Environmental Research with Citizen Participation: a Tool for Creating a Cooperative Relationship between Science and Local Knowledge

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Abstract

The aim of this paper is to discuss the difference between nature conservation and nature restoration as well as the possibility of Environmental research with citizen participation.

Compared with nature conservation, nature restoration has an expanded domain, techniques, and strategy. These differences make the process of social consensus building more complicated. The technique of adaptive management tries to address this problem and to introduce a method to enhance collaboration between science and local knowledge.

However, when we consider the pluralistic and fluid character of the values that are prevalent in society, it appears necessary to pay more attention to the dynamism of values between man and nature. In order to find this “human-nature relation,” Japanese citizens have started participating in projects which collect not only biological and ecological data, but also sociological information. Some of these data are used for consensus building for nature conservation and restoration, tourism, the compilation of hazard maps and various other local activities.

Thus participatory research explores in-depth the local characteristics of the “human-nature relation,” based on a renewed need for knowledge. Therefore, it could be argued that the movement of nature restoration links the renewal of ecosystems and the renewal of communities.

Key words: adaptive management, consensus building, nature conservation, nature restoration, participatory research

1. Preface

The goal of this paper is to substantiate the necessity of citizen participation in nature restoration and to discuss its specific methods.

When seen from a social process perspective, traditional nature conservation and nature restoration are significantly different. This has largely been influenced by the application of two concepts, biodiversity and ecosystems (Constanza et al., 1997). The use of these concepts has enabled a comprehensive discussion of various issues concerning environmental problems, such as nature conservation and climate change. Furthermore, a comprehensive discussion of the relationship between the environment and economic activities, such as agriculture, has become possible by means of quantitative data. In the course of this discussion, the limitations of the quantity and quality of data that are needed for solving urgent problems have been recognized, and adaptive management techniques have been introduced (Parma et al., 1998).

The framework for problem-solving with regard to nature restoration has changed. Conventional nature conservation puts emphasis on a political discourse in which a value judgment between the preservation of the natural environment, such as natural objects and regional ecosystems, and economic development, which is likely to negatively influence the natural environment, takes place. The basis of the debate is varied, including resource utilization, scientific value, the aesthetics of landscapes, disaster prevention, the right to enjoy nature, and others. The justifiability of nature conservation is thus constructed and strengthened with various positive values that are associated with the comprehensive concepts of “nature” and “environment.” This logic functions well in the discourse concerning the protection of existing nature because nature conservation has little compatibility with the logic that characterizes economic development. In this case, the binary framework of “development or nature” is possible, and it is an appro-
private strategy for nature conservation.

However, despite the efforts for nature conservation, the present condition of biodiversity indicates an alarming trend. Therefore, we need to reexamine the effectiveness of the conventional conservation framework. It may have been effective in the justification of nature conservation in some cases; however, it does not function sufficiently when it comes to nature restoration because there is no “enemy” to protest against. A mutually accepted definition of public good that could guide the decision-making process is necessary but difficult to achieve. Furthermore, it is not easy for scientific knowledge (or scientists) to play a decisive role in adaptive management. In short, it appears that a new framework is needed to take the issue of nature restoration further.

In sum, this paper discusses a new way of generating knowledge which is necessary for nature restoration. First, it clarifies that nature restoration requires a target domain called “human-nature relation” here. This section also includes a summary of concepts, such as the relationship of nature restoration with biodiversity and ecosystems. Subsequently, environmental research that is conducted with the participation of citizens (participatory research), and which explores the “human-nature relation” is introduced. Finally, a method of forming social consensus with regard to nature restoration is proposed.


2.1 Nature restoration and adaptive management

Nature restoration has transformed the state of environmental conservation. The following three characteristics distinguish it from the conventional conservation of nature.

The first characteristic is that the domain is expanded. Conventional nature conservation deals with natural objects, species, or natural ecosystems, but nature restoration addresses an expanded domain that also includes the broad concept of biodiversity, which leads to the second character: the diversification of methods. While nature conservation uses passive techniques, such as the maintenance of remaining ecosystems and legal protection, nature restoration uses additional active techniques, such as the re-introduction of wildlife and re-naturalization of degraded ecosystems. Finally, nature restoration employs not only regulatory techniques, such as prohibition of access and restriction of utilization, but it also considers wise use. This is because the issue no longer is the overuse of the environment alone, but also the problem of abandonment of formerly used areas. Because in Japan continuous resource utilization was maintained until recently, the deterioration of the socioeconomic system due to underutilization is a new problem, (Ministry of the Environment, 2002). As a result, the maintenance and reintroduction of continuous human involvement has become an important issue. Furthermore, the creation and renewal of values that enable human intervention are emerging challenges. In other words, not only the removal of adverse effects on the ecosystem but also the sustainable utilization of the ecosystem must become the framework of the discussion.

The conventional conservation of nature often caused a dichotomy between “humans or nature.” However, nature restoration is changing this debate. It can be said that the concept of sustainability is absorbing the conflict-of-interest debate in relation to the overuse of the environment.

On the other hand, the concept of nature restoration also brings with it the diversification and enlargement of conflicting interests, rendering the task of decision-making more complicated. For example, when the protection of anthropogenic ecosystems, such as “village area and village mountain” (satochi satoyama), i.e. the traditional rural landscape in Japan, is required, interactions with the owner of the land and those who work on it need to happen at the very least. In addition, in order to secure continuous nature restoration, additional human relations must be taken into consideration, which might include the circulation of agricultural products and communication with the consumer. To develop viable solutions, participation of stakeholders such as agricultural organizations, consumers, and distributors is essential. Moreover, various scenarios of required actions become possible. Besides protestation, many other possible actions become available, such as policy proposals, protection activities, utilization, and involvement of the corporate sector. This trend is fundamentally different from the logic of “nature conservation” against “destruction of nature” or “destruction of the environment.”

The expansion of the relationship among interested parties signifies the diversification of value standards and diagnosis of circumstances (Wakita, 1995). For example, resource utilization has begun to be evaluated not only on the basis of economics, but also on the basis of cultural and spiritual value (Takeuchi et al., 2002). In this pluralistic co-existence of various interests, there is no guarantee that environmental conservation always comes to be one of the top priorities. Nonetheless, it is evident that the behavior of stakeholders and the issues themselves are becoming more complex.

The development of nature restoration has led to a more diversified composition of the stakeholders and has made the process of problem solving more complicated. The kind of nature that is to be “conserved” or “restored,” the way of preservation, and the actors who participate in the process become issues. In other words, the concept of nature restoration has made both the “hard” subject of nature itself and the “soft” subject of human-nature relation relevant.

The technique of adaptive management understands this situation. Parallel with scientific monitoring and evaluation, it points out the importance of social consensus building. In addition, adaptive management intends to organize problem identification and goal setting procedures, assuming scenarios such as a case in which scientific procedure and social consensus building act separately and a case in which both collaborate (Rossberg et al., 2005).
It can also be seen as a method of constructing a consistent relationship between local knowledge and scientific knowledge, which are concrete for specific locations and unique to a particular region. There are various techniques, including scientific methods, that can help to understand the state of natural objects and environmental conditions. However, no single-dimensional evaluation of the outcome is viable. For this reason, no one framework can provide an optimal solution, and problem-solving based on a paternalistic framework is unlikely to lead to satisfactory results. Adaptive management, on the other hand, could become a viable method to solve these issues.

2.2 The necessity of the “human-nature relation” in nature restoration

The new challenge that adaptive management faces is the pluralistic and fluid character of the values held by society. Let’s illustrate this by using the concept of ecosystem services as an example. This concept was first employed in the field of economics, and in the United Nations’ Millennium Ecosystem Assessment it was classified into four services – provisioning services, regulating services, cultural (non-material) services and supporting services. The last contributes to the functionality of the first three services (Millennium Ecosystem Assessment, 2005).

The significance of this concept resides in the ability to comprehensively and analytically understand complex and diverse concepts of the value of nature. As a result, while relativizing traditional arguments about the value of nature, the concept of ecosystem services allows to express this value as a combination of functions. For example, it is possible to present the value of wilderness in a unified form with multiple functions, such as amenity value and scientific value. The concept of ecosystem services realizes the presentation of singularities (i.e. the unique local conditions) in a general framework, which is a prerequisite for successful adaptive management.

However, the problem is that the implicit function of ecosystem services is not always self-evident. There are various cultural frameworks through which the material aspect of ecosystems and the service aspect of ecosystems relate to each other. The simplest example is found in the area of cultural (non-material) services. Psychological value and aesthetic value are part of culture itself, and functions, such as recreation, can only be realized in the culture that values it. The same can be said about the other categories. For instance, animals can become a food source only if a meat diet is the cultural norm. Moreover, sometimes human well-being is not directly depending on ecosystem services. Friendship is a case in point. This integrated totality is defined as “human-nature relation.” In this overall system it is determined whether or not the ideas concerning the concept of environmental conservation and nature restoration are shared.

3. Activating Participatory Research

3.1 “Human-nature relationships” and participatory research

The preservation of biodiversity is an important prerequisite for the well-being of humans. However, preserving biodiversity only guarantees the imminent possibility of receiving some kind of benefit. Specific engagement, such as nature restoration, faces the challenge of goal sharing. For instance, in cases where an ecosystem has been determined to be scientifically valuable, when the value of such an ecosystem service is not shared among the people of the region, they may disagree with the proposed level of necessity of environmental conservation. Moreover, as mentioned earlier, cultural mediation for ecosystem services is fluid in dynamic “human-nature relationships.”

On the other hand, such fluidity could provide the possibility of inducing secondary effects that would increase the motivation to preserve biodiversity. For example, human relations in a locality and special feeling about a place could become triggers to activate and encourage environmental conservation. Experimental winter flooding of rice fields in Osaki city in Miyagi prefecture and Toyooka city in Hyogo prefecture, which intends to increase biodiversity and provide habitat for wild birds, is clearly deemed as an environmental conservation effort. However, it produces multiple benefits. The experiment has been recognized as a rational agricultural method to activate the soil and control weeds. It has provided opportunity for farmers to market their agricultural products as environmentally friendly. Furthermore, the experiment has become the pride of the region.

From a historical perspective, very few environmentally-conscious activities exist that serve the purpose of environmental conservation itself. It is often the case that the primary purpose was something practical such as food production, while de facto environmental conservation was realized as a secondary effect (Inoue, 2001). Contemporary interpretation of those events calls for close and careful analyses. Nonetheless, it could be concluded that our mid- to long-term aim should be the design of a social system that makes the activities by various constituents who are motivated by various values, which are not limited to those associated with environmental conservation, to function as environmentally-conscious activities.
3.2 Development of participatory research

Participatory research deserves close attention in this context. There is a relatively long history of citizen participation in research activities. Participatory research in Japan goes back to before World War II, which includes biological investigations and local history research by citizens themselves. In the 1970s, activities of this kind expanded in the context of nature conservation campaigns, when nature walks and similar activities became popular. In the late 1980s, a widely applicable technique for investigating the water quality of rivers and ponds was put forward (Ogura, 1987), and environmental research activities by citizens using this method were launched.

In this sense, participatory research possesses a certain degree of history. In recent years, the kind of civic participation activities have been increasing at the same pace as the diversification of types of stakeholders and their interests. There is also a movement which promotes participatory research as a technique of monitoring nature restoration operations. It is expected that it will play an important role in adaptive management processes (Washitani & Kitoh, 2007).

For example, the nature Conservation Society of Japan (NACS-J) initiated research activities in which citizens investigate the relationship between the nature of a region and its inhabitants (Fig. 1). Another outcome of the development is the introduction of an environmental impact assessment law. The law sets “rich contact between people and nature” as a criterion that has to be investigated. It measures day-to-day activities in which local residents come into contact with nature. The technical guidelines were issued in 2002 (“Contact with nature” section in the Environmental Impact Assessment Technology Study Group edition, 2002). However, some details of the investigation technique were problematic, and environmental assessment activities by citizens were not yet adequate. In addition, the public’s attention to the pervasive crisis of the loss of biodiversity due to the abandonment of cultivation raised the interest in a method to sustain secondary nature in remote and mountainous areas which have hitherto been maintained by agricultural activities within the framework of contemporary society.

Accordingly, the NACS-J carried out an investigation regarding human interaction with nature and published its findings concerning the current conditions and causalities (NACS-J, 2002). Furthermore, the organization published a technical instruction on how to conduct such research projects, which was titled “Fureai Chosa (investigation of interactions between people and the natural environment)” (NACS-J Fureai Research Study Group, 2005). This publication described not only research methods for fauna and flora, but also neighborhood interviews and evaluation of sites by citizens (Fig 2). It was intended to collect basic data about environmental protection activities or environmental assessments. Furthermore, it was attempted to explore the human-nature relationships which are expected to provide hints about ideal landscape design. The research findings were expected to help to preserve nature in the region by stimulating awareness of citizens that they are involved in the local human-nature relations.

There are also attempts to reintroduce traditional secondary nature, i.e. anthropogenic rural ecosystems by means of agricultural activities as a kind of recreation for urban residents. This shows that there has been a significant shift from the traditional strategy of nature conservation campaigns to the development of new propositions and invention of new models.

While the research of “human-nature relationships” is born out of the nature conservation movement, there are participatory investigations that stem from other origins. A project called “local study” that appeared simultaneously in Minamata city and Miyagi prefecture is a typical example (Yoshimoto, 2001; Yuki, 2001). The projects are so planned that people living inside and outside of regions can find together various characteristics, by fieldwork, mapping, and workshops. This undertaking has expanded nationwide; many localities promote events called “search for the existing,” which signifies that instead of crying over what is lost or what they don’t have, one should make an effort to discover what is already there. Some of the localities intend to use the information collected by the project for the promotion of regional development, e.g. by tourism.

![Fig. 1 Participatory research.](image1)

![Fig. 2 GIS data of “Fureai Chosa” on google map.](image2)
Other examples include the creation of a hazard map, town development, environmental education and various other local activities.

4. Participatory Research and the Principle of Nature Restoration

As described above, participatory research projects have expanded both in type and places. One of the reasons for this rapid expansion was the availability of tools like computers and the Internet. They significantly simplified tasks associated with research activities and made the dissemination of research data easier and cheaper than before. In addition, geographic information systems (GIS) made the visualization of comprehensive regional data possible. Currently, telecommunication companies and information technology researchers are trying to develop a new technology that can gather and summarize information provided by ordinary citizens. As a result, investigations and the dissemination of their results will become even easier.

Moreover, because citizen participation in policy development and decision-making is becoming more common, the quantity and quality of required information have changed. Nature restoration is one of these political decisions, and it requires data from natural sciences as well as from subjective human judgments and opinions. Similarly, sometimes realignment of goals is required in the process consensus building (Miyauchi, 2003).

Furthermore, I would like to point out that the significance of the local “human-nature relation” is being recognized by citizens. In other words, it is not the direct confrontation with global and abstract concepts such as global environmental problems, but it is the idea that we should approach the daily and concrete characteristics of “the accessible” issues first (Kada, 2002). One of the features of environmental problems in the context of social issues is that the components of causal relationships are dispersed temporally and spatially. This means that each constituent of society also has relatively dispersed power of influence, and it results in a lack of sense of ownership by individuals. It also leads to a sense of pessimism toward meaningful problem solving. For example, individual power to solve the daunting problem of global warming is more often than not limited in reality, and any resulting changes are hard to be detected by an individual person.

When these characteristics of environmental problems are recognized, one can realize the value of setting immediate goals. In this context, identifying issues in the “accessible” territory is effective and necessary. Although “the accessible” and “the remote” problems are physically related, the connection is often not perceived. For this reason, it is highly effective to approach concrete and “accessible” problem-solving first.

It is a certainty that environmental problems are issues which we have to be concerned about. However, when this universal discourse is simply applied to society at large, the pluralistic problem structure and possible solutions paths, which are visible from the perspective of an individual, become opaque. The attractiveness of participatory research is found in its potential ability to find viable solutions.

Participatory research explores in-depth local characteristics of the “human-nature relation.” Expert facilitators have begun to emerge and support actions on the ground. These activities are creating a renewed need for knowledge concerning various ecological and socio-economic issues. Events involving citizens help to generate and disseminate this knowledge, and this in turn is the basis for new, locally adapted concepts. Therefore, it could be argued that the movement of nature restoration provides essential links between the renewal of ecosystems and the renewal of communities.

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References


Notes

1. There is a problem of misalignment of the temporal axis that exists between the cycle of ecosystem and life cycle of humans. Because of it, under a certain condition environmentally unfriendly behaviors by humans become economically rational.

2. In the field of Conservation Ecology, along with the findings in Anthropology, it is determined as Traditional Ecological Knowledge (Berkes, 1999). This concept as well as the concept of Local Knowledge (Geertz, 1983) have been gaining support from various fields of academic disciplines.

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