Rehabilitation, Conservation, and Utilization of *Satoyama* Ecosystems and Human Well-being: A Case of Kanagawa Prefecture in Japan

Osamu Koike

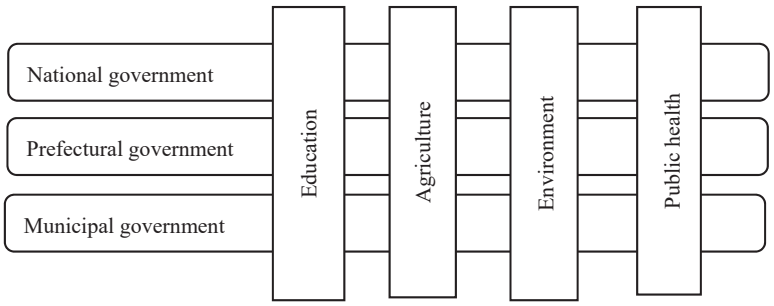
Introduction

Satoyama is defined as a 'mosaic of different ecosystem types including secondary forest, agricultural lands, irrigation ponds, and grasslands, along with human settlement' (Duraiappah and Nakamura, 2012:3). It occupies nearly 40% of the land in Japan (Ministry of Environment). In the past, *satoyama* produced much of the food, wood for fuel, timber, and water for communities. Japanese people have considered *satoyama* landscapes to be a symbol of traditional lifestyles and a spiritual home for the population. However, many *satoyama* have rapidly deteriorated due to industrialization and urbanization. Farmers use chemical fertilizers instead of natural composts, and people use electricity and gas instead of firewood. A decline in the economic value of agriculture and forest products from rural areas has accelerated the migration of young generations to urban centers (Duraiapapah and Nakamura, 2012: 5). In the urban fringes, housing development encroaches on the rural landscape, which results in the deterioration of the ecosystem and biodiversity in these areas.

In the era of economic growth (1960s–1980s), national and local governments did not promote *satoyama* conservation. The Ministry of Agriculture, Forestry, and Fisheries (MAFF) concentrated on increasing the scale of farming and encouraged the industrialization of agriculture. The Environmental Agency tackled environmental pollution issues, the Ministry of Education focused on scholastic achievement, and local governments placed high priority on urban development including transportation and housing.

In the late 1980s, a growing global concern for sustainable development triggered policy transformation in Japan. In 1987, the World Commission on Environment and Development (the Brundtland Commission) published 'Our Common Future.' It proposed long-term environmental strategies for achieving sustainable development. The Brundtland Report laid the groundwork for the Rio Earth Summit in 1992, which proclaimed the global actions for sustainable development known as *Agenda 21*. The rise of concern for sustainable development boosted policy debates in Japan. In the late 1990s, the government decided to protect rural landscapes and display strong supports for sustainable development to the world.

However, MAFF and the Ministry of Environment had separate focuses in policy development from the very beginning. MAFF emphasized the role of agriculture and forestry in the conservation of rural landscapes. The Ministry of Environment (formerly named the Environmental Agency) focused on the biological



Source: Wright, 1988. Modified by the author.

Figure 1 A 'Picket-fence' Representation of Central-Local Relations

diversity intrinsic to the *satoyama* ecosystems. However, the 'dual approach' in the *satoyama* conservation was not a 'division of labor' in the cabinet. Rather, it was a product of the traditional 'vertically segmented administration (*tatewari gyosei*)' in Japan (Samuels 1986).

In principle, the rehabilitation, conservation, and utilization of *satoyama* for human well-being are the responsibility of local government. Thus, it requires a 'bottom-up approach' in the architecture of policy intervention, in which prefecture governments support municipalities and the national government support prefectures and municipalities. Given the nature of multiple functions of *satoyama*, it demands a multi-dimensional collaboration beyond the boundaries of policy subsystems. This paper examines the effectiveness of policy interventions in *satoyama* conservation at the community scale through the example provided by Kanagawa prefecture.

Analytical Framework

Akira Amakawa characterizes Japan's central-local relations as the 'interfusion model' in which the functions of national and local governments are inseparable (Amakawa 1982). In this model, national ministries could intervene in the local public administration at will. However, the ministries are dependent upon local governments for policy implementation (Koike 1990). Equally, local public officials often borrow national authority and knowledge for their policy outcomes (Scheberle 2004). Thus, the central-local relations are characterized as an 'interdependency model' rather than the 'central control model' (Muramatsu 1997).

However, the proliferation of intergovernmental programs has developed the 'picket-fence' type policy networks across the levels of governments (Wright 1988). In this model, it is difficult for the public officials to work together for cross-cutting issues beyond the policy subsystems (see Figure 1).

In 1999, the Government enacted the Omnibus Decentralization Promotion Act.[1)] It was presented that

1) In fact, the national ministries had intervened in the local administration through the system of 'Agency delegated Functions (ADFs)' until the 1990s. In the system of ADF, the elected governors and mayors should implement the delegated function as the agency of national ministers. The ADF was abolished by the Omnibus Decentralization Promotion Act of 1999.

the decentralization gives local government a chance to compete with one another and create better public services. However, decentralization is a double-edged sword. It allows local governments to focus on their own business. It could widen the gaps among the rich and poor local governments.

In fact, local governments work for local economies. Reform-minded governors and mayors have applied the concept of 'New Public Management (NPM)' that emphasizes 'value-for-money.' The reform tools include outsourcing, 'public-private partnerships (PPPs),' and performance management (Koike 2013). However, contraction of public services based on the theory of 'public choice' has widened the gaps between the developed center and the less developed periphery. In addition, the outsourcing of service delivery institutions has reduced the coherency in the public service provisions. In the end, it has deprived local public officials of working with one another. To some extent, NPM has transformed local governance from a hierarchical bureaucratic model to a 'networked governance' model. In theory, it enables local government to mobilize local resources necessary for policy goals. It addresses the cross-cutting issues such as multifaceted *satoyama* conservation. However, in a networked governance, it would be a big challenge for local public officials to coordinate multidimensional interests for policy goals.

On the other hand, the promotion of decentralization deprives national ministries of power to pull local governments into intergovernmental policy management (Koike 1990). A lack of policy dialogue in the weakened 'interdependency' model might result in fragmented policy actions and limited policy outcomes at the local level. Unfortunately, this happens in the implementation of the *satoyama* conservation program at a local level.

Prior to the analysis of *satoyama* conservation in Kanagawa prefecture, it will be appropriate to look at the development of 'dual approach' in the national government.

'*Satoyama*' in the Agricultural Policy

There was a focus on rural landscape conservation during the full revision of agricultural policy in the late 1990s. The government of Japan enacted the Food, Agriculture and Rural Areas Basic Act in July 1999. This was the first legislation that defined multiple functions of farmlands including the conservation of national land, water resources, natural environment, the aesthetic value of the landscape and the respect for cultural tradition. In the same year, the government enacted the Advanced Sustainable Farming System Promotion Act that emphasizes the promotion of environmentally friendly agriculture. It stipulates that farmers shall improve soil quality management by applying composted manure or other organic materials and simultaneously reduce the amount of chemicals, including fertilizers and pesticides. In 2000, MAFF introduced a direct income support payment program for farmers in the hilly and mountainous areas based on the Basic Act. Contrary to the EU's common agricultural policy, this program provides grants for farmers who continue farming more than five years in the hilly and mountainous areas. It aims to reduce the abundance of abandoned farmlands in the hilly and mountainous areas through the support of farmers' livelihoods.

In the process of policy development, scholars on agriculture and forest have supported the establishment of theoretical background. In 2001, the Science Council of Japan (SCJ), a representative organization of Japanese scientist community submitted the report titled 'Assessment of Multi-functionality of Agriculture and Forest in Relation to the Global Environment and Human Life' in response to the inquiry from the Minister of Agriculture, Forestry and Fisheries. It provided a scientific analysis on the multiple functions of agriculture

Table 1 Multi-functionality of Agriculture and Forest by the Science Council of Japan

Multi-functionality of Agriculture	Multi-functionality of Forest
1 Safety through sustainable food provision 2 Contribution to environment through agricultural land-use that supports nutrient cycling 1) Formation of nutrient cycling (1) Controlling water cycling; flood prevention, landslide prevention, soil erosion prevention, river flow stabilization, ground water recharge (2) Climate Mitigation; Water purification, climate regulation, prevention of overuse of resources 2) Formation/maintenance of secondary nature (1) Conservation of biodiversity (2) Conservation of land space Conservation of quality farmland, provision of green space, conservation of traditional landscape 3 Integration of production and living; formation and maintenance of community 1) Community and culture (1) community development (2) cultural tradition 2) Mitigation of urban stress (1) restoration of humanity (2) action learning and education	1 Conservation of biodiversity Conservation of gene, species, ecology 2 Conservation of global environment Mitigation of global warming (carbon absorption, alternative energy) Stabilization of global climate 3 prevention of land slide, conservation of soil, prevention of avalanche, storm protection 4 Water recharge Flood mitigation, water reservoir, water-content control, water purification 5 Amenity Climate mitigation, clean air, comfortable living (noise prevention, amenity) 6 Health and recreation Cure, recharge (rest, walk, forest bath) Recreation, sport 7 Culture Landscape, scenic beauty, learning and education (production, labor, closeness to nature), Art, religion, festival Traditional culture, cultural diversity 8 Production of materials Woods, foods, raw materials for manufacturing and craft

Source: Science Council of Japan, 2001.

and forest and recommended the policy measures to the government (Table 1).

After a lengthy debate in 2007, MAFF launched the direct payment program for environmentally friendly farming to reduce the use of chemical fertilizer and pesticide. It was expanded in 2011 to cover farming for biodiversity conservation and climate change. In 2015, MAFF enacted the Multi-functionality Promotion Act to provide a legal ground for 'Japan style Direct Payment System.' Under the Multi-functionality Promotion Act, MAFF launched the multi-functional payment program consisting of 'farmland maintenance payment (FMP)' and 'resource improvement payment (RIP).' FMP provides subsidies for the groups that promote the maintenance of farmlands such as the repair of irrigation. RIP provides financial support for the groups that engage in landscape conservation, traditional farming, and other cooperative activities for local resources. It is obvious that the multi-functional payment attempts are to rescue rural communities facing crisis in the *satoyama* areas.

Satoyama and Biodiversity

The conservation of biodiversity is another pillar of policy interventions for *satoyama* conservation in Japan. In 2002, the Ministry of Environment (MOE) established the New National Biodiversity Strategy that stated three 'crises' spur the loss of biodiversity in Japan. The first crisis is the destruction of ecosystems due to overdevelopment and overuse of resources. The second crisis is the abandonment of *satoyama* areas. The

third is the deterioration of ecosystems due to the increase of invasive alien species. Based on the new strategy, MOE launched the *Satoyama* Conservation and Rehabilitation Model Program in 2004 to support citizens' actions for environmental protection in *satoyama* areas.

In 2007, MOE established the national sustainability strategy titled 'Becoming the Leading Environmental Nation in the 21st Century.' It declared the promotion of 'Japan Model for a Sustainable Society' with the slogans of 'low carbon society,' 'sound-material cycle society,' and 'society in harmony with nature.' In 2008, the government enacted the Biodiversity Basic Act that defined *satoyama* areas eligible for biodiversity conservation. In 2010, MOE unveiled the *Satoyama* Conservation Action Plan to provide a guideline for local government to use for protecting *satoyama* areas.

Furthermore, the global policy debate on biodiversity encouraged MOE to organize a policy community with the ecologists. MOE launched the international '*Satoyama* Initiative' in cooperation with the United Nations University (UNU) to share Japanese experiences in biodiversity conservation in *satoyama* with other countries. In 2010, in conjunction with the 10th Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP10) in Nagoya, Japan, MOE and UNU established the International Partnership for the *Satoyama* Initiative (IPSI) comprised of organizations committed to supporting Socioecological Production Landscapes (SEPLs).

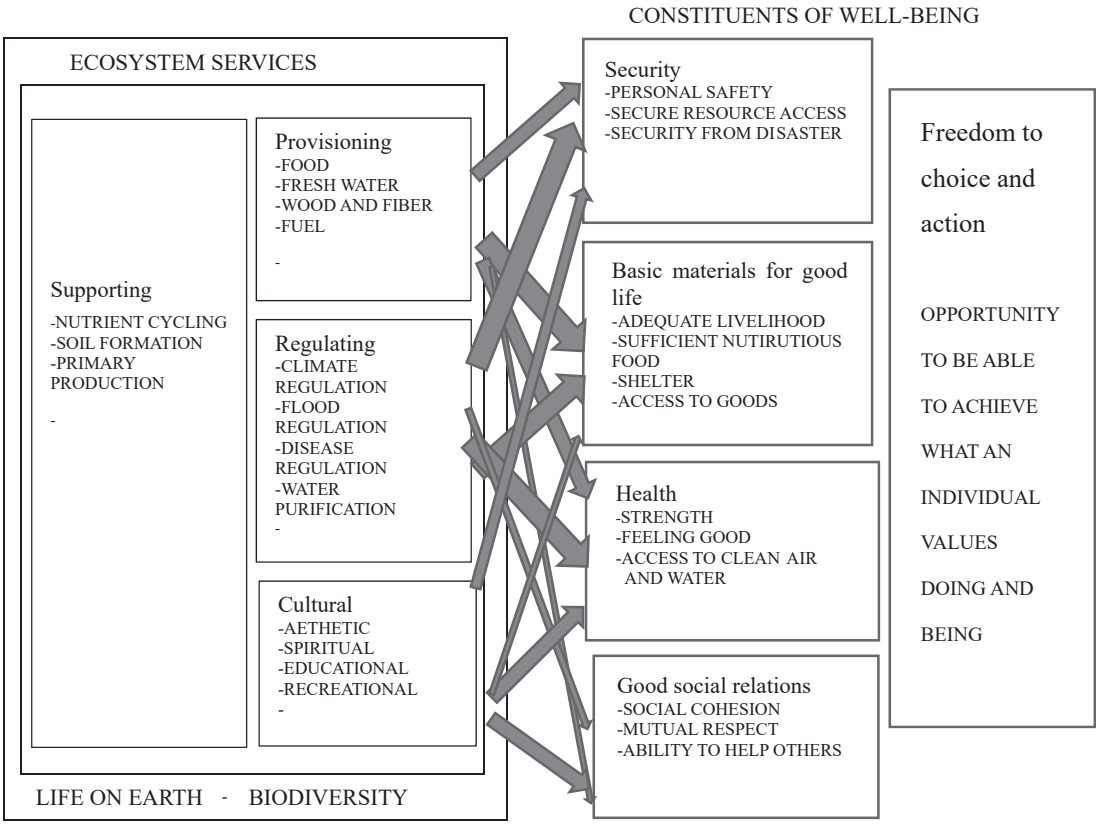
In agricultural policy development, academics contributed to the establishment of theories for *satoyama* conservation. In 2006, the United Nations University-Institute of Advanced Studies (UNU-IAS) organized the Japan *Satoyama Satoumi*[2] Assessment (JSSA) consisting of ecologists within and outside of Japan. JSSA attempted to use the 'Millennium Ecosystem Assessment (MA),' launched by UN Secretary–General Kofi Annan, on June 5, 2001, to analyze *satoyama* ecosystems in Japan.

MA defines 'ecosystem' as a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit (Millennium Ecosystem Assessment, 2005). 'Ecosystem services' are the benefits people obtain from ecosystems. It includes *provisioning* services such as food, water, timber, and fiber; *regulating* services that affect climate, floods, disease, wastes, and water quality; *cultural* services that provide recreational, aesthetic, and spiritual benefits; and *supporting* services such as soil formation, photosynthesis, and nutrient cycling. Humans are fundamentally dependent on the flow of ecosystem services (see Figure 2).

MA examines how changes in ecosystem services influence human well-being such as the basic requirements for a good lifestyle, health, social relations, security, and freedom of choice and action. People are integral parts of ecosystems and a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being (Millennium Ecosystem Assessment, 2005).

In the application of MA to Japan, JSSA has identified three values that *satoyama* ecosystems would generate. The first is 'direct use values' such as food, fiber, fuel-wood and water. The second is the 'indirect use values' that include flood and water regulation, water purification, and cultural services. The third is 'option values' such as maintaining *satoyama* for future generations as a source of cultural heritage (Duraiappah and

2) A term of '*satoumi*' is used to describe mosaics of land use that have formed in marine and coastal ecosystems.

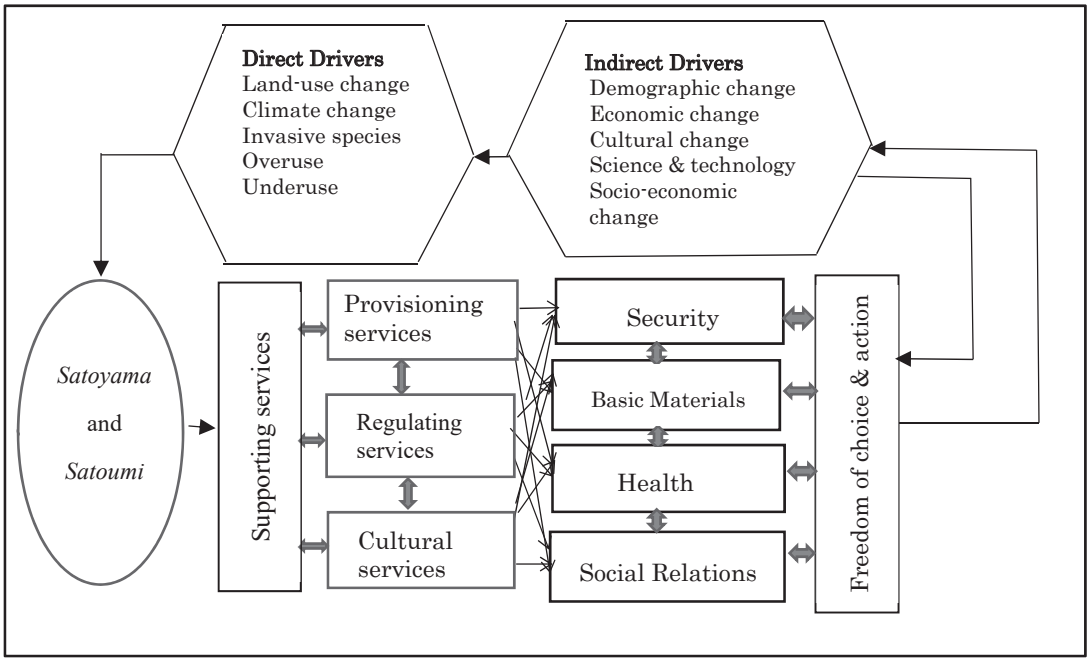


Source: Millennium Ecosystem Assessment, 2005, p. 50.

Figure 2 Ecosystem Services and Human Well-being

Nakamura, 2010: 4).

According to JSSA, there is a strong correlation between an increase in biodiversity, the resilience of ecosystems, and human well-being (see Figure 3). Rich biodiversity in *satoyama* areas provides a base for unique ecosystem structures and functions, which supports provisioning, regulating, and cultural services for human well-being (Saito and Shibata, 2010: 37). Provisioning services include timber for construction, fuel in the form of wood and charcoal, and food such as rice and mushrooms. Regulating services in *satoyama* include climate control, water quality control, wildlife habitat regulation, and disaster control. Finally, cultural services of *satoyama* are embedded in the very foundation of Japanese society. The traditional knowledge used



Source: Japan *Satoyama Satoumi* Assessment, 2010, p.11.

Figure 3 Conceptual Framework of JSSA

in the management of these landscapes, as well as the cultural identity they provide for society in general, offers valuable cultural services such as cultural heritage, sense of identity, tourism, walking, and recreation. Environmental education and ecotourism lead to the creation of new industries (*ibid.*).

However, the fuel and fertilizer revolution after the World War II weakened the relationships between livelihoods and ecosystem services in *satoyama* areas. Farmers discontinued the use of weeds and fallen leaves from the secondary forest. It has changed the structure and biota of *satoyama* ecosystems and spurred the deterioration of various ecosystem functions and services (Yumoto 2010: 138). In the field of cultural services, a decline of cultural and material links with ecosystem services breaks down the resilience of social communities, as cultural services are associated with the spiritual aspect of human well-being. The JSSA report reveals a significant negative correlation between the amount of nature and health, especially mental health (*ibid.*, 141). In conclusion, JSSA recommends that government and society should encourage multi-functionality of *satoyama* to harmonize human activities and the environment (*ibid.*, 150).

Based on the JSSA report, the study group of MOE released the report titled 'Comprehensive Assessment Report of Biodiversity and Ecosystem Services' in 2016. It analyzed the relationships between ecosystem services and human well-being in Japan using the framework of JSSA (see Table 2). In the report, the study group argues that losing population in agriculture, forestry, and fisheries would decrease our knowledge and technology on how to gain benefits from natural capital. The loss of food diversity and the mosaic of rural landscapes would lead to the loss of cultural services created through interaction with ecosystems. In addition, the loss of interaction with

Table 2 Relationships between Ecosystem Services and Human Well-being

Human well-being	Applying ecosystem services
【Supporting good life】 Provision of foods and resources for our life	Provision of food, water, raw materials (agricultural products, mushroom, aquatic product, pure water, timber); Regulating services (water, soil, biological control)
【Contact with nature and health】 Purification of water and air through the ecosystem and their positive and negative effects on physical and mental health	Regulating services contributing to health (regulation of climate, air, and water); Cultural services (tourism and recreation, leisure)
【Security and Safety】 Disaster prevention; Control of damages by animals	Regulating services on security and safety (soil erosion control, flood control, prevention of surface failure, Tsunami mitigation); disservice (animal, birds)
【Living and culture in harmony with nature】 Religion originated in nature and traditional culture	Cultural services (religion/festival, education, landscape, traditional art and craft, ecotourism)

Source: Ministry of Environment, 2016.

nature would decrease human health, in particular, the health of children. In conclusion, the report warns that the degradation and deterioration of *satoyama* ecosystems would harm the lives of people of Japan.

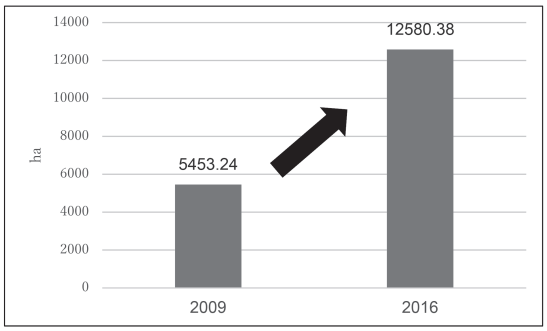
Pros and Cons of 'Dual Approach'

As we have observed, the policies on *satoyama* landscapes have divided agriculture and the environment from the very beginning of policy intervention. In theory, a contestation between the parties enriches the quality of policy. In fact, both MAFF and MOE have developed excellent analytical frameworks that are useful and applicable to local policy implementation. However, it is ironic that both ministries have emphasized the multi-functionality of *satoyama* landscapes respectively. In fact, the multiple functions of agriculture overlap with the conservation of biodiversity in the communities. It suggests the deadly sin of 'dual approach,' as this approach reinforces the segmented public administration at local level. In the latter half of this paper, the author examines the influence of 'dual approach' on the local actions for *satoyama* conservation with the analysis of the case of Kanagawa prefecture.

Promotion of *Satoyama* Conservation in Kanagawa Prefecture

The *satoyama* areas in Kanagawa are rapidly degrading and deteriorating due to urbanization and industrial development. In the areas closest to the urban districts, the encroachment of housing and manufacturing is damaging the landscape of rural areas. Within *satoyama* areas, aging farmers are giving up farming and forestry, and their children are moving away to work in urban offices. This is resulting in the devastation of rural landscapes in the Kanagawa region. To save *satoyama* ecosystems from deterioration, the Governor Shigefumi Matsuzawa (2003–2011) proposed the enactment of the ordinance on the conservation, rehabilitation, and utilization of *satoyama* areas in 2007. The enacted ordinance stipulates that *satoyama* have a multifaceted significance, providing seasonal scenery, biodiversity, cultural heritage, fresh air, safe food, disaster relief, etc. It has premised that the development of multifaceted functions of *satoyama* would enrich human well-being and benefit the larger population (Koike 2014).

In the implementation process, the prefecture government has deployed a 'bottom-up approach' that



Source: GLERC-YNU, 2017, p. 113.

Figure 4 *Satoyama* Conservations Area

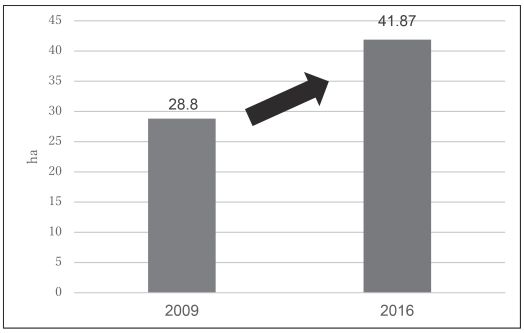


Figure 5 Agreed Partnership Area

underscores the role of community and municipal government in the promotion of *satoyama* conservation. It is the prefectural government that selects the land for *Satoyama* Conservation Areas and accredits '*Satoyama* Conservation Partnership Agreements' between landowners and local action groups. The prefectural government provides financial and technical assistance for local action groups. The Agriculture Division of Kanagawa Prefectural Government hosts the programs to raise public awareness of the multi-functionality of *satoyama* through farming programs for children, *satoyama* symposiums, and other initiatives. The municipal governments support local action groups in cooperation with the prefectural government.

In the first eight years, the *satoyama* conservation program has achieved remarkable progress. The selected *Satoyama* Conservation Areas have increased from seven areas (5,453 ha) in 2009 to twenty areas (12,580 ha) in 2016 (Figure 4). The Partnership Agreement Areas have also increased from 28.8 ha in 2009 to 41.87 ha in 2016 (Figure 5). In the conservation areas, local action groups have developed various programs for the conservation of rural landscapes. In 2015, the Ministry of Environment has included all *satoyama* conservation areas in Kanagawa in the '500 Important *Satochi-Satoyma*.' There are three criteria in selecting *satoyama* conservation areas: 1) The area conserving diversified, high quality secondary natural environment. 2) Various wild species specific in *satochi-satoyama* living in the area. 3) The area contributing to the formation of ecosystem network. The inclusion in the '500 Important *Satochi-Satoyama*' has certified that *satoyama* conservation areas in Kanagawa maintain healthy conditions for biodiversity.

However, there is a large gap among 33 municipal governments in the Kanagawa region. *Satoyama* conservation areas are only found in 10 out of 33 municipalities. These municipalities are located in the western part of Kanagawa Prefecture, and among the 10 municipalities, only Sagamihara City and Atsugi City have enacted the local ordinance on *satoyama* conservation areas. Five cities have provided some financial assistance for local action groups, and the rest of the municipalities run modest services such as promotion through public newsletters.

Interestingly, the administrative organization in charge of *satoyama* conservation varies across the municipalities. In four municipalities, the agricultural divisions are in charge of *satoyama* conservation. In the other four municipalities, the environmental divisions promote *satoyama* conservation. In the rest, the urban

policy division and the tourism office are in charge of *satoyama* conservation. There is no single organization specialized in the support of *satoyama* communities. This suggests the influence of the 'dual approach' in the local government. In general, the environmental divisions promote *satoyama* conservation in the urbanized areas, whereas the agricultural divisions promote *satoyama* conservation in the rural areas. At the prefectural level, the agricultural division is responsible for the implementation of *satoyama* conservation ordinances, and likely this has a harmful effect on the promotion of *satoyama* conservation at the community level due to the segmented administration across all levels of government. However, a majority of municipalities remain passive in the promotion of *satoyama* conservation, mainly due to a lack of professional staff and a limitation of financial resources.

Evaluation of Outcomes

The Global-Local Education and Research Center of Yokohama National University (GLERC-YNU) has conducted a two-year study on the evaluation of *satoyama* conservation in Kanagawa Prefecture from 2015–2016. During the research, GLERC-YNU established the Project Team consisting of scholars from various academic fields.[3)] Prior to the analysis, the Project Team disassembled the multifaceted functions of *satoyama* ecosystems into five categories: 'local economy,' 'environment and land conservation,' 'landscape formation,' 'education and human development,' and 'health and community.' In relation to the framework of JSSA, the 'local economy' corresponds to the *provisioning* services and the 'environment and land conservation' correspond to the *regulating* services. The Project Team divided the *cultural* services into three subcategories of 'landscape formation,' 'education and human development,' and 'health and community.' The 'biodiversity' is included in the 'environment and land conservation.' The team hypothesized that the restoration of *supportive* services (soil, water) would rehabilitate biodiversity. It would restore the *provisioning* services (food, fiber, fuel), improve the *regulating* services (clean air, disaster prevention), and enrich the *cultural* services (beauty, landscape, food, education) of *satoyama* ecosystems. Then, a variety of human well-being including quality of life, health, and safety would be provided through the utilization of *satoyama* ecosystem services.

Table 3 is a summary of the research findings by the GLERC-YNU. In the field of local economy, 14 action groups out of 21 action groups have engaged in economic activities such as rice planting and harvesting events. Some groups have collected fees from the participants for covering necessary expenses. Others sold hand-made crafts, charcoal, homegrown vegetables at the event sites.

In the field of 'environment and land conservation,' the restoration of biological diversity has been remarkable in the rehabilitated areas. Some groups planted rare species in the *satoyama* forest and others managed biotope. Many local action groups engaged in environmentally friendly agricultural practices, such as using fewer pesticides. In the rehabilitated areas, scholars and universities have conducted various academic studies on biodiversity. All these activities have contributed to public awareness of biodiversity in the *satoyama*

3) The member of Project Team is as follows: Osamu Koike (Leader, Graduate School of International Social Sciences), Osamu Ebihara (Graduate School of Education), Yoshifumi Ikejima (Graduate School of International Social Sciences), Takaaki Kobayashi (Graduate School of International Social Sciences), Fumito Koike (Graduate School of Environment and Information Sciences), Mine Sato (Graduate School of Urban Innovation), Maki Shimura (GLERC), and Keiji Ujikawa (Graduate School of International Social Sciences).

Table 3 Activities, Outcomes, and Generated Values in the *Satoyama* Conservation Program

Field	Activities	Outcomes	Generated value
Local economy	Rehabilitation of abandoned farm land, sale of farm products, farming experience, event	Vitalizing agrarian economy, increase of agricultural related consumption, increase of urban-rural exchange	Economic value (contribution to agribusiness)
Environment/ land conservation	Rehabilitation of *satoyama* ecosystem, use of biomass, environmentally friendly agriculture	Recovery of biodiversity, promoting understanding of low carbon society, cyclical society, and society in harmony with nature	Environmental value (sustainability, good living)
Landscape formation	Landscape formation (planting, thinning, maintenance of walkways), event	Increased tourism (firefly viewing, chrysanthemum festival, *satoyama* art)	landscape values (green tourism)
Education/ human development	Biological studies, farming experience, food education, traditional culture, acceptance of volunteers	Farm to School partnerships, promotion of food education, development of voluntary actions, promotion of CSR	Cultural values (sustainable living, traditional culture)
Health/ community	Cooperation with community organizations, traditional events, interaction with welfare institutions	Health promotion, community development, partnership with Non-profit organizations, agriculture-welfare cooperation	Social values (social capital, empowering women and the elderly)

Source: GLERC-YNU, 2017, p. 114.

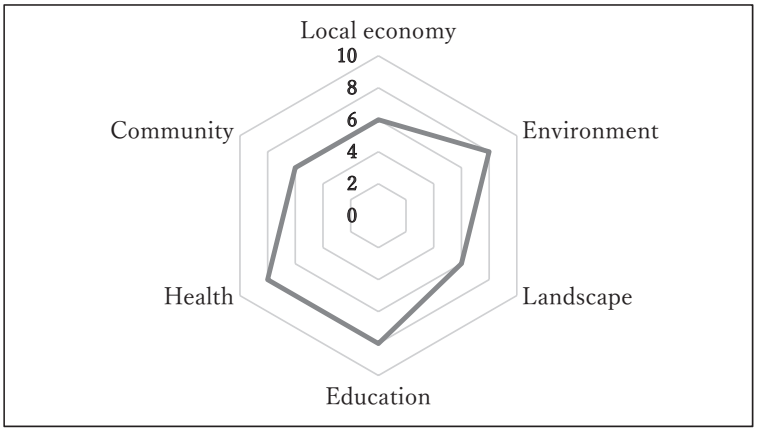
ecosystems.

On 'landscape formation,' local action groups plant flowers, trim trees, and repair walkways to invite visitors and tourists. In the conservation areas, tourists enjoy beautiful rural landscapes, eat local food, and take pictures. In Kurokawa, the art school students have exhibited their works around the farm fields. These actions exhibit that *satoyama* landscapes provide well-being to the urban population through the various cultural services.

According to the GLERC-YNU study, the highest concern among the local action groups is education and human development. Most groups have provided farming experience programs and environmental education programs for schoolchildren. In Tsuchizawa, the local action group provided the rehabilitated forest for a nature playground for kindergarten child. Atsugi City government calls on citizen volunteers to help *satoyama* conservation groups. A variety of private companies have engaged in the *satoyama* conservation as a part of 'corporate social responsibility (CSR)' activities. For example, a private company provides employees to cut grass in the *satoyama* areas every year. The Odakyu Railway Company supports ecotourism events in the *satoyama* areas through the campaign in the rail.

Finally, *satoyama* conservation has increased public awareness of health in the community. Local action groups have reached out to women and the elderly in communities to join in the conservation activities, saying that it would improve health condition. The GLERC-YNU survey results have revealed that the people who have engaged in the conservation activities have been to the hospital less frequently than the average of Kanagawa prefecture. Recently, two local action groups have hosted people with mental disabilities to learn about farming in the *satoyama* areas.

Figure 6 is the illustration of the development of multiple functions of *satoyama* in Kanagawa prefecture.



High: 8~10
Moderate: 5~7
Low: 1~4
Source: GLERC, 2017, p. 116.

Figure 6 Development of Multiple Functions in the *Satoyama* Area

It is based on the analysis of the outcomes of conservation activities. In the evaluation process, the GLERC-YNU study separated community development from the health.

Firstly, the development of economic function is 'moderate.' In the rehabilitated *satoyama* areas, local action groups produced rice, vegetables, mushrooms, and other products. However, agricultural production remains at the level of self-consumption. It is mainly due to the small scale of agriculture. In addition, a large majority of group members are retired people who do not need to rely on income from agriculture. It suggests that 'economic benefit' is unlikely to be a key driver for their 'collective action.'

Secondly, the environmental function of *satoyama* ecosystems is highly developed. It is endorsed by the fact that all conservation areas are included in the '500 Important *Satochi-Satoyama'* of the Ministry of Environment. In the conservation areas, many groups promote a variety of environmental education programs.

Thirdly, *satoyama* landscapes have attracted many visitors and tourists. The beauty of the landscapes is the pride of local action groups. Thus, they plant trees and restore devastated terraced rice fields. However, the value of *satoyama* landscapes does not permeate throughout the Kanagawa region. Municipal governments are less interested in the promotion of ecotourism in the *satoyama* areas. Thus, the development of the cultural function of landscapes is 'moderate.'

Fourthly, the educational function of *satoyama* ecosystems has developed well in the *satoyama* areas. Local action groups have provided a variety of educational programs for children. They support scientific research of *satoyama* ecosystems conducted by academic institutions.

Fifthly, *satoyama* conservation is interlinked with the promotion of health in the communities.

Finally, the GLERC-YNU pointed out that conservation activities have increased 'social capital' in the community. It is interesting that partnerships between local action groups and non-profit organizations (NPOs) in the *satoyama* areas are growing. It suggests a rise of 'networked governance' in the rural communities. However,

the aging population remains a serious problem in the *satoyama* areas. It makes community development stay in the 'moderate' level. As the MOE study report warns, a lack of successors endangers the succession of traditional knowledge on *satoyama* ecosystems.

Concluding Remarks

The GLERC-YNU study proves that the multifaceted functions of *satoyama* landscapes have been developing largely in the *satoyama* conservation areas in Kanagawa prefecture. Their research findings have identified the interlinkages between the *satoyama* ecosystems and human well-being in the rehabilitated *satoyama* areas. It is quite interesting that the development of multifaceted *satoyama* functions is largely attributable to the voluntary efforts of local action groups. It is mainly due to the strategy of 'bottom-up approach' in the prefecture. Based on the principle of 'self-governing', the Agriculture Division of Kanagawa Prefecture admits the flexible use of subsidies.

On the other hand, the influence of policy intervention through the 'dual approach' is limited in the Kanagawa region. The Agriculture Division of Kanagawa Prefecture has developed its own programs based on the prefectural ordinance. The inclusion in the '500 Important *Satochi-Satoyma*' has no impact on the environmental programs for *satoyama* conservation by the municipalities. However, as analyzed in this paper, the theoretical frameworks of 'multi-functionality of agriculture' and the 'interlinkages between *satoyama* ecosystems and human well-being' are excellent and applicable to the *satoyama* conservation in the communities. Unfortunately, the local public officials have not utilized these analytical frameworks for policy development.

Therefore, we should not be satisfied with the voluntary efforts of local action groups. Rather, we should think that we could have achieved more results if the national and local government officials had effectively collaborated for policy outcomes. In the case of public health, the Ministry of Health, Welfare and Labor, the Public Health Institutions, and municipal health centers could have developed excellent *satoyama*-based health promotion programs if they had worked together. It could have happened in the case of the Education for Sustainable Development (ESD), if the local governments, the Boards of Education, the national ministries such as MAFF, MOE, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the Ministry of Internal Affairs and Communication (MIC) had effectively cooperated with one another.

In conclusion, we can say that a 'bottom-up' approach is the most desirable in the intergovernmental policy implementation, in particular, in the case for cross-cutting issues such as the community-based *satoyama* conservation. In this approach, local public officials should work with communities in the analysis of problems, and then, define appropriate policy frameworks for desired outcomes. If the municipal governments lack policy resources, the prefectural governments should provide appropriate support for them. If the prefectural governments need national support, then national ministries should act for them. In the implementation process, the public officials shall work together beyond the 'fence' of policy subsystems across the levels of governments for maximum outcomes in the local communities.

Then, the advocacy of 'bottom-up approach' in the intergovernmental policy implementation leads us to the redesign of the 'interfusion model' on central-local relations. It demands a transfer from a hierarchical, bureaucratic model to a horizontal, 'networked governance' model, which enables the efficient and effective use of local resources for outcomes. Again, it addresses the cross-cutting issues such as multifaceted *satoyama*

conservation. The *satoyamas* are experiencing a crisis due to aging community members and depopulation. There is little time left. Prompt and effective policy actions are required.

References

Amakawa, Akira. 1982. 'Regionalism and Autonomy: The Continuing Debate in Japan.' A paper presented at the Conference on Local Institutions in National Development: Strategies and Consequences of Local-National Linkages in the Industrial Democracies, Bellagio, Italy, March 15−19.

Duraiappah, A. K. and Koji Nakamura. 2010. 'The Japan Satoyama Satoumi Assessment: Objectives, Focus and Approach.' In Duraiappah, A. K. *et al.* eds. *Satoyama-Satoumi Ecosystems and Human Well-being: Socio-Ecological Production Landscapes of Japan*. United Nations University Press.

European Union. 2010. The Common Agriculture Policy: A Story to be continued.

Global-Local Education and Research Center. 2017. 'The Final Report of the Interdisciplinary Study on the Conservation Effects of *Satochi-Satoyama* in Kanagawa Prefecture' (in Japanese), Yokohama National University.

Japan *Satoyama Satoumi* Assessment. 2010. *Satoyama-Satoumi Ecosystems and Human Well-Being: Socio-ecological Production Landscapes of Japan*. United Nations University Press.

Koike, Osamu. 1990. 'Intergovernmental Policy Management in a Bureaucratic State: Is Japan Changing?' *Journal of Management Science and Policy Analysis*, 17(3): 226−43.

———. 2013. 'Rise and Fall of the New Public Management Reforms in Japan.' In César Madureira and Maria Asensio, eds. *Handbook de Administração Pública*, Ina Editora, Lisbon, pp. 419−430.

———. 2014. 'Rural Landscape Conservation in Japan: Lessons from the Satoyama Conservation Program in Kanagawa Prefecture.' In Nobuhiro Kaneko, Shinji Yoshiura, and Masanori Kobayashi, eds. *Sustainable Living with Environmental Risks*, Springer, pp. 253−263.

Koike, Osamu and Deil S. Wright. 1998. 'Five Phases of Japanese Intergovernmental Relations: Policy Shifts and Governance Reform,' *International Review of Administrative Sciences* 64: 203−218.

Millennium Ecosystem Assessment, 2005. *Ecosystem and Human Well-being: Synthesis*. Island Press.

Ministry of Environment of Japan. 2011. 'Report on the Effectiveness of *Satochi-Satoyama* Conservation Promotion: A Summary' (in Japanese). http://www.env.go.jp/nature/satoyama/conf_pu/chousakekka.pdf

———. 2016. Comprehensive Assessment Report of Biodiversity and Ecosystem Services (in Japanese).

Muramatsu, Michio. 1997. *Local Power in the Japanese State*. California: University of California Press.

Saito, Osamu and Shibata Hideaki. 2010. '*Satoyama* and *Satoumi*, and Ecosystem Services: A Conceptual Framework.' In Duraiappah, A. K. *et al*. eds. *Satoyama-Satoumi Ecosystems and Human Well-being: Socio-Ecological Production Landscapes of Japan*. United Nations University Press.

Samuels, Richard J. 1986. *The Politics of Regional Policy in Japan: Localities Incorporated?* Princeton, New Jersey: Princeton University Press.

Scheberle, Denise. 2004. *Federalism and Environmental Policy: Trust and the Politics of Implementation.* Georgetown University Press.

Science Council of Japan. 2001. 'Assessment of Multi-functionality of Agriculture and Forest in relation to the Global Environment and Human Life' (in Japanese).

Wright, Deil S. 1988. *Understanding Intergovernmental Relations*, 3rd ed. California: Brooks/Cole.

Yumoto, Takakazu. 2010. 'Why is Change to *Satoyama* and *Satoumi* a Concern? ' In Duraiappah, A. K. *et al*. eds. *Satoyama-Satoumi Ecosystems and Human Well-being: Socio-Ecological Production Landscapes of Japan*. United Nations University Press.

［こいけ　おさむ　横浜国立大学大学院国際社会科学研究院教授］