

Nature Conservation Strategies for the 'SATOYAMA' and 'SATOCHI', Habitats for Secondary Nature in Japan

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Abstract

The importance of conserving the traditional Japanese rural landscapes, 'SATOYAMA' and 'SATOCHI', as habitat for secondary nature is well recognized by Japanese society today. These landscapes suffered large-scale destruction during the late-1960s, especially due to rapid urbanization of the peripheries of major cities in the wake of rapid economic growth. The natural environment of the 'SATOYAMA' was widely destroyed. Citizens' movements since then have attempted to protect and manage such secondary nature, which is considered a valuable space for guaranteeing both the quality of life and regional biodiversity. A long-term conservation strategy for the 'SATOCHI' should be framed to revitalize the economy of Japan's rural areas and for utilizing secondary nature for domestic biomass production in this era of global environmentalism. The lost nature of the 'SATOCHI' will also need to be restored with an aim to reconstruct an ecological network on national lands.

Key words : Nature conservation strategy, Rural landscape, SATOCHI, SATOYAMA, Secondary nature

1. Introduction

The Japanese term 'SATOYAMA' was originally used to indicate agricultural forest (Shidei, 2000). Today, nature-loving citizens often use 'SATOYAMA' to symbolize the remaining natural environment in Japan. Citizens have become more aware of natural environmental conservation because of the loss of nature due to rapid urbanization and the destruction of the natural environment in the suburbs. In the late 1960s, rapid growth of the Japanese economy led to a surge of urban development in the peripheries of major cities. In particular, coppice forests on hill slopes and dissected uplands were cleared for large-scale residential development sites. The sites for such large-scale housing projects in the suburbs, such as *Senri New Town* and *Senboku New Town* in Osaka, *Kouzoji New Town* in Nagoya, and *Tama New Town* in Tokyo were all once 'SATOYAMA' on hill slopes (Tamura *et al.*, 1983). To develop extensive housing sites in 'SATOYAMA' areas, the hill ridges were planed, and the removed earth was used to bury valley bottoms to create flatlands. As a consequence, the natural environment of the 'SATOYAMA' was completely destroyed.

Subsequently, people developed a gradual awareness of nature conservation in their neighborhoods, and housing site construction methods have been changed to maintain slopes covered with woodlands and to make the best use of natural landscapes. As one of several active nature conservation measures, the preservation of natural environment of the 'SATOYAMA' came to be undertaken at development sites. Moreover, the citizens who moved to these new towns started voluntarily managing the surrounding woodlands and rice paddies. These citizens were getting more and more interested in the 'SATOYAMA',

and the concept of 'SATOYAMA' conservation rapidly started to influence all of Japan. In the process, 'SATOYAMA' has become a popular word to describe the traditional Japanese rural landscape with rich coppice forests, and it has been accepted by Japanese society.

Today, the word 'SATOYAMA' is used on various occasions, but it generally indicates a natural environment managed by humans and, therefore, its basic element can be represented as "secondary nature". Secondary nature is easily lost in the process of large-scale urban development, but on the other hand, if it remains untouched, it will be thoroughly transformed by vegetation succession. In order to keep the 'SATOYAMA' as it is, adequate human intervention such as "management" is essential, as has been observed in traditional agricultural activities. In other words, we can see the richness of the natural environment of the 'SATOYAMA' not only as original natural diversity, but also as a natural diversity enriched by human intervention.

There are, however, different interpretations as to what elements can be included in the category of secondary nature. There is no doubt for including coppice and pine forests in this category as these are the typical plant communities seen in so-called, 'SATOYAMA' forests. Also, in the Japanese traditional agricultural system, areas for thatch grass collection were regarded as important and, therefore, such areas can be included in the 'SATOYAMA', although today these areas are diminishing. The problem is whether to include farmlands and settlements in the 'SATOYAMA' category. Considering that the traditional rural landscape was formed of coppice, grasslands, farmlands, and settlements, all these elements must be included as a set of landscape elements.

2. 'SATOYAMA' and 'SATOCHI'

Moriyama (1999) mentioned that the typical land use arrangement of coppice (*yama*), farmlands (*nora*) and settlements (*mura*) can be observed in upland rural areas of the Kanto Plain. Here, the word *yama* (mountain in Japanese) is used to indicate coppice and, therefore, this *yama* can be regarded as the same as the 'SATOYAMA'. It may be inappropriate, however, to use the word 'SATOYAMA' for farmlands and settlements. In this paper, I propose to call the entire area the 'SATOCHI'. Figure 1 illustrates the concepts of 'SATOYAMA' and 'SATOCHI' used in this paper, and it classifies these concepts by relating them to landform and land use. As shown in the figure, 'SATOCHI' indicates a rural landscape including the 'SATOYAMA', farmlands, settlements, and reservoirs. All these elements were once strongly connected to each other through the agricultural land use system.

The word 'SATOCHI' is not as popular as 'SATOYAMA'. However, it is increasingly used now to indicate the importance of secondary nature (Environment Agency and 'SATOCHI' Nature Research Group, 1996). The Basic Environment Plan that was implemented in December 1994 fully recognized the importance of the 'SATOCHI'. In this Plan, "co-existence of nature and humans" was regarded as one of the most important long-term ends. Also, in order to achieve the goal, a policy of "co-existence of nature and humans with high natural and social quality in national lands" was proposed, and there arose a need for policy implementation corresponding to each natural area with a different natural environment. The "natural areas" include mountainous areas, the 'SATOCHI', flatlands and seashore areas. 'SATOCHI' was defined as the intermediate area between mountainous areas and flatlands.

The Basic Environment Plan describes 'SATOCHI' areas as follows (Environment Agency, 1994): a 'SATOCHI' has considerable secondary nature, and it is an area that allows wild animals and humans to live together". The natural environment of this area is created through human intervention such as farming and forestry, and it is what Japanese people have always imagined as their mother landscape. In order to conserve the coppice, rice paddies, and reservoirs of the 'SATOCHI', some actions of citizens and public support are necessary.

3. Why is 'SATOCHI' Nature Becoming so Popular?

'SATOCHI' nature is drawing much attention today as an essential element of national land management. Earlier when rural areas switched to a dependency on fossil fuel and chemical fertilizers in the 1960s the 'SATOYAMA' was considered useless as a resource supply and, as a result, these areas became a target for large-scale urban and recreational development. There are now, however, considered a valuable space

for maintaining the quality of life, and this recognition has been brought about by the nostalgia of people who have lost their close relationship with the natural environment. People are also becoming concerned about the continuing destruction of the natural environment that was once so familiar to them. The 'SATOCHI' that still remains untouched by extensive development activities is becoming a shining star of hope for citizens who long to live in a natural environment.

The 'SATOCHI' is attractive because it has a beauty of natural richness that is appropriately managed by humans. In order to fully enjoy 'SATOCHI' nature, one must be involved with the 'SATOCHI' and feel it, rather than viewing the nature from a distance. Handing down 'SATOCHI' nature, which was once so familiar, to the next generation is almost like passing down a story of the Japanese cultural climate to the future. For that, it is not enough to conserve the 'SATOCHI' in a particular area. Rather, it is important to create a movement for protection and management of the 'SATOCHI' throughout Japan. It is also necessary to prepare a concrete plan for institutional and financial support, so that the obstacles that are making 'SATOCHI' conservation difficult can be surmounted.

There is another aspect to this recent popularity of the 'SATOCHI'. It is said that the 21st Century is the "Century of the Environment", and that there is a need to invoke the concept of the "commons" in order to change the traditional "private" and "public" dichotomy. Historically, the 'SATOYAMA' was a common property, and natural resource richness was treated as a common asset. The community members, however, could make excessive use of such a common property, and consequently, the resources could be exhausted. This is what Hardin (1968) called the "Tragedy of the Commons". In today's society, it is especially important to consider how to maintain the 'SATOCHI' as a common asset because now we know that we should treat environmental resources as commonly owned.

4. Conservation of Biodiversity in 'SATOCHI' Nature

The conservation of 'SATOCHI' nature may contribute to solving global environmental problems. The United Nations Convention on Biological Diversity (CBD) requires each of the participating countries to protect the biodiversity inside its national territory. Japan planned a National Strategy for Biodiversity Conservation in 1995 in order to keep up with the Treaty (Ministers Meeting on Global Environmental Conservation, 1995). According to this strategy, two long-term goals have been set: one is to conserve the flora, fauna and ecosystem of each biogeographical classification and to use them in a sustainable manner; the other is to manage a large-scale reserved areas that form an extensive network among different species. In order to achieve these two goals, a couple of projects related to 'SATOCHI'

conservation have been introduced: preparation of a guidebook for citizens to conserve and rehabilitate the 'SATOCHI' environment and protect rare species, and regional development projects for restoration and management of natural environments containing diverse flora and fauna and for establishing a network among different species".

The 5th Convention of the Parties to the CBD, held in Nairobi in 2000, adopted the "Principles of Ecosystem Approach" in order to achieve the Convention's three basic goals: conservation, sustainable use, and the fair and equitable sharing of the benefits arising from the utilization of genetic resources. These Principles are significant since they admit the former policies that put more priority on management of reserved areas and protection of rare species were insufficient. Adopting them clearly points out the importance of ecosystem management from an economic point of view, and puts emphasis on ecological functions and structural conservation. The Principles also foresee inevitable change in natural environments, and insist the necessity of flexible "adaptive management" (UNEP/CBD, 2000).

Referring to these Principles, Japan's natural conservation policies have obviously underestimated the importance of conserving secondary natural environments such as the 'SATOCHI', which extend outside the reserved areas. According to the Report of the Research Team on Biodiversity Conservation (Ministry of Environment, 2000), the designers of the new Basic Environment Plan did not reach an agreement on the ideal form of secondary nature management for the entire nation. The report states, however, that it is important to outline the roles of secondary nature in biodiversity conservation. It also stresses the necessity of establishing a management priority order according to each "network" and "link" of the natural environment to tackle the quantitative and qualitative degradation of secondary nature. Moreover, the Plan asserts that the value and function of secondary nature in addition to biodiversity should be appreciated, and regional efforts to make the best use of it must be evaluated in order to establish adequate management measures.

National-scale management of the 'SATOCHI' is considered difficult because of high labor and financial costs. Therefore, each region is required to make its own decision to evaluate the significance of the 'SATOCHI' in the region, and the decision whether or not to maintain it will be based on an agreement on the cost burden on community members. It is understandable that national and local governments would have great difficulty in making 'SATOCHI' management a public project, since public investment has been concentrated in artificial construction, and the financial bases of governments have been weakened. National and local governments should, however, consider an overall picture of the future of the 'SATOCHI', since biodiversity conservation has become an important issue in Japan. National planning for future 'SATOCHI' conservation must be formulated despite all the present difficulties.

5. 'SATOCHI' Conservation in National Land Planning

The National Comprehensive Land Development Plan takes a more active attitude toward conserving 'SATOCHI' natural environments. The plan, "Grand Design of National Land in the 21st Century", which was implemented in 1998, asserted that it was important to manage secondary nature by promoting farming, forestry, and fisheries. Here, conservation of qualified natural environments in national parks was not considered a top priority. It also claimed that it was essential to establish a network system between the government and citizens in order to maintain the 'SATOYAMA', and public projects needed to be conducted to create and to rehabilitate woodlands and reservoirs (National Land Agency, 1998). National-scale 'SATOCHI' conservation cannot be separated from farming and forestry activities and, therefore, farming and forestry and regional development must be planned together.

In order to achieve these objectives, the new Plan suggests local cities and the surrounding rural areas regard themselves as frontiers of development in the 21st Century. This strategy is named "Creation of Residential Areas Full of Natural Environment", and it shows the ways to manage and to transform local cities and the surrounding rural areas into new residential areas with a rich natural environment (Fig. 2). The strategy places importance on the creation of synthetic spaces which have local cities surrounded by rural areas. This concept of a "marriage" between cities and villages reminds us of Howard's Theory of Garden Cities Program (Howard, 1902). In this sense, farming and forestry activities must be regarded as an "environment" which contains multiple functions and values (Yokohari *et al.*, 1994), and they should not be categorized only as primary industry.

When we look at the 'SATOCHI' around large cities, it is obvious that 'SATOCHI' nature is attractive to city dwellers. There are as attractive, or even more attractive communities in more remote areas. Recently green tourism promoting holidays in the countryside is gaining popularity. In European countries like the U.K., Germany, and France, "holidays in the countryside" have already become so popular that there are now many farmhouse inns. In Japan, an increasing number of people now spend their holidays in rural villages. In these rural communities, a "dissimilar" experience is more appreciated than an "extraordinary" experience. People who are tired of labor in artificial environments enjoy other lifestyles in 'SATOCHI' areas.

Obviously, the economic profit brought by such holiday activities does not cover all the expenses of keeping residential areas abundant with nature. Therefore, it will be necessary to establish various economic opportunities to enable people to make a living in these areas. The traditional way of inviting large factories, however, must be avoided, as it would reduce the 'SATOCHI' nature's attractiveness. Rather,

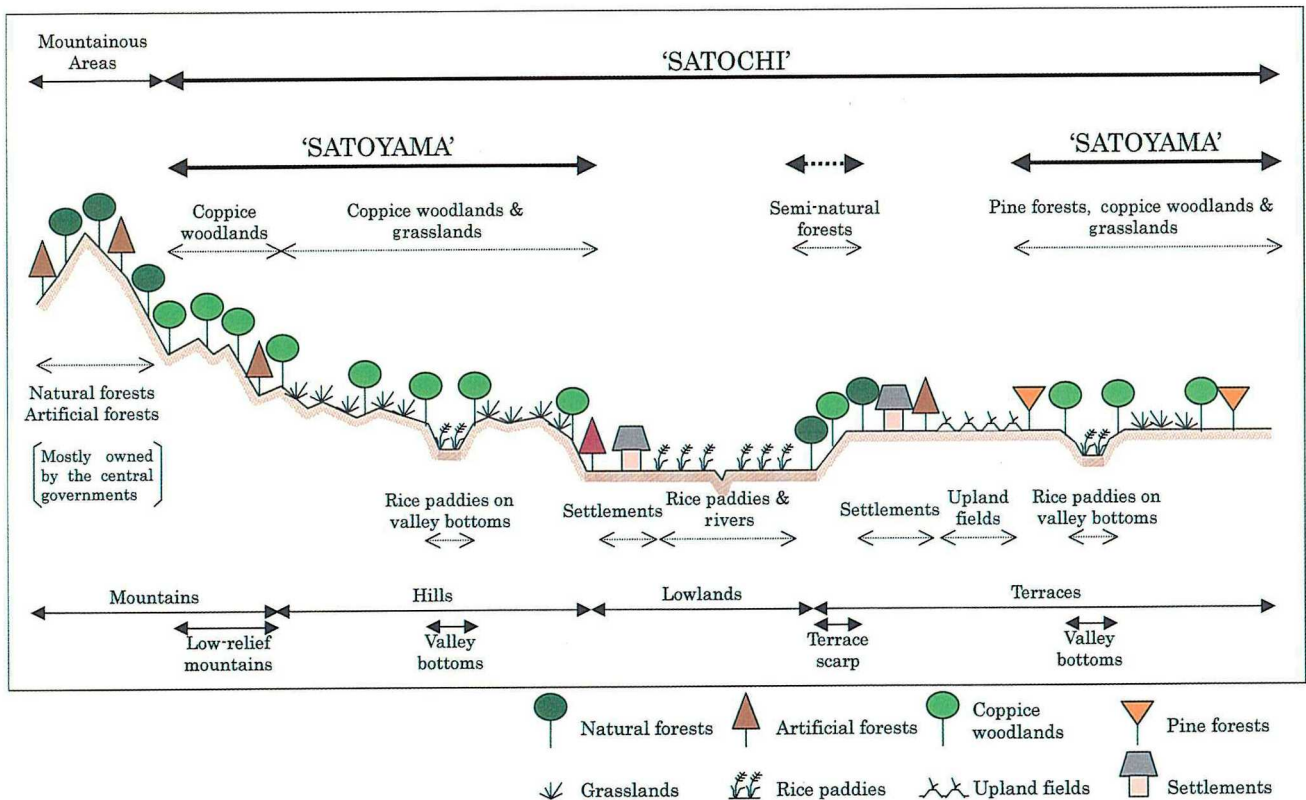


Fig. 1 Schematic presentation of landscape elements in the 'SATOYAMA' and 'SATOCHI' (after Yamamoto, 2001, modified by the author)

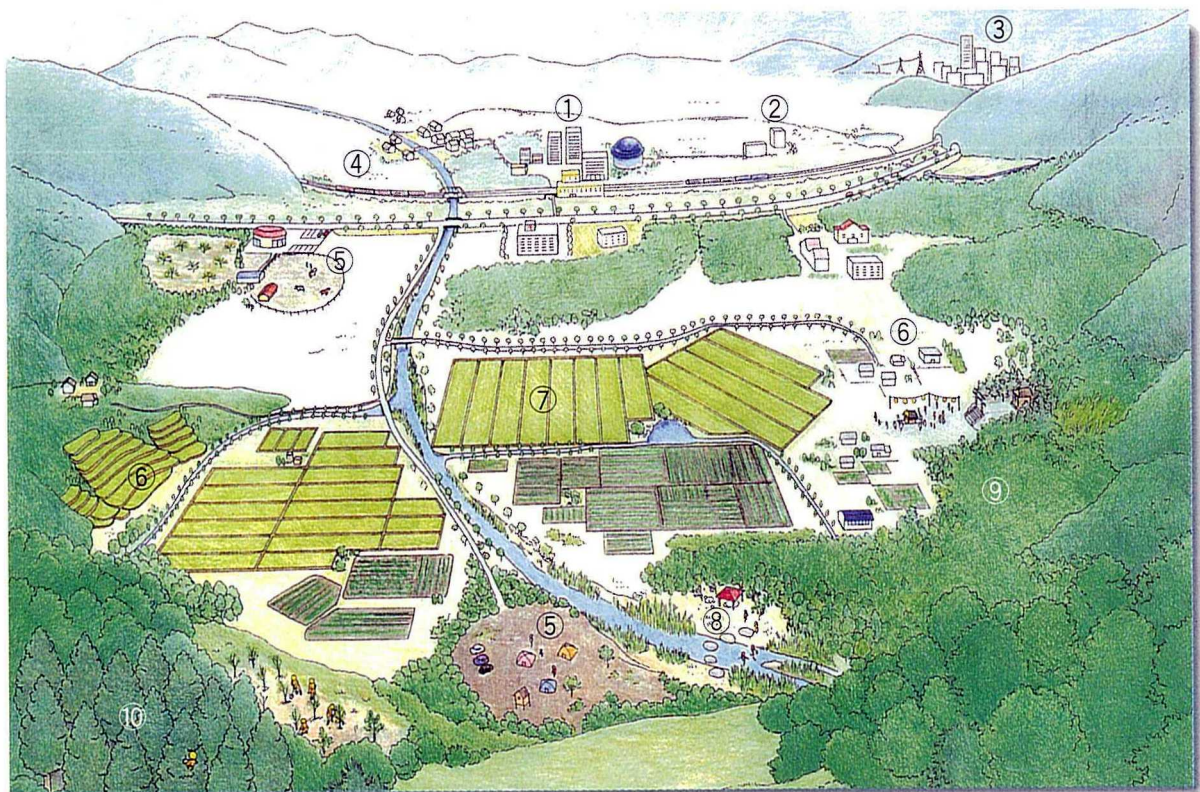


Fig. 2 Image of Residential Areas Full of Nature (after National Land Agency, 1999)

- ① Urban planning for compact cities,
- ② Decentralization of business (IT-based),
- ③ Inter-linking of large and small cities, as well as rural settlements,
- ④ Inter-linking of cities and regions through traffic networks,
- ⑤ Encouraging urban dwellers to experience rural and natural landscape,
- ⑥ Preservation of historical landscapes and structures,
- ⑦ Land readjustment for intensive farming,
- ⑧ Restoration of river ecosystems,
- ⑨ Conservation of coppice woodlands, and
- ⑩ Forest management with people's participation.

highly knowledge-intensive industries or welfare industries that respond to the aging society are desirable. Although agriculture and forestry are not very stable today, they may have prospects for future development by involving processing, distribution and marketing of the finished products, as well as by connecting themselves to "green tourism".

6. Restoration of Lost Nature in the 'SATOCHI'

Today, disorderly urban expansion has been restrained, and it is now time for us to think of how to improve the present urban environment. Japan has gradually changed from an "urbanization" society to an "urbanized" society, but it is necessary to solve the problems that have come up in the process of disorderly urbanization. For 'SATOCHI' conservation in urban areas, restoration of lost nature is necessary in order to rebuild the ecosystems in cities. We must make efforts to improve 'SATOCHI' natural environments by tending city parks with secondary nature, or by greening vacant lots created in the process of urban re-development.

Here, the concept of the ecosystem network must be appreciated (Bennett, 1991). In 'SATOCHI' areas around large cities, a quantitative loss of natural species is observed, and ecosystems are split apart. The fragmented ecosystems threaten biodiversity conservation, as gene flow is limited. The Netherlands, where artificial environments predominate has proposed a Nature Policy Plan (Ministry of Agriculture, Nature Management and Fisheries of the Netherlands, 1990). Japan has not yet reached the stage for active promotion of environmental policies. Such policies would solve the problems of ecosystem fragmentation, and the government would be expected to implement public projects to recuperate lost natural environment.

The Mitigation Strategy of the United States is drawing attention as it may halt the quantitative loss of natural environment. The word "mitigation" indicates the easing of environmental destruction, and it attempts to restore lost natural environments and rejoin split ecosystems. It also stresses the necessity of reducing the impact of development on the natural environment. The method is called "Compensatory Mitigation Measures", and it has been adapted to wetland conservation. Based on the "No Net Loss" principle, recuperated nature must exceed lost nature. In order to measure the quantitative balance of the natural environment, the Habitat Evaluation Procedure (HEP) is used.

In the United States, there is another strategy called the "Mitigation Bank", which secures a "deposit" of nature that is to be recuperated (Brown and Lant, 1999; Tanaka, 1999). This is based on a viewpoint that sees recuperated nature as a source of ecosystem networking, and the Bank is expected to effectively hold "savings" of nature for future restoration. In Germany, the Federal Construction Law was revised to oblige every new construction planning design to clearly indicate areas for

"Ökokonto" (ecological saving) in order to estimate nature that would be lost in the construction process (Wiesner, 1998). The natural environment is to be rehabilitated after the projects are completed.

In Japan, "Basic Matters Related to the Environmental Impact Assessment Law" (Environment Agency, 1997) gives consideration to environmental conservation measures. Facing a need for the effective environmental conservation measures, it claims that it is essential to avoid and to reduce impacts on the natural environment. Moreover, it admits that compensatory mitigation measures must be considered, which will offset the loss of natural environmental elements. From now on, the idea of compensatory mitigation measures should be appreciated not only in environmental assessment activities, but also in development planning processes.

7 'SATOCHI' Management by Various Actors

The most important aspect of today's 'SATOCHI' conservation is the increase in 'SATOCHI' managing actors. While restraining further quantitative area loss, civic movements are starting to manage the 'SATOCHI' in rural areas as well as in the cities. Today, non-profit organizations (NPO) are allowed to become corporations, and the scope of their activities has expanded. Conservation movements with wider vision will arise when these civic movements proceed hand in hand. Land management of the 'SATOCHI' is also expected to connect citizens, private companies and public institutions.

As decentralization proceeds, regional decisions on future development become more important. Each region is responsible for determining how to maintain and manage spaces that do not have much economic values like the 'SATOCHI'. In order to avoid traditional destructive regional development, a conceptual change associated with "richness" is essential. Basic policies must be implemented to realize regional development, which guarantees a "rich" life. Citizens and private companies should actively participate in such policy-making processes, together with provincial or municipal governments. In decentralized regional development, the individual uniqueness of each region must be considered. Unique and attractive regional land use planning should arouse the affection and pride of local people in each region.

It is also true that 'SATOCHI' nature conservation in remote rural communities of hilly and mountainous areas faces some economic difficulties. In these less favored areas, a "direct payment" system has been adopted in order to repay the farmers for maintaining the environmental functions of the "SATOCHI". It is still unknown how effective this direct payment system will be, but, at any rate, mere conservation policies are not enough. It will be essential to establish a social system that allows people to continue their traditional lifestyles while securing the 'SATOCHI' environment.

Recently, there has been a movement among

farmers' organizations to found corporations. The forestry sector has already organized corporations and has largely improved labor conditions so that a number of young laborers have been successfully secured. Some cases show that economic profits have increased by combining forestry with other related industries. Such organizational efforts should also be made in the agricultural sector to overcome recent difficult situations. The direct payment system can also encourage farmers if the money is used in a collective manner. A combination of farming and forestry is expected to make effective management of the 'SATOYAMA' possible in complicated natural conditions.

8. A Long-Term 'SATOCHI' Conservation Strategy

'SATOCHI' conservation strategies must be considered from a long-term horizon. The clearest difference between short-term and long-term strategies is the change in the socio-economic environment. If large cities cease to grow, the 'SATOCHI' around urban areas will suffer from qualitative degradation because of the loss of adequate management. In this case, nature conservation policies similar to that for remote mountainous areas might be employed. It is important to plan a strategy for common use and management by the citizens, but it may also be necessary to create natural parks in areas with a lot of rare species.

Regarding the future of the 'SATOCHI' in rural areas, there are two possible situations. One is that the 'SATOCHI' will become more appreciated as a source of biological resources. Development of alternative energy resources to fossil fuels has been promoted, and technological advances at the global level have enabled extensive biomass energy use. Although Japan is a rich source for biomass energy generation, technological research and development have been outstripped. If adequate technological development lowers the production cost of biomass energy in Japan, the 'SATOYAMA' will be seen as a rich repository of biomass. When biomass use occurs, other functions such as biodiversity conservation must be adjusted to this new function of the 'SATOYAMA'.

The other possible situation is that the Japanese national land will become more important as a source of wood and food. Global environmental problems and decreasing biological resources in developing countries will make it difficult for Japan to import all its needed timber and agricultural products and, therefore, it will be necessary to take measures to improve the productivity of the 'SATOCHI' without destroying its natural environment. In any case, the present Japanese attitude of depending on other countries for biological resources should be reconsidered since there is still a great potential for domestic agriculture and forestry production.

References

- Bennett, G. ed. (1991) *Towards a European Ecological Network*. Institute for European Environmental Policy, The Netherlands.
- Brown, P.H. and C.L. Lant (1999) The effect of wetland mitigation banking on the achievement of no-net-loss. *Environmental Management*, 23 : 333-345.
- Environment Agency (1994) *Kankyo-kihon-keikaku* (The Basic Environment Plan). Environment Agency, Tokyo. (in Japanese)
- Environment Agency (1997) *Kankyo-eikyo-hyouka-hou-no-kitei-ni-motozuku-kihon-teki-jikou* (Basic Matters Related to the Environmental Impact Assessment Law). Environment Agency, Tokyo. (in Japanese)
- Environment Agency and 'SATOCHI' Research Group (1996) *'SATOCHI'-kara-no-henkaku* (Reform from the 'SATOCHI'). Jiji-tsushin-sha, Tokyo. (in Japanese)
- Hardin, G. (1968) The Tragedy of the Commons. *Science*, 162 : 1243-1248.
- Howard, E. (1902) *Garden Cities of To-Morrow*. Swan Sonnenschein, London.
- Ministers' Meeting on Global Environmental Conservation (1995) *Seibutu-tayousei-kokka-senryaku* (National Strategy for Biodiversity Conservation). Government of Japan, Tokyo. (in Japanese)
- Ministry of Agriculture, Nature Management and Fisheries of the Netherlands (1990) *Nature Policy Plan of the Netherlands*, Den Haag.
- Ministry of the Environment (2000) *Seibutu-tayousei-nokentou-chiimu-houkokusho* (Report of the Research Team on Biodiversity Conservation). Ministry of the Environment, Tokyo. (in Japanese)
- Moriyama, H. (1999) *Mura-no-sizen-wo-ikasu* (Reviving rural nature). Iwanami-shoten, Tokyo. (in Japanese)
- National Land Agency (1998) *21-seiki-no-kokodo-no-grando-desain* (Grand Design of National Lands in the 21st Century). National Land Agency, Tokyo. (in Japanese)
- Shidei, T. (2000) Miscellaneous notes of farm forest. *Bulletin of Kansai Organization for Nature Conservation*, 22(1) : 71-77. (in Japanese)
- Tamura, T., H. Yamamoto and S. Yoshioka (1983) A national summary of recent trends of large-scale landform-transformation in Japan. *Geogr. Rev. Japan*, 56 : 223-242. (in Japanese with English abstract)
- Tanaka, A. (1999) A compensatory mitigation case study in the United States and its prospects in Japan. *Journal of the Japanese Institute of Landscape Architecture*, 62 : 581-586. (in Japanese with English abstract)
- Wiesner, H. (1998) Ökokonto-Neues Schlagwort oder praktikables Instrument für eine nachhaltig raumplanung. *UVP-report*, 2/98 : 118-121.
- Yamamoto, S. (2001) : Studies on the Effect of Changes in Rural Landscape Structure on Secondary Forest Plants in Japanese Rural Areas. *Bulletin of the National Institute for Agro-environmental Sciences*, 20 : 1-105. (in Japanese with English abstract)
- Yokohari, M., R. D. Brown and K. Takeuchi (1994) A framework for the conservation of rural ecological landscapes in the urban fringe area in Japan. *Landscape and Urban Planning*, 29 : 103-116. (in Japanese with English abstract)
- UNEP/CBD (2000) Ecosystem approach. UNEP/CBD/COP/5/23, 103-109.