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1. Research and development project

- (1) Research and development area: Science/Technology and Human Beings
- (2) General area manager: Yoichiro Murakami
- (3) Representative researcher: Tetsu Sato
- (4) Research & development project name: "Construction of a pragmatic scientist community contributing to stakeholder-driven management of local environment"
- (5) Research and development period: October 2008 - September 2012

2. Summary of implementation of the project

2-1. Goals of the project

The "Local Science Network for Environment and Sustainability" will be established to grasp the actual situation of scientists transforming to the problem-solving type through the interactions with stakeholders in the efforts of communities toward solution of environmental problems and to allow scientists and stakeholders all over Japan on the basis of the findings. On the basis of the Guideline for Collaboration between stakeholders and scientists, a foundation for enrooting the transdisciplinary problem-solving research directly connected to solution of environmental problems, with which the communities are faced, by encouraging the transformation of scientist communities through the construction of web journals adopting the stakeholders' participatory evaluation of local science, the activities of working groups addressing a wide variety of regional problems, and the attempt for residential research internship toward the cultivation of young residential researchers.

2-2. Implemented activities

- 1. Construct the "Local Science Network for Environment and Sustainability," in which the residential researchers and translators in various parts of Japan, and visiting researchers and regional stakeholders, who will work in collaboration with those regional knowledge producers, will participate.
- 2. Formulate and publish the "Guideline for Collaboration between Communities and Scientists."
- 3. On the basis of the Guideline for Collaboration, the participatory evaluation of local science system will be established for stakeholders to participate in it to evaluate problem-solving researches for solutions of local environmental problems. More specifically, the web journal "Future of Local Environment" will be constructed and widely used.
- 4. Working groups addressing various regional problems will be established within the Local

Science Network for Environment and Sustainability to promote the vitalization of the activities.

5. With the objective of nurturing young researchers intended to conduct studies directly connected to community-based problem solutions, the “residential research internship” will be implemented for graduate students who aim to work as residential researchers.

6. A foundation to enroot problem-solving researches contributing to solutions of various problems faced with communities in the scientist communities will be constructed by further developing those activities.

2-3. Major results and achievements

We conducted research and development with the chief objective of formulating the Guideline for Collaboration between Communities and Scientists and constructing stakeholders' participatory evaluation of local science and constructing an evaluation method for scientific researches stakeholders' participating by establishing the “Local Science Network for Environment and Sustainability” for scientists and stakeholders to participate in it to grasp the actual situation of scientists transforming to the problem-solving type scientists through the interactions between the Residential research institutions stationed in communities, visiting researchers, and stakeholders in the efforts of communities for solution of environmental problems.

In order to achieve this objective, we held eight field workshops and four open symposia at residential research institutions and their activity sites in all over Japan, constructed and improved the websites for the project and the local environmental network to share the vision and achievements and disclose the achievements toward the establishment of the Local Science Network for Environment and Sustainability and the construction of the Guideline for Collaboration, Participatory Evaluation of Local Science. In designing research and development, a simple dichotomy between scientific knowledge and local knowledge (indigenous knowledge, life knowledge) has been adopted for convenience's sake. It was found important, however, to grasp the structural complexity of the knowledge held by regional stakeholders from the front. As a matter of fact, stakeholders have used various knowledge including scientific knowledge by adopting/rejecting it, importing it, and domesticating it according to their needs without being able to separating the local knowledge in the classic meaning. we proposed the new concept of “local environmental knowledge” based on the recognition of the actual condition of various knowledge dynamically transforming in complete harmony and mutual interaction, and re-evaluated the significance of science in such condition. Under such diversified significance of knowledge, it was also revealed that advanced specialties produced from the life needs play an important role at primary industry worksite particularly in the context of sustainable management of regional environments or natural resources. In an example of the Okinawa Prefecture Onna-son Fisheries Cooperative, such technologies as aqua farming technology for mozuku, sea grape, etc. and coral reef regeneration technology were developed under the leadership of the for the development of fishing activities, a part of which has been established as an industry. The example of the production of the local environmental knowledge essential for resource management by stakeholders on their own through advanced specialties shows that it is possible for the stakeholders to hold the function as residential research institutions. In this way, it was

re-recognized that the actor providing the communities with local environmental knowledge is not limited to professional scientists or actors for civil surveys but are much more diverse. The recognition of the diversity in knowledge producers led to the reappraisal of the positioning of regional companies. The regional construction firms, which are active chiefly in Fukushima Prefecture, play a role of an opinion leader proposing a new life style of living in an environmentally-friendly house through the house construction from forestry management, processing and distribution of lumber, and use of domestic materials. In Tokushima Prefecture, a group of regional companies is working on the wide-area surveys on the ecosystem and environmentally conservation activities in collaboration with university researchers, authorities, and various regional stakeholders. The above examples show that regional companies play a more important role than expected in collaboration with scientists and stakeholders.

We conducted a visiting survey and information gathering on examples in all over Japan of marked achievements in solving regional environmental problems, and invited founders for the establishment of the Local Science Network for Environment and Sustainability from among them. In addition, we held a group leader meeting and brain storming sessions with chief founders invited to discuss the network design and the way that the guideline ought to be. We established a website for the Local Science Network for Environment and Sustainability to promote the widespread proliferation of the vision and significance as well as preparing bylaws by examining how the network ought to be organized and operated. Based on those achievements, the Local Science Network for Environment and Sustainability was formally established on March 31, 2010 with participation of 42 founders. We had various residential researchers, visiting researchers, knowledge translators, trade-related knowledge producers, administrative researchers, regional companies, regional leaders organizing regional stakeholders, and so on participating in the network from all over Japan. We could realize a multilayered and multifaceted organizational structure, which can promote interactive transformation of scientists, experts, and stakeholders through the information sharing about advanced examples in all over Japan and mutual evaluation and studies, by constructing and expanding the Local Science Network for Environment and Sustainability. Toward the designing of the Guideline for Collaboration and the Participatory Evaluation of Local Science, the improvement of visions progressed through questionnaire surveys with the network founders, etc. We implemented the designing of Participatory Evaluation of Local Science by examining the original guideline from the perspective of “scientific researches for problem-solving” and “Collaboration between Communities and Scientists.”

It was revealed during the foundation process of the Local Science Network for Environment and Sustainability that the actors and the positioning of problem-solving researches currently under way in all over Japan are complicated and diverse far beyond our expectations, and we were hence urged to radically review the definition of the way how the scientific research directly connected to the community problems, which we aim at, ought to be. The functions and the way of involvement in communities of the extremely diversified knowledge producers positioned at the forefront of knowledge production and use in communities vary significantly depending on the individual personality, regional properties, characteristics of knowledge users, nature of environmental problems, and so on. We examined the process to integrate the findings extracted from diverse individual cases into a highly general guideline for the realization of adaptive governance with the production and

distribution of local environmental knowledge as a nucleus. In March 2010, the "Guideline for Collaboration between Communities and Scientists (First Edition)" was completed and published on the specially constructed website. This guideline consists of "(A) 17 provisions for networking for solutions of problems," which are intended to advance the collaboration with scientists and stakeholders, and "(B) 17 provisions for production and use of knowledge," which are intended to promote sciences contributing to the solutions of problems. We attempted to solicit comments for improvement of the provisions on the Webpage. In September 2010, We held a symposium in commemoration of the establishment of the Local Science Network for Environment and Sustainability, "Pursuit of Sciences Useful for Environmental Conservation and Sustainable Development of Communities," at the Osaka Gakuin University where lectures and panel discussions were held by 15 speakers for two days. As a result of encouraging the publicity of the significance and activities of the Local Science Network for Environment and Sustainability through such activities, the Local Science Network for Environment and Sustainability was extended and expanded smoothly with participation of 127 multidisciplinary members from all over Japan at the end of the project.

On the basis of the "Guideline for Collaboration between Communities and Scientists," we designed the web journal equipped with a peer review system enabling participation of stakeholders, "Future of Local Environment," organized the editorial committee under the leadership of the project members, and started soliciting contributions in December. In addition, seven working groups sharing interests and study information (village beach, village forest, natural energy, wildlife management, social technologies, ecotourism, young "Hiyoko-gumi" scientists) are formed within the Local Science Network for Environment and Sustainability that have started voluntary activities on their own. What is noteworthy is the activities of "Hiyoko-gumi" carried out under the leadership of the young members of the Local Science Network for Environment and Sustainability. This is working group voluntarily formed by young researchers, who started their carrier as residential researchers at their sites in communities, in search of an opportunity for mutual learning to solve their worries and difficulties they face respectively. They have started extremely active and organic interchanges. The "Residential Research Internship" was run as a trial at residential research institutions for graduate students with the activities of the Hiyoko-gumi as a mother body to foster young researchers who promote community-based problem-solving researches. Three graduate students enjoyed internship residential research at community sites in the WWF Coral Reef Conservation and Research at Ishigakijima Shiraho; Tsushima City, Nagasaki Prefecture; and Yumoto District, Tenei Village, Fukushima Prefecture.

In the research and development process, we could see the appearance of many members evolving studies and activities using network resources in various ways. As a matter of course, the participants in this network are highly interested in studies and knowledge structures directly connected to the solution of difficult problems in communities in nature. Through the network activities, however, there occurred a process where many participants increase sol-called "drawers" of knowledge useful for communities by expanding their perspectives of various knowledge technologies useful in addressing their regional problems in areas other than their own special fields or interests. The individual researchers and stakeholders evolved by acquiring various drawers so that they may take multifaceted and flexible measures on the scene of problem solutions. On the other hand, the Local Science

Network for Environment and Sustainability served as a great incentive for young researchers and graduate students who aim to be engaged in residential research. The mechanism of the “residential research internship,” which started in 2011 as a trial, will lead to the cultivation of human resources, who can promote residential researches, by providing graduate school internship with a new option. It remains as a large issue to analyze in further detail how the production and distribution of the local environmental knowledge directly connected to the solution of local environmental problems will encourage the decision-making and behavioral transformation of people and how they will lead to the solution of environmental problems and the construction of sustainable society.

As a result of four-year research and development, the mechanism for cultivation of young researchers was developed with the platform and human foundation constructed for the collaboration between scientists and stakeholders promoting problem-solving researches directly connected to the solution of regional environment problems. We wish to promote a dynamic evolution commensurate with the changes in the socioeconomic system while operating the Local Science Network for Environment and Sustainability in a sustainable manner. We are committed to continuing further challenges toward the construction of adaptive governance to challenge the community-based resolution of global environmental problems from the bottom upward with the production and distribution of local environmental knowledge as a nucleus.

2-4. Project implementation structure

(1) The group changing scientist communities through the formation of the Local Science Network for Environment and Sustainability

Group leader: Tetsu Sato (Professor, Research Institute for Humanity and Nature)

Changes of scientists by expanding and deepening the Local Science Network for Environment and Sustainability through the formation of the Local Science Network for Environment and Sustainability, the formulation of the Guideline for Collaboration between stakeholders and scientists, and the construction of the participatory evaluation of local science

(2) The group grasping the actual condition of changing scientists focusing on residential research institutions

Group leader: Mahito Kamada (Professor, Institute of Socio Techno Science, Tokushima University)

Analysis of effective knowledge production for sustainable construction of communities through the review of the roles of residential research institutions, the analysis of regional environment approaches by residential museum

(3) The group grasping the actual condition of interactions and collaboration between stakeholders and scientists

Group leader: Shigeru Yanaka (Associate Professor, Faculty of Regional Sciences, Tottori University)

Analysis of the way how the collaboration between stakeholders and scientists ought to be

through the interactions over the life strategies of stakeholders and the interactions between the conventional knowledge technologies and the imported knowledge/systems

3. Concrete case-studies from the project

3-1. Goals of the project

It is often the case that a proposed scientifically appropriate solution to a regional environment problem is not accepted or applied by the stakeholders of the community. This may not be caused by lack of understanding of the stakeholders but may be caused by the scientific knowledge produced away from the regionally inherent problem structures, the conventional sense of value, the decision-making system, and so on. We grasped the actual condition of the residential researchers, visiting researchers, and so on, who are active in the efforts of conservation and use of ecosystem services such as conservation of ecosystems, natural resource management, and natural regeneration in all over Japan, transforming to the problem-solving type through the interactions with various stakeholders and so on, by participatory observation, visiting surveys, and so on for the cases in various areas. With the achievements as a basis, we created communities of scientists committed to contribute to voluntary solutions of problems by communities by constructing the "Local Science Network for Environment and Sustainability," in which various knowledge producers from all over Japan and regional stakeholders participate, and developing the Guideline for Collaboration between Stakeholders and Scientists, the participatory evaluation methods for scientific researches, in which stakeholders participate, and so on, with the aim of constructing a social mechanism to promote sciences directly connected to community-based solutions of environmental problems. In addition, we newly added the cultivation of young residential researchers to the objective of research and development in fiscal 2011 because the need of cultivating the bearer of the community-based problem-solving sciences and the increased interest in the career path for residential researches among young researchers and graduate students recognized in the research and development process.

3-2. Implemented activities

(1) Collection and analysis of examples

Many researchers in "residential research institutions," who are engaged in research activities by being stationed in communities, have tackled with the research directly connected to solution of problems concerning the natural environment of communities in an advanced manner. In order to conserve and regenerate the dynamically changing complicated regional environment, it is necessary to conduct interdisciplinary/transdisciplinary research directly connected to the solution of regional environmental problems in collaboration with various knowledge producers including regional stakeholders, "visiting researchers," who have a base in large cities etc. and visit communities to implement a study; civil survey

implementers; regional companies and those engaged in agriculture, forestry and fisheries industry; local governments and NPOs, etc., and to promote activities in collaboration with various actors by exploiting the achievements. In addition, in order to cope with the uncertainty of the complicated system, a process of adaptive management is essential to monitor the activity results and improve the activities according to the results. We collected and analyzed the information about the actual condition of the adaptive management process in the transdisciplinary studies realized by the collaboration between various researchers and stakeholders, who aim to solve regional environmental problems, and in the efforts of solving problems by various actors by participatory observation and case studies in various parts of Japan, and analyzed with dynamism of the regional network with respect how the collaboration between scientists and stakeholders ought to be and how problem-solving sciences ought to be. We then developed visions and designed the network on the basis of the analysis of various cases in various areas toward the construction of the “Local Science Network for Environment and Sustainability,” the “Guideline for Collaboration,” and the “Participatory Evaluation of Local Science.”

(2) Establishment and operation of the Local Science Network for Environment and Sustainability

The “Local Science Network for Environment and Sustainability” was established based on the above multifaceted case studies and started operation. The “Local Science Network for Environment and Sustainability” is a nationwide network that enables stakeholders and scientists in communities tackling with various regional environmental problems to mutually learn and cultivate each other. It can be positioned as a higher-level network to mutually connect the activities of intra-regional networks active in various communities and other nationwide or wide-area networks aiming to solve specific environmental problems to provide those who play an important role in those activities with an opportunity to get together and interchange. Accordingly, the stakeholders, residential researchers, and visiting researchers, who are engaged in advanced activities in various parts of Japan, are important constituents of the Local Science Network for Environment and Sustainability as well.

The stakeholders in various areas can access study results, which are useful for their own activities, through the collaboration with experts in various fields by participating in the Local Science Network for Environment and Sustainability. Scientists can develop new study fields as well as promoting transdisciplinary problem-solving researches by obtaining various resources, which are useful for the expansion of their studies through the interchange with various cases and human resources in problem-solving researches and regional studies. It is an important function of the “Local Science Network for Environment and Sustainability” to support the activation of the problem-solving research and collaboration between various actors at various areas through such interchanges between stakeholders and scientists.

(3) “Guideline for Collaboration between Communities and Scientists”

We repeated discussions on the basis of the analysis of various cases in the Local Science Network for Environment and Sustainability and designed and constructed the “Guideline for Collaboration between Communities and Scientists.” In order to solve environmental issues and realize the construction of a sustainable society by bottom-up approach from communities, sciences, which can be used by stakeholders living in communities for the environmental

conservation and sustainable development of communities, and a social system for the use are required. The scientific knowledge, which are produced by scientists everyday, however, does not always harmonize with the way how the indigenous knowledge, which was produced by the people living in the community and has been inherited so far, and the decision-making rules of the community. The Guideline for Collaboration was prepared by local stakeholders and scientists, who constitute the Local Science Network for Environment and Sustainability, by compiling various device in collaboration, which they have produced to solve the problems they face in their respective communities. Thus the guideline intends to provide guidelines and gist in producing and using various knowledge that is required to solve regional problems. This guideline is used for local stakeholders and scientists to confirm the points to note in grappling with problems so that they may review the mutual condition toward better solutions of problems.

This guideline consists of “(A) 17 provisions for networking for solutions of problems,” which are intended to advance the collaboration with scientists and stakeholders, and “(B) 17 provisions for production and use of knowledge,” which are intended to promote sciences contributing to the solutions of problems. (A) chiefly proposes provisions serving as guidelines that can be used by those who specifically address the solution of problems by exploiting their knowledge on the scene of their activities; whereas (B) chiefly proposes to knowledge producers, who try to produce knowledge technologies useful for solutions of problems, a new way of science that they will evolve it through learning in communities. (A) and (B) are not separated strictly but are closely related to each other of course.

(4) Working groups

Through the previous research and development, a structure of several groups sharing interests and research/activity fields have been spontaneously formed among the members of the Local Science Network for Environment and Sustainability. With the aim of activating various interchanges and collaborative activities within the network, it was decided at the second general assembly of the Local Science Network for Environment and Sustainability held in July 2011 that several working groups will be formed with research and development members as organizers. Seven working groups (village beach, village forest, natural energy, wildlife management, social technologies, ecotourism, young "Hiyoko-gumi" scientists) were formed before the end of the project.

The respective working groups are expected to implement autonomous activities with members recruited from among the members of the Local Science Network for Environment and Sustainability according to the shared problems in interest. The Local Science Network for Environment and Sustainability Administration Office will promote the expansion and deepening of the network by widely publishing the achievements through its the website and so on as well as supporting the activities of the working groups. The working groups have already started multifaceted activities. Before the end of the project, the Village Beach Aquatic Resources Management Working Group held a workshop sponsored by the working group, “Community-led Village Beach Development,” at the Kyushu University in January 2012 with nine speakers recruited. The digest is published on the website. The young scientists' working groups “Hiyoko-gumi” held the first field workshop in February 2012 with the objective of learning from activities in the Noto Region such as the “Noto Peninsula Satoyama Satoumi Nature School (present Oraccha Satoyama Satoumi)” and the “Satoyama

Master Education Program" about the processes of producing and developing the trades and activities with the abundant nature and culture put into full use. The Social Technologies Working Group conducted workshops, seminars, and field surveys concerning social technologies with stakeholders in collaboration with the Village Forest Working Group in August 2012 in Geihoku-cho, Hiroshima Prefecture. In addition, the Wildlife Management Working Group has started activities toward the formation of the "International Network for Local Scientists of Wildlife Management." In this way, new activities of the Local Science Network for Environment and Sustainability have emerged from the formation of working groups by agenda and interests.

(5) Participatory Evaluation of Local Science

We developed the visions toward the establishment of the "Participatory Evaluation of Local Science" system to evaluate the achievements of problem-solving researches directly connected to the solution of regional environment problems not only among scientists but also with stakeholders in light of the "Guideline for Collaboration between Communities and Scientists." We advanced the development of rules and standards for peer review by discussing with a wide variety of network members with the editorial committee for the web journal "Future of Local Environment" established under the leadership of the organizers of the working groups. In December, we constructed the web journal site interactive with stakeholders and started soliciting contributions. On the other hand, however, as for the regional activity award program, which had been discussed as another pillar for the evaluation of local science system, we decided to put off the introduction of the award program in the present design because numerous objections erupted from project members and area advisors.

The web journal, "Future of Local Environment," evaluates sciences, which can support efforts on environmental conservation and sustainable community development led by various regional stakeholders and publishes the achievements. The web journal evaluates and publishes the results of studies aiming to contribute to the efforts on sustainable community development by stakeholders themselves by providing guidelines, ideas, and technologies that meet the conditions indigenous to the respective regions, are useful for obtaining agreement from local stakeholders and consensus building, and can be shared by various people with different interests. The web journal contains research papers on knowledge technologies directly connected to the solution of regional environment problems, comments about findings in various fields useful for decision making and concrete activities of people in communities, and reports on regional activities using such knowledge technologies.

(6) Residential research internship

Residential researchers are researchers and experts who are engaged in studies and practices toward the solution of regional problems and environmental conservation as one citizen living in the community. Graduate students and young researchers, who aim to become residential researchers, designed the residential research internship with the objective of learning the basic attitudes and approaches to communities of residential researches and developing the basic skills for collaboration. The internship was re-defined from an activity, which had been proposed as a "short-stay study" in the planning stage, to an internship program for young researchers to experience the actual condition of residential

researches. As a result of discussion with many receiving organizations and graduate schools, a senior-year university student of Tokyo Metropolitan University (expected to go on to a graduate school) could conduct a short-stay study at the WWF Coral Reef Conservation and Research in Ishigakijima Shiraho as the first intern in fiscal 2011. Later, two other students participated in the internship by staying at the residence of residential researchers and could learn about various practical approaches for collaboration with local stakeholders as experts/scientists. This activity had a significant impact both on the participants and the receiving organizations and was considered as significantly contributing to the cultivation of young researchers who aim to work on the research directly connected to the solution of environmental problems, with which communities are faced, and to the future transformation of the entire scientist communities. This activity is expected to be continued after research and development with the collaboration with graduate schools in related fields strengthened.

3-3. Major results and achievements of the project

3-3-1. Collection of case-studies through field workshops and participatory observations

The researchers participating in the project will conduct a participatory study in their respective fields in collaboration with local stakeholders, and the participating researchers and stakeholders will integrate their findings by mutually visiting their fields to reveal the roles of residential research institutions, the actual condition of mutual interactions between various knowledge producers and stakeholders including visiting researchers and civil survey implementers, and the transformation process of scientist communities. In order to promote the interactions between the scientists and community stakeholders and the transformation of scientist communities under the leadership of residential research institutions on the basis of the findings obtained there, communities \oslash stakeholders, residential researchers, visiting researchers, the "Local Science Network for Environment and Sustainability" will be established with various actors involved in production and use of knowledge such as civil survey implementers as constituents. In order to share the achievements of the participatory study in the individual fields and to collect the cases of productive collaboration between scientists and stakeholders in various regions, a series of field workshops were held in residential research institutions and their activity sites in various regions. In addition, since fiscal 2011, we held open symposia along with workshops in order to share the study results with local stakeholders and to improve research and development with feedback obtained from them. Based on the results, we examined the Guideline for Collaboration between Stakeholders and Scientists and the method of evaluating the study results while grasping of actual condition of the scientist communities transformation in the network. We will transmit the network activities widely through webpages and media to promote the activation of interactions between sciences indigenous to communities and the society and knowledge production conducive to the solution of problems in line with the actual regional condition by using the information shared in the network. The continued transformation of scientist communities will be ensured by fair evaluation of achievements of studies and activities indigenous to communities through the formation of new scientist communities promoting regional environment studies for the solution of environmental problems in collaboration with

stakeholders.

(1) Fiscal 2008

In order to implement the analysis of knowledge and system structures usable for stakeholders based on the recognition that the decision maker on matters concerning the Future of Local Environment is absolutely the various regional stakeholders, we held a workshop in November at the Nagano University located in Ueda City, Nagano Prefecture. We analyzed the results of a trial study on the way how the knowledge set produced by the problem-solving studies in the "AUN Nagano University Reforestation Project" ought to be. The Village Reforestation Tool Kit used as a trial in the AUN Nagano University Reforestation Project intends to develop and provide scientifically valid and sustainable various options for the sustainable development of communities by the use of forest ecosystem services, and proposes a role of scientists of continuously providing various options with consideration given to the ecosystem.

We list up potential residential research institutions all over Japan, conducted a visiting survey to the Echigo-Matsunoyama Museum of Natural Science; Kushiro Wetland; Amami Wildlife Center; Ishigaki Branch, Seikai National Fisheries Research Institute; Kanazawa University, and so on, and gathered information about the AMSL Akajima Marine Science Laboratory, the Toyota Yahagi River Institute, and so on. As for the existing networks relating individual environmental problems, we constructed a foundation for collaboration by exchanging information with the Network of Afforested Universities, the Satoyama Satoumi Sub-Global Assessment, the Tanada Network, the National Amamo (Eelgrass) Summit, the National Grass Planting Network, etc. We collected examples of productive collaboration with local stakeholders and visiting researchers, and accumulated information especially about the "EIMY" implemented by the Tohoku University at Tenei Village, Fukushima Prefecture; the "Establishment of the Social System for Sato-umi Creation," implemented by the Kyushu University at coastal zones all over Japan; the wetland conservation by WWF Japan in Kashima City, Saga Prefecture; and so on.

(2) Fiscal 2009

Field workshops were held in Kamikatsu Town, Tokushima Prefecture (July) and in Ishigaki City, Okinawa Prefecture (September). At the workshops, discussions were deepened about the network structure based on case reports in various communities under the theme of "Interactive Decision-making Process and Network Structure Encouraging the Transformation of Scientists and Local Stakeholders." In particular, the analysis of the actual condition of collaborations between various stakeholders and researchers in Kamikatsu Town and the network structure with the aim of enabling collaboration while keeping the difference in views and visions revealed the importance in network activities in the respective regions and the importance in the role of human resources who play a central role in formation, maintenance, and development of the network. At the workshop in Ishigakijima Shiraho, discussions were deepened about the production and use of knowledge by researchers in administrative organizations, interactions between local knowledge and scientific knowledge, the use of ecotourism by stakeholders, and so on. It was revealed through the analysis of the roles, which had been played by a residential research institution, WWF Coral Reef Conservation and Research, that residential researchers and experts, who reside in

communities, play a function of a catalyst that promotes dynamic changes of communities. In addition, we collected new examples from residential researchers and stakeholders energetically active in various communities who participated in those field workshops. From the activities of regional museums including the Echigo-Matsunoyama Museum of Natural Science and various residential research institutions such as the AMSL Akajima Marine Science Laboratory and the Ishigaki Branch, Okinawa Prefectural Fisheries and Ocean Research Center, the diversity of knowledge producers engaged in community-based studies and the actual condition of flexible production, distribution, and use of knowledge emerged.

Toward the inauguration of the Local Science Network for Environment and Sustainability, we carefully selected various scientists, experts, knowledge producers, and stakeholders grappling with the solution of regional environment problems in various regions and called on them to participate in it as founders. We conducted a questionnaire survey with the founders of the Local Science Network for Environment and Sustainability, in February 2010, and held a group leader meeting and brain storming in March in Tokyo with chief founders invited to discuss the ideal and vision of the Local Science Network for Environment and Sustainability.

(3) Fiscal 2010

In order to share the achievements of participatory studies in the respective fields and to collect examples of collaborations between scientists and stakeholders in various regions, and various dynamic movements of intra-regional networks, we held field workshops in Amami City, Kagoshima Prefecture (June), and in Toyooka City, Hyogo Prefecture (February). In Amami City, an intense workshop was held with a small number of participants invited from those who are active in concrete activities related to regional environmental conservation and knowledge production such as residential researchers, NPO organization members, ecotour providers, and Rangers for Nature Conservation of the Ministry of Environment, to have discussions in search of possible contributions of researchers' communities, which are an external actor, while reviewing the actors of environment/landscape protection activities promoted under the leadership of local stakeholders, and the knowledge exploited in such activities. Through the discussion, the actual condition of networks, which enable the collaboration with stakeholders and scientists/experts with various standpoints and viewpoints while maintaining the difference in opinions and way of thinking, and the importance of the regional culture, which plays as a moving spirit in such effort, emerged. In Toyooka City, Hyogo Prefecture, which is known for its advanced cases of sustainable community development with returning of the oriental white stork to the wild as a nucleus, we walked on the field with the Hyogo Prefectural Homeland for the Oriental White Stork, which is a residential research institution; Toyooka City; farmers promoting a farming method that nurture the oriental white stork; NPO organizations that promote wetland regeneration; and so on to grasp the actual condition of the activity of returning the oriental white stork to the wild that promotes the participation and collaboration of diverse stakeholders and drives dynamic movements of intra-regional networks. In the activity, we found that the knowledge about the oriental white stork is produced, distributed, and used not only by residential researchers but also various people such as the administration and farmers and confirmed the importance of various knowledge producers other than scientists and experts.

The Local Science Network for Environment and Sustainability Foundation Symposium

was held in September in Suita City, Osaka Prefecture, encourage the transmission and recognition of the information about the Local Science Network for Environment and Sustainability (Data 1). While having speech by and discussions with various people with marked activity achievements in various regions from the founders of the Local Science Network for Environment and Sustainability, we had a poster session presented by network members. In addition, at the simultaneously held General Assembly for the Establishment of the Local Science Network for Environment and Sustainability, we summarized and discussed the issues toward the establishment of the Guideline for Collaboration and the Participatory Evaluation of Local Science with input obtained from various members, who participated in the network, as well as research and development implementers. For the speech, panel discussion, and poster session presentation at the symposium, the data and moving images were published on the website to widely transmit the activities of the local environmental network. In Toyooka City, Hyogo Prefecture, an open symposium for the Local Science Network for Environment and Sustainability, "Community Regeneration through Nature Regeneration—From Economic and Cultural Perspective," was held along with a field workshop. We invited guests who are engaged in activities relating to regional environment to have active discussions and view exchanges with local stakeholders. At the international symposium "Science in Society -- a challenge in Japan" for the "Interactions between Science, Technology and Society" program, which was held in August, the idea and activities of the Local Science Network for Environment and Sustainability were widely made known to inside and outside of Japan through the speech by and discussions with representative researchers, with Dr. Michael Crosby invited as a commentator from the Mote Marine Laboratory in the United States. In addition, we deepened discussions about the "New Paradigm" toward the collaboration between policy makers and scientists, which has been proposed by Dr. Crosby, and constructed the foundation toward the future collaborations by sharing the understanding about the importance of a "bi-directional translator," who connects various stakeholders with scientists.

(4) Fiscal 2011

With the smooth extension and expansion of the Local Science Network for Environment and Sustainability, the field workshop and open symposium, "For Effective Use of International Systems by Communities," was held in July at Aso City and Kumamoto City in Kumamoto Prefecture with the objective of deepening the discussions about the significance of sciences, international systems, and mechanisms from the standpoint of local stakeholders using the various resources gathered in the network. We deepened analysis of the issue of how local stakeholders should master international systems to enrich the nature and livelihood in communities. International systems such as UNESCO World Natural Heritage Site have been introduced to various parts of Japan with the objective of preserving and using the regional nature and cultures. While communities are expected to obtain various merits such as proper natural environmental conservation and use as tourist resources from international systems, application of a uniform standard or framework from abroad, which is different from the interest of the community, may confuse or upset the community. At the symposium, discussions were deepened about the possibility and issues in using international systems and frameworks for people living in the community to understand their regional nature and culture better and to voluntarily promote sustainable community development.

In October, a field workshop and open symposium, "Regional Environmental Study for Creation of Sato-umi," was held at Zamami-son and Naha City in Okinawa Prefecture. Discussions were deepened on the themes of "Community-driven Ecotourism" and "Regional Environmental Study for Creation of Sato-umi" by network members engaged in practices and studies in various regions. A coastal sea area with biodiversity and productivity increased by human intervention is called "Sato-umi (village beach)" after the example of satoyama (village forest) in continental areas. This concept is nature recognition based on the relationship between human livelihood and nature where people conserve nature while using it, and is an ideal that can become a nucleus for sustainable community development of coastal zones. In the coral reef seas areas surrounding the Okinawa islands, which is a typical example of the "Sato-umi," the coral reef ecosystem in Okinawa has been significantly deteriorated. In order to search for the process to return the correlation that human intervention leads to recovery of the sea, we discussed the issue of "Creation of Sato-umi," which is closely related to the livelihood, with the participation of network members who are engaged in the production and distribution scenes or policy practices.

In January 2012, the joint workshop and open symposium, "From a local community to the rest of the world—mechanism for bonding local communities to the world from a Shiretoko world heritage point of view," was co-hosted with the Research Institute for Humanity and Nature Feasibility Study, "Formation of Local Environmental Knowledge for Creation of New Commons and Sustainable Management," which has been implemented by representative researchers since October 2011 with an eye on the development of the activity after the end of the project, at Hokkaido Shari Town - Shiretoko World Heritage Area. It was reconfirmed through the workshop/symposium held at Aso City and Kumamoto City that a bottom-up approach to cumulate regional activities is important and accumulation of community-based efforts using international systems such as world heritage may be effective to build a sustainable society in harmony with abundant natural environment. To this end, we discussed processes toward comprehensive environmental conservation connecting the community and the world and toward sustainable society building based on examples of activities in the Shiretoko World Heritage and all over the world in an attempt to use various knowledge and systems, which have been cultivated in communities, on a global scene. Those workshops and open symposia have been gradually tinged with transdisciplinary nature capable of addressing various problems, which a community faces, with the expansion of the Local Science Network for Environment and Sustainability and diversification of members. The network became able to cover themes directly connected with various problems as a significant turning point for increase in members. The contents and achievements of those symposia and field workshops were widely published through websites and became significant incentives for network participants, with the network visions and activities penetrated into potential participants in a wide range of layers. In particular, the network came to be obtain participation of researchers who are faced with a gap with the real society and young researchers who have almost established the social position as residential researchers.

(5) Fiscal 2012

In preparation for the completion of the research & development project, a basic study project "Formation of Local Environmental Knowledge for Creation of New Commons and

Sustainable Management (local environmental knowledge project)"(project leader: Tetsu Sato, April 2012 - March 2017) started at the Research Institute for Humanity and Nature with the activities of the Local Science Network for Environment and Sustainability as important study resources (discussed later). In September, the final symposium for the project "The Pursuit of Science for Use in Local Communities The Past, Present, and Future of LSNES" and kick-off symposium for the newly started local environmental knowledge project, "Knowledge Production, Activities, and Adaptive Governance Supporting the Community" was co-hosted by the Local Science Network for Environment and Sustainability and the Local Environmental Knowledge project for two days in Kyoto City where the Research Institute for Humanity and Nature is located.

At the symposium, "The Pursuit of Science for Use in Local Communities The Past, Present, and Future of LSNES," we attributed the problem that a scientifically appropriate solution proposed for regional environment problems is not accepted or used by the stakeholders in the community to the scientific knowledge produced away from the regionally inherent problem structures, the conventional sense of value, the decision-making system, and so on, at the starting point of the project. From such awareness of issues, we have pursued how sciences ought to be used by local stakeholders with the "Local Science Network for Environment and Sustainability" established to be joined by residential researchers and so on who are resident in communities to produce knowledge useful to solve regional environmental problems. Accordingly, we looked back on the past developments of the Local Science Network for Environment and Sustainability and discussed the problems in the efforts toward the cultivation of scientists and experts who will conduct transdisciplinary and problem-solving studies to support the solution of various environmental problems, which communities are faced, under the leadership of local stakeholders. Through the speech by and discussions with young researchers, who are actively engaged in the actual community sites, and residential research interns who attended the Local Science Network for Environment and Sustainability, discussions were deepened about the problems toward the cultivation of the next-generation residential researchers.

At the symposium, "Knowledge Production, Activities, and Adaptive Governance Supporting the Community," discussions were deepened with an eye on the "local environmental knowledge," which is a combination of scientific knowledge and local knowledge, which has been cultivated in the life of people, as a new knowledge structure, which forms the foundation for the efforts of the community people, in the "Formation of Local Environmental Knowledge for Creation of New Commons and Sustainable Management (Local Environmental Knowledge Project)" that started in April 2012. The Local Environmental Knowledge Project aims to elucidate the how sciences ought to support the bottom-up efforts to build a sustainable society and how the society ought to master the sciences by collecting and analyzing various examples in all over the world and clarifying the system of adaptive governance in communities with the mechanism of the local environmental knowledge formation and the knowledge put into full use. We widely shared the challenge to new sciences for the building of sustainable society with the formation of this formation of local environmental knowledge as a nucleus through the speech given by various project members who gathered at the venue from all over the world. In addition, we held a poster session to introduce the cases of production and use of local environmental knowledge in various regions and to introduce cases of transdisciplinary sciences that support the bottom-up efforts for the

solution of global environmental problems that had been consistently pursued by two projects. Through the discussions at the symposium, preparation was made for the launching the voyage of knowledge production to open the horizon of new sciences with the wisdom gathered from the many participants in the Local Science Network for Environment and Sustainability and the Local Environmental Knowledge Project.

3-3-2. Local Science Network for Environment and Sustainability

(1) Vision of the Local Science Network for Environment and Sustainability

We have discussed the vision and design of the Local Science Network for Environment and Sustainability through the collection and analysis of various cases in all over Japan. The Local Science Network for Environment and Sustainability was designed as a nationwide network that enables stakeholders and scientists in communities tackling with various regional environmental problems to mutually learn and cultivate each other. A chief function of the network is to activate the activities in various communities by information sharing through interchanges and collaborations by providing fora to various scientists and experts engaged in research activities directly connected to the resolution of environmental problems and to community stakeholders working on the solution of problems by using the knowledge at the community sites. In addition, it is also an important issue to support the cultivation of the next-generation young researchers who will assume the research directly connected to the solution of regional environment problems.

Close collaborations between scientists/experts and community stakeholders is indispensable for the solution of regional environmental problems. The Local Science Network for Environment and Sustainability aims to mature sciences, which provide “useful knowledge” that can be used by stakeholders to solve concrete problems, through the cultivation and support of scientists who will play a role of a good partner for the local stakeholders who assumes the solution of problems. In addition, the network will provide an opportunity for mutual learning to for local stakeholders to improve their respective efforts by sharing the information about the activities in the respective areas. The network will promote the interactions and mutual learning between scientists and stakeholders by providing an opportunity for scientists/experts in various fields and stakeholders in the respective areas to deepen their interchanges.

The Local Science Network for Environment and Sustainability will formulate and publish the “Guideline for Collaboration” as a guideline for local stakeholders and scientists/experts to mutually stimulate and collaborate while evaluating each other. In addition, the “Participatory evaluation of local science” system, which evaluates the activities and study achievements of scientists both from the regional perspective and from the scientific perspective, will be constructed to cultivate scientists and experts who can support the activities of regional stakeholders with thorough recognition that the actor of efforts for the solution of environmental problems is local stakeholders. Furthermore, cultivation of young researchers, who will be engaged in studies to solve local environmental problems as residential researchers, will be promoted through the residential research internship and so on. The Local Science Network for Environment and Sustainability aims to develop the scientific and social foundation for the activities toward the sustainable society by using the

above-mentioned systems.

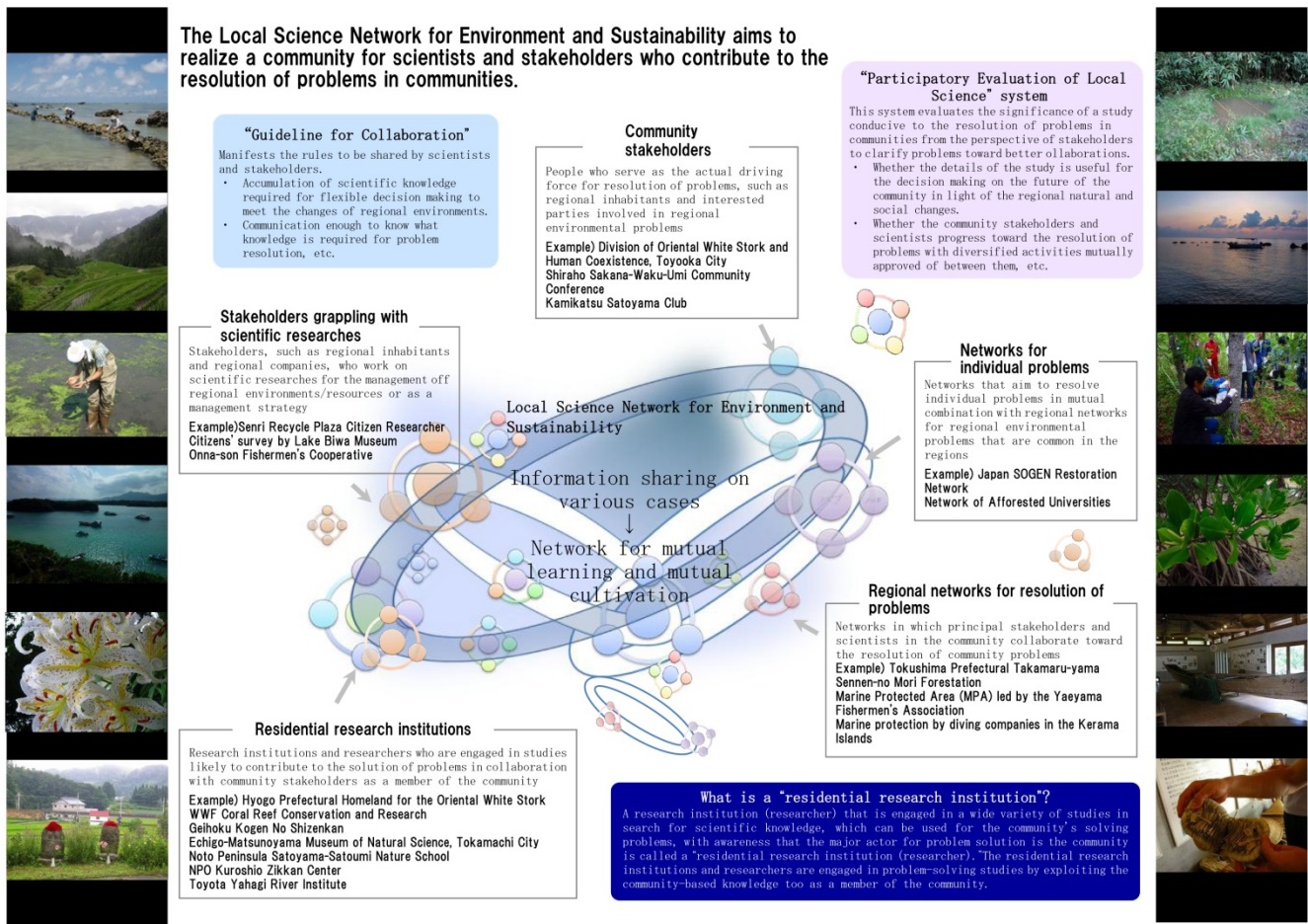
(2) Significance and characteristics of the Local Science Network for Environment and Sustainability

Scientists grappling with problem-solving researches and community stakeholders participate in the Local Science Network for Environment and Sustainability from all over Japan to grope for how the collaboration between communities and scientists ought to be through information exchange. The "Guideline for Collaboration," which shows how scientists and community stakeholders should collaborate in the community sites, will be shared by all participants as a general guideline, and will be improved to a better guideline through the mutual studies.

The "participatory evaluation of local science" will be implemented that is a system to evaluate studies useful for the solution of regional environmental problems and for sustainable community development both from the regional perspective and from the scientific perspective. The web journal, "Future of Local Environment," will be constructed to summarize, evaluate, and publish information about various cases on the Internet. In addition, information exchange and mutual evaluation between members will be encouraged through the holding of study meetings, symposia, workshops, and so on.

Community stakeholders will be able to obtain ideas useful for the improvement in individual efforts from exchanges with various local stakeholders and scientists who participate in the network from all over Japan. In addition, they will be able to make the first step toward the solution of problems in collaboration with scientists through the exchange with scientists who are willing to work on problem-solving researches. Furthermore, the foundation for steady step-up of efforts through the mutual objective evaluation of the efforts by obtaining the know-how and scientific knowledge and human networks from outside of the community.

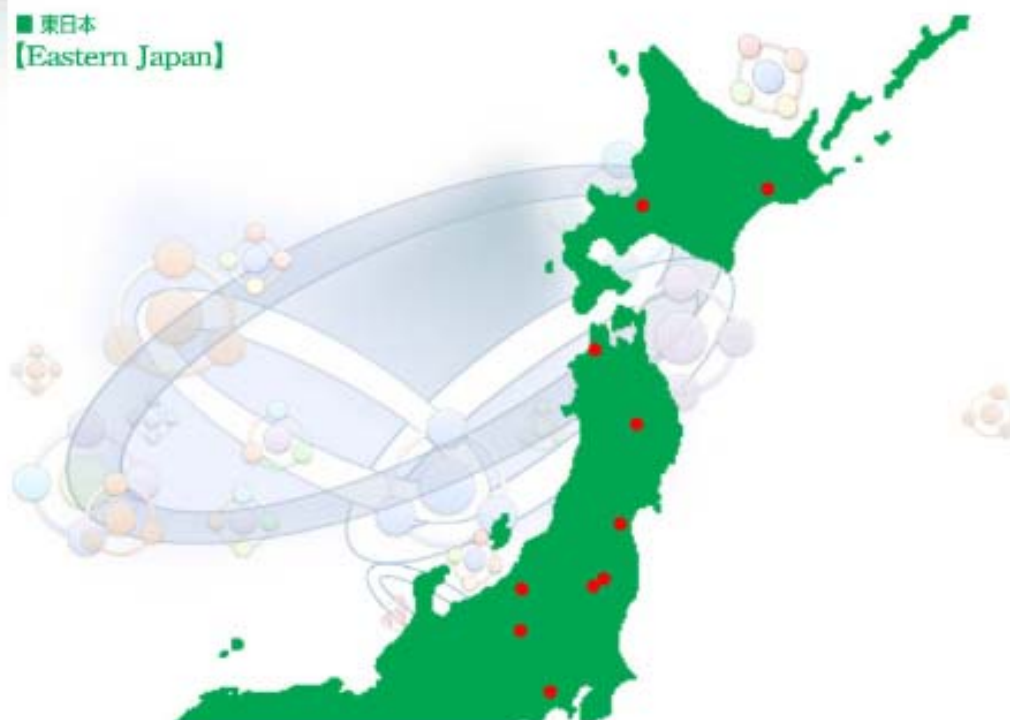
Scientists will be able to evaluate the social value of their studies in terms of "contribution to the solution of problems," which are less appreciated at the conventional academic meetings, both from the regional perspective and from the scientific perspective, and hence obtain hints for further development of studies. They will be able to obtain evaluation and cooperation from scientists and stakeholders, who participate in the network from various regions, in the series of processes including the formulation of study plans, the implementation of field surveys, the writing of study papers, and the presentation of study results.



(3) Establishment and Development of the Local Science Network for Environment and Sustainability

The Local Science Network for Environment and Sustainability was formally established on March 31, 2010 with 42 scientists, various knowledge producers, and stakeholders active in advanced cases in various regions from Hokkaido to Okinawa listed as founders with approval for such vision of the “Local Science Network for Environment and Sustainability.” We could realize a multilayered and multifaceted organizational structure, whose transformation can be promoted through the interactions between scientists, experts, and stakeholders, through the information sharing, mutual evaluation, and study on the cases of various regions, with participation obtained from those who have promoted advanced activities across the nation. Along with the establishment, we completed a PR leaflet and bylaws (Data 2) for the Local Science Network for Environment and Sustainability, held the Foundation Symposium in September 2010, and started the operation of the dedicated website and mailing list to gain penetration of the vision and significance of the network.

■ 東日本
【Eastern Japan】



■ "One da Green da" project, Nature Restoration Project of
Hokkaido Kushiro Wetland, Kushiro, Hokkaido
[Support in wetland restoration activities by local citizens and
network creation](#)

■ Iwaki River basin in Hiroaki, Aomori/ Watarase Retarding
Basin in Kita-Kanto, Hokkaido University
[Reconstruction of Environmental Management System by Local
Communities – Role of ecosystem study and metagovernance –
\(PDF\)](#)

■ Kawasaki-cho, Shibetsu-gun, Miyagi • [Association for utilizing
resources in Kawasaki-cho](#)
[Directly Connecting Satoyama and Wood Stove Users –
Society of Kawasaki-Sendai Wood Stove Association –
Thinking about and interacting with forests through firewood
\(PDF\)](#)

■ Tenei Village: EIMYumoto Project in Fukushima, [Tohoku
University • EIMYumoto Regional Conference – Mountains, hot
springs, and people – making a living using valuable local
resources "EIMY Yumoto Project" – \(PDF\)](#)

■ AUN Nagano University "Megumi no Mori" project, Ueda City,
Nagano [Building a tool lot for Satoyama restoration.
Effect of water area within forests on biodiversity and
ecosystem service improvement \(PDF\)](#)

■ Yezo Deer Association, Sapporo, Hokkaido
[Yezo Deer Association, Sapporo, Hokkaido](#)

■ Field Science Center, Faculty of Agriculture, Iwate
University, Morioka, Iwate
[Field Science Center, Faculty of Agriculture, Iwate University,
Morioka, Iwate](#)

■ Shikokubo Co., Ltd., Koriyama, Fukushima
[Proposal involving sustainable lifestyles through the provision
of environmentally friendly housing ★Details of activities★](#)

■ Echigo-Matsuyama Museum of Natural Science "Kyororo" in
Tokamachi, Niigata
[Local museum as a hub for rural revitalization research and
studies](#)

■ Tokyo Metropolitan University, Hashigai, Tokyo
[Consortium for the Interdisciplinary Study of Human and Nature
Symbiosis in Island Systems \(PDF\)](#)



The Local Science Network for Environment and Sustainability was extended and expanded smoothly with 127 multidisciplinary members participating in it from all over Japan as of the end of the project. The actual condition was revealed through the establishment of the network and the development of the activities that sciences, which produce useful knowledge for the efforts on the solution of problems by the people in the community, are supported not only vocational scientists and experts but also people in various positions, and the fact promoted the pursuit of how the new knowledge production ought to be over the borders of the conventional sciences. This issue is expected to be continuously discussed after the end of the project in the newly started "Local Environmental Knowledge Project" by the Research Institute for Humanity and Nature. In addition, the various people grappling with environmental problems, which communities are faced in the respective regions, form networks engaged in dynamic activities within the communities, where

vocational scientists/experts and various knowledge producers are important constituents. The project has discussed a system, which can promote activities toward the solution of problems with such intraregional networks maintaining their centripetal force, viz. an adaptive governance system, through advanced cases in various regions. This will be also pursued as a chief issue in the Local Environmental Knowledge Project.

3-3-3. Guidelines for collaboration between local communities and science communities

(1) Concept of the guideline

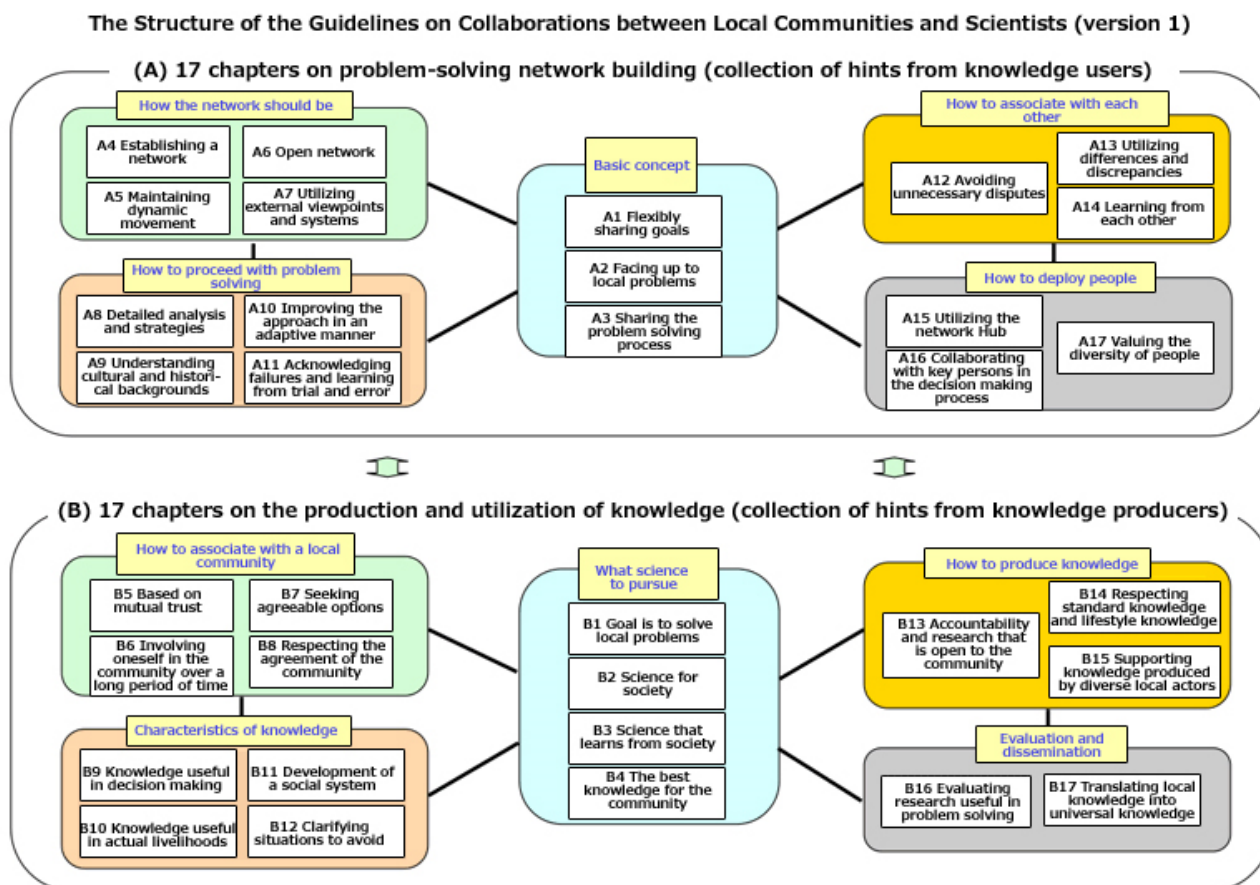
The "Guideline for Collaboration between Communities and Scientists" was worked up over approximately one year by preparing a basic concept through the brain storming etc, by the founders of the Local Science Network for Environment and Sustainability held in March 2010, notifying the original proposal with a summary of previous achievements in research and development to the network members, proposing the first proposal at the inaugural meeting for the Local Science Network for Environment and Sustainability, and then discussing it closely on the mailing list for network members. The final version of the first edition completed after discussion at the field workshop held at Toyooka City in February 2011. The concept, the brief edition, and the full edition of the "Guideline for Collaboration between Communities and Scientists (First Edition)" were published on the website for the Local Science Network for Environment and Sustainability on March 10. In addition, we published a Webpage soliciting comments on the guideline with a system constructed to enable feedback from a wide variety of people.

In order to realize the community-based solution of environmental problems and a sustainable society from the bottom upward, a social system is required that can be used by stakeholders living in communities for the environmental conservation and sustainable development of communities. The scientific knowledge produced by scientists everyday, however, does not always harmonize with the nature of the knowledge produced and inherited by people living in communities or the rules of communities in decision making. The "Guideline for Collaboration between Communities and Scientists" was constructed in the bottom up approach by the local stakeholders and scientists, who constitute the Local Science Network for Environment and Sustainability, by bringing about various device for collaboration, which they have developed to resolve problems facing the individual communities. Thus the guideline intends to provide guidelines and gist in producing and using various knowledge that is required to solve regional problems. This guideline is used for local stakeholders and scientists to confirm the points to note in grappling with problems so that they may review the mutual condition toward better solutions of problems.

(2) Guideline for Collaboration between Communities and Scientists

This guideline consists of " (A) 17 provisions for networking for solutions of problems," which are intended to advance the collaboration with scientists and stakeholders, and " (B) 17 provisions for production and use of knowledge," which are intended to promote sciences contributing to the solutions of problems. (A) chiefly proposes provisions serving as guidelines that can be used by those who specifically address the solution of problems by exploiting their knowledge on the scene of their activities; whereas (B) chiefly proposes to knowledge

producers, who try to produce knowledge technologies useful for solutions of problems, a new way of science that they will evolve it through learning in communities. (A) and (B) are not separated strictly but are closely related to each other of course.



Full text of the Guideline for Collaboration between Communities and Scientists

(A) 17 provisions for networking for solutions of problems

Basic concept

A1. We shall gently share visions and goals for regional activities.

We shall encourage people with different values or visions to collaborate based on their mutual trusts by finding a vision or goal, which can be shared by various factors, and constructing a network that gently involve the people with such vision or goal as a nucleus.

A2. We shall sincerely face the actual condition and problems of communities.

We shall analyze the actual condition of regional environments and problems facing communities from various perspectives, and work on problem resolution by sincerely accepting them.

A3. We shall advance the process of problem resolution in concert with various people.

We shall enable the activities toward the open resolution of problems through the process of a wide variety of stakeholders and scientists/experts in communities to discuss and address regional environment problems.

Ideal networking

A4. We shall network the people who support the community efforts on problem resolution.

We shall form and activate networks of various stakeholders with different interests in order to support and drive the community efforts on problem resolution.

A5. We shall maintain the dynamic movement of the network and avoid rigidification.

We shall maintain the dynamic movement of the network and avoid rigidification. We shall explore how a dynamic network ought to be so that the networks of people aiming to resolve community problems may go on moving with structures and functions flexibly changed.

A6. We shall aim at an open network without preventing the advent of new actors.

We shall aim at an open vigorous network enabling participation of many people by welcoming the participation of new actors in community networks and allowing the roles of the individual actors to change flexibly.

A7. We shall import and make full use of outside perspectives and systems.

We shall endeavor to find a better option by importing the perspectives and foreign systems relating to regional environments by translating them in accordance with the actual condition of the community.

How to advance the solution of problems

A8. We shall advance activities with elaborate and careful strategies.

We shall strategically resolve problems from a perspective of many people by elaborately analyzing the present condition complicated with various values and interests.

A9. We shall understand and make use of cultural and historical backgrounds.

We shall convince and encourage various stakeholders to participate in the network by thoroughly understanding the cultural and historical backgrounds of communities.

A10. We shall improve the efforts in an accommodative manner.

We shall improve the efforts in an accommodative manner by flexibly introducing new approaches with the definitions of problems to be solved and improvement goals reviewed in accordance with the complicated and dynamically changing regional

environments.

A11. We shall acknowledge failures and learn from trial and error.

We shall improve efforts by sincerely accepting the results of the efforts on problem resolution through trial and error without refusing to acknowledge failures.

How to interact with each other

A12. We shall aim to obtain understanding and consent from many people by avoiding unnecessary struggles.

We shall implement activities based on mutual trusts with due efforts in explanation and mutual understanding by trying to explain and mutually understand with every possible precaution paid so that the people with different sense of value or views may not fall into needless confrontations.

A13. We shall explore a way to make use of differences or inconsistencies in the community by respecting the differences of each other.

We shall try to find a common values or views while allowing the differences of each other by accepting as natural the existence of people with various individuality or various problem awareness in the community. We shall explore new needs and buried human resources by accepting and adopting differences or inconsistencies rather than resolving the diversity in values or views.

A14. We shall cultivate younger generations by consistently encouraging them to mutually learn from each other.

We shall cultivate younger generations, who will bear the future of the community, through the mutual learning by consistently encouraging scientists and stakeholders to learn from each other, transform themselves, mutually understand, and deepen interactions.

How to achieve the potential of human resources

A15. We shall give consideration so that the human resources, who are expected to play a central role, may achieve their own potential.

We shall promote the effective functioning of the problem resolution process by developing an environment where the “hub” of the network, which involves people in various positions and the “catalyst,” which promotes collaborations through the mutual learning and mutual development among the people, may be generated and play an active role.

A16. We shall emphasize the collaborations with actors who will play a key role in decision making of communities.

We shall take concrete and effective measures in close cooperation with people and organizations, who play a central role in decision of making of the community, with due

understanding of the conventional decision-making system of the community.

A17. We shall explore a way to allow various human resources and technologies in the community to be put into full use.

We shall strive to enable people to naturally achieve their respective personalities and capabilities with expectation for the latent potential of the human resources in regional networks with various professional abilities and skills such as the assessment of regional environments and extraction of issues, scientific knowledge technologies useful for problem resolution, administrative processing, comprehension of legal systems, transmission of information, and fund raising.

(B) 17 provisions for production and use of knowledge

Directions to be aimed at by sciences

B1. Our studies shall aim to solve problems relating to regional environments.

We shall cultivate sciences that can produce knowledge useful for problem resolution in the actual situation of the individual communities. We shall pursue sciences that support stakeholders, who are problem solving actor in communities to solve problems relating to regional environments by using various knowledge.

B2. Our mission is to produce sciences for the society.

We shall pursue “sciences in the society for the society,” which does not end up in sciences, with due attention paid to the use by local stakeholders of the knowledge transmitted as research results. To that end, we shall develop our skills in “translating” scientific knowledge in accordance with the actual regional condition with the aim of producing knowledge that are in harmony with conventional knowledge technologies and decision-making systems and are useful for problem resolution communities.

B3. We shall deepen the of sciences by learning from communities.

We have learned much so far through the exchanges with local stakeholders. We shall consistently review and deepen the scientific system itself by developing our knowledge technologies while learning from the actual condition of communities and by making the most of such experience to increase the quality of scientific researches.

B4. We shall pursue producing the best scientific knowledge for communities.

We shall aim at sciences to search for a solution likely the best for the community by learning from the community in the condition specific to the individual community as well as pursuing universal and highly general scientific results. Those two approaches are not opposed to each other. We believe that we can find a clue to the essence, truth, and solution of environmental problems and further deepen scientific researches by

being deeply involved in the community and learning from the community.

How to interact with communities

B5. We shall support problem solving by stakeholders on the basis of mutual trusts.

We shall aim to encourage scientists and stakeholders to trust each other and collaborate by understanding the mutual limitations. The scientists/experts shall learn from and support the activities of various stakeholders with an attitude of leaving the judgment to the stakeholders.

B6. We shall be involved in communities with a long-term perspective.

We shall fulfill our commitment for the future of the community as one of stakeholders by keeping involved in the community either in the position as a knowledge producer or user irrespective of residential or visiting.

B7. We shall respect various senses of values and views and pursue options enabling consensus building and realization.

We shall patiently pursue options bridging the gaps among stakeholders in various positions, which can be selected or realized based on consensus, with awareness of the existence of various and sometimes mutually opposing values.

B8. We shall respect the consensus of the community.

Once a consensus of the community is obtained, we shall pursue knowledge useful for problem solving within the range of the consensus.

Nature of knowledge

B9. We shall emphasize the knowledge that is useful for judgment or decision making.

We shall emphasize producing knowledge technologies, which are useful for judgment or decision making on the problem solving scene in the individual community, in collaboration with and through interactions with various stakeholders

B10. We shall produce knowledge that can be used on the scene of livelihood or trade in communities.

We shall emphasize the development of knowledge and techniques, which are useful for the sustainable use of resources and for the promotion of industries in harmony with the environment, on the scene of agriculture, fishery, and forestry and in the corporate activities using natural resources.

B11. We shall develop social technologies required to construct sustainable communities.

We shall promote the development of consensus building techniques and social systems such as the use and distribution of resources, which are required to enable problem resolution, as well as the scientific exploration of the way of problem solving.

B12. We shall strive to disclose the situation to be avoided.

We shall sincerely face the actual condition where the best solution is difficult to find

due to the actual complexity and uncertainty of the community, disclose a situation based on a consensus, which should be avoided by all means even if it is uncertain in scientific terms, and explore the possibility that the situation may occur and options to avoid the situation.

Method of knowledge production

- B13. We shall achieve accountability and implement studies open to communities.** We shall achieve accountability by implementing open studies with the study purposes, methods, and study processes such as prospective risks shared with processes stakeholders. We shall enhance the quality of scientific researches by learning a lesson from advance and criticism from various people.
- B14. We shall emphasize conventional knowledge and knowledge cultivated in the daily life.** We shall deepen various conventional knowledge, folk technologies, and life knowledge to use for solving problems by constructing new sciences aiming to comprehensively understand regional environments along with scientific findings.
- B15. We shall support knowledge production by various actors in the community.** We shall put importance on the fact that various actors, such as those who are engaged in the primary industry and regional companies, produce excellent knowledge technologies deeply concerning the regional environment, and support such knowledge production activities.

Evaluation and transmission

- B16. We shall highly evaluate studies that are useful to solve problems in communities.** We shall implement studies with an attitude of highly evaluating the contribution to communities as well as sincerely pursuing an academic value in an attempt to cultivate young researchers responsible for the next generation, who can roll out high quality studies with their passion for the community and involvement in it as spiritual nourishment.
- B17. We shall transmit the knowledge and systems cultivated by communities by translating them into universal knowledge.** We shall aim to enhance the communities' appreciation of our activities by translating the conventional knowledge and social systems accumulated in communities and widely transmitting them to the communities with confidence.
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(3) Assessment of the guideline and future improvement

The Guideline for Collaboration between Communities and Scientists is published on the website of the Local Science Network for Environment and Sustainability and comments are

solicited on it on the web. In addition, we attempted to widely collect views and advice through field workshops, symposia, etc. However, this attempt did not go effectively and we could obtain very few comments. The reason is probably attributed to the high level of abstraction of the guideline. At an informal discussion about the Guideline for Collaboration between Communities and Scientists held by the University of Tokyo graduate students group, they unanimously evaluated that the guideline is “considered very well.” In other words, it seems that we produced knowledge “that is generally correct but is useless on the community scene” again.

It is apparent that the Guideline for Collaboration between Communities and Scientists needs to be improved for the usability in the daily scene from the field perspective. The basic study project “Formation of Local Environmental Knowledge for Creation of New Commons and Sustainable Management” (project leader: Tetsu Sato, for five years since April 2012), which started at the Research Institute for Humanity and Nature in fiscal 2012, aims to elucidate how scientific researches ought to support the adaptive governance of ecosystem services by various stakeholders in communities and the mechanism of producing, distributing, and using the “local environmental knowledge” by a wide-ranging comparative study and meta-analysis from the perspective of knowledge users. In this project, a detailed analysis will be made on the way how the sciences ought to support the activities toward the sustainable community development led by community stakeholders not only in the cases collected at the Local Science Network for Environment and Sustainability, but also in a wide variety of global case studies and meta-analysis. Through such efforts, the Guideline for Collaboration between Communities and Scientists is expected to mature as a guideline for decision making and actions by people in the community scene. More specifically, the construction of the guideline will be promoted so that it will be effectively used on the scene of real world communities in a manner that the priority of the items be presented according to the nature of problems facing the individual communities.

3-3-4. Working groups

With the expansion in size and the diversity of members of the Local Science Network for Environment and Sustainability, lower structures sharing interests in specific problems came to be produced spontaneously within the networks. Those groups have a potential of rolling out various new activities on the axis of the common interests. Accordingly, the network adopted a strategy of supporting the activities of those spontaneous groups by positioning them as working groups (hereinafter referred to as WGs) within the network. The gathering of members with certain interests in common is expected to produce an incentive in the network activities. In addition, the research activities toward the resolution of the individual problems is expected to be activated with those working groups as a nucleus, resulting in further development through such effects as raising of outside funds.

Seven WGs—“Satoumi and Aquatic Resources Management (organizer: Kakuma),” “Satoyama (Kamada),” “Wildlife Management (Matuda),” “Natural Energy (Niitsuma),” “Social Technologies (Yanaka),” “Ecotourism (Sato),” and “Young Scientist WG (Hiyoko-gumi, Shimizu)” — have been established as of the end of the project and various activities started. What is noticeable among others is the activities of the “Hiyoko-gumi.” This working group

was participated in by many young scientists, enabled flexible information exchanges using media such as Facebook, and conducted the first field survey by a working group in February at the Noto Peninsula Satoyama Satoumi Nature School, Kanazawa University with 12 participants. The report is published on the website (Data 3). The design of the residential research internship significantly progressed with the activities of the Hiyoko-gumi as a turning point.

Young Scientists' Working Group

“Hiyoko-gumi group”

Working Group of Young Scientists



- Participated by (self-described) young researchers who are active as “residential researchers,” “cooperative coordinators,” “visiting researchers,” and so on in various communities.
- A forum for young scientists to discuss what they should do to contribute to the improvement of their own communities
- “Residential researchers” have various worries...on Facebook
 - How can research activities be used for community development?
 - Confidential relationship building with local people
 - Regional activities consistent with research activities
 - Receiving system for residential researchers
 - Until when should we or can we stay here?
 - Sustainability of residential research institutions
 - How should we raise funds?
 - Regional vitalization
 - Cultivation of residential researchers

1

Most of the members of Local Science Network for Environment and Sustainability, who participate in the Hiyoko-gumi, are scientists/experts fresh from a graduate school. A potentially large number of young people exist in the working group who became gradually less attracted to the institutional researchers as a career path. An increasing number of people, who should have gone on a career path of obtain employment in a company after graduation from the graduate school, wishes to go back to their hometowns or communities to do something for the sake of them. For example, there is an increasing number of cases where a botanical researcher who works at a museum located in a suburban area on a permanent basis drops out with an intention to work for the community, which used to his research field, and settled down at the community as a residential researcher. An environment is gradually developing in Japan that enables young people who feel awkward about the research style in the existing system to start residential researches at a field in the community. The Local Science Network for Environment and Sustainability is expected to function as an effective platform to support and cultivate such a young generation.

○Summary of working groups (published on web site)

Satoumi/marine resources management WG

"This summary is provisional including the name of WGs. The situation may change in future with the progress of discussion. We wish to discuss the satoumi for the time being. Topics about the aquatic resources management are also welcome. The term "Satoumi (village beach)" came to be heard often recently. Satoumis exist in all over Japan with diverse landscapes. The problems in satoumi development are also diversified and were classified into six themes, viz. definition, use, system, culture, interchange, and technologies as a result of a certain Satoumi Meeting. The "Regional Environmental Study for Creation of Sato-umi" symposium held by Local Science Network for Environment and Sustainability in October 2011 focused on "Distribution" (theme: interchange). Satoumi development thus requires an interdisciplinary approach that extends over the natural science, the social science, and humanities. Satoumi development getting popular in overseas as well. The Satoumi workshop in Shanghai is held in 2008 and the Satoumi workshop Manila in 2009. At CBD-COP10 in 2010, at least four side events relating to Satoumi were held. Satoumi is expected to further spread in future in particular in the Asia-Pacific region. The MPA (marine protected area) was acknowledged as an important item in the COP10, the National Marine Biodiversity Strategy, and so on. As the MPA is expected to be an effective tool for Satoumi development, it will be discussed at this WG too. As the first activity of this WG, the "community-led Satoumi development" workshop (provisional title) will be held at the Kyushu University in January 20, 2012. The holding of this workshop was enabled by the cooperation of Professor Tetsuo Yanagi of the Kyushu University. Participation of non WG members is also welcome."

Wildlife WG

"Half a century ago, many wildlife species were sharply reduced or in the extinction crisis in Japan due to the effects of human activities such as land development, overhunting, environmental pollution, and introduced species. Later, many wildlife species are about to recover as a result of such efforts as prohibition of hunting, water purification, and pesticide regulation. Rather, an excessive increase of wildlife started to cause new problems including the damage of agriculture and forestry products. The hunters, who used to cause overhunting, continued to decrease and age, reportedly resulting in danger of extinction of the hunting culture. In particular, overpopulated Japanese deer, goats, and Japanese cormorant, not only damage the agriculture and forestry products but are also about to have an adverse effect on the ecosystem such as feeding damage on natural vegetation and soil erosion. The Local Science Network for Environment and Sustainability will encourage information exchanges by taking up wildlife problems in the regional activities not only on the aspect of countermeasures against damage by wildlife but also the effective use and protection activities. We wish to deepen interdisciplinary discussions not only from the biological perspective but also the aspects of economy and culture. we will exchange information and propose plans not only on events of this network but also other activities."

Natural energy WG

"Energy is indispensable for all activities and trades in communities and is deeply involved in the regional environment and ecosystem as well."

This WG will exchange information and views, introduce cases and activities, mutual learning of wisdom, technology exchanges, and liaisons with other related organizations on a wide variety of matters relating to the regional energy with "Consider Energy through Communities and Environment" and "Consider Communities and Environment through Energy" as keywords.

Natural energy includes not only hydraulic power and solar power but also firewood and charcoal, grass, and energy such animals as cow and horse, and energy of human beings, who are a bearer of community life and industries.

Potential agenda include but are not limited to the following:

- Interactions between the sustainable use of biomass in Satoyama, grassland, and reed fields and the ecosystem
- Plantation of secondary forests (forests for fuel) and grassland
- Use of natural energy in agriculture, forestry, and fishery
- Community development using natural energy
- Environmental education through regional energy
- Use of natural energy for regional safety and peace of mind
- Natural energy application technology
- Social technologies for use of natural energy
- Regional traditional techniques for use of natural energy
- Environmental effects of use of natural energy
- Environmental load and environmental destruction resulting from the use of natural energy
- Environmental coexistence society

The participation of those who will study on or are interested in regional natural energy or communities in energy terms are welcome regardless of past achievements."

Ecotourism WG

We will position ecotourism as one of "various approaches for sustainable management and use of ecosystem services (such as natural resource management, ecosystem management, etc.) or as one of methods for sustainable community development. It important to meet those two requirements at the same time. This working group aims to work on the management of ecosystem services and the development of sustainable communities through the promotion of ecotourism at various parts of the world, to mutually learn from the diversity revealed by collecting and analyzing various cases, and to share new ideas. We will discuss, through mailing lists and workshops, the system of exploring the value of regional resources from the promotion of ecotourism, the system of creating additional values from consideration of the natural environment and efforts on sustainable management of natural resources, and the system of compiling success stories of sustainable community development to a resource of ecotourism, and will collect and share sustainable options that can be used in the actual condition of communities. It must be pleasurable if we can construct a "toolkit for promotion of ecotourism," which enables people in various parts of the world to voluntarily select options appropriate for their respective condition, through the collection of various cases."

Youth WG (aka Hiyoko-gumi (chick group))

The young members, who participate in the "Hiyoko-gumi," struggle everyday considering

what they can do for the community where they are stationed or where they grew up in all over Japan.

This WG aims to bring about experiences and problems on the frontline for addressing new problems such as problem-solving researches and community development in collaborations with various actors, and use them in practice as a researcher or a bearer of community development.

Our future events include the workshops to be held by visiting study fields of members and the issuing of the "Quarterly Magazine Hiyoko" (provisional name). We also exchange information and have discussion on the Facebook."

3-3-5. Participatory evaluation system

① Concept of the Participatory Evaluation of Local Science system

We aimed to promote the transformation of scientist communities by appreciating the achievements of problem-solving researches directly connected to the solution of regional environment problems, with light shed on the studies implemented by residential researchers who face the regional properties from the front, through the construction of the Participatory Evaluation of Local Science system to evaluate them both from the regional perspective and from the scientific perspective. The system was concretely designed based on two original proposals of (1) Evaluation of local science in accordance with the 17 provisions for production and use of knowledge and (2) 17 provisions for networking for solutions of problems. (1) aims to support the problem-solving studies by constructing a system to evaluate the sciences, which produce knowledge applicable by local stakeholders to problem resolution, and the results of exploration of social systems conducive to the use of knowledge and construction of a sustainable society system from the perspective of both stakeholders and scientists. To that end, we designed the criteria for peer review by stakeholders on the basis of the Guideline for Collaboration between Communities and Scientists, constructed a website for stakeholder-participatory web journal, "Future of Local Environment" in December 2011, and started soliciting contributions. At present, several authors express their intention for contribution and the first paper is expected to be published in fiscal 2012.

For (2) of the Participatory Evaluation of Local Science system, we effectively implemented activities toward the conservation of regional environments and the construction of a sustainable society through the collaboration between stakeholders and scientists/experts within communities and attempted to design an award program of appreciating successful cases with participation of various members obtained to support excellent collaborative activities. For this activity, however, many objections erupted from project members and area advisors. An especially serious concern is that such award program may result in a new top-down authorization likely to differentiate various regional activities. With respect to the evaluation criteria, which plays a central role in the award program, it was pointed out that the Guideline for Collaboration is only one of guidelines and it should not provide any distinct criteria to evaluate the value of regional activities. From a concern over likely construction of an arbitrary award program without distinct evaluation criteria, it was decided to put off the introduction of the award program in the present design in fiscal

2012. From the recognition that it is important only to evaluate a science contributing to the regional problem resolution instead of evaluating the entire regional activities by returning to the starting point, a new system to select and recognize "Impact Stories" from among reports contributed to the stakeholder-participatory web journal will be deliberated after constructing detailed evaluation criteria. Given a new large research project, "Formation of Local Environmental Knowledge for Creation of New Commons and Sustainable Management," started in fiscal 2012 at the Research Institute for Humanity and Nature, in a manner of effectively taking over this research & development project, we will promote the construction of an evaluation system for sciences directly connected to the solution of regional problems from the perspective of adaptive governance of communities with the production and distribution of knowledge as a nucleus in that project with the previous accumulation put into full use.



(Only Japanese web site is currently available.)

② Outline of the "Future of Local Environment"

The "Future of Local Environment" is a web journal operated by the Local Science Network for Environment and Sustainability that contains research papers, activity reports, and comments relating to regional environments written by network members.

The Local Science Network for Environment and Sustainability pursues sciences that can properly support the activities for environmental conservation and sustainable community development implemented by various stakeholders in communities as an actor. If we can

provide guidelines, ideas, and technologies, which meet conditions specific to the respective communities, are helpful to obtain agreement and consensus building of people in communities, and are shared by various people with different interests or concerns, such knowledge and technologies must be significantly useful for the activities of the people in communities toward the sustainable future. The "Future of Local Environment" will contain research papers concerning such community-based knowledge technologies, comments about findings in various fields, which will help in the decision making and concrete activities of the people in communities, and reports on community activities using such knowledge technologies.

③ Characteristics of the "Future of Local Environment"

1. Summary for Stakeholders

The research papers and comments to be contained in the "Future of Local Environment" are required to provide a "Summary for Stakeholders." The summary will be edited in an easy to understand manner so that "knowledge users (stakeholders)," who are not experts but are in a position of using the knowledge technologies contained in the research papers or comments in their communities, may use the knowledge technologies contained in the account more easily. A significant characteristic of the "Future of Local Environment" is thereby is promote the use of the knowledge technologies at the activity fields in communities.

2. Peer review by stakeholders

All the accounts (including activity reports) contained in the "Future of Local Environment" have been recognized as worth publishing for the contents through the review (peer review) by several referees. Such a peer review is evaluated usually by experts familiar in the respective fields in accordance with scientific accuracy and value. The "Future of Local Environment," which provides knowledge technologies to be used by community people or application cases, requires evaluation not only for the scientific value but also from the perspective of whether the knowledge technologies are significant or usable for the people who will use them on a specific scene. Accordingly, we have developed a system where research papers and comments are subject to peer review by referees, who are non-expert in the field but are stakeholders, with respect to the "Summary for Stakeholders" and activity reports are subject to peer review by the referees with respect to the entire account. We believe that this system permits us to select only accounts that are likely to be actually useful to solve the regional problems as well as for the scientific value.

3. Disclosure of peer review comments and exchange of comments after publishing

The "Future of Local Environment" is a web journal free from space limitations. Accordingly, we disclosed the comments by peer reviewers and answers from the authors for all the published accounts as device to realize a highly transparent review. The "peer review criteria" are published on the "contribution solicitation" page. In addition, we constructed a system to allow readers to enter comments for discussion with the author after the account is published with the interactive nature of the web put into full use. For details, see the "Comment" section in the accounts. The knowledge technologies, which are published in the "Future of Local Environment," are expected to be further refined and improved as a catalyst for new studies

or activities through such discussions.

4. Definitions of “experts,” “stakeholders,” and “residential researches”

For those definitions, see the following websites.

Website for the Local Science Network for Environment and Sustainability
(<http://lsnes.org/index.html>)

Website for the Research & Development Project “Construction of a Pragmatic Scientist Community Contributing to Stakeholder-driven Management of Local Environment,”
Research Institute of Science and Technology for Society, Japan Science and Technology Agency
(<http://localsci.org/index.html>)

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(4) Peer review criteria for the Participatory Evaluation of Local Science

The design philosophy of the “Future of Local Environment” is embodied in the peer review criteria. The full text of the “peer review criteria” is shown below.

“Future of Local Environment” Peer Review Criteria (“Future of Local Environment” Editorial Committee)

(Basic concept)

The peer review of the “Future of Local Environment” aims to publish as widely as possible the knowledge technologies, which are useful for the resolution of local environmental problems and sustainable development, and various reports on activity cases in various parts of Japan, which can be used by community people for reference. Accordingly, the peer review shall be conducted with the aim of improving the description of accounts from the perspective of stakeholders, who are a knowledge user, and of achieving the level required for publishing as much as possible. In conducting the peer review, views of peer reviewers shall be disclosed for the following items and concrete improvement points shall be definitely described with the objective of thereby improving the description of the account. Reasonable and convincing reasons are required for peer reviewers to finally make a decision of rejecting to accept the account.

(Disclosure of the peer reviewer selection and peer review process)

Research papers and comments shall be peer-reviewed by two experts, who will be selected by the editorial committee in consideration of special fields, details of activities, and so on, for the full text (including the "Summary for Stakeholders"), and shall be peer-reviewed by one stakeholder in the related field, who is a knowledge user, for the "Summary for Stakeholders." Activity reports shall be peer-reviewed by one expert and one stakeholder. The real names of the peer reviewers shall be disclosed in principle. The views of the peer reviewers, the judgment of the editorial committee, and the response of the author to them shall be disclosed too along with the adopted document. Those measures shall be taken with the objective of realizing fair and highly transparent peer review.

(Publishing criteria)

The contributed papers shall be graded out of 10 for the following items, and the editorial committee shall comprehensively judge the advisability of publishing the papers, which are selected subject to the criteria that they contain one or more especially excellent items graded 7 or higher in average by all the peer reviewers, in consideration of the details of the individual comments. The peer reviewers are required not only to evaluate the respective items but also to encourage the improvement of the texts by providing concrete advice as required. The editorial committee shall provide advice for improvement as required based on the views of the peer reviewers.

1. Research papers and comments

1-1. Criteria for peer review by scientists/experts

1-1-1. (Scientific standard)

As the scientific standard, the description and details of research papers and comments shall meet the reliable reasonableness for the evaluation criteria for decision making by various stakeholders in communities. The scientific standard does not ask about scientific novelty or innovativeness. In addition, an attempt to transmit a value of activity by local stakeholders by translating into a universal science will be also welcome.

1-1-2. (Study design and accountability)

It is important that a study is designed so that it may be consistent with the structure of problems faced with the community, the community's sense of value, and the decision-making system in due light of the history, culture, and conventional knowledge technologies specific to the community. It shall be emphasized that a knowledge technology has been explored that is concretely applicable by community stakeholders in the actual condition of communities. A certain measure needs to have been taken to ensure that the study is conducted based on formation sharing and consensus with local stakeholders and that study results are shared with the local stakeholders in line with the publication of the study results on this journal.

1-1-3. (Summary for Stakeholders)

The "Summary for Stakeholders" needs to explain the study results in an easy to understand manner so as to so that it may help knowledge users in understanding, comprehension, and utilization. In addition, it is important that knowledge technologies, which can concretely contribute to the resolution of local environmental problems and the sustainable development, are described in a concise and obvious manner.

1-1-4. (Nature of knowledge technologies)

Information needs to be included that may contribute to the solving of problems by stakeholders such as information providing scientific grounds for judgment or decision making by local stakeholders, knowledge technologies usable on the scene of livelihood and industries, and social technologies conducive to the resolution of environmental problems and the construction of sustainable society.

1-1-5. (Uncertainty and scope of application)

Uncertainties and insufficient elucidation included in the study results need to be explained with definite consciousness. In addition, the scope of application of the study results need to have been explained, and consideration need to have been given to the possibility of generalization to different conditions.

1-2. Criteria for peer review by stakeholders (Summary for Stakeholders)

1-2-1. (Ease of understanding of description)

The "Summary for Stakeholders" needs to have been written in an easy to understand manner so that stakeholders less familiar with the special field may easily understand and apply the knowledge technologies without due professional knowledge.

1-2-2. (Persuasiveness and reasonability)

The details of knowledge technologies need to be logically explained with sufficient grounds in a persuasive manner with the conclusion and rolled out ideas likely to be understood by a wide variety of stakeholders.

1-2-3. (Effectiveness)

At least one idea or vision, which will serve as an activity guideline on the scene, or finding helpful to understand the actual condition of the local environment or society, or knowledge technology etc. applicable to concrete activities need to be proposed.

1-2-4. (Agreeableness and feasibility)

It shall be emphasized that the knowledge technology can be accepted and realized in the long run by stakeholders with different senses of values or interests, and that a tool or vision is shown that is helpful in decision making or consensus building.

1-2-5. (Insufficient elucidation, application limits)

Indefinite points and uncertain points shall have been explained with definite

consciousness, consideration needs to have been given to the scope that the study result is applicable, and the possibility of improper use of the knowledge technology.

2. Activity reports (common to expert/stakeholder peer reviewers)

2-1. (Creativity and originality)

It is important that limiting factors facing communities such as socioeconomic limitations, difficulties in use of natural resources, lack of human resources, diversity of values, and difficulties in consensus building have been accurately grasped and activities to overcome them have been rolled out. It is indispensable that the ideas and processes, methods and techniques applied there, and the activity results have been reported to provide findings, which may serve as reference for activities in various communities facing their own specific problems.

2-2. (Collaborations among various stakeholders)

It should be shown definitely that the study results have been achieved in collaborations among various stakeholders who participated in the study from their own perspectives. It is important that people with different standpoints and points of view are accepted and various views and ideas are adopted.

2-3. (Flexible activities without rigidification)

It should be definitely shown that various stakeholders promote activities by daringly adopting practically acceptable ideas and collaboratively feasible goals and methods with the mutual relations and differences between various actors in communities deeply understood without being bound by narrow perspectives and senses of values.

2-4. (Use and cultivation of human resources)

It is necessary that human resources in the community with various knowledge technologies useful in constructing a sustainable society, such as residential researchers in the community and translators in various positions, have been recruited and applied and that the aspect of human resource training has been adopted in the activities with a vision toward the cultivation of the next generations who will play the central role in the community in future.

2-5. (Recognition of limitations of activities and future issues)

It is necessary that not only what could be achieved in the reported activities but also problems left unsolved and new problems likely to occur in future have been explained with definite consciousness. In addition, it is important that future visions to overcome them have been proposed and that concrete problems to be considered continuously and activities to be implemented have been shown.

December 13, 2011

3-3-6. Residential research internship

The Residential Research Internship is positioned not as a field study for academic research but as an internship for career formation prepared for future residential researchers. The internship period is approximately one month as a standard and will be set in coordination with the receiving organization in accordance with the provisions of the internship program of the graduate school. The Local Science Network for Environment and Sustainability will coordinate the internship by intervening between applicants and the receiving organizations. The internship accepts applications throughout the year with the expectation that it will be conducted as a part of the internship program of graduate schools.

As of the end of the project, eight organizations have agreed to accept the Residential Research Internship as follows:

- “Echigo-Matsunoyama Museum of Natural Science, Tokamachi City” Tenei Village, Tokamachi City, Niigata Prefecture
- “EIMY Yumoto Regional Conference,” Fukushima Prefecture
- “School of Noto Studies, Kanazawa University,” Suzu City, Ishikawa Prefecture
- “Hachigoro's Tojima Wetland (Oriental White Stork Shicchi Net, Toyooka City),” Toyooka City, Hyogo Prefecture
- “Environment&Town Planning / Kamikatsu Satoyama Club,” Kamikatsu Town, Tokushima Prefecture
- “NPO Tosa No Mori Kyuentai,” Ino Town, Kochi Prefecture
- “Tsushima City Upper Prefecture Activation Center,” Tsushima City, Nagasaki Prefecture
- “WWF Coral Reef Conservation and Research,” Shiraho, Ishigaki City, Okinawa Prefecture

The internship program will cultivate human resources capable of supporting the resolution of environmental problems by stakeholders and the efforts on sustainable community development as residential researchers settled in the region by further expanding the receiving organizations and participating universities.

As a case showing the impact of the Residential Research Internship on the participating student and on the researcher at the receiving organization, the internship report of Mizuki Hosogai (Second Year, Masters Course Student, Majored in Environmental Management, Graduate School of Global Environmental Studies, Kyoto University) (receiving organization: Tsushima City Upper Prefecture Activation Center, internship period: July 19, 2012 - August 16, 2012) is shown below.

Internship Report

〈What I felt through the internship at Tsushima〉

I participated in the one-month internship with a chief objective of learning the attitude required for a residential researcher and the way how to interact with the community from Ms. Kimura, a biology scholar who has been engaged in community development at Tsushima since last year. What I could see in one month was only a rough overview of the community or only a part of the community. Partly because I was treated as a guest, what I could see must have been considerably limited.

Nonetheless, Tsushima was a very attractive place. Japanese mythical landscapes, historical breaths continuously succeeded from generation to generation since the ancient

times, energy of people who have lived in the nature with blessings of sea and mountains. I felt like Tsushima is an island where gods live that is supported by prayers of people living there.

I was struck by words what Ms. Kimura told me when we walked in the community of the Shitaru Area, Kamitushima Town, where she is based. She told me, "I thought that I will be able to do what I want to do as my lifework here." I could have an opportunity of looking back on what I can do and what I want to do as my lifework during my stay in Tsushima by experiencing the nature and culture of Tsushima and through the conversation with Ms. Kimura who is engaged in the activities there. Ms. Kimura was impressive to me so much so probably because she is a woman who is not much older than I. The meeting with Ms. Kimura, who is flexible yet powerful became my treasure.

Actually, before I came to Tsushima as an intern, I was expected to accumulate experience abroad for several years, because I wanted to be involved in developing countries in my career. The vision remains deep in my heart; however, now that I completely rely on the outside economy, I feel that my statement is too superficial. First of all, I wish to increase the areas in which I can procure food, clothing and shelter by myself. To that end, I need to master reasonable techniques and experience. I will form the foundation for several years from now on in Japan. After that, I wish I can be of some help in this community where I experienced the internship.

I have neither specific specialty, doctor's degree nor career as a researcher. In that regards, it is difficult for me to return my research results to the community and I cannot contribute to the community as a "researcher." If a residential researcher needs to have an academic background, I cannot be engaged in the activities as a residential "researcher" with my present competence. In the meantime, while Ms. Kimura is engaged in her activities with her skills cultivated as a researcher put into full use, her activity at site is not research. In that sense, I have not found the definition of residential researchers yet.



On the other hand, I could obtain a feeling in Tsushima that even an inexperienced young person like me may be able to do something in the position of an outsider. I wish to do what I can do now without overstretching myself while living in a community. I believe that I will realize the extent of what I can after I actually start activities in the community.

If I come to want to go on to the doctoral course after all to deepen my specialty in future, I am sure the experience and perspective that I accumulate during the activities in the

community will be useful. My destination may not be a residential“researcher” but something else. I honestly wish to make the utmost efforts to do what I can do step by step through I do not know how many years it will take me to achieve my goal.



I am supposed to start residential research in a community not in an urban region but in a local region. In that case, I came to find out as my own private problem that I will not die of hunger in rural areas but I must obtain earnings enough to pay my insurance premiums and pension. I will clear that issue first of all.

Lastly, I wish to express my heartfelt gratitude to the people in Tsushima City Upper Prefecture Activation Center, who kindly accepted me to the community, to the people in Tsushima City, who kindly accepted my interview, and to Ms. Kimura and the people in the Local Science Network for Environment and Sustainability and the people in JST-RISTEX Research & Development Project “Construction of a Pragmatic Scientist Community Contributing to Stakeholder-Driven Management of Local Environment,” who rendered me all the assistance out of their busy schedule. Thank you very much for giving me such a precious opportunity.





Comment from the attendant

Motoko Kimura (Tsushima City Upper Prefecture Activation Center)

〈Contents of intern activity〉

Ms. Hosogai, who decided to be received as an intern, wished to study the traditional apiculture in Tsushima because she had studied traditional apiculture technologies and related religions and culture. Accordingly, I decided to assign her an internship activity of organizing information likely to be required in future for the community development of Tsushima, so that the activity may also benefit the Ms. Hosogai's own apiculture study. In addition, I asked her to support my work with the objective of allowing her to know better about the actual condition of community development.

The contents of activities that Ms. Hosogai actually conducted as an intern are as shown below.

1. Organizing of the technical system relating to apiculture in Tsushima

Ms. Hosogai stayed at the residence of a beekeeper in Tsushima for about one week, and organized and summarized in a report the apiculture technologies; annual schedule; species, distribution, and transitions of bee plants; problems facing the apiculture in Tsushima; and so on. In addition, she presented the study results in front of the students in a summer seminar at the Tsushima Wildlife Conservation Center.

2. Organizing of rice planting system in Tsushima and its association with the habitat of Tsushima wildcat

The effects of agricultural chemicals on bees are highlighted on the nationwide basis. In order to grasp the situation in Tsushima, Ms. Hosogai made an actual hearing survey with several rice farmers based on the planting calendar produced by the JA to collect data on the agriculture chemicals applied and the spraying frequency. In addition, in order to investigate the condition of paddy field use by Tsushima wildcat, Ms. Hosogai collected data of automatic shooting cameras installed at forest roads in the vicinity of farm fields and organized the data.

3. Attendance to work shops

Ms. Hosogai attended the "Appropriate Use and Management of Biological Resources" workshop, which is implemented jointly with the Natural Environment Promotion Department according to my proposal to the city. She also attended a guidance by an instructor.

4. Assistance to the paddy field of Kimura

Apart from the intern activity, Ms. Hosogai helped my rice planting at my small rental paddy field for weeding, installation of animal fences, trapping, repair of water leakage, and so on.

〈New perspectives obtained through the reception of intern〉

I relocated to Tsushima, I was engaged in studies on sustainable society development from the biological standpoint as a researcher in evolutionary ecology. On the other hand, Ms. Hosogai has visited various regions not only in Japan but also in Nepal, Philippines, and Indonesia to observe communities from the "human" perspective with a background of anthropology. I think that the best achievement obtained from the recent internship of Ms. Hosogai was that we could observe the same object from two different perspectives. Ms. Hosogai emphasizes the "traditional knowledge" remaining in the community. The traditional knowledge is technologies and knowledge, which were produced before the globalization of information progressed, and is hence formed by including all the biological factors such as climate condition, soil condition, and biology, as well as disaster occurrence condition, history, and so on. What is best in one region is not always applicable to another region. On the contrary, there is no guarantee that globally "best" or "state-of-the-art" technologies exert a prospective effect in another region. Through the perspective of Ms. Hosogai, I understood the importance of recording such traditional knowledge before technologies and culture are unified due to excessive globalization of information. Biology and anthropology are very agreeable sciences in that meaning and should be collaborated more in the academic world too.

I felt that Ms. Hosogai was very excellent in the approach and technique to fit in a community probably because she has abundant experience of implementing activities in a overseas rural community by communicating with the local people. It may be briefly expressed as a high empirical value, but I felt that Ms. Hosogai has strengthened her "empirical value" not only because she has abundant and high quality experience but also because she has the ability to properly ingest the experience to use it as her skill and she is keen on experiencing. I learned a lot from her attitude.

〈Conclusion〉

One month may have been too short for the intern, but it was a very large profit for me that I could obtain a peer to share the same awareness of issues and dreams and to discuss together about them through the involvement of the intern in the community development of Tsushima. When I worked alone, I sometimes worried over "the feasibility of programs," "the appropriateness of directions," and so on. But I was encouraged by positive words of Ms. Hosogai such as "Interesting!," "Great!," "I wish to work together." I could regain my confidence and incentives, and came to have a concrete image of success. I was involved in this project as a receiving organization, but I was rather favored from this project in that

regard. I wish to express my appreciation to the Local Science Network for Environment and Sustainability and the JST-RISTEX Research & Development Project, "Construction of a Pragmatic Scientist Community Contributing to Stakeholder-driven Management of Local Environment," who provided me with such an opportunity.

3-4. Future perspectives for utilizing the major results and achievements

After the end of the research and development, the Local Science Network for Environment and Sustainability is expected to further activate its activities by functioning as the research base for the basic study project "Formation of Local Environmental Knowledge for Creation of New Commons and Sustainable Management" (project leader: Tetsu Sato, for five years since April 2012), which started at the Research Institute for Humanity and Nature in fiscal 2012, aims to elucidate how scientific researches ought to support the adaptive governance of ecosystem services by various stakeholders in communities and the mechanism of producing, distributing, and using the "local environmental knowledge" by a wide-ranging comparative study and meta-analysis from the perspective of knowledge users. Most of the case of production and use of knowledge by participants of the Local Science Network for Environment and Sustainability function as a site for case studies and social experiment in this project. In addition, the achievements of this research and development may be expanded to a global perspective by a global-scale comparative study including the previous study sites of the Research Institute for Humanity and Nature and the study results of various residential researchers in all over the world. Further, most members of the Local Science Network for Environment and Sustainability are expected to join the new project to analyze the scientific knowledge production from the perspective of community knowledge users. We believe that we can further expand new scientist communities, which promote the knowledge production supporting community-based problem resolution, through the use of the previous achievements of this research and development as important research base for new studies in such a manner.

3-5. Concluding remarks

There are residential researchers in communities all over Japan who fight a lone battle on researches for the resolution of problems relating to regional environment. If there is a network, which enables them to mutually exchange and to learn together with various cases of activities brought together, it must be a great help. In addition, if the collaboration between visiting researchers and residential researchers, who are willing to work on solving regional problems, can be promoted through the network, the community-based problem-solving researches will be able to be expanded throughout the scientist communities.

Local stakeholders must be able to learn the approach to make full use of scientists through the network. There must be great needs for fora for such interactions and learning. From such idea, we founded the Local Science Network for Environment and Sustainability in March 2010 with 41 founders. The network expanded smoothly with participation of 127

multidisciplinary members at the end of this project.

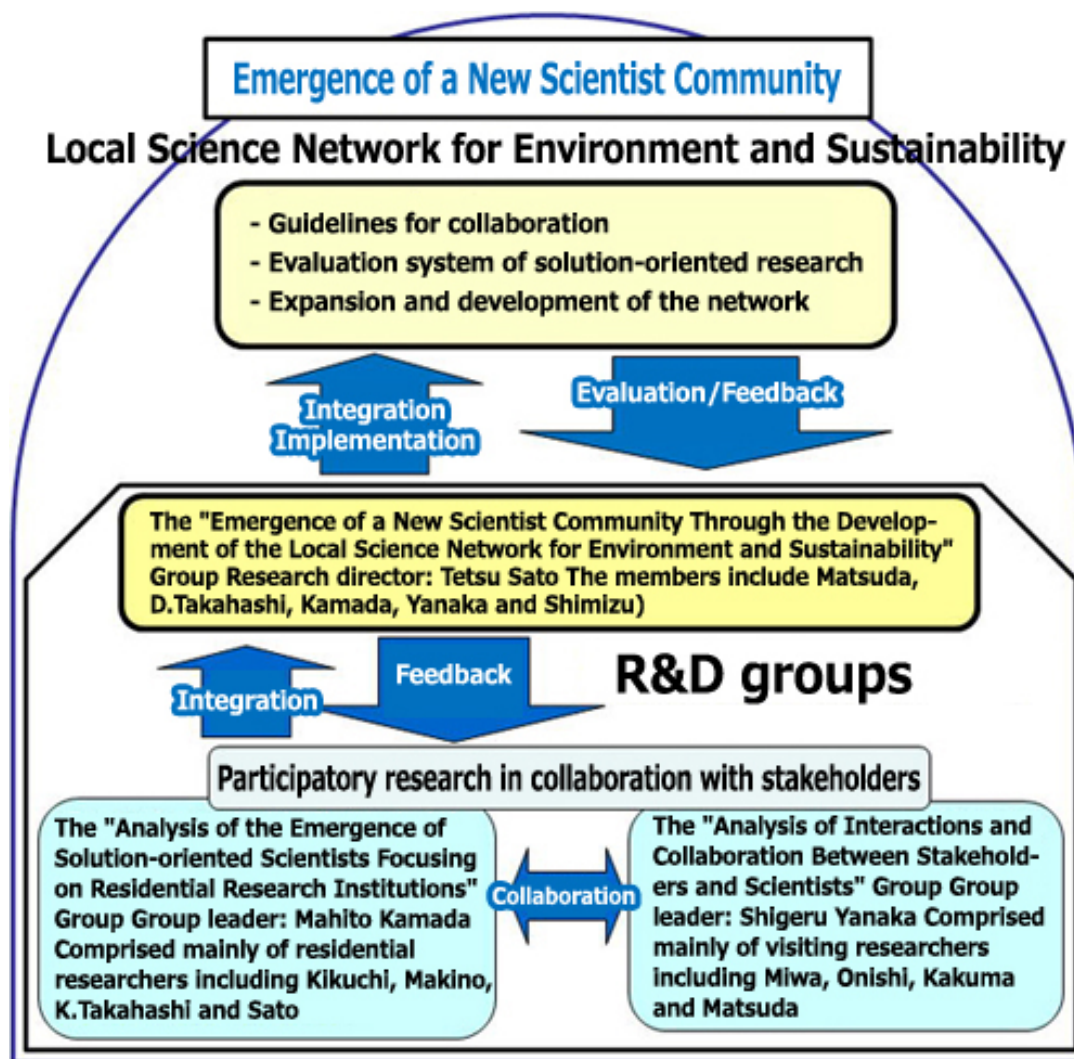
In the research and development process, we could see the appearance of many members evolving studies and activities using network resources in various ways. As a matter of course, the participants in this network are highly interested in studies and knowledge structures directly connected to the solution of difficult problems in communities in nature. Through the network activities, however, there occurred a process where many participants increase so-called “drawers” of knowledge useful for communities by expanding their perspectives of various knowledge technologies useful in addressing their regional problems in areas other than their own special fields or interests. The individual researchers and stakeholders evolved by acquiring various drawers so that they may take multifaceted and flexible measures on the scene of problem solutions. On the other hand, the Local Science Network for Environment and Sustainability served as a great incentive for young researchers and graduate students who aim to be engaged in residential research. In the “residential research internship,” which started in 2011 as a trial, three graduate students enjoyed internship of residential researches at community sites. This mechanism will lead to the cultivation of human resources, who can promote residential researches, by providing graduate school internship with a new option. On the basis of those achievements, the need came to emerge as a significant issue for further analysis on the way how the production and distribution of local environmental knowledge directly connected with the solutions of local environmental problems will promote the transformation of human decision making and behaviors and how it will lead to the resolution of environmental problems and construction of a sustainable society. toward the construction of adaptive governance to challenge the resolution of global environmental problems by bottom-up approach from communities with the production and distribution of knowledge as a nucleus, the basic study project “Formation of Local Environmental Knowledge for Creation of New Commons and Sustainable Management (Local Environmental Knowledge Project)” started at the Research Institute for Humanity and Nature in April 2012. The five-year project will pursue the way how the local environmental knowledge produced by residential researchers etc. will transform the human behaviors and realize the adaptive governance of communities through the process of being distributed between stakeholders and used for the resolution of problems. The international expansion of studies will be implemented on the basis of the various findings and human networks that the Local Science Network for Environment and Sustainability has accumulated so far.

In the Local Science Network for Environment and Sustainability, we could collect many cases where communities ingeniously incorporate and use international frameworks. From those cases, it was gradually revealed that the functions of various bilateral translators, who introduce global values and systems to communities and transmit the local environmental knowledge by transmitting it into universal knowledge, promote the dense distribution of knowledge between different layers. The Local Environmental Knowledge Project will elucidate the knowledge distribution and the knowledge base construction mechanism by those inter-layer translators will be elucidated to clarify the ideal adaptive governance that connects different layers. Through such efforts, we wish to depict the way of promoting a broad-based resolution of global environmental problems by the bottom-up approach from communities.

4. Implementation structure

4-1. Organizational structure

Research and development implementation organization



4-2. List of implementers the project

① "Transformation of Scientist Communities through the Formation of the Local Science Network for Environment and Sustainability" group

Name	Affiliation	Title	R&D implementation items in charge	Participation period
Tetsu Sato	Research Institute for Humanity and	Professor	Formation of Local Science Network for Environment and Sustainability / Guideline for	October 2008 - March 2013

	Nature		Collaboration, and Construction of Evaluation System	
Hiroyuki Matuda	Graduate School of Environment and Information Sciences, Yokohama National University	Professor	Formation of Local Science Network for Environment and Sustainability / Guideline for Collaboration, and Construction of Evaluation System	October 2008 - March 2013
Daisuke Takahashi	Faculty of Tourism and Environmental Studies, Nagano University	Professor	Formation of Local Science Network for Environment and Sustainability / Guideline for Collaboration, and Construction of Evaluation System	October 2008 - March 2013
Mayuko Shimizu	Faculty of Policy Science Ryukoku University	Lecturer	Formation of Local Science Network for Environment and Sustainability / Guideline for Collaboration, and Construction of Evaluation System	April 2009 - March 2013
Atsuko Fukushima	Research Institute for Humanity and Nature	Research supporter	Data collection / support for data reduction / support for fieldwork administration / support for outreach activities	October 2008 - March 2013

② “Actual Condition Survey on Transformation of Scientists Chiefly by Residential Research Institutions” group

Name	Affiliation	Title	R&D implementation items in charge	Participation period
Mahito Kamada	Department of Civil and Environmental Engineering, Socio-Techno Science Research Department, University of Tokushima Graduate	Professor	Regional universities as residential research institutions with Tokushima University as an example	October 2008 - March 2013

	School			
Ikeda Hiroshi (in memoriam)	Hyogo Prefectural Homeland for the Oriental White Stork	Professor	Study on the role of residential research institutions in efforts on nature regeneration and community regeneration in Toyooka City, Hyogo Prefecture	October 2008 - March 2010
Naoki Kikuchi	Institute of Natural and Environmental Science, University of Hyogo	Lecturer	Study on the role of residential research institutions in efforts on nature regeneration and community regeneration in Toyooka City, Hyogo Prefecture	October 2008 - March 2010
Atsushi Makino	Faculty of letters, Kumamoto University	Professor	Analysis of the approach to regional environments by residential museums with Shiga Prefectural Lake Biwa Museum as an example	October 2008 - March 2013
Kazuaki Takahashi	Faculty of Tourism and Environmental Studies, Nagano University	Associate Professor	Analysis of effective knowledge production methods through the construction of tool kit for Satoyama regeneration in Nagano University Reforestation Project	October 2008 - March 2013
Katsunobu Shirakawa	Geihoku Museum of Nature	Chief Curator	Formation of Local Science Network for Environment and Sustainability / Guideline for Collaboration, and Construction of Evaluation System	October 2008 - March 2013
Toshiaki Sawada	Environment and Town Planning, NPO Commons (Tokushima Prefecture)	Representative and director	Provision of findings relating to scientific researches by residential research institutions	October 2008 - March 2013
Mariko Sakamoto	Environment and Town Planning, NPO Commons (Tokushima Prefecture)	Research Supporter	Data collection / support for data reduction / support for fieldwork administration / support for outreach activities	October 2008 - March 2013
Atsushi	Regional	Division	Provision of findings relating	October 2008

Ueda	Strategy Promotion Division, Toyooka City Policy Coordination Department	Manager	to scientific researches by residential research institutions	-March 2013
Shigefumi Kanao	Lake Biwa Museum	Curator	Provision of findings relating to scientific researches by residential research institutions	October 2008 -March 2013
Tsunekazu Yamashiro	Committee for the Conservation of Shiraho Sea	Representative	Provision of findings relating to scientific researches by residential research institutions	October 2008 -March 2013
Masahito Kamimura	WWF Coral Reef Conservation Research Center, Committee for the Conservation of Shiraho Sea	Director, Director of Center	Participation in the construction of evaluation system for problem-solving researches in collaboration with stakeholders	April 2010 - March 2013

③ “Actual Condition Survey on Interactions and Collaborations between Stakeholders and Scientists” group

Name	Affiliation	Title	R&D implementation items in charge	Participation period
Shigeru Yanaka	Faculty of Regional Sciences, Tottori University	Associate Professor	Interactions among scientists, administration, and regional industries surrounding the life strategy of stakeholders and collaborations between various researchers, and the use of accumulated knowledge	October 2008 -March 2013
Nobuya Miwa	Faculty of International Studies, Osaka Gakuin University	Professor	Collaborations among various researchers surrounding civil surveys and the use of accumulated knowledge, and interactions among scientists, administration, and local industries surrounding the life	October 2008 -March 2013

			strategy of stakeholders	
Hideyuki Ohnishi	Faculty of Contemporary Social Studies, Doshisha Women's College of Liberal Arts	Associate Professor	Interactions and collaborations between stakeholders and scientists with the knowledge and techniques at the residential area as a nucleus	October 2008 -March 2013
Shinichiro Kakuma	Extension Office for Fishery, Okinawa Prefectural Government	Chief Officer	Actual condition survey on the knowledge production by administrative organs surrounding aquatic resources management and the interactions with stakeholders	October 2008 -March 2013
Yoshimi Higa	Onna Village Fisheries Cooperative Association	Councilor	Data collection / support for data reduction / support for fieldwork administration / support for outreach activities	October 2008 -March 2013
Kaoru Kakihana	Kerama Coastal Environment Conservation Association	Representative/Chairperson	Provision of findings relating to interactions and collaborations between stakeholders and scientists	October 2008 -March 2013
Yukari Handa	Amami Mammalogical Society	Representative	Provision of findings relating to interactions and collaborations between stakeholders and scientists	October 2008 -March 2013
Tadashi Yogi	Yaeyama Fisheries Cooperative Association	Youth Leader	Provision of findings relating to interactions and collaborations between stakeholders and scientists	October 2008 -March 2013

4-3. List of collaborators of the project

Name/Affiliation/Title (or Name of Organization)	Description of collaboration
Daisuke Akaishi, Suzu City Hall / Research Fellow for Society Co-existing with Nature,	Member of Local Science Network for Environment and Sustainability
Jun Akamine, Associate Professor, School of Humanities and Social Sciences, Nagoya City University	Member of Local Science Network for Environment and Sustainability
Tomoya Akimichi Emeritus Professor, Research	Member of Local Science Network for

Institute for Humanity and Nature	Environment and Sustainability
Shogo Arai, Director, Seaweed Research Co., Ltd.	Member of Local Science Network for Environment and Sustainability
Natsu Anahara, Nature guide of Miyake Island, Miyake Island Marine School Executive Committee	Member of Local Science Network for Environment and Sustainability
Ann MacDonald, Professor, Sophia University Graduate School of Global Environmental Studies	Member of Local Science Network for Environment and Sustainability
Minoru Igarashi, Principal, Nihon College of Natural Environment	Member of Local Science Network for Environment and Sustainability
Tsubasa Igarashi, Masters Course Student, Social Innovation Course, Doshisha University Graduate School of Policy and Management	Member of Local Science Network for Environment and Sustainability
Maki Komatsu (Ikegami), Coordinator, Hokkaido University Office for a Sustainable Campus	Member of Local Science Network for Environment and Sustainability
Hiromasa Igota, Associate professor, Faculty of Environment Systems, Rakuno Gakuen University	Member of Local Science Network for Environment and Sustainability
Hiroyuki Ida, Director of Yezo Deer Association	Member of Local Science Network for Environment and Sustainability
Miro Ichijo, In charge of awareness raising and community building at Tsushima Wildlife Conservation Center	Member of Local Science Network for Environment and Sustainability
Takanori Ohishi, Research Fellow, Center for African Area Studies, Kyoto University	Member of Local Science Network for Environment and Sustainability
Ikuko Inamori, Nature Conservation Association of Sonenji	Member of Local Science Network for Environment and Sustainability
Yusuke Iwasaki, Teacher, Fukushima Prefecture Aizu High School, <i>ELIMY</i> Yumoto Regional Conference	Member of Local Science Network for Environment and Sustainability
Atsushi Ueda, Manager, Regional Strategy Promotion Division, Toyooka City Policy Coordination Department	Member of Local Science Network for Environment and Sustainability
Kohei Ueda, Asago Forestry Promotion Center, Bureau for the Residents of Tajima Province, Hyogo	Member of Local Science Network for Environment and Sustainability
Shinobu Uchida, In charge of “One da Green da” project, (former) Nature Restoration Project of Hokkaido Kushiro Wetland, Hokkaido Environment Foundation	Member of Local Science Network for Environment and Sustainability
Hiroki Oikawa, Associate Professor, Graduate School of Environment and Information Science, Yokohama National University	Member of Local Science Network for Environment and Sustainability

Itaru Ohta, Okinawa Prefectural Fisheries and Ocean Research Center	Member of Local Science Network for Environment and Sustainability
Yoko Ohta, Western Japan Grassland Research Group Western Japan Grassland Research Group	Member of Local Science Network for Environment and Sustainability
Ohtani Ryu, the National Institute of Advanced Industrial Science and Technology	Member of Local Science Network for Environment and Sustainability
Takahiro Okano, Special-appointed Associate Professor, Kagoshima University Education Center	Member of Local Science Network for Environment and Sustainability
Yukino Ochiai, Associate Professor, The Kagoshima University Museum	Member of Local Science Network for Environment and Sustainability
Kunihiro Otonari, Representative, Tancho Community (Japanese crane community)	Member of Local Science Network for Environment and Sustainability
Takenobu Kakinohana , President of 21 Zamami Co., Ltd, former chairperson of Kerama Environmental Conference of Nature Conservation, former chairperson of Zamami Chamber of Commerce	Member of Local Science Network for Environment and Sustainability
Koichi Kaji, Professor, The Graduate School of Agriculture, Tokyo University of Agriculture and Technology	Member of Local Science Network for Environment and Sustainability
Hiroyuki Kajihara, Director, Aso Tanibito Ecomusée	Member of Local Science Network for Environment and Sustainability
Naoki Kachi, Professor, Graduate School of Science & Engineering, Tokyo Metropolitan University/Chairperson, Ogasawara Research Committee/Representative, Consortium for the Interdisciplinary Study of Human and Nature Symbiosis in Island Systems	Member of Local Science Network for Environment and Sustainability
Masaru Kanda, Director of NPO Kuroshio Jikkan Center, visiting associate professor at Kochi University	Member of Local Science Network for Environment and Sustainability
Kenji Kitamura, Specialist, National Institute for Environmental Studies Planning Department	Member of Local Science Network for Environment and Sustainability
Motoko Kimura, Research fellow, One of Tsushima Rangers in charge of conservation of biological diversity	Member of Local Science Network for Environment and Sustainability
Tatsuya Kinjo, Doctoral Course, Hokkaido University Graduate School of Letters	Member of Local Science Network for Environment and Sustainability
Hirofumi Kubo, Okinawa Prefectural Fisheries and Ocean Research Center	Member of Local Science Network for Environment and Sustainability
Takashi Kume, Associate professor, Faculty of Agriculture, Ehime University	Member of Local Science Network for Environment and Sustainability

Koichiro Kuraji, Co-representative of Researchers Group of Yahagi River Watershed Forests, Director/associate professor of Ecohydrology Research Institute, The University of Tokyo Forests, University of Tokyo	Member of Local Science Network for Environment and Sustainability
Noboru Kuramoto, Professor, School of Agriculture, Meiji University	Member of Local Science Network for Environment and Sustainability
Shigeharu Kogushi, Representative, Green Front Research Institute Co.	Member of Local Science Network for Environment and Sustainability
Hideki Kobayashi, Pal System Consumers' Cooperative Union	Member of Local Science Network for Environment and Sustainability
Seiji Kondo, Professor, Research Faculty of Agriculture Hokkaido University, Field Science Center for Northern Biosphere, Chairperson of Yezo Deer Association and Hokkaido Native Horse reservation Association	Member of Local Science Network for Environment and Sustainability
Akiko Sakai, Associate professor, Graduate School of Environment and Information Science, Yokohama National University Vice-chairperson and in charge of administration office, Japanese Coordinating Committee for MAB	Member of Local Science Network for Environment and Sustainability
Rho Sakurai, Technical assistance member, Graduate School of Environment and Information Science, Yokohama National University	Member of Local Science Network for Environment and Sustainability
Takanori Sato, Research Fellow, Palau International Coral Reef Center	Member of Local Science Network for Environment and Sustainability
Shikikobo Co., Ltd., President, Nozaki Susumu (corporate member)	Member of Local Science Network for Environment and Sustainability
Asami Shikida, Professor, Hokkaido University Center for Advanced Tourism Studies	Member of Local Science Network for Environment and Sustainability
Motoko Shimagami, Vice Representative, i-i-network, Research & Action for Community Governance / Visiting researcher, Research Institute for Humanity and Nature	Member of Local Science Network for Environment and Sustainability
Miki Shimizu, In charge of "One da Green da" project, Nature Restoration Project of Hokkaido Kushiro Wetland, Hokkaido Environment Foundation	Member of Local Science Network for Environment and Sustainability
Hiroko Shinkai, Environmental Partnership Office Chubu (EPO Chubu), Ministry of the Environment	Member of Local Science Network for Environment and Sustainability
Yutaka Suga, Professor, Institute for Advanced	Member of Local Science Network for

Studies on Asia, The University of Tokyo	Environment and Sustainability
Toko Suzaki, Co-representative of the Researchers Group of Yahagi River Watershed Forests, Chief researcher at Toyota Yahagi River Institute	Member of Local Science Network for Environment and Sustainability
Katsuya, Suzuki, Institute of Natural and Environmental Sciences, University of Hyogo, Assistant Professor for the Wildlife Management Research Center, Hyogo	Member of Local Science Network for Environment and Sustainability
Masatsugu Suzuki, Professor, Faculty of Applied Biological Sciences, Gifu University	Member of Local Science Network for Environment and Sustainability
Akiko Sudo, Senior managing director, Eaglet Office Inc.	Member of Local Science Network for Environment and Sustainability
Hiroaki Sono, Representative, Environmental Network Amami	Member of Local Science Network for Environment and Sustainability
Hiroyuki Tanouchi, Shikoku Research Center, Forestry and Forest Products Research Institute	Member of Local Science Network for Environment and Sustainability
Toshimori Takahashi, Satoyama Science Research Center, Faculty of Agriculture, Utsunomiya University	Member of Local Science Network for Environment and Sustainability
Amane Takeuchi, Executive Director, Igeta Takeuchi Co., Ltd	Member of Local Science Network for Environment and Sustainability
Hiroki Taniguchi, Research Fellow, Akajima Marine Science Laboratory	Member of Local Science Network for Environment and Sustainability
Toshiyuki Tsuchiya, Professor, Graduate School of Agriculture, Tokyo University of Agriculture and Technology	Member of Local Science Network for Environment and Sustainability
Kenshi Tetsuka, Chairperson, Yakushima Biodiversity Conservation Council	Member of Local Science Network for Environment and Sustainability
Akira Terabayashi, Research Fellow, Norinchukin Research Institute Co., Ltd. Doctoral Course, Hokkaido University Graduate School of Letters	Member of Local Science Network for Environment and Sustainability
Sadayoshi Tohbai, Office chief, WWF Japan Nature Conservation Office	Member of Local Science Network for Environment and Sustainability
Toi Akiko, Professor, Faculty of Environment Systems, Rakuno Gakuen University	Member of Local Science Network for Environment and Sustainability
Hiromi Tokusho, Representative, Wakasa Mori no Kai	Member of Local Science Network for Environment and Sustainability
Sho Tomita (Hoshi), Senior Researcher, Council of Energy in My Yard, Japan (<i>EIMY</i>), <i>EIMY</i> Yumoto Regional Conference	Member of Local Science Network for Environment and Sustainability

Ryoto Tomita, Assistant Professor, Faculty of Agriculture, Shizuoka University	Member of Local Science Network for Environment and Sustainability
Chigusa Nakagawa, Project Researchers, Research Institute for Humanity and Nature	Member of Local Science Network for Environment and Sustainability
Kenzo Nakajima, Director, NPO Tosa no Mori Kyuentai	Member of Local Science Network for Environment and Sustainability
Masahiro Nagano, Lecturer, Environment field, Faculty of Education and Welfare Science, Oita University	Member of Local Science Network for Environment and Sustainability
Koji Nakamura, Professor, Institute of Nature and Environmental Technology, Kanazawa University	Member of Local Science Network for Environment and Sustainability
Chie Natsume, Mahae Co., Ltd.	Member of Local Science Network for Environment and Sustainability
Naoko Namizaki, Coral Reef Science Administration Office, National Institute for Environmental Studies	Member of Local Science Network for Environment and Sustainability
Hiroaki Niitsuma, Professor Emeritus, Tohoku University Director, Council of Energy in My Yard, Japan (<i>EIMY</i>)	Member of Local Science Network for Environment and Sustainability
Nobuko Nishizaki, Associate Professor, Faculty of Administration and Social Sciences, Fukushima University	Member of Local Science Network for Environment and Sustainability
Hikaru Nishino, Representative, Eelgrass Support (Amamo Supporters)	Member of Local Science Network for Environment and Sustainability
Katsuhiro Nishimori, Shiga Prefectural Fisheries Experimental Station	Member of Local Science Network for Environment and Sustainability
Sakiko Ninomiya, Research Fellow, The Institute of Basic Environmental Research, Environmental Control Center Co., Ltd.	Member of Local Science Network for Environment and Sustainability
Kenji Niwa, Representative, Yahagi River Forest Health Check Committee	Member of Local Science Network for Environment and Sustainability
Shinya Numata, Associate Professor, Department of Tourism Science, Graduate School of Urban Environmental Sciences, Tokyo Metropolitan University	Member of Local Science Network for Environment and Sustainability
Sayoko Hata, Representative, Kayanezumi Network Japan Visiting Researcher, Center for Spatial Information Science, University of Tokyo	Member of Local Science Network for Environment and Sustainability
Takeo Horiguchi, Associate professor, Hokkaido University School of Law (Faculty of Public Policy)	Member of Local Science Network for Environment and Sustainability

Hitoko Fujisawa, researcher in the Research Institute for Humanity and Nature project	Member of Local Science Network for Environment and Sustainability
Mayumi Fukunaga, Associate Professor, Research Organization for the 21st Century, Osaka Prefecture University	Member of Local Science Network for Environment and Sustainability
Mizuki Hosogai, Masters Course Student, Majored in Environmental Management, Graduate School of Global Environmental Studies, Kyoto University	Member of Local Science Network for Environment and Sustainability
Yasunori Maezono, Environmental Conservation Coordinator, Katsuyama City/part-time lecturer, Toho University Faculty of Science	Member of Local Science Network for Environment and Sustainability
Mitsutaku Makino, Group Leader, National Research Institute of Fisheries Science, Fisheries Research Agency	Member of Local Science Network for Environment and Sustainability
Yasushi Masuda, Director general, Shiretoko Nature Foundation	Member of Local Science Network for Environment and Sustainability
Takahiro Mano, Chief Researcher, Toyota Yahagi River Institute	Member of Local Science Network for Environment and Sustainability
Yasushi Maruyama, Associate professor, Graduate School of Environmental Studies, Nagoya University	Member of Local Science Network for Environment and Sustainability
Koichi Mikami, Research Fellow, National Institute for Agro-Environmental Sciences	Member of Local Science Network for Environment and Sustainability
Hiromune Mitsuhashi, Institute of Natural and Environmental Science, University of Hyogo, Lecturer for the Museum of Nature and Human Activities, Hyogo	Member of Local Science Network for Environment and Sustainability
Takuya Mineta, In charge of Resource Evaluation, Rural Infrastructure Research Field, National Institute for Rural Engineering, National Agriculture and Food Research Organization	Member of Local Science Network for Environment and Sustainability
Taisuke Miyauchi, Professor, Hokkaido University Graduate School of Letters	Member of Local Science Network for Environment and Sustainability
Yasuda Akito, Research Fellowship for Young Scientists (postdocs), Japan Society for the Promotion of Science/Postdoctoral Research Fellow, The University of Tokyo	Member of Local Science Network for Environment and Sustainability
Tetsuo Yanagi, Professor, Research Institute for Applied Mechanics, Kyushu University	Member of Local Science Network for Environment and Sustainability
Yasuo Yamakawa, NPO Kunigami Tourism Association Director of Board	Member of Local Science Network for Environment and Sustainability
Gen Yamakoshi, Associate Professor, Graduate	Member of Local Science Network for

School of Asian and African Area Studies, Kyoto University	Environment and Sustainability
Kaoru Yamasuga	Member of Local Science Network for Environment and Sustainability
Hiroya Yamano, Chief Researcher, National Institute for Environmental Studies	Member of Local Science Network for Environment and Sustainability
Atsushi Yamaba, Forestry Technology Center, Hiroshima Prefectural Technology Research Institute	Member of Local Science Network for Environment and Sustainability
Shinji Yamamoto, Associate Professor, Field Science Center, Faculty of Agriculture, Iwate University	Member of Local Science Network for Environment and Sustainability
Shinji Yamamoto, Board Member, Pal System Consumers' Cooperative Union	Member of Local Science Network for Environment and Sustainability
Takakazu Yumoto, Professor, Primate Research Institute, Kyoto University	Member of Local Science Network for Environment and Sustainability
Masako Watanabe, Environment Division, Regional Collaborative Center for Science and Technology, Anan National College of Technology	Member of Local Science Network for Environment and Sustainability

5. Dissemination of results and achievements

5-1. Dissemination of information and outreach activities

Date	Name	Venue	Number of participants	Summary
November 14 to 16, 2008	The 1st Field Workshop	Nagano University	20	At the launch of the project, the 1st Field Workshop was held to share an overview of the project, future agenda, , and the R&D roadmap with the participants. We also had an in-depth discussion about research styles suitable for working out solutions to specific problems with Nagano University's Restoration of Satoyama Forest Project and other projects as case examples.
July 10 to	The 2nd Field	Kamikatsu	25	The 2nd field workshop was held

12, 2009	Workshop	Town, Tokushima Prefecture, and Tokushima University		jointly with stakeholders of Kamikatsu Town. Analysis was made on the actual condition between various stakeholders and researchers and on the network structure required to conduct collaborations while maintaining the difference in views and visions. The importance of network activities in communities and the importance of the role to be played by hub human resources in forming, maintaining, and developing networks were revealed.
August 5 to 8, 2009	The 3rd Field Workshop	Naha City / Ishigaki City, Okinawa Prefecture	40	At the 3rd field workshop, joint workshops and discussions were made with stakeholders of the Aquatic Resources Management and the Shiraho Sustainable Community Development. It was revealed through the analysis of the roles, which had been played by WWF Coral Reef Conservation and Research and other residential research institutions such as Akajima Marine Science Laboratory (AMSL), that residential researchers and experts, who reside in communities, play a function of a catalyst that promotes dynamic changes of communities.
February 28 to March 1, 2010	The 2 nd Extended Group Leader Meeting & Brainstorming	Hotel in Tokyo and RISTEX	20	The group leader meeting and brain storming was held with actors in various regions, who newly participated in the Local Science Network for Environment and Sustainability as founders, invited to discuss about the ideal and vision of the Local Science Network for Environment and Sustainability. Diversity emerged

				beyond imagination in the ideal of knowledge production for regional environment.
June 19 to 20, 2010	Amami Workshop	Amami City Museum	14	Opinions were exchanged on expectations and complaints in scientists and contributions of scientists with various stakeholders invited who were involved in regional environmental conservation and knowledge production in Amami region.
September 18 to 19, 2010	Symposium to Commemorate the Establishment of Local Science Network for Environment and Sustainability “The Search for Science That is Useful in Environmental Conservation and the Sustainable Development of Local Communities”	Osaka Gakuin University	100	In commemoration of the establishment of the Local Science Network for Environment and Sustainability, the vision and significance of the network were introduced to many people and discussion was made on the Guideline for Collaboration, Participatory Evaluation of Local Science.
February 5 to 6, 2011	Open Symposium “Local Revitalization through Restoration Nature—from the perspectives of the Economy and Culture”	Toyooka Citizens’ Hall	60	The symposium was held at Toyooka City, Hyogo Prefecture, a city known for advanced community regeneration activities through nature regeneration, with actors of various activities invited such as Nijibetsu Korokamui-kai and NPO Tosa no Mori Kyuentai.
July 3, 2011	Open Symposium “Toward Local	Kumamoto University	47	The applicability and problems of international systems and frameworks for voluntary

	Communities utilizing the International System”			sustainable community development by people living in communities based on better understanding of their regional nature and culture were discussed in light of cases in various areas of Japan such as Aso region.
October 16, 2011	Open Symposium “Local Environmental Studies on Creating Satoumi”	Yoshio-so (Naha City)	66	Seas where biodiversity and productivity can be increased by human intervention are called Satoumi. This symposium discussed the problems in “Creation of Sato-umi” activities deeply connected with life with those who are involved in production, distribution, and policy implementation from the perspective of how the brilliant relations with seas can be recovered by human intervention.
January 28, 2011	Open Symposium “From a local community to the rest of the world—mechanism for bonding local communities to the world from a Shiretoko world heritage point of view”	Shari Town, Shari-gun, Hokkaido	30	This symposium discussed the mechanism of using international systems such as world heritage for the construction of a sustainable society in harmony with rich natural environment and the mechanism to apply various knowledge cultivated in communities to international scenes in light of the Shiretoko world heritage and examples of activities in various parts of the world.
September 16, 2012	Open Symposium “The Pursuit of Science for Use in Local Communities The Past, Present, and Future of LSNES”	Kyoto City	70	At this symposium, the activities of the Local Science Network for Environment and Sustainability were reviewed, activity reports were made by young researchers, who will bear the regional environmental study in future, and future perspectives were discussed in light of the evaluation by guests invited from

				abroad.
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① Books, DVD, etc.

‘Mita Hyouron’ November 2010 edition: Discussion meeting “Special topic What is biodiversity?: Relations between biodiversity and our life” C. W. Niccole, Naoya Furuta, Tetsu Sato, Ayumi Onuma)

‘SEEDer’ No.3 (Showado) 2010 “Challenge of the “Local Science Network for Environment and Sustainability” Tetsu Sato

② Cons4truction of websites

Construction of a Pragmatic Scientist Community Contributing to Stakeholder-Driven Management of Local Environment

<http://localsci.org/index.html> (revised and relocated on July 12, 2008)

Local Science Network for Environment and Sustainability

<http://lsnes.org/index.html> (revised and relocated on July 12, 2012)

Construction of a Pragmatic Scientist Community Contributing to Stakeholder-driven Management of Local Environment

<http://localsci.org/jst2en/index.html> (Relocated on July 12, 2012)

Local Science Network for Environment and Sustainability

<http://lsnes.org/english/index.html> (September 26, 2012)

Future of Local Community and Nature (web journal)

<http://oths.biz/future/> (February 7, 2012)

③ Invited lecture

Tetsu Sato

October 31, 2009 Hyogo Prefectural Homeland for the Oriental White Stork 10th anniversary memorial symposium (panelist)“Community Development Enabling Coexistence Between Man and Nature" Toyooka City, Hyogo Prefecture

November 29, 2009 1st Symposium of Integrated Studies on NOTO Peninsula “What We Expect from Satoyama-satoumi Activities" Suzu City, Ishikawa Prefecture

January 30, 2010 “Residential Research Institutions Support Regional Activities—Activities in Ishigakijima Shiraho and Local Science Network for Environment and Sustainability" Suntory Foundation Symposium “Environmental Conservation and Decision Making in

Okinawa—Relations between Human Movement and Environment/Culture" Naha City, Okinawa Prefecture

June 23, 2010 Review on Regionalogy, Tottori University Part 2: lecture “What is the Local Science Network for Environment and Sustainability?...Collaboration between Scientists and Stakeholders in Conservation of Regional Environment" Tottori City, Tottori Prefecture

August 24, 2010 Japan Science and Technology Agency / Research Institute of Science and Technology for Society “Interactions between Science, Technology and Society" program, 3rd international symposium “Science in Society - a challenge in Japan": Panelist “Construction of a Pragmatic Scientist Community Contributing to Stakeholder-driven Management of Local Environment" Tokyo Metropolitan Government

December 6, 2010 13th Japan Coral Reef Society Meeting, Coral Reef Conservation Committee: “Toward the Collaboration between Scientists and Stakeholders...What the Local Science Network for Environment and Sustainability aims," Tsukuba City, Ibaraki Prefecture

December 11, 2010 Lake Biwa Museum Forum—What Was the Citizens' Participatory Biological Research—Results, Meaning, and Problems: “Meaning and Problems of Participatory Research—from the Perspective of Community Development," Kusatsu City, Shiga Prefecture

March 11, 2011 Lecture Meeting, Kawanishi Satoyama/Mizube Wo Tsunagu Kai (Ueda City, Nagano Prefecture): “For development of community coexisting with nature in Satoyama and water front--Introduction of the Activities of the Local Science Network for Environment and Sustainability and Cases in Various Parts of Japan", Ueda City, Nagano Prefecture

March 28, 2011 Workshop, Center for Integrated Area Studies, Kyoto University, Trends and Problems of Policies over Global Environmental Problems—Pursuit of Harmony with Communities: “Possibility and Problems of the Concept of Ecosystem Services—Over the Activities of the Local Science Network for Environment and Sustainability toward the Collaboration between Sciences and Communities" Kyoto City, Kyoto Prefecture

April 12, 2011 Niigata University Extra-regional Ibis Project, Nature Regeneration Science Seminar“Toward the Construction of Sustainable Communities through Nature Regeneration: What the Local Science Network for Environment and Sustainability Aims" Niigata City, Niigata Prefecture

May 28, 2011 Hyogo Prefectural Homeland for the Oriental White Stork Symposium “Transmit the Contrivances of Community Development to the World: Geopark and Oriental White Stork, and Return of Hachigoro" panelist, Toyooka City, Hyogo Prefecture

July 22, 2011 SATREPS Workshop “Man and Nature Coexistence Strategy in Tropical Region" keynote lecture“Ecosystem Services and Sustainable Development of Communities: From Japan and Africa" Kyoto City, Kyoto Prefecture

August 4, 2011 Symposium, Research Institute of Science and Technology for Society, Japan Science and Technology Agency From the Reconstruction from Earthquake Disaster to the Development of “vigorous towns and communities” — social technologies to extract the regional “potentials”: “Long-term Reconstruction Support for Disaster-stricken Area” Sendai City, Miyagi Prefecture

September 17, 2011 Hyogo Prefectural Homeland for the Oriental, Community Development Seminar for Coexistence with White Stork Round 1: “sciences useful in communities—What the Local Science Network for Environment and Sustainability Aims—” Toyooka City, Hyogo Prefecture

September 30, 2011 Graduate school of Rakuno Gakuen University, special lecture on living together with nature : “Pursuit of Sciences Useful in Communities—Roles of Experts Shown in Cases of Local Science Network for Environment and Sustainability” Ebetsu City, Hokkaido

October 21, 2011 Seminar, Cybermedia Center Osaka University: “Dynamism of Stakeholder Network through the Production and Distribution of Local Environmental Knowledge” Suita City, Osaka Prefecture

November 17, 2011 38th Hokkaido Biological Mathematics seminar, Graduate School of Environmental Science, Hokkaido university: “Social Decision Making and Adaptive Governance Based on Production and Distribution of Local Environmental Knowledge” Sapporo City, Hokkaido

December 7, 2011 National University of Singapore NUS and JST Joint Workshop “Climate Change, Disaster Management, & Urban Sustainability STS Approaches to Three Asian Challenges” : ” Residential Research and Integrated Local Knowledge Supporting Community-based Adaptive Governance” Singapore

December 10, 2011 Tokyo University of Agriculture and Technology Symposium, Study on Wildlife Management for Sustainable Community-Ideal Governance-“Network for Ecosystem Management and Sustainable Community Development” Fuchu City, Tokyo

Mahito Kamada

November 19, 2011 Hyogo Prefectural Homeland for the Oriental White Stork Community Development Seminar for Coexistence with White Stork Round 3: “How to Make the Most of Regional Resources” Toyooka City, Hyogo Prefecture

Hiroyuki Matsuda

June 18, 2011 Yokohama National University Ecological Risk COE Symposium Ecosystem and Man—Future of Satoyama and Satoumi Charted with the Community: “Shiretoko World Heritage Sea Area Management Plan and Local Science Network for Environment and Sustainability” Yokohama City, Kanagawa Prefecture

Mayuko Shimizu

March 21, 2012 Korea Regional Foundation 8th Anniversary Symposium Actor for Collaboration and Solidarity—Vision of New Cooperative: “Sustainable Development and Human Resource Training in Farming Village in Japan” Seoul, Korea

5-2. Publications

(National journal: 1, global journal: 0)

Author, name of published papers, name of journal, volume, issue, publication year

Tetsu Sato “Face the Nature from the Perspective of Community: Interactions between Folk Knowledge and Sciences” `BIOSTORY'15: 64-67, 2011

5-3. Oral Presentations

(1) Invited lecture (National conference: 3 times, international conference: 0)

Presenter (affiliation), title, name of conference, venue, date, etc.

Tetsu Sato (Nagano University) “Why Biodiversity Should Be Protected?: Ecosystem Services and Society,” Joint Symposium (Panelist) held by three major environmental academic societies (Japanese Society for Environmental Sociology, Japan Association for Environmental Law and Policy, Society for Environmental Economics and Policy Studies): June 28, 2009

Hiroyuki Matsuda (Yokohama National University) How Can We Realize the Aichi Target—achievements and problems of COP10—Open Symposium “Landscape Ecology to Protect Biodiversity - Toward the Achievement of Aichi Target” Japan Association for Landscape Ecology, Tokyo University of Information Sciences June 25, 2011

Mahito Kamada (Tokushima University): Biodiversity Protection by Collaboration of Different Actors—From Activities of the Local Science Network for Environment and Sustainability—Open Symposium “Landscape Ecology to Protect Biodiversity—Open Symposium “Landscape Ecology to Protect Biodiversity - Toward the Achievement of Aichi Target” Japan Association for Landscape Ecology, Tokyo University of Information Sciences June 25, 2011

(2) Verbal presentation (National conference: 1, international conference: 0)

*Other than (1)

Presenter (affiliation), title, name of conference, venue, date, etc.

Sato T, Takahashi K, Takahashi D, Mikami K, Ando H “**Regeneration of Satoyama Ecosystem Services as an Educational Resource**”, URBIO2010: Urban biodiversity & Design, Nagoya, Japan, May 2010.

- ④ Poster presentation (6 time at domestic meeting, 4 time at international meeting)

Presenter (affiliation), title, name of conference, venue, date, etc.

Shimizu, M and T. Sato “Practices of local science for regeneration of ecosystem services in networks of experts and stakeholders”, URBIO2010: Urban biodiversity & Design, Nagoya, Japan, May 2010.

Takahashi D, Ide Y, Takahashi K, Mikami K, Ando H, Sato T “**Effects of small reservoir pond on improvement of Satoyama biodiversity and ecosystem services**”, URBIO2010: Urban biodiversity & Design, Nagoya, Japan, May 2010.

Takahashi K, Takahashi D, Mikami K, Ando H, Sato T “Environmental Education curriculum for Regeneration and Use of Satoyama Ecosystem Services”, URBIO2010: Urban biodiversity & Design, Nagoya, Japan, May 2010.

Mikami K, Takahashi K, Takahashi D, Ando H, Sato T “**Environmental Monitoring Using a Sensor Network System in an Attempt of Regenerating Satoyama Ecosystem Services**”, URBIO2010: Urban biodiversity & Design, Nagoya, Japan, May 2010.

Mai Ohnishi, Shion Takemura, Masahiro Kamimura, Katsunobu Shirakawa, Mahito Kamada (Tokushima University etc.): Process Management Toward the Collaborative Management of Natural Resources Found in Cases of Shiraho and Geihoku, Japan Association for Landscape Ecology, Tokyo University of Information Sciences June 25, 2011

Shion Takemura, Mai Ohnishi¹), Katsunobu Shirakawa²), Mahito Kamada (Tokushima University etc.): Network Design for Collaboration Toward the Management of Natural Resources Found in the Case of Geihoku, Japan Association for Landscape Ecology, Tokyo University of Information Sciences June 25, 2011

5-4. Press reports, contributions and awards

(1) Press reports/contributions

Yaeyama Mainichi Shimbun, morning edition dated September 7, 2009 “Opinion Exchanges for Shiraho Community Development between Experts from Japan Science and Technology Agency and citizens, Return Study Results to Community”

Yaeyama Nippo, Morning Edition dated September 7, 2009 “JST call for establishment of a network for environmental conservation researchers at Ishigakijima Workshop

Amami Shimbun, Morning Edition dated June 20, 2010 “community-based utilization of “knowledge””

Sankei Shimbun Kansai edition dated September 1, 2010 “Local Science Network for Environment and Sustainability Foundation Symposium “Pursuit of Sciences Useful for Environmental Conservation and Sustainable Development of Communities”

Kumamoto Nichinichi Shimbun dated July 4, 2011 “Use of World Heritage System, symposium held in Kumamoto University, Report on Activities of Aso”

Ryukyu Shimpo dated October 12 (contribution) “For generation of ‘Satoumi’ – Greeting for Symposium” Tetsu Sato

Okinawa Times dated October 13, 2011 (Contribution) “Toward the generation of ‘Satoumi’— activities of Onna-son Fisheries Cooperative” by Shigeru Yanaka

(2) Awards

No special awards

5-5. Patent applications

No patent application

■BIBLIOGRAPHY■

Sato, T. Makimoto, N. Mwafulirwa, D. Mizoiri, S. 2008. Unforced control of fishing activities as a result of coexistence with underwater protected areas in Lake Malawi National Park, East Africa. *Tropics* 17 (4):335-342.

Tetsu Sato. 2008. Wildlife and Communities as Environmental Icons—Iconizing Process and Roles of Sciences in Ecosystem Services. Japanese Association for Environmental Sociology 14: 70-85

Tetsu Sato. 2009. Environmental Sociology of Semi-cultivation—Future Relationship of Man and Nature edited by Taisuke Miyauchi, “Semi-cultivation and Ecosystem Services—What We Obtain from The nature” Showado. pp22-44.

Tetsu Sato. 2009. Residential research institutions in communities—Linkage between Indigenous Knowledge System and Scientific Knowledge— Edited by Syuichi Kito, “environmental ethics”. The University of Tokyo press. pp221-226.

Tetsu Sato "Face the Nature from the Perspective of Community: Interactions between Folk Knowledge and Sciences" `BIOSTORY'15: 64-67, 2011