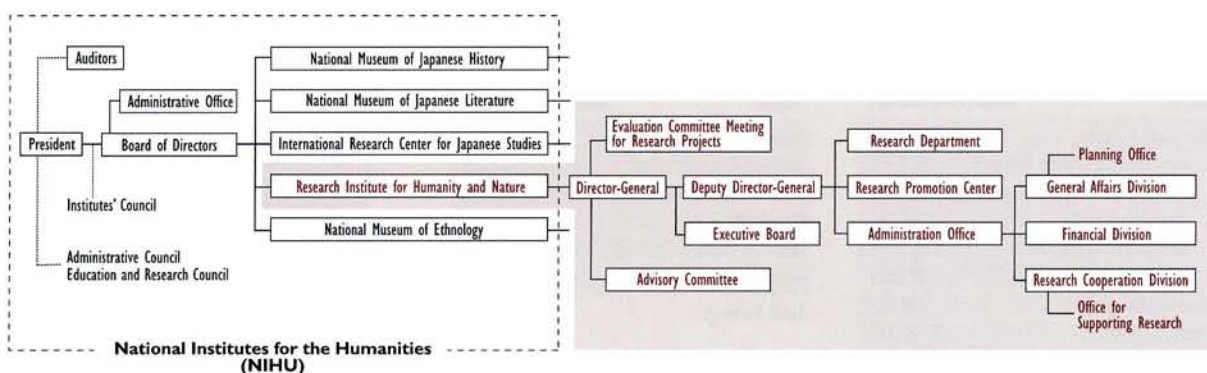
Organization

History

Fiscal Year

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

Organization



Board and Committees

*in alphabetical order

Advisory Committee

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

FUJII, Yoshiyuki

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

FURUSAWA, Iwao

President, Tottori University of Environmental Studies

IWASAKA, Yasunobu

Research professor, Kanazawa University Frontier Science
Organization

SHIRAHATA, Yozaburo

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

UEDA, Hiroshi

Director, Hydrospheric Atomspheric Research Center,
Nagoya University

YOKOYAMA, Toshio

Vice-President, Kyoto University
Professor, Kyoto University Graduate School of
Global Environmental Studies

WASHIDA, Kiyokazu

Vice-President, Osaka University

AKIMICHI, Tomoya

Deputy Director-General, RIHN
Program Director, RIHN

FUKUSHIMA, Yoshihiro

Program Director, RIHN

HAYASAKA, Tadahiro

Program Director, RIHN

NAKAWO, Masayoshi

Program Director, RIHN

SAITO, Kiyooki

Director, Research Promotion Center, RIHN

SATO, Yo-Ichiro

Program Director, RIHN

Evaluation Committee for Resarch Projects

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

EHLERS, Eckart

Professor Emeritus, University of Bonn, Germany

FURUSAWA, Iwao

President, Tottori University of Environmental
Studies

HEINTZENBERG, Jost

Director, Institute for Tropospheric Research,
Germany

IKAWA-Smith, Fumiko

Former Associate Vice Principal, McGill University,
Canada

IWASA, Yoh

Professor, Graduate School of Sciences,
Kyushu University

IWASAKA, Yasunobu

Professor, Kanazawa University Frontier Science
Organization

KIKKAWA, Jiro

Professor Emeritus, The University of Queensland,
Australia

LEGENBRE, Louis

CNRS Research Professor, Director,
Villefranche Oceanography Laboratory, France

MURAKAMI, Yoichiro

Professor, Division of Comparative Culture,
International Christian University

NIWA, Masako

Professor Emeritus, Former President, Nara
Women's University

OHMURA, Atsumu

Professor, Swiss Federal Institute of Technology,
Switzerland

OTSUKA, Ryutaro

President, National Institute for Environmental
Studies

SAWA, Takamitsu

Professor, Nitsumeikan University

SASAKI, Toshihiro

Executive Director, The Asahi Shimbun Social
Welfare Organization

SUN, Honglie

Professor, Institute of Geographical Science and Natural
Resources Research, Chinese Academy of Science,
People's Republic of China.

TANAKA, Koji

Director, Center for Integrated Area Studies, Kyoto
University

TANAKA, Masayuki

Specialized Professor, Tohoku Institute of Technology

Executive Board

Discusses important matters of the institute.

TACHIMOTO, Narifumi

Director-General, RIHN

AKIMICHI, Tomoya

Deputy Director-General, RIHN

FUKUSHIMA, Yoshihiro

Program Director, RIHN

HAYAKAWA, Tadahiro

Program Director, RIHN

NAKAWO, Masayoshi

Program Director, RIHN

SAITO, Kiyooki

Director, Research Promotion Center, RIHN

SATO, Yo-Ichiro

Program Director, RIHN

FURUYA, Isamu

Director, Administration Office, RIHN

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

Financial Information

Segmental Financial Information (Fiscal Year 2006)

Operating Expenses

Category	Amount (Yen in thousands)
Operating Expenses	2,027,879
Inter-University/Joint Research	929,958
Educational/Research Aids	33,701
Outsourced Studies	71,385
Outsourced Operations	8
Personnel	992,827
General Management	144,615
Financial Expenses	83,163
Total Expenses	2,255,657

Operating Expenses

Category	Amount (Yen in thousands)
Subsidy for Operation	2,162,542
Contract Research, etc.	84,682
Contract Operations, etc.	8
Donations	22,800
Financial Profit	10
Miscellaneous	45,890
Total Earnings	2,315,932

External Sources of Funding

(Fiscal Year 2006)

Category	Amount (Yen in thousands)
Fund for Promotion of Academic and Industrial Collaboration	84,682
Grants-in-Aids for Scientific Research	120,010
Donations for Research	33,200

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

Operational Balance (as of May 15, 2007)

60,275

Staff Members

*in alphabetical order

DIRECTOR-GENERAL

TACHIMOTO, Narifumi

DEPUTY DIRECTOR-GENERAL

AKIMICHI, Tomoya
ADVISER
 HIDAKA, Toshitaka

PROFESSORS EMERITUS

NAKANISHI, Masami
 HIDAKA, Toshitaka
 WADA, Eitaro

ADMINISTRATION OFFICE

Director FURUYA, Isamu

GENERAL AFFAIRS DIVISION

Head INOUE, Akio

Deputy Head ISHII, Koji

• General Affairs Section

Head TSUNEMI, Hiroyuki

Clerk OKITA, Masaki

Clerical assistants

MORITA, Migusa

Secretary HIRAI, Hisami

• Personnel Section

Head MIZUTANI, Yukihiko

Clerks MATSUYAMA, Hiroyo

SETA, Yoriko

Clerical assistants

IKEDA, Yasuyo

UENO, Risa

• Planning Office

Head ISHII, Koji

• Planning and Assessment Section

Head SHINDO, Kenji

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TANAKA, Yuka

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• Research Cooperation Section

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 TA, wangquan
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 KOBORI, Masako
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 KOKADO, Emi
 KOBAYASHI, Toshinori
 NAGANO, Takanori

Access

By Car, Taxi

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

By City Subway

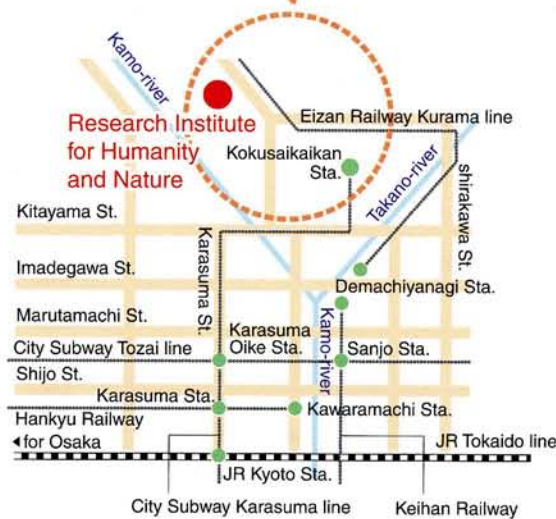
(<http://www.city.kyoto.jp/koho/eng/access/>)
From Kyoto Station, Take subway Karasuma line to Kokusaikaikan Station (Kyoto International Conference Hall), and Transfer to Kyoto Bus.

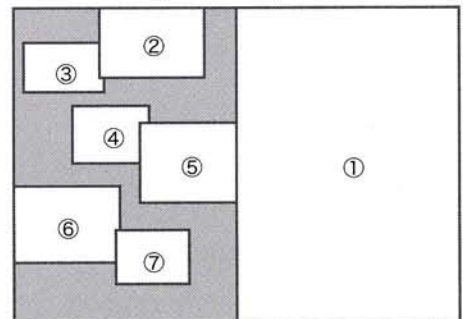
By Eizan Railway

(<http://www.pref.kyoto.jp/visitkyoto/en/area/kyoto/course/09/index.html/>)
From Demachiyangi station, Take railway Kurama line to Nikenjaya Station and walk 15 minutes.

By Kyoto Bus

From Kokusaikaikan Station. Take No.40,50 to Chikyuken-mae.





Notes of cover page photos

1. Desert in Hsinchiang, Uighur Autonomous Region: the white ground is covered with salt. This area is thought to have been covered with abundant green vegetation three thousand years before. It has turned into unproductive land due to the overuse of ground water for agricultural development.
2. Funeral offerings pictured in a town in Wenshan, Yunnan Province, China.
3. Festival offerings used on Iriomote Island.
4. Merchants at a market in southern Laos selling betel nuts, pepper leaves, tree barks, lime, etc.
5. The Lahu people of northern Thailand eating together at a rice harvest rite.
6. A peddler selling Hami melons at a market in Hsinchiang Uighur Autonomous Region. The Hami melon is an important source of hydration in the region.
7. Various *Naniwa* vegetables. In Osaka where an advanced food culture developed before the premodern age, various species of vegetables were created in its suburban areas, as in Kyoto.



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