

Chapter 6

Satoyama Landscape of Japan—Past, Present, and Future

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Abstract *Satoyama* landscape is expressed as vegetation mosaic composed of different successional stages, such as cropland, grassland, and pine and oak forests in different growth phase. The mosaic structure was dynamically sustained by use of natural resources with periodical cutting, under local rule for sharing resources without exhaustion. It is said, therefore, that *Satoyama* landscape represents people's life harmonized with nature. The landscape, however, drastically changed due to the socioeconomic change of Japan, in relation to rapid economic growth from 1955 to 1975. Since people moved from rural to urban area for getting jobs in the period, wide area of *Satoyama* at urban fringe was developed to housing estate. Materials for daily life, such as domestic fuel, fertilizer for crops, timber, were changed from natural resources collected from *Satoyama* to those of chemical and/or imported ones. Disuse of natural resources allowed vegetation to progress natural succession, and caused a change of *Satoyama* landscape from mosaic into monotonous one, and then spread of pine and oak wilt diseases. Explosive increase in Shika deer population and extreme expansion of bamboo forests have seriously damaged to *Satoyama* ecosystems. These challenges represent change into people's life disharmonized with nature. Activities for restoring and utilizing *Satoyama* have newly arisen in different regions. In urban and urban fringe areas, NPOs and other volunteers outside the area have formed theme community and taken a core role in improving supplying services of *Satoyama* ecosystems with getting cultural services. In the depopulating mountainous area with less volunteer power, social system for getting domestic energy and for circulating economy in the area has built to make an incentive of *Satoyama* restoration for community member, such as forest owners, forest owner's cooperative and store managers, under a management of NPO. The trial is to improve supporting services by getting provisioning services from the *Satoyama* forest. In every region, NPO is the key not only for player but also for producer and manager of the activities.

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1 Introduction—*Satoyama* as Representative of Entity of People’s Life in Japan

Satoyama is a “Japanese term for landscapes that comprise a mosaic of different ecosystem types including secondary forests, agricultural lands, irrigation ponds and grasslands along with human settlements (Duraiappah and Nakamura 2012)” as shown in Fig. 1. It is expressed as “socio-ecological production landscape” in *Satoyama* Initiative, which was established along with CBD/COP10 to realize “society in harmony with nature, comprising human communities where the maintenance and development of socioeconomic activities align with natural processes” (Takeuchi 2009; Ministry of the Environment Japan 2010).

Satoyama landscape was formed and maintained in daily activities for sustaining people’s life in each region. Studies on wood materials for structuring old houses (Nunotani and Nakao 1986; Ida et al. 2010) showed that Japanese red pine (*Pinus densiflora*) and Japanese cedar (*Cryptomeria japonica*) were commonly used as timber in all over Japan. In addition to these trees, it was revealed that beech (*Fagus crenata*), oaks (*Quercus serrata*, *Quercus crispula*), Japanese horse-chestnut (*Aesculus turbinata*), Katsura (*Cercidiphyllum japonicum*), castor aralia (*Kalopanax septemlobus*), Japanese bigleaf magnolia (*Magnolia obovate*) and Japanese lime (*Tilia japonica*) were used in cool temperate region such as at Sakae and Iiyama in Nagano Pref., Shiwa in Iwate Pref., and Tsuruga in Fukui Pref. While in warm temperate region such as at Shiiba in Miyazaki Pref. and Totsukawa in Nara Pref., evergreen oaks (*Quercus* spp.) were used. Former trees are major components in summer-green forests, and the latter are typical in evergreen forests (see Fig. 8). These results represent that local people used to cut trees from neighboring forest to build a house (Fig. 2). Roof used to be covered by grass straws (Fig. 3), which were collected from grassland around the resident. *Miscanthus sinensis* has been used in almost entire region of Japan, and *M. tinctorius*, *Sasa palmate*, and *Phragmites australis* in some regions. Grasses for feed of



Fig. 1 *Satoyama* landscape at Haku in Ishikawa Prefecture (December 20, 2013)



Fig. 2 Materials for building the house used to be collected from *Satoyama*. Old house at Tono in Iwate Prefecture (July 2, 2013)

labor animals and materials of compost and/or mulching and firewood for cooking used to be brought from neighboring ecosystems in *Satoyama* (Fig. 4). People have made irrigation channel and control water level to put water into fields and to grow rice (Fig. 5).

As shown in those examples, local people have continuously acted to surrounding ecosystems and gotten materials for daily life. These activities are the drivers forming, maintaining and altering *Satoyama* landscape. People used to work in *Satoyama* along with phenology of living things and use natural resources not to exceed resilience of ecosystems. Rich biodiversity has kept along with people's life in the *Satoyama* landscape (Kato et al. 2009). Those images led to ideas of *Satoyama* Initiative, harmony with nature.

However, the *Satoyama* landscape, its structure as well as function, has changed due to the socioeconomic change of Japan (Kamada and Nakagoshi 1996, 1997), and perspective for reconstructing has been required (Takeuchi et al. 2016). The chapter aims to introduce pattern and process of *Satoyama* landscape in relation to change of social demands and current trends to restore *Satoyama* landscape.



Fig. 3 Roof covered by grasses. The area, Shirakawa-go in Gifu Prefecture, has been designated as world cultural heritage (June 3, 2014)

2 Component Vegetation of *Satoyama* and Socio-ecological Systems for Sustaining the Landscape

2.1 *Pine Forest*

Japanese red pine (*P. densiflora*) forest is one of the main components of *Satoyama* landscape, particularly in western Japan (Nakagoshi 1988, 1995; Kamada et al. 1991). Pine forests spread rapidly from 1500 B.P. under influence of human activities, such as slash-and-burn agriculture (Tsukada 1966, 1981). From that time, pine forests have been closely connected to daily life and agriculture.

According to the study at Kitahiroshima in Hiroshima Pref. (Kamada and Nakagoshi 1990; Kamada et al. 1991), dynamic mechanism for sustaining pine forest was summarizing as Fig. 6. The pine, which is a pioneer tree species, colonizes into clear-cut area and starts to develop a forest (Type A). Oak trees



Fig. 4 **a** Grass for feed of labor horse, **b** grass for fertilizer, **c** and **d** firewood are collected from *Satoyama*. (**a** October 20, 2015, at Tono in Iwate Pref., **b** August 12, 2015, at Higashi-Iya in Tokushima Pref., **c** September 4, 2015, at Kitahiroshima in Hiroshima Pref., and **d** December 20, 2013, at Wajima in Ishikawa Pref.)

(e.g., *Q. serrata*) also grow in the maturing pine forest (Type B). When people cut and remove those oaks for using firewood and/or charcoal, young pine forest without undergrowth occurs (Type B1). When the oaks are cut and used for producing charcoal with long intervals, over 20 years, oaks can regenerate and grow in pine forest as well as pine trees, and then move to the Type C. If the long interval usage is continued, C and C1 type forests are maintained cyclically.

When cutting intervals are medium, cutting shrubs once in 5 years for firewood, C1 and C2 type forests are maintained cyclically. And when the cutting interval becomes shorter, such as once a year, retrogressive succession occurs and grass, *M. sinensis*, becomes dominant on forest floor (Type C2). If people use there for mowing site, C2 type forest is maintained persistently. Finally, matured pine forest is clearly cut to obtain timber and others, and the cycle restarts from Type A.



Fig. 5 Traditional irrigation system for rice cropping at Komatsushima in Tokushima Prefecture (April 17, 2012)

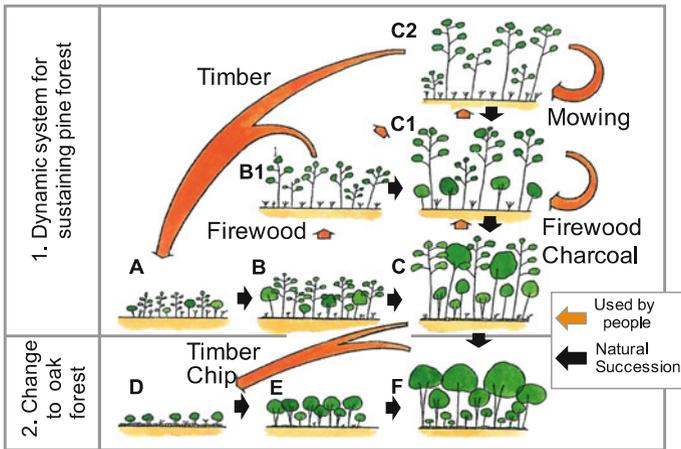


Fig. 6 Scheme of dynamic system for sustaining pine forest (Kamada et al. 1991)

2.2 Oak Forests

Evergreen and summer-green oak forests are also main components of *Satoyama* landscape as well as pine forest (Nakagoshi 1988). In northern part of Japan, summer-green oak forests of *Quercus serrata* occur at low altitude area, and those of *Q. crispula* at higher area, while evergreen oak forests occur at coastal area in southern part of Japan (Fig. 7).

Oaks have high ability of coppicing and suitable to produce charcoal (Fig. 8). Oak forests, therefore, used to be cut for producing charcoal periodically with interval of 15–25 years and regenerated by coppicing. Periodical cut used to sustain mosaic landscape dynamically.

In both pine and oak forests, people used to collect wood from their own land, and timing of cutting varied from person to person. In the situation of forested area in *Satoyama*, mosaic landscape composed of different succession stages could be maintained dynamically.

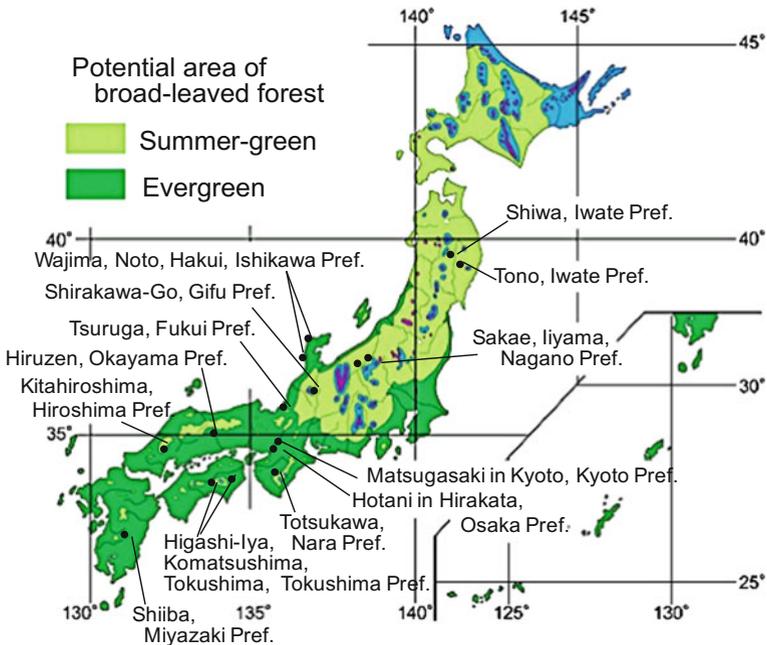


Fig. 7 Forest zone of summer-green and evergreen oaks, and places introduced in the chapter (Base map; <http://gis.biodic.go.jp/webgis/sc-009.html>)



Fig. 8 Oven for producing charcoal and produced charcoal (Noto in Ishikawa Pref., June 29, 2014)

2.3 *Grassland*

Grassland used to be a major component in *Satoyama* landscape (Fig. 9); it was kept mainly for mowing, and then meadow and pasture for labor animals such as cattle and horse. Burning was a major method for sustaining grassland in Japan.

In Higashi-Iya, which is a mountainous farm village in Tokushima Prefecture, local people had used *Miscanthus sinensis* for roofing houses and for fertilizing crops (Kamada and Nakagoshi 1997). People used to keep large grasslands (1,575 ha on average in 1960) on mountain ridge, locating from 1,200 to 1,600 m in altitude, for collecting *M. sinensis* as roof material. The grasslands were shared by community members. People used to burn the ridge every early summer to sustain the grassland, and the grass was harvested in late autumn by all households, ca. 30, of the community. Then using the grasses, a house roof was repaired by community members; one house a year in turn and thus each house could be repaired in about 30-year interval.



Fig. 9 Grassland along paddy fields for mowing grasses (Hiruzen in Okayama Pref., September 2, 2008)

While small patches of grassland (82 ha on average in 1960) were kept around crop fields on a slope in order to get *M. sinensis* for fertilizer, grass was collected at the grassland owned and managed by a household and put into the crop fields cultivated by the household.

2.4 *Satoyama Landscape as Vegetation Mosaic*

Although pattern and process of *Satoyama* landscape differ between region and region (Kamada and Nakagoshi 1996), it is common that the landscape is expressed as vegetation mosaic composed of different successional stages as shown by vegetation map of 1966 (Fig. 10). Crop fields, such as rice, wheat and vegetables, can be regarded as vegetation type covered with annual and/or biennial plants. Mowing site, meadow, and pasture are the patches of perennial grasses. Forest contains several growth phases. Land attributes, such as distance from residence, slope inclination, slope direction and soil type, are the factors for local people to determine land use type (Kamada and Nakagoshi 1997).

The mosaic structure of *Satoyama* was dynamically sustained by use of natural resources with periodical cutting, under local rule for sharing resources. The rule has been established in each region, and it has functioned to avoid “tragedy of the commons (Hardin 1968).”

However, the *Satoyama* landscape has drastically changed due to the socio-economic change of Japan.

3 Crisis of *Satoyama* Landscape and Driving Forces

3.1 *Rapid Economic Growth of Japan*

After the World War II, which ended in 1945, Japan started to rehabilitate devastated land and plunged into economic growth period from 1955. Industries of steel, shipbuilding, automotive manufacturing, electric machine, chemical, petrochemical and synthetic fiber were rapidly developed. In the period until 1975, annual economic growth rate had exceeded 10% every year. The development of those industries was powered by people who moved from rural to urban areas; during the 15 years from 1960 to 1975, population of 1,533,000 moved to three metropolitan areas, Tokyo, Osaka and Nagoya. In order to accept people, wide areas of *Satoyama* were developed into housing estates, so-called new town in Japan. Expansion of urban area eliminated the landscape of *Satoyama*.

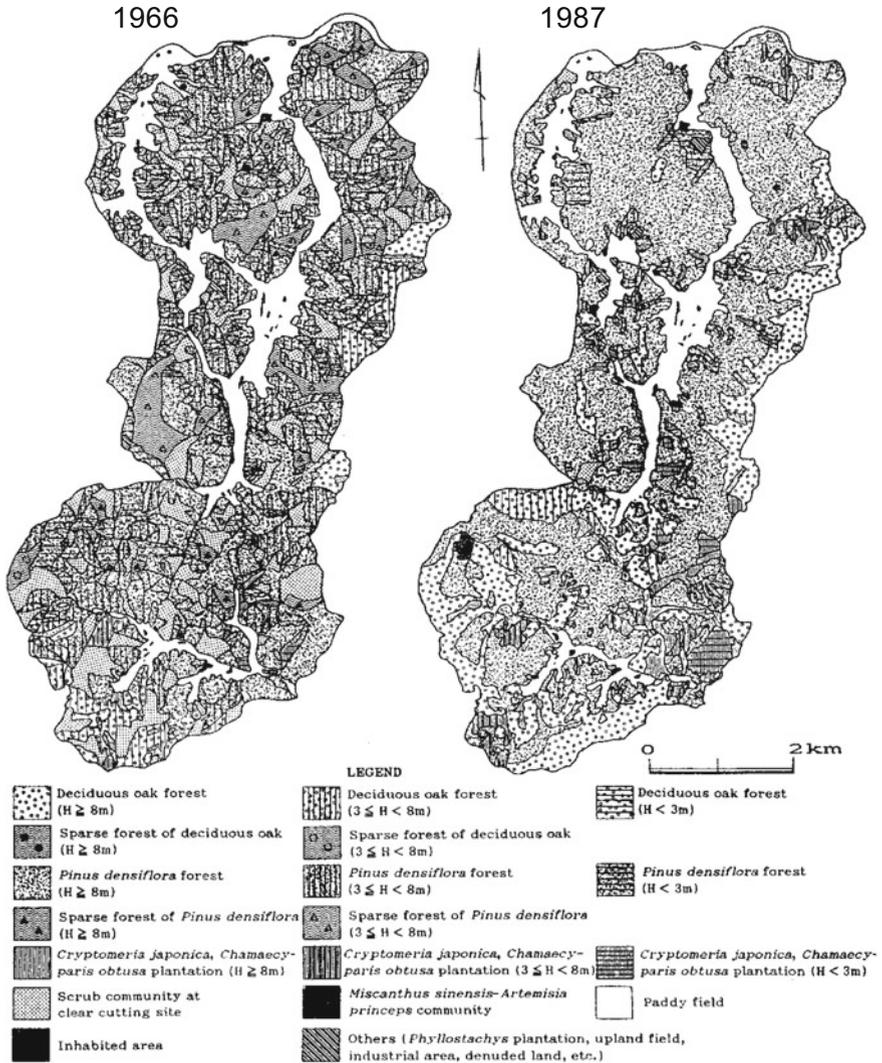


Fig. 10 Vegetation map at a part of Kitahiroshima in 1966 and 1987, during and after rapid economic growth period (Kamada and Nakagoshi 1990)

Due to increase of house construction in the period of rehabilitation and economic growth, demand for timber had increased. Japanese government, therefore, propelled afforestation policy; the government recommended rural people to plant conifer trees such as *Cryptomeria japonica* and *Chamaecyparis obtusa* as much as possible. As a result, about 40% of forested area has changed to artificial coniferous forest. In other words, the policy led to alter structure of *Satoyama* landscape.

3.2 *Disuse of Natural Resources in Satoyama*

In the same period, population in rural areas decreased rapidly; the number of full-time farm households was 3 million in 1950 and it decreased to 0.85 million in 1970. At the same time, materials for life as well as lifestyle drastically changed: from human and animal power to machines such as tractor and combine harvester in labor forces, from grass to tile for roofing house, from organic to chemical for fertilizer, and firewood and charcoal to gas, petroleum and electricity for domestic fuel. Amount of firewood production used to be $13,300 \times 10^6$ bundles in 1940, but now is almost zero (Fig. 11).

Disuse of natural resources in *Satoyama* has allowed vegetation to progress natural succession. Almost pine forest has been matured, and wide area has changed to oak forest (Fig. 12). Managed forests are few and well-developed pine forests such as Type C shown in Fig. 6 had widely occurred. In Type C forests, oak and other hardwoods can grow up and much litter is accumulated on forest floor. When these forests are felled, pine tree cannot regenerate because thick litter inhabits seeds to germinate.

While oaks can regenerate by sprouts (Type D), and very little oak coppices have been cut for charcoal production in recent Japan. Oaks, therefore, can grow to Type F successfully (Kamada et al. 1991). Thus, well-developed oak forests have increased in wide area of Japan. Pine wilt disease has killed pine trees, as mentioned later, and it has accelerated change from pine to oak forest by eliminating pine canopy from Type C forest.

In 1964, Japan started liberalization of wood trade and huge amount of wood became to be imported; population decrease in rural areas has caused shortage of labor force in forestry; and success of economic growth raised labor expenses in Japan. Thus, price of imported wood became cheaper than domestic one. As a result, wide area of forest has been abandoned and self-sufficiency rate in wood

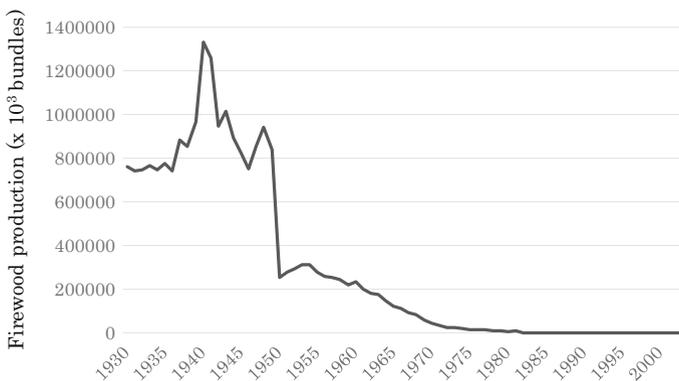


Fig. 11 Change of firewood production (Data source; Ministry of Agriculture, Forestry, and Fisheries, Japan; <http://www.stat.go.jp/data/chouki/zuhyou/07-34.xls>)

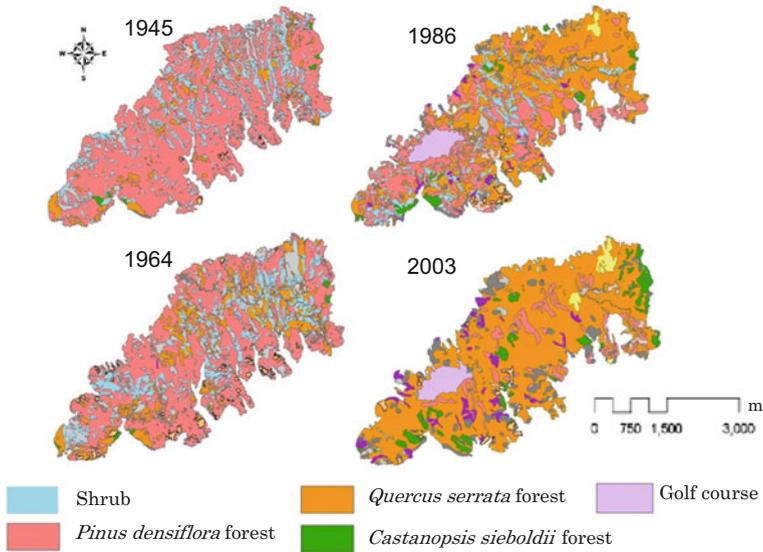


Fig. 12 Vegetation change from pine to oak forest at Mt. Bizan in Tokushima City, Tokushima Prefecture

decreased from 95% in 1955 to 28% in 2013. Globalization in relation to the economic growth has affected to the landscape of *Satoyama*.

3.3 Explosive Increase in Wildlife Population

As shown in the vegetation map in 1986 after the period of rapid economic growth (Fig. 10), mosaic structure of *Satoyama* landscape has changed into monotonous one, which is composed of well-developed pine and/or oak trees, and artificial conifer trees. Grasslands have disappeared due to replacement to mainly conifer plantation, because no grass has been necessitated for daily life. In other words, patches of early successional vegetation have disappeared from *Satoyama* and moved to late stages, and thus many species depending on early successional environments have been endangered (Kaneko et al. 2009).

Homogeneous landscape enhances disturbance if the disturbance is likely to propagate within a community such as species-specific parasite (Turner 1989). In fact, change of *Satoyama* landscape has been accelerated by pine wilt disease caused by pinewood nematode (*Bursaphelenchus xylophilus*). The nematode is carried and dispersed by Japanese pine sawyer (*Monochamus alternatus*). These pests have explosively increased their population in large area of homogeneous pine forest and blighted huge number of pine trees in Japan (Kamada et al. 1991). It has accelerated the change from pine to oak forest.

Same phenomenon has occurred in oak forests. Japanese oak wilt fungus (*Raffaelea quercivora*), which is carried and dispersed by ambrosia beetle (*Platypus quercivorus*), has attacked well-grown oaks and blighted large number of oak trees (Kuroda et al. 2012).

Outbreaks of the pests in pine and oak forests resulted from abandonment of the use of natural resources in *Satoyama*; in a situation under periodical use of woods, there was little chance for the pests to spread because infected trees were cut and removed during the activities for producing timber and/or charcoal.

Sika deer (*Cervus nippon*, including several subspecies) is explosively increasing population and expanding inhabiting area. Increase in the deer population has happened not only in rural areas but also in urbanized areas, and increased the deer population has given serious damage to *Satoyama* landscape by grazing plants on forest floor (Fig. 13).

Bamboo, mainly *Phyllostachys heterocyclus* f. *pubescens*, is also the species expanding its distribution. Bamboo was planted to harvest shoots, which was important for food and cash crop for farmers. Bamboo pole was useful material for hanging crops to dry and for scaffolding. The production of bamboo shoots, however, has drastically decreased due to the import of cheap bamboo shoot from China. Bamboo pole has been replaced by steel and/or plastic. In the situation, only little farmers have managed bamboo planation, and the bamboo has become free to



Fig. 13 Disappearance of forest floor vegetation due to over-grazing by increased Sika deer population at Matsugasaki, Kyoto city in Kyoto Prefecture (photographs by K. Noda)



Fig. 14 Bamboo invasion to neighboring forest at Hotani, Hirakata City in Osaka Prefecture (April 20, 2009)

grow. The bamboo is invading into neighboring forest by stretching subterranean stem (Fig. 14).

It is predicted that the expansion will occur in wide area of Japan and cause aggravation of *Satoyama* landscape (Someya et al. 2010; Fig. 15).

Any challenges described here have been caused by rarefaction in relationship between people's life and nature that represents a current situation of people's life disharmonized with nature and will result in vanishment of tradition of Japanese culture (Berque 1986; Kamada 2016). Social system under a new paradigm, which must be suitable to the current society, is necessary to recover the harmonious relationship.

4 Movement for Reconstructing *Satoyama* Landscape in Different Geographic Regions

4.1 Urban Area—*Matsugasaki in Kyoto*

Matsugasaki, locates at northern fringe of downtown of Kyoto city, was a rural area in the past. Paddy fields have replaced by residence, and population in the area is increasing year by year, 7,159 (2,929/km²) in 1990 and 8,320 (3,404/km²) in 2010.

Part of remnant forest has used as urban park, which is owned and managed by local government of Kyoto City. Many people enjoy walking in nature and join to activities for nature observation (Fig. 16b, c). In the park, playpark has been established and open to children; children stay in the forest in creating plays by themselves (Fig. 16d, e).

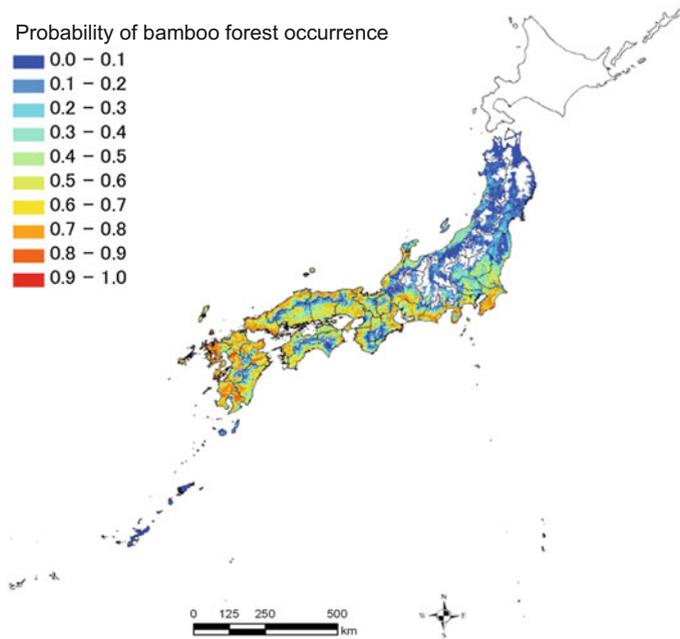


Fig. 15 Occurrence probability of bamboo forest, area with high probability has high risk of expansion (Someya et al. 2010)

For urban dweller, there is no *Satoyama* forest to go and play near their houses. Even if the forest can be found near their residence, it is not easy to play because dense shrubs grown in the forest prohibit people to enter. And thus parents, as well as school, prohibit children to go *Satoyama* forest. In addition, many young parents have no experience that played in *Satoyama* forest and do not know how to play with kids in the forest. In the situation, the playpark has become important place for children and parents, since it is safe and easy to access. Staffs in the playpark, who are the NPO (nonprofit organization) member and help to manage playpark as part-time worker, give guidance to kids how to touch with nature; the guidance includes not only fun things but also risks in the forest, which are the things learning from grandparents, parents, and elder friends if they are in traditional community. In other words, the playpark has become a center of newly formed community.

Spread of oak wilt disease and heavy grazing by increased Shika deer population, however, are damaging the forest seriously (Fig. 13). In order to restore the forest condition, the staffs of the playpark called on stakeholders to form a platform and the council was voluntarily established in cooperation with researchers in universities, officers of Kyoto city, and citizen group. In the council, ideas on measures and activities are exchanged, and goal for restoration is shared. Based on



Fig. 16 Remnant *Satoyama* forest used as urban park at Matsugasaki, Kyoto City in Kyoto Prefecture. Playpark is established in the park for children. (a–c April 7, 2013, d & e April 8, 2012)

a consensus, citizen group has started works for restoration in cooperation with researchers in universities (Fig. 17).

At the urban area, the part-time staffs of playpark, who belong to the NPO, have taken important roles: as the educator and/or storyteller, as the monitor to watch forest condition, and as the manager of platform to exchange information among different sectors and to make and share a goal.

4.2 Urban Fringe—Hotani in Hirakata City, Osaka

Hirakata city has been urbanized in accordance with economic growth of Japan; the number of household and population was 13,931 and 58,906 in 1955 and increased to 173,344 and 409,964 in 2012. A wide range of *Satoyama* landscape was altered to housing estates. Hotani area has been relieved of development, and beautiful *Satoyama* landscape has remained (Fig. 18). The landscape has been selected in the



Fig. 17 Activities for exchange information and share goal for restoration among different sectors concerned



Fig. 18 *Satoyama* landscape remaining at urban fringe, Hotani, Hirakata City in Osaka Prefecture (left, April 14, 2014; right, November 24, 2010)



Fig. 19 Voluntary work for restoring Satoyama landscape by NPO members at Hotani (November 24, 2010)

100 best *Satoyama* landscape of Japan, and thus many people visit to enjoy walking and nature observation.

Farmer's households have decreased from 79 in 1970 to 37 in 2005 and it becomes difficult to keep the landscape. Paddy fields remote from resident has been abandoned and changed to shrub, and bamboo is invading hill slope and paddy fields. (Fig. 14).

For improving the situation, NPOs have started voluntary works to maintain beautiful *Satoyama* landscape (Fig. 19). The members of the group are the people who moved from rural areas to Hirakata for getting job, and now have been retired. They feel nostalgic about *Satoyama* landscape, which is memorized as the landscape of their homeland, and want to touch with it near their home. The activities by voluntary members are the example of the trial to improve provisioning services of *Satoyama* ecosystem through getting cultural services.

Challenges in the area are an occurrence of a conflict between residential farmers and volunteers, due to the discommunication among them. Only part of residential farmers knew the volunteer groups and their purpose, and there were little chances for other residential people to know. In order to exchange and share information, a committee has been formed by an initiative of the governmental office of Osaka and the nature conservation society.

4.3 *Depopulating Area—Geihoku in Kitahiroshima Town, Hiroshima*

Geihoku area of Kitahiroshima town in Hiroshima Prefecture still has *Satoyama* landscape, which composed of grassland, oak forests on calm slope, and paddy fields on floodplain (Fig. 20). Population, however, is decreasing year by year, from 7,602 in 1955 to 2,490 in 2012. People have become not to use forest resources for daily life, and thus the dynamic system for sustaining *Satoyama* landscape has been lost.

Since the number of volunteers who want to work for improvement of forest conditions is little in the depopulating area in contrast with the areas of urban and urban fringe, it is necessary to establish a social system that can be operated by community members. For building restoration activities fitting to the social situation, NPO has established social system stimulating to occur autonomous flow of energy and economy in the region (Fig. 21). The system can motivate community member to participate in the activities, and it has been activated by the council formed by forest owners, store managers and NPO. This is an example of the trial to improve supporting services by getting provisioning services from the *Satoyama* forest, which has a possibility to retrieve dynamic system for sustaining *Satoyama* landscape.



Fig. 20 *Satoyama* landscape at Geihoku, Kitahiroshima in Hiroshima Prefecture (July 1, 2016)

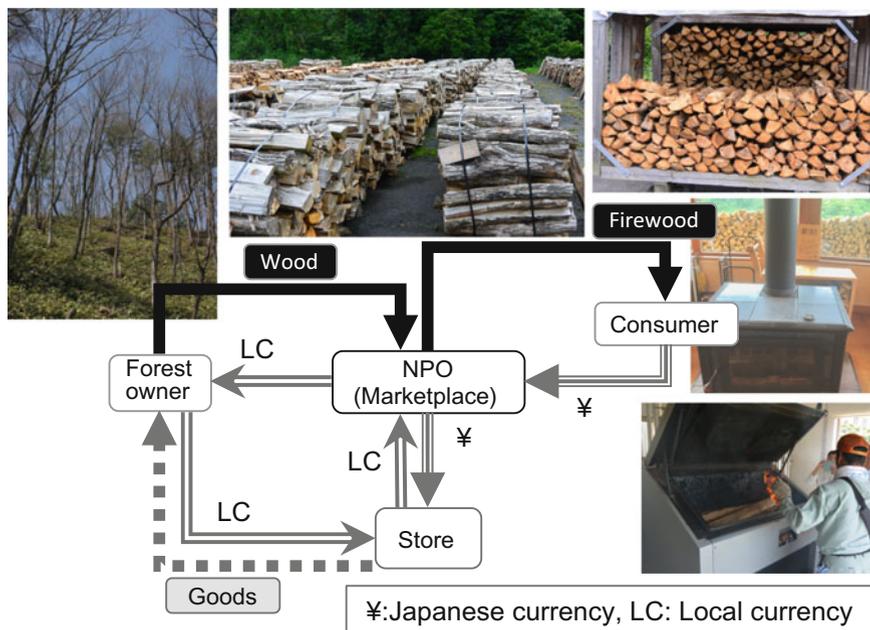


Fig. 21 Self-sufficient systems for getting domestic energy and circulating economy. The system motivates community member to participate in restoration work of *Satoyama* forest, at Geihoku in Kitahiroshima, Hiroshima Prefecture

5 Conclusions

Recent landscape of *Satoyama* represents recent life of people, which has been disharmonized with nature. In the situation, activities to retrieve the life of people harmonious with nature have started and are becoming huge movement. Participants and stakeholders are different in region-by-region (Table 1) and have changed from the period before economic growth. In the urban area, urban park has become a center for community, which has been loosely formed by urban dweller wishing to play in *Satoyama*. Another community in terms of the council has also established by stakeholders from several social sectors, under the sense of mission for giving chances to touch with nature safely to children and urban dwellers. The characteristic is that the local people who are living around the *Satoyama* have less role in decision making, because the land ownership has moved from the local community to the local government.

In the urban fringe, NPOs are voluntarily working at the private land in the traditional community, where is owned by local farmer but unmanaged. The committee composed of local people as landowner and NPOs has important role to make a decision. In a process for reconciling differences of views, equality and authority of the local government are helpful.

Table 1 Stakeholders for restoring *Satoyama* landscape in different regions

	Stakeholder					
	Local government	Land owner	Local people	NPO	Researcher	Visitor, user
Urban						
Matsugasaki, kyoto	●	○	△	●	●	△
Urban fringe						
Hotani, Osaka	○	●		●		
Depopulating						
Geihoku, Hiroshima	△	●	●	●		

In the area of both urban and urban fringe, the activities for restoring and conserving *Satoyama* have been powered by urban dwellers.

Area of *Satoyama* has been decreased due to the expansion of urban area, and thus the *Satoyama* landscape has become valuable for urban dweller to be conserved. Working in the *Satoyama* itself, therefore, is the motivation for them.

The activities in depopulating mountainous area have been conducted by members of traditional community, under support of the NPO. Getting income is an incentive for the member as well as the strong wish to hold people’s life in their community.

Relationship between people’s life and *Satoyama* is changing in accordance with the change of social system. Things we can recognize from the three regions are that *Satoyama* has changed its domain from private to commons, and now is just the turning point moving to next phase to retrieve the life harmonious with nature by collaboration with a wide range of participants. NPO takes important roles in governance of *Satoyama* as common property: linking people/organizations concerned, creating social system, consensus building, making action, and management.

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