



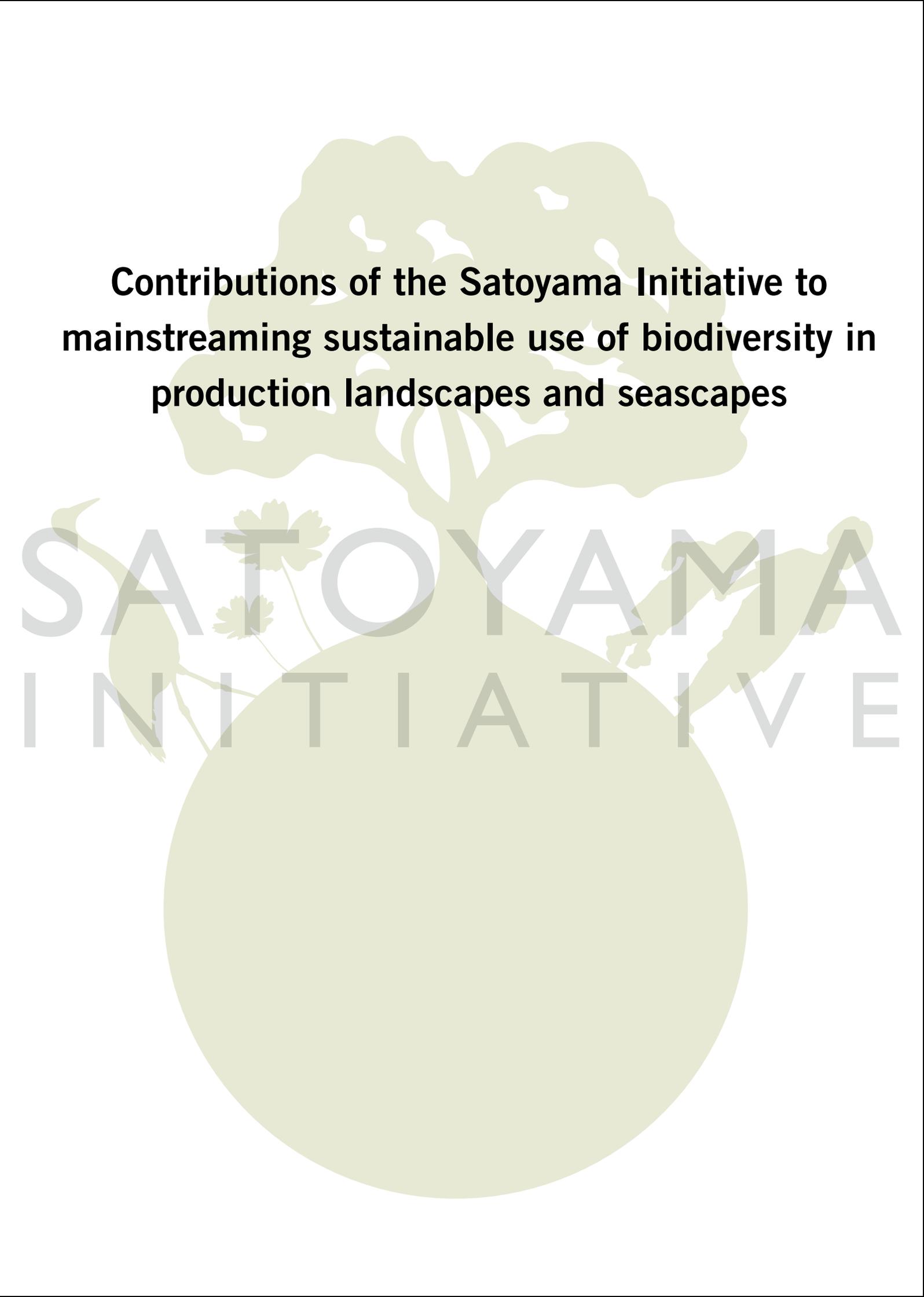
**SATOYAMA
INITIATIVE**

Advancing Socio-Ecological Production Landscapes and Seascapes (SEPLS)
for the benefit of biodiversity and human well-being

IGES
Institute for
Global Environmental
Strategies

SATOYAMA INITIATIVE

**Contributions of
the Satoyama Initiative to
mainstreaming sustainable use of
biodiversity in
production landscapes and seascapes**

The background features a light green illustration of a large tree with a thick trunk and a full, rounded canopy. To the left of the tree, a bird is shown in profile, facing right. To the right, a person is depicted in a crouching position, appearing to be working with the ground. At the bottom center, a large, solid light green circle represents the Earth or a globe. The text is overlaid on these elements.

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mainstreaming sustainable use of biodiversity in
production landscapes and seascapes**

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This publication has been prepared as part of an IPSI collaborative activity between United Nations University Institute of Advanced Studies (UNU-IAS) and the Institute for Global Environmental Strategies (IGES)

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Contents

Executive summary	1
1 Introduction	4
1.1 <i>The concept of the Satoyama Initiative and Socio-Ecological Production Landscapes and Seascapes</i>	5
1.1.1 Target Areas	5
1.2 <i>Activities of the Satoyama Initiative</i>	7
1.3 <i>International Partnership for the Satoyama Initiative (IPSI)</i>	8
2 Study outline	10
3 Results of the study	12
3.1 <i>Review of the Satoyama Initiative case studies</i>	12
3.1.1 Existing challenges	12
3.1.2 Good practices of the Satoyama Initiative case studies	14
3.2 <i>Key contribution of the Satoyama Initiative to the achievement of the Aichi Biodiversity Targets</i>	19
3.3 <i>Implications for potential collaborative activities under IPSI clusters</i>	30
4 Conclusions and way forward	34
5 References	36

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Executive summary

Despite a significant increase in protected areas across the world, the rate of global biodiversity loss has not slowed down. The need to look beyond the cataloguing of protected areas and to take concrete steps for the sustainable use of biodiversity in broader landscapes and seascapes is becoming all the more dire, as we face the growing challenges of global food production, natural resource use and land cover change.

To tackle these challenges, the Ministry of the Environment of Japan and the United Nations University Institute of Advanced Studies (UNU-IAS) jointly initiated the Satoyama Initiative, which aims to contribute to the implementation of the Convention on Biological Diversity (CBD) through the sustainable use of biodiversity, as well as to the achievement of the Aichi Biodiversity Targets. Important tools towards implementing this convention are the National and Local Biodiversity Strategies and Action Plans (NBSAPs and LBSAPs), to which the Satoyama Initiative can provide valuable support.

The Satoyama Initiative promotes the sustainable use of “Socio-Ecological Production Landscapes and Seascapes (SEPLS)”, such as farmlands, secondary forests, and fishing grounds, which people have developed and maintained over time. The highlight of this initiative is the International Partnership for the Satoyama Initiative (IPSI), acting as a platform for sharing information and fostering synergies among its diverse members through collaborative activities.

This publication has been prepared as part of an IPSI collaborative activity between UNU-IAS and the Institute for Global Environmental Strategies (IGES) to provide policy makers and IPSI members with materials that can support them in the process of selecting actions to be included in their NBSAPs and LBSAPs. IPSI has been fostering knowledge management by collecting case studies on sustainable use of production landscapes and seascapes from its members, which have served as the basis for this study. A review of these case studies has been conducted to identify good management practices of SEPLS, and their contributions to the achievement of the 2020 Aichi Biodiversity Targets. The good practices have also been classified according to the IPSI clusters as a basis for considering future IPSI activities.

The Satoyama Initiative case studies have provided useful examples of actions to

allow a shift towards the sustainable management of SEPLS both from an environmental and a socio-economic perspective. The establishment of local management structures to allow the representation and coordination of direct resource user's interests resulted in self-organization in resource management, with a decline in overexploitation and offences to local resource use rules, as well as a stronger stewardship by user communities. Strengthening the management capacity of local communities for the maintenance of the ecological functions of local ecosystems was essential for the development of a holistic management plan to maintain critical ecosystem services and to secure livelihoods for the local people. Valuing cultural and ecological landscapes and providing incentives for their protection has been shown to play a critical role for the preservation of historical and cultural landscapes and their agrobiodiversity, leading to the protection of local flora and fauna and their habitats. Assisting local farmers in knowledge management and consolidation of traditional practices through technical and institutional support was shown to be critical to maintaining traditional and local knowledge, agrobiodiversity, and ecosystem services. Technical support from research institutions in this process was also crucial for local farmers to document and understand the dynamics of traditional landscape management.

These good practices, alongside IPSI's activities, are an important resource for implementing the CBD's Strategic Plan for Biodiversity 2011-2020, including the Aichi Biodiversity Targets. The contributions of the good practices of the Satoyama Initiative to some of the Aichi Biodiversity Targets have been illustrated in this publication. The strengthening of multi-stakeholder partnerships in resource management contributes to Target 4. The reduction of pressures on biodiversity through sustainable use of forests, agricultural, pastoral land and other landscapes and seascapes contributes to Targets 6 and 7. Other practices contribute to Target 11 by enhancing the conservation of biodiversity within production landscapes through integration between production and conservation areas. They also contribute to Target 13 by protecting and restoring cultural and historical landscapes which harbour agrobiodiversity. Contributions to Target 14 are made through strengthening benefits to direct resource users, thus providing incentives to protect important landscapes,

and to Target 15 by strengthening the resilience of production landscapes and promoting climate change adaptation. The good practices contribute to Target 18 by promoting broad public understanding and appreciation of cultural and traditional values, and to Target 19 by enhancing capacity building and education on sustainable resource use.

Finally, the good practices extracted from the review of case studies have been used to illustrate possible activities that could be included in each of the five clusters of the IPSI collaborative activities, namely Knowledge Facilitation, Policy Research, Research for Indicators, Capacity Building, and On-the-ground activities. These actions can serve as a basis for exploring synergies among IPSI members, and for developing future IPSI collaborative activities.

The review of the Satoyama Initiative case studies has illustrated the variety of activities required for the successful management of SEPLS based on sustainable use of biodiversity. By promoting the implementation of these activities in a locally appropriate manner, the Satoyama Initiative can bring about proper recognition of the value of traditional knowledge systems as well as participatory resource management for the maintenance of ecological functions within production landscapes and seascapes. In addition to this report, numerous resources under the Satoyama Initiative provide materials for considering actions to take for the sustainable use of biodiversity. The next step would be to take these ideas forward and to translate them into local actions. IPSI is an active and useful platform which can support these endeavours through enhancing synergies and collaborations on SEPLS management, demonstrating innovative approaches and tools that strengthen linkages between SEPLS and human well-being, promoting revision and communication on policy changes related to SEPLS, as well as knowledge generation and facilitation through a multi-stakeholder platform, and through monitoring and evaluating progress and impacts on SEPLS at all scales.

1 Introduction

By 2010, nationally designated protected areas had increased significantly, with over 150,000 protected areas covering 12.7% of the world's land area and 1.6% of the global ocean area (Bertzky et al., 2012). Despite this increase, global biodiversity loss has been showing no signs of slowing down and rates of land cover change in the past few decades have remained high, due to various challenges such as growing demand for food production, rapid industrialization, and urbanization. This, together with demographic ageing and rural depopulation, has led to the degradation and loss of production landscapes and seascapes as well as the sustainable practices and knowledge they represent. It is thus necessary to look beyond simply designating additional protected areas, and to diversify the approach to conservation by incorporating sustainable types of human-influenced natural environments.

To tackle these challenges, it is important to make full use of traditional knowledge and socio-economic systems to find locally adapted solutions. Furthermore, in order to promote sustainable use of biodiversity, it is necessary to mainstream biodiversity concerns into the management of broader landscapes and seascapes.

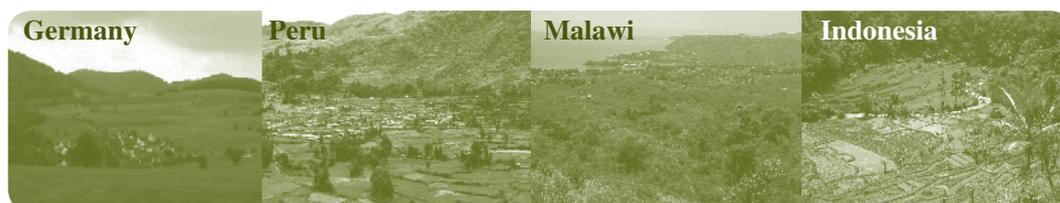
Toward this end, the Ministry of the Environment of Japan and the United Nations University Institute of Advanced Studies (UNU-IAS) jointly initiated the Satoyama Initiative. This international effort promotes activities consistent with existing principles for sustainability such as the Ecosystem Approach. Its core vision is to realize societies in harmony with nature built on positive human-nature relationships. The Satoyama Initiative aims to contribute to the implementation of the Convention on Biological Diversity (CBD) through the sustainable use of biodiversity, as well as to the achievement of the Aichi Biodiversity Targets. An important means for the national level implementation of this Convention are the National Biodiversity Strategies and Action Plans (NBSAPs), which must be adopted by the Parties to the CBD by 2015, and the Local Biodiversity Strategies and Action Plans (LBSAPs), which can be an effective policy instrument at the local government level. The Satoyama Initiative can be a valuable resource in determining effective actions to be included in NBSAPs or LBSAPs. Thus this publication has been prepared as part of an IPSI collaborative activity between UNU-IAS and the Institute for Global Environmental Strategies (IGES) to provide policy makers and IPSI members with materials that can support them in this process.

1.1 The concept of the Satoyama Initiative and Socio-Ecological Production Landscapes and Seascapes

The Satoyama Initiative promotes the sustainable use of human-influenced natural environments, such as farmlands, secondary forests, and fishing grounds, which people have developed and maintained over time. These human-influenced natural environments, or “Socio-Ecological Production Landscapes and Seascapes (SEPLS)”, play an important role in sustaining and enhancing biodiversity as they often harbour a variety of species adapted to and relying on these landscapes and seascapes to survive. SEPLS are dynamic mosaics of habitats and land uses that have been shaped over the years by the interactions between people and nature in ways that maintain biodiversity and provide humans with goods and services needed for their well-being (Annex of Paris Declaration on the “Satoyama Initiative”). Sustainable use of land and water in accordance with its ecological features is common in SEPLS, although land use practices may range widely from rice cultivation to grazing. SEPLS are indispensable for food, water, lives and livelihoods, and for nurturing culture and tradition while helping to conserve biodiversity.

1.1.1 Target Areas

The Satoyama Initiative targets a diverse range of areas such as villages, farmland, adjacent woods and grasslands, inland water systems, coastal systems, and urban fringes that have been formed and maintained through human influence. These unique places at the interface of nature and human settlement have many names— *muyong* in the Philippines, *kebun* in Indonesia and Malaysia, *mauel* in Korea, *ngunda* in Tanzania, *chitemene* in Zambia, *fadana* in Nigeria and Niger, *chacras* in Argentina, *dehesa* in Spain, and *terroir* in France. Such landscapes vary widely due to their unique adaptations to local climatic, geographic, cultural, and socio-economic conditions, but are equally valuable in terms of sustainability.



Characteristics of socio-ecological production landscapes and seascapes considered in the Satoyama Initiative (from the IPSI Strategy)

Socio-ecological production landscapes and seascapes (SEPLS) are dynamic mosaics of habitats and land uses where the harmonious interaction between people and nature maintains biodiversity, the planet's natural capital, while providing humans with the goods and services needed for their livelihoods, survival and well-being in a sustainable manner.

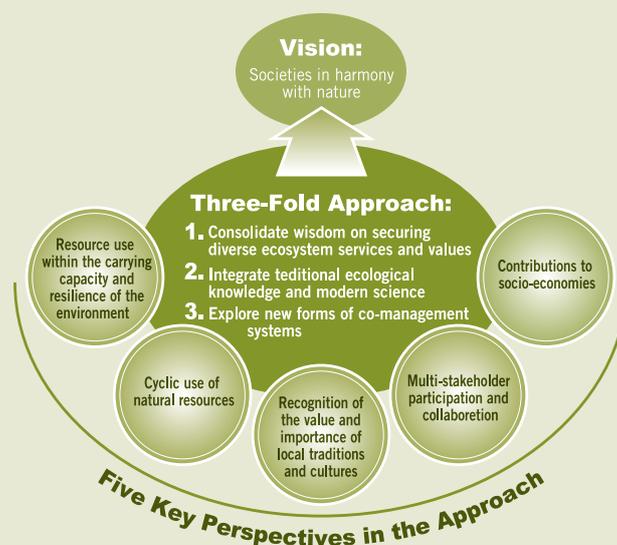
Natural resources in SEPLS considered in the Satoyama Initiative are used and managed in a sustainable manner, and benefits arising out of the utilization of genetic resources from these SEPLS are shared in a fair and equitable manner, in accordance with the Convention on Biological Diversity.

In such landscapes and seascapes:

- (a) Resources are used within the carrying capacity and resilience of the environment;
- (b) Natural resources are re-used and/or recycled;
- (c) The value and importance of local traditions and culture are recognized;
- (d) Management of natural resources and ecosystem services is sustainable and multi-functional, and through multi-stakeholder participation and collaboration, and
- (e) Activities contribute to sustainable socio-economies including poverty reduction, food security, sustainable livelihood and local community empowerment.

The Satoyama Initiative recommends the application of a three-fold approach for maintaining or expanding SEPLS that are functioning well and rebuilding, revitalization or restoration of lost and/or degraded SEPLS. The approach consists of:

- (a) Consolidating wisdom on securing diverse ecosystem services and values;
- (b) Integrating traditional ecological knowledge and modern science to promote innovations; and
- (c) Exploring new forms of co-management systems or evolving frameworks of “commons” while respecting traditional communal land tenure systems.



(source: the Strategy for the International Partnership for the Satoyama Initiative, available at: <http://satoyama-initiative.org/wp-content/uploads/2012/12/IPSI-Strategy.pdf>)

1.2 Activities of the Satoyama Initiative

The Satoyama Initiative has been developed to respond to the urgent need to support and, where necessary, revitalize or rebuild SEPLS. Its overall objective is to promote and support SEPLS to maintain their contribution to human well-being and the three objectives of the Convention on Biological Diversity¹. The Satoyama Initiative recognizes the importance of other ongoing initiatives dealing with SEPLS and seeks to provide a platform for cooperation and support.



Through its activities, the Satoyama Initiative aims to:

- a. Enhance understanding and raise awareness of the importance of SEPLS for livelihoods and the three objectives of the Convention.
- b. Support and expand SEPLS where appropriate and as part of the implementation of the post-2010 Strategic Plan of the CBD.
- c. Collaborate with other initiatives and programmes which are operating in this area.

These goals will be met through a diverse range of activities including, among others:

- Collecting, analysing, synthesising and comparing case-studies and distilling lessons learned;
- Undertaking research on means to promote knowledge and practice, inter-cultural communication, explore new forms of co-management, revitalize SEPLS; and integrate results in policy and decision-making processes;
- Developing measurable indicators of resilience in SEPLS and applying these indicators to the implementation of the Ecosystem Approach;
- Increasing awareness through education and information dissemination;
- Enhancing capacities for maintaining, rebuilding and revitalizing SEPLS;
- Collaborating with local community organizations, national governments, donor agencies, NGOs, and UN agencies.

¹ The three objectives of the CBD are: 1) The conservation of biological diversity, 2) The sustainable use of the components of biological diversity, and 3) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.



1.3 International Partnership for the Satoyama Initiative (IPSI)

One of the highlights of the Satoyama Initiative is its International Partnership with diverse members including governments, NGOs, indigenous communities, academic institutions, private sector organizations, and international organizations that have joined the Initiative to carry out its activities. The International Partnership for the Satoyama Initiative (IPSI) is open to all organizations dealing with SEPLS to foster synergies in the implementation of their respective activities. The broad, multi-sectoral partnership has given the Satoyama Initiative momentum since its launch at the Tenth Meeting of the Conference of the Parties to the Convention of Biological Diversity (CBD COP10) held in Aichi, Nagoya, in October 2010.

Members of IPSI:

132 member organizations from 40 countries (as of March 2013)

17. National governments	4. Government-affiliated organizations	10. Local governments	39. Civil society organizations
8. Indigenous or local community organizations	27. Academic and/or research institutes	13. Private sector organizations	14. International organizations

IPSI acts as a platform for sharing information and fostering discussion among its members in order to identify synergies and complementarities towards maximization of resources, and strengthening of outcomes through collaborative activities. All IPSI members engage, in an appropriate capacity, in one or more of the activities promoted under IPSI. These activities are divided into five clusters, namely:

- (1) Knowledge Facilitation
- (2) Policy Research
- (3) Research for Indicators
- (4) Capacity Building
- (5) On-the-ground activities

In addition to its collaborative activities, IPSI has been aiming to foster knowledge management by collecting case studies on sustainable use of production landscapes and seascapes from its members, which have been published with inputs from over 50 member organizations covering different regions and ecosystems (as of February 2013). These case studies have been shared through IPSI's website and IPSI booklets, and have served as useful materials to promote sustainable resource use in SEPLS.

Furthermore, IPSI holds an annual Global Conference including the IPSI Assembly meeting and a Public Forum, as an occasion to bring together stakeholders for discussions on ongoing and future IPSI activities. More than 80 research, policy and development activities were presented by IPSI members at the first and second IPSI Global Conferences. Over 20 collaborative activities were launched among IPSI members following endorsement by the IPSI Steering Committee.

Highlights of IPSI collaborative activities jointly implemented by member organisations:

Community Development and Knowledge Management for the Satoyama Initiative Project (COMDEKS)

To enhance the resilience of SEPLS by developing sound biodiversity management and sustainable livelihood activities with local communities, IPSI has established the Community Development and Knowledge Management for the Satoyama Initiative Project (COMDEKS). Implemented by the United Nations Development Programme (UNDP) in partnership with the Secretariat of the CBD, the Government of Japan, and UNU-IAS, COMDEKS will leverage existing experiences, resources and networks, and support landscape level approaches in sustainable human development for the long-term benefit of local communities and ecosystems.

Indicators for Resilience in Socio-Ecological Production Landscapes and Seascapes.

IPSI members (Bioversity International and UNU-IAS) have developed a set of socio-ecological production landscape indicators intended to help measure the resilience of targeted landscapes and seascapes. The indicators are currently being tested in the COMDEKS project sites, and will be improved based on lessons learned through this practical application. This piloting exercise will help refine the overall methodology for measuring landscape resilience, and contribute to linking traditional knowledge and sustainable use.



2 Study outline

The purpose of this study is to provide policy makers and IPSI members with materials that can help them in developing or revising national level policies for the sustainable use of biodiversity, especially in determining effective actions to be included in their National or Local Biodiversity Strategies and Action Plans. A review of IPSI case studies and activities has been conducted to identify good management practices for biodiversity conservation and human well-being.

Objectives

- Extract evidence of effectiveness of sustainable resource use and conservation of biodiversity in production landscapes and seascapes
- Identify the contribution of the Satoyama Initiative towards achieving the Aichi Biodiversity Targets through advancing SEPLS for the benefit of biodiversity and human well-being
- Describe the potential activities of IPSI in alignment with the five clusters

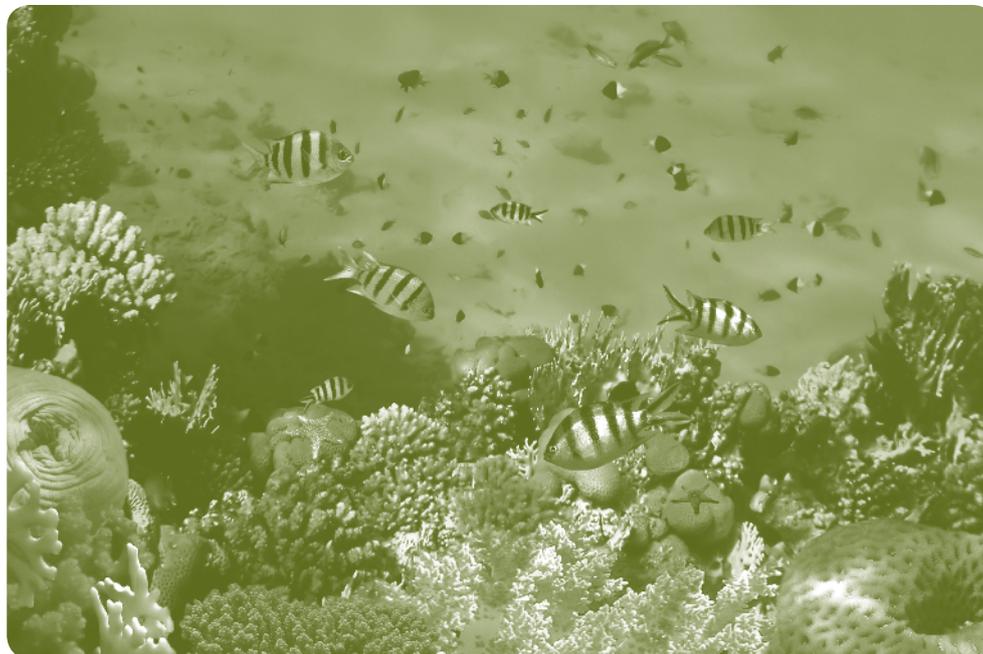
The case studies submitted by IPSI members have been reviewed to identify good practices that could be useful for application in a broad context of sustainable management of SEPLS. Furthermore, in order to demonstrate the added value of the Satoyama Initiative, its contributions to the achievement of the 2020 Aichi Biodiversity Targets were identified. Finally, the good practices have been classified according to the IPSI clusters as a basis for consideration on future activities to be promoted under IPSI.

The following case studies were selected as a basis for the review².

Region	Country	Title
Africa	Benin	Benin's experience in the management of sacred forests for biodiversity conservation
	Kenya	The communal forest, wetland, rangeland and agricultural landscape mosaics of the Lower Tana, Kenya: A socio-ecological entity in peril
	Niger Republic	Management of the palm tree population in Gaya
	Tanzania	Changing land-use in the fragile Lake Nyasa catchments of Tanzania: A lowland-highland nexus
America	Brazil	Abrolhos seascape, a field demonstration model
	Peru	The <i>ayllu</i> system of the Potato Park
	Peru	Utilization of natural pastures in the Huascarán National Park by users and rural communities

² Selected from IPSI (2012) IPSI Case Study Booklet, and Belair et al. (Editors) (2010). Sustainable use of biological diversity in socio-ecological production landscapes. Background to the 'Satoyama Initiative for the benefit of biodiversity and human well-being.' Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 52, 184 pages.

East Asia	Japan	Conserving biodiversity by utilizing wood thinned from forests as biomass fuel for power generation (Sustainable Utilization of Biological Resources)
	Japan	Working for the Living in Harmony with Nature, Aichi's Efforts toward Ecosystem Networking
	Japan	Conservation and management of agricultural land by traditional methods in Machida City, Tokyo, Japan
SE Asia	Cambodia	Role and involvement of the commune council in community forestry activities in Domnak Neak Ta Thmor Puan
	Philippines	Role of Traditional Knowledge in Strengthening Socio-Ecological Production Landscapes
	Thailand	Local livelihood in the Lower Songkhram Basin, Thailand
South Asia	India	Homegardens: sustainable land use systems in Wayanad, Kerala, India
	Nepal	Biodiversity Conservation through Domestication of High Value Medicinal and Aromatic Plants in Mountain Ecological Landscapes of Nepal
	Nepal	Community Forestry in Nepal
	Sri Lanka	Kandyan homegardens: A promising land management system in Sri Lanka
	Sri Lanka	Village small tank system: An integrated landscape for adaptation to a changing climate
Oceania	Australia	Nature-Friendly Agriculture in the State of Queensland, Australia
Europe	Germany	The scattered fruit tree meadows of the Swabian Alb
	Italy	Passerano Marmorito's bio-cultural landscape
	Spain	Challenges in collective action for natural resource management: A study of common property regimes in the municipality of Gutiriz (North-West of Spain)
Global		The use of Agrobiodiversity by indigenous and traditional agricultural communities: Adapting to climate change



3 Results of the study

3.1 Review of the Satoyama Initiative case studies

Based on the above case studies, this review has attempted to achieve a better understanding of the challenges and possible solutions for the sustainable use of biodiversity by focusing on two aspects, firstly, the underlying challenges faced by SEPLS today, and secondly, the good practices across the world which have contributed to overcoming these challenges.

3.1.1 Existing challenges

Through the review of the Satoyama Initiative case studies, a number of recurring issues have been identified in the context of implementing local activities for the sustainable use of SEPLS. They have been illustrated here as a background to the good practices highlighted in the following section.

Lack of community involvement and weakening traditional management practices

The degradation and overexploitation of forest resources due to the lack of community involvement and weakening traditional management practices was a recurring issue in case studies from countries such as Niger Republic, Cambodia, Peru, Japan, Benin, and Nepal. The lack of a local resource governance structure can allow the establishment of anarchical forest exploitation by both local and external users, eventually leading to the depletion of forest resources. This was observed in Cambodia, where the resulting loss of forest cover caused soil erosion, loss of wildlife and non-timber forest products, creating a dramatic impact on the livelihoods of local people.

Also, when resource management is organised without community involvement, consumption patterns can become unsustainable due to the lack of ownership. Such was the case in Niger where the local communities had been excluded from decision-making on the use of traditional Gaya palm tree forests, and were abandoning their traditional management practices, opting instead for rapid exploitation.

Urban development and cultural shifts are also driving the abandonment of customary management practices and livelihoods. This was seen in the case of sacred forests in Benin, where traditional leadership and religious practices associated with the conservation of sacred forests were being lost, and over-exploitation of forest products caused increasing poverty and food insecurity in surrounding villages.

Lack of multi-stakeholder collaboration for coordinating riverine and coastal resource use

Case studies from countries such as Thailand, Brazil, Kenya, Tanzania, and Australia showed that unregulated and intensive exploitation, loss of traditional production land and riverine ecosystems to large scale water infrastructure, and degradation of downstream ecosystems due to upstream agricultural practices were posing difficulties for the sustainability of aquatic resources.

In the case from Thailand, the use of destructive commercial fishing gear, commercial coal production, agribusinesses, and dam projects were causing the decline in productivity of seasonal flood forests. In Brazil, coral bleaching and disease were caused by threats such as overfishing and climatic changes.

In other cases, rapidly increasing water demand for urban and domestic uses, irrigation and industries, as well as the competition for water between different sectors, caused the loss of traditional production land and riverine ecosystems to large scale water infrastructure development. This was the case in Kenya, where a large scale floodplain irrigation project did not give sufficient consideration to the environmental impacts of the development, resulting in intense water system changes and negative impacts to the rural society.

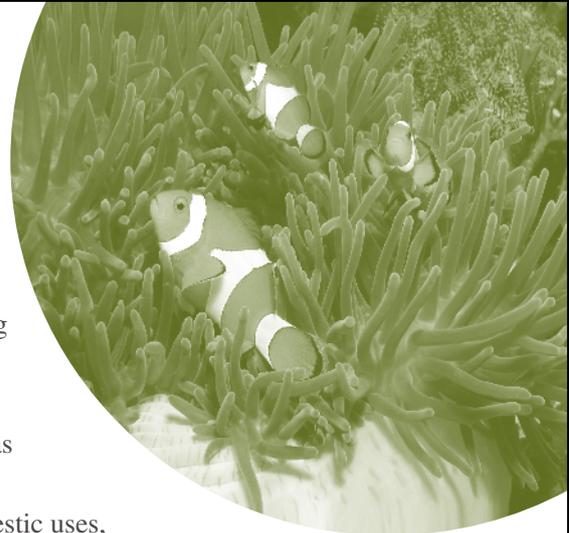
The degradation of downstream ecosystems and water resources due to upstream agricultural practices is also an important issue raised in a case study from Tanzania, where the loss of traditional land ownership in water catchment areas led to unsustainable agricultural practices, impacting the downstream lake ecosystem and lowland communities through degradation of aquatic resources.

Undervaluation of traditional ecological knowledge and traditional land use

The abandonment of cultural and ecological landscapes with rich biodiversity and ecosystem services was seen to be increasingly severe in developed countries like Italy, Germany, Japan, and Spain, where traditional ecological knowledge and traditional land use have been undervalued in contrast to urbanisation and larger scale, mechanised, and profit-driven production activities.

For instance, in the village of Passerano in Italy, mosaics of fields, vineyards, hedges, and forested areas punctuated by country churches, still remain as evidence of rural and religious life. But abandonment due to social and economic changes, urbanisation, and industrialisation are eroding this beautiful bio-cultural landscape. This was also the case for the scattered fruit tree meadows of the Swabian Alb of Germany, which is a low-intensity system that needs to be maintained through regular, but moderate human action. In the municipality of Guitiriz in Spain, abandonment of communal forest lands, which support agricultural production in the cultivated lowlands, is becoming a serious issue.

Abandonment of beautiful cultural landscapes to rapid residential developments has also caused degradation and fragmentation of ecosystems in the countryside of Japan, such as in Machida city, where the traditional landscape used to be characterised by a mixture of rice paddies, farmlands, secondary forests, and human settlements, also serving as a habitat for local fauna and flora. Rapid urban development without comprehensive urban planning has also caused the fragmentation of local ecosystems in Aichi prefecture, Japan. The abandonment of forestry due to low profitability is also a trend seen in Japan, where the forestry business has declined markedly due to increased imports of cheap lumber, leading to abandonment and decrease in forest productivity and biodiversity.



Lack of consolidated traditional knowledge on securing agricultural diversity and ecosystem services

Expansion of intensive agricultural practices and monoculture plantations has caused increased pressures on locally suited sustainable agricultural practices in Australia, India, Nepal, and Sri Lanka. The resulting loss of traditional and local knowledge has triggered a decline in local agricultural diversity, key ecosystem services, and wildlife habitats. This also affects human well-being by compromising food security, income from cash crops, and other natural products.

For instance, in the State of Queensland in Australia, large-scale farm management and mechanized farming practices have gradually eroded rainforests, and reduced biodiversity and key ecosystem services such as pollination, pest control and microclimate regulation suited to food production. Traditional homegardens in Sri Lanka have continuously provided high levels of nutritional diversity to households while medical plants, spices and trees have provided substantial additional income. Communities in the Wayanad district of India have also cultivated traditional homegardens and maintained multiple products besides generating employment and cash income. Traditional homegardens support not only human well-being, but also unique plant diversity and key ecosystem services including erosion control, carbon sequestration, soil fertility and water quality. Homegardens are mainly managed through family labour with locally appropriate technologies that rely on rich local knowledge systems. However, there has been an expansion of plantations, urbanisation, and population increase, putting these traditional homegardens at risk.

Traditional medicinal and aromatic plants (MAPs) have long been an important source of income for resource poor farmers in mountainous regions of Nepal. MAPs are also inextricably linked to regional biodiversity. However, the expansion of unregulated trade and over-harvesting of MAPs have brought some high-value MAPs to the verge of extinction.

3.1.2 Good practices of the Satoyama Initiative case studies

In these contexts, the Satoyama Initiative case studies have provided useful examples of actions that can serve to overcome the underlying challenges and allow a shift towards more sustainable management of SEPLS both from an environmental and a socio-economic perspective.

Establishment of local management structures to allow the representation and coordination of direct resource user's interests

In circumstances where forest resources were ravaged through unregulated exploitation, it was necessary to build partnerships among the government, local populations, NGOs, and the private sector for the establishment of a conflict management structure (such as land-use committees) to support resource management bodies formed by representatives from rural communities and other stakeholders.

In order to address issues of unsustainable resource use due to a lack of ownership, a significant shift was needed from central government-imposed management systems,



to resource management through active participation from the direct users. Providing a legal basis for community forestry (such as user right laws), and involving community members in forest management (patrolling, grazing and hunting controls, surveillance for illegal activities, forest fire control, thinning and planting) such as in the community forestry practices of Nepal, were indispensable. It is also important to define clear roles and responsibilities of the management committee vis-à-vis other community members in order to foster self-organisation and ownership.

In cases where customary management was abandoned due to cultural shifts, it was indispensable to integrate pre-existing community level management rules into the national resource management system. This has been effective in Benin where the forest management and environmental education role of traditional authorities was strengthened through the recognition of sacred forests as part of the national protected areas system under the law. Similarly in Peru, allocating special resource user rights to indigenous communities was important to secure their livelihoods and ensure long term management. This could also be backed by the appropriate valuation and marketing of locally produced goods, or the diversification of marketable products, in order to secure an income and thus an incentive for long term resource management by the communities.

As a result of the establishment of local governance structures, self-organization and sufficiency in the management of resources could be promoted within local communities. Participatory resource management in turn led to a decrease in overexploitation, with a decline in offences to locally developed rules on resource use. The legal recognition of traditionally important lands strengthened the status of traditional authorities, and allowed public intervention and financing for the sustainable use of traditional land as part of the national system of protected areas. This led to stronger stewardship of forest resources by user communities, resulting in biodiversity conservation through partnership between the government and traditional authorities. The promotion of locally produced goods and diversification of income sources could contribute to the securing livelihoods and to the revitalisation of both ecosystem services and local businesses arising from agricultural and forestry production. Overall, the maintenance of forest resources provided a basis for future elaboration of sustainable lifestyles without the loss of not only ecological values but also cultural values, and a guarantee for a high quality of life.



Strengthening management capacity of local communities for the maintenance of the ecological functions of local ecosystems

Case studies from Thailand and Brazil have showed that the creation of local capacity for marine conservation and effective design of marine protected areas (MPAs) based on evaluations of the socio-economic impacts of MPAs was essential for the development of a holistic management plan for the maintenance of critical ecosystem services and sustainability of fisheries and other aquatic resources.

In the case where large scale water infrastructure developments had caused the destruction of traditional production lands and riverine ecosystems, a fundamental shift to a holistic and participatory planning approach was deemed necessary.

Consideration for a wide set of ecosystem services both at the river basin scale and at the local level, and their links to human well-being with particular emphasis on vulnerable groups is a key to this transition.

When degradation of downstream ecosystems and water resources was caused by upstream agriculture in Tanzania, local farmer initiatives supported by universities and local governments have allowed livelihood diversification and lifestyle changes for improved fishing and agricultural practices. The development of a partnership between highland and lowland farmers to exchange knowledge and conduct joint activities for better soil management contributed highly to the improvement of sustainability in production practices within the lake basin. The case study from Australia also provides useful solutions to the negative downstream impacts of agriculture. Introducing low impact agricultural practices upstream was shown to be effective in minimising soil erosion, chemical run-off, and retention of soil nutrients. This can be backed by the provision of government funds to support effective soil management practices, as well as the introduction of an eco-accreditation system to distinguish nature-friendly agriculture produce from non-nature friendly agricultural produce.

The case studies showed that as a result of the measures taken to preserve aquatic resources and to build local capacity for implementation, effective recharge of groundwater, improvement of water quality, and the maintenance of marine resources could be achieved, leading to secure livelihoods for the local people. Fish populations were stabilised through establishment of MPAs, providing positive spill-over effects and ensuring food security for local populations. The shift towards participatory water infrastructure development planning and appropriate environmental considerations is expected to improve the resilience of the ecosystems and local communities, as well as ensure the maintenance of essential ecosystem services to support people's livelihoods.



Valuing cultural and ecological landscapes and providing incentives for their protection

In order to prevent the loss of cultural and ecological landscapes, local governments have been shown to play a critical role in encouraging local farmers to maintain traditional agricultural practices through supportive policies. For the preservation of historical and cultural landscapes and their agrobiodiversity, Passerano village in Italy, as well as municipalities in Germany have developed programmes to help local farmers to convert to organic or environmentally friendly production based on traditional land use systems. In the Piedmont region of Italy, regional funds for landscape projects provide financial support for renovation of historical architecture and landscape restoration. The local government has provided training to raise the awareness of farmers and citizens about Passerano's landscape value and importance of biodiversity. The state government of the Swabian Alb in Germany supports farmers who are undertaking small-scale agro-ecological programmes and preserving diverse orchards. Both the Swabian Alb and Passerano were designated as cultural heritage sites under UNESCO biosphere Reserve and Cultural Heritage of Italian law (law 42/2004) respectively. In order to avoid abandonment of communal forest lands, the municipality of Guitiriz in Spain introduced a plan for collaborative management of pastures. This plan promotes economic, social, and environmental benefits of common land management.

To prevent the degradation of local ecosystems and landscapes, Machida City in Japan developed a regional environmental master plan to conserve and restore the natural, historical and cultural environment. Tokyo metropolitan government also commissioned a project in Machida City to maintain historical landscapes in collaboration with local farmers, NGOs, landowners, private sector organizations, and other local stakeholders, utilising their traditional knowledge. To reduce the fragmentation of local ecosystems, Aichi Prefecture in Japan prepared a local biodiversity map for planning of ecosystem networking in the prefecture, collaborating with local residents, private sector organizations, academia, and local governments. Under this ecosystem networking plan, the local government promotes mitigation and compensation of loss of biodiversity to enhance ecosystem networking in Aichi. In cases where forestry was abandoned due to low market competitiveness, finding alternative uses for forest resources such as replacing conventional fuel with wood has allowed diversification of businesses at the local level. By seeking opportunities for public-private-partnerships, especially in the context of corporate social responsibility activities, it has also been possible to promote the conversion of economically nonviable artificial forests back into natural forests through afforestation.

With local and national government policies and programmes to provide incentives to protect cultural and ecological landscapes, traditional land-use knowledge and agriculture practices



were maintained by local farmers and other stakeholders, which led to the protection of local flora and fauna and their habitats. Landscape protection programmes commissioned by local governments also enhanced or restructured ecological networks in the area. At the same time, the value of cultural and ecological landscapes and ecological networks is recognised by local stakeholders including local farmers, residents and the private sector.

Assisting local farmers in knowledge management and consolidation of traditional practices through technical and institutional support

Institutional support and active participation of local farmers were shown to be critical to maintaining traditional and local knowledge, agrobiodiversity, and ecosystem services. Technical support from research institutions or academics in this process was also crucial for local farmers to sustain traditional land-use systems and to document and understand the dynamics of traditional landscapes.

In order to protect medical and aromatic plants in mountainous regions, the Nepal Agroforestry Foundation collaborated with the District Agriculture Development Office, Office of Lamtang National Park, and Kathmandu Forestry College to implement a medical and aromatic plants (MAPs) domestication project. The project assists local farmers in producing sufficient amounts of MAP seeds and seedlings, provides technical training to strengthen farmers' skills and knowledge on domestication and cultivation of MAPs, and forms farmers groups and cooperatives to manage credit saving programs and marketing of MAPs. The project aimed to achieve not only conservation and domestication of MAPs, but also to improve local community's livelihoods, which motivates local communities' active participation in the project.

To promote sustainable agricultural practices in large scale farms and to maintain local biodiversity and ecosystem services, the State of Queensland in Australia are calling for the retention of tropical rainforests in large scale fruit farms. For instance, one of the tropical fruit farms committed to preserving approximately two thirds of the 89-hectare property in order to connect with the tropical rainforest in the Wet Tropics World Heritage Area. This tropical rainforest shields strong winds and sustains a microclimate suited to fruit cultivation. The rainforest also creates a habitat of endemic species that help with the pollination of fruit trees and promote effective pest control.

Protection of homegardens improves people's livelihoods and food security as well as ensuring the diversity of local plants and vegetables. Key ecosystem services are also maintained including erosion control, carbon sequestration, soil fertility and water quality. These benefits strengthen the resilience of local communities in the face of increasing stress stemming from various global transformations such as climate change. The domestication of MAPs ensures preservation of endangered plant species and maintains the livelihood of local communities. With sustainable agricultural practices in Queensland, Australia, farmers benefit



from key ecosystem services including pollination and microclimate regulation. Furthermore, this protects the iconic natural heritage of Queensland and preserves important habitats for local biodiversity including the endangered Southern Cassowary.



3.2 Key contribution of the Satoyama Initiative to the achievement of the Aichi Biodiversity Targets

To date, as illustrated in the previous section, a large number of case studies have been collected for the Satoyama Initiative which relate to the sustainable use of biodiversity and successful management of SEPLS. These good practices, alongside IPSI's activities, are an important resource not only for IPSI members but also for international agreements, particularly the CBD. The Satoyama Initiative case studies provide a basis for implementing the Strategic Plan for Biodiversity 2011-2020, including the Aichi Biodiversity Targets under the five Strategic Goals, which was adopted at CBD COP10. The contributions of the good practices of the Satoyama Initiative to some of the Aichi Biodiversity Targets are described in this section.

Strategic Goal A:

Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 4

By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strengthening multi-stakeholder partnerships in resource management to reduce unsustainable use

Good practices in local communities' self-organisation for resource management have been documented in the case studies of the Satoyama Initiative. Participatory resource management has led to a decrease in resource overexploitation, with a decline in offences to user rules. Partnership-building between the government, local populations, NGOs, and the private sector has been an essential part of SEPLS management. The strengthening of local communities' participation in wetlands and water management has maintained ecological functions as well as livelihoods. Collaboration between community members and the scientific community has allowed the development of a holistic management plan for the maintenance of critical ecosystem services.

An example is the management of the Gaya palm tree plantation in the Niger Republic, where the lack of community involvement and ownership in the management of this resource was leading to the abandonment of traditional management practices and causing unsustainable use. Prompted by stakeholder opposition, the government initiated a shift towards building a partnership between the government, local communities, NGOs, and the private sector. The partnership established a local management structure with representatives from rural communities, set up a production line and formulated a marketing strategy, and established land-use committees as a conflict management body. This reform led to self-organisation and sufficiency in the use and management of resources among local communities. Presently all the villages around the palm tree population are involved, and many individual farmers plant and grow palm trees without assistance. Around 3,280 ha were planted in 1997 with a tree density of 100 trees per ha.

In Spain, efforts have been made to engage stakeholders in the conservation of biodiversity in the agrarian landscape through common property regimes in order to halt landscape degradation and the loss of associated species due to changes in land-use practices. Communal management plans, such as the Conservation Measures of the Landscape and Prevention of Erosion on Forest Grazing System have been introduced in lands which support agricultural production in the lowlands. The activities seek to achieve the economic, social, and environmental benefits provided by communal management of pastures in common lands. The plans aim to avoid land abandonment, secure economic, social, and environmental benefits, and improve the environment and landscape management.

Strategic Goal B

Reduce the direct pressures on biodiversity and promote sustainable use

Target 6

By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

AND

Target 7

By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Reducing pressures on biodiversity through sustainable use of forests, agricultural, pastoral land and other landscapes and seascapes

The case studies of the Satoyama Initiative introduce good practices for the sustainable use of traditional production land, riverine, coastal, and marine ecosystems. Pressures on biodiversity

from large-scale development can be avoided through a shift towards holistic and participatory planning that considers a wide set of ecosystem services at different scales and their links to human well-being. At a more local level, programmes to support resource users in applying low impact production methods contributed to promoting sustainable use through techniques for mitigation of soil erosion, chemical run-off, and retention of soil nutrients.

In a case study from Peru, the sustainable use of natural pastures in the Huascarán National Park was promoted through recognition of indigenous communities' rights over the use of ancestral lands. In Huascarán National Park, indigenous communities are accorded a special right through Ministerial Resolution to use natural pastures for cattle grazing provided that the activities remain within the carrying capacity of the grassland, and the user communities do not deteriorate the productive capacity of the resource or alter the hydrological regime of the basin. The users of natural pastures of Huascarán National Park are limited to rural communities and rural enterprises, or small and medium farmers who were in possession of the area at the time of establishment of the park. They must obtain prior authorisation from the park's headquarters, and agree not to destroy the natural landscape, to prevent hunting or trapping of wild animals, to not cut or burn down tree or shrub species, to avoid overgrazing pastures, as well as to not introduce goats or pigs into the area. Participatory resource management systems have also been introduced, with 62 user committees who also participate in the management of the park as volunteer rangers to maintain the streams on which they rely for household subsistence and income. Joint management is also carried out between the committee board members and local governments to create suitable conditions in the buffer zone to reduce grazing pressure in the core areas of Huascarán National Park.

Another case from Nepal illustrates the sustainable use of forest resources through community forestry. Where the failure of a centrally controlled forest management was causing the loss of livelihoods for low income and forest-dependent communities, the establishment of Community Forest User Groups (CFUG) based on existing informal indigenous forest management systems allowed the paradigm-shift from government-controlled forestry to active user participation in thinning, and planting, regular patrolling, grazing controls, hunting controls, alert systems against illegal activities, and forest fire control. The Forest Act 1993 provides a clear legal basis for community forestry where land ownership remains with the state, while the land use rights belong to the CFUG and all management decisions (land management and forest management) are made by the CFUGs. This system has led to the sustainable use of forests, restoration of degraded forests, and enhancement of community livelihoods through promoting community rights to forests, enhancing forest sector governance and local democracy, and strengthening social development activities through CFUG, such as infrastructure development, water management, cultural activities, income generation activities, scholarships, and information dissemination.

The Satoyama Initiative's case study from Thailand touches upon the sustainable use of wetlands in the Lower Songkhram Basin where the decline in productivity of

the seasonal flood forest as the result of the use of destructive commercial fishing gear, coal making, commercial farming operations owned by agribusiness companies, and dam projects were impacting the community. The knowledge of local communities on ecology, management of natural resources, local history, socio-economy and livelihoods was applied to the strengthening of local communities' participation in the management of wetlands and the allocation and management of water for maintaining the ecological functions of wetlands in order to promote the recharge of groundwater, improvement of water quality, flood alleviation, food and fuel production, clean water, and protection from natural hazards.

Strategic Goal C:

To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Enhancing the conservation of biodiversity within production landscapes through integration between production and conservation areas

The conservation of biodiversity and genetic diversity was achieved in many of the good practices as identified in the case studies of the Satoyama Initiative. Useful measures ranged from government level landscape protection programmes for securing ecological networks and protected areas, to resource user activities for the maintenance of agrobiodiversity such as the retention of tropical rainforest in large scale fruit farms.

In Benin, the management of sacred forests for biodiversity conservation provides a case of integrated protected area management and sustainable use. These sacred forests faced threats from weakening of traditional leadership and religious practices associated with the conservation of sacred forests, lack of legal frameworks for the protection of sacred forests, overexploitation of forest products, and increasing poverty and food insecurity in surrounding villages which exacerbate pressure on sacred forests resources. To safeguard these forests, the government attempted the integration of sacred forests in the protected area system through a new form of co-management that applies a combination of both traditional knowledge and modern science. This new policy is expected to promote the sustainable use of Benin's sacred forests as a network of community-managed conservation areas incorporated into the national system of protected areas.

In terms of securing a well-connected network of ecosystems, an example of useful policies is provided by a case study from Japan. The natural environment of Aichi prefecture is becoming increasingly fragmented by urban development, thus putting

its characteristic ecosystems, which provides habitats for diverse species, at risk of disappearing. Thus the prefectural government launched an initiative based on the Aichi Natural Environment Conservation Strategy drawn up in 2009. This involves the preparation of Aichi Biodiversity Potential Maps, planning of Ecosystem Networks based on this map, and applying compensatory mitigation for any degradation in order to enhance Ecosystem Networking (Aichi Method) to reconnect divided and isolated natural environment by arranging greenery and aquatic areas to facilitate the movement of living creatures. Along with the ecosystem networking model project, Aichi Prefectural Government launched a three-year project in 2010 to develop its compensatory mitigation framework and guidelines.



Another case from Germany illustrates how the conservation of biodiversity can be integrated within production landscapes by maintaining the scattered fruit tree meadows of the Swabian Alb, a traditional ecological landscape which has been undergoing loss due to intensified use, abandonment from low profitability, and urbanisation. Based on the EU policy agenda, the local government launched an initiative, the agro-environment programme of Baden-Württemberg (MEKA III), requesting farmers to undertake environmental activities in exchange for compensation for any income losses and additional costs. Another scheme, the EU co-financed Life+ Project, started in 2009, promotes bird-friendly cutting of trees and revitalising trees on communal lands. Other supporting schemes include the processing and marketing of fruits and fruit juices from scattered fruit trees with a price premium for the producers' environmental maintenance efforts.

Target 13

By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Protecting and restoring cultural and historical landscapes harbouring agrobiodiversity

By developing regional environmental master plans, applying traditional land use management, supporting resource users in implementing sustainable use such as the domestication of medicinal plants, and promoting multi-stakeholder participation, case studies of the Satoyama Initiative present good practices for protecting and restoring cultural and historical landscapes. Cultural and historical landscapes maintained by sustainable resource use contribute to the protection of local agrobiodiversity and provide habitats for local species.

In Nepal, the domestication of high-value medicinal and aromatic plants (MAPs) in the mountainous areas supported biodiversity conservation through reduced pressures on wild plant resources. Medicinal and aromatic plants (MAPs) are increasingly faced with major threats from environmental, socio-economic and institutional factors including the expansion of unregulated trade and commercial use (over-harvesting, inadequate processing and storage). Some high value MAPs were at the verge of extinction due to their high market value followed by unsustainable harvesting in natural habitats. In this context, the Nepal Agroforestry Foundation launched an initiative in collaboration with the Kathmandu Forestry College, Langtang National Park and District Forest Office for the domestication of medicinal plants for livelihood improvement and biodiversity conservation. Farmers received technical training on MAP cultivation and management and formed a cooperative to establish linkages with big companies. The initiative provided increased income to farmers at the same time as contributing to the maintenance of MAP populations in the wild.

Another case from Italy provides an example of efforts to maintain biologically and culturally important landscapes as a foundation for future sustainable lifestyles and for a higher quality of life. In the bio-cultural and historical landscapes production activities are based on few mechanized cultivation practices, low chemical inputs, and high crop diversity. Woodlands are managed with the primary objective of regenerating annual and long-term wood availability, therefore only extracting what is strictly needed, and water is used sparingly. A fundamental role will be played by producers, citizens and private initiatives for maintaining these practices through landscape-friendly business activities such as farm holidays, food and wine tourism, organic farming or those related to local product marketing.

In both India and Sri Lanka, homegardens serve as good examples of socio-economically and culturally valuable areas for preserving the genetic diversity of cultivated plants. However, these areas have gradually been shrinking due to low profitability of the marketable surplus produced by farmers compared to large scale monocultures. In order to conserve biodiversity, the People's Biodiversity Register (PBR) programme in India promotes documenting and understanding the dynamics of the landscapes and strengthening community bonds and saving rural lands from intensive agricultural practices. Farmers maintain a spectacular variety of plants in their homegardens to meet their varied needs, ensure food security of the region by supplying products throughout the seasons, provide high commercial timber and fuel wood, provide products used in many traditional and religious ceremonies, provide traditional medicinal plants, and maintain and increase agricultural productivity through nutrient cycling and soil protection.



Strategic Goal D:

Enhance the benefits to all from biodiversity and ecosystem services

Target 14:

By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Strengthening benefits to direct resource users and providing incentives to protect important landscapes

The case studies of the Satoyama Initiative provide useful approaches to strengthen benefits from biodiversity to resource users. Effective measures include promotion of nature-friendly farming and recognition of role and responsibility of communities. These in the long term contribute to securing livelihoods and revitalising local businesses. By recognizing benefits of nature-friendly farming such as reduction of fertilizers cost and improvement of pest control, and getting some support from governments and academic institutions, nature-friendly farming practices and restoration of forest by community forestry have been promoted.

In the state of Queensland in north-east Australia, retaining tropical rainforest in fruit farms and two thirds of the 89 hectare property have not been exploited so as to partly connect to the tropical rainforest in the Wet Tropics World Heritage Area. With this practice in the fruit farms, animals and insects habitats in the forest have been protected. Thus, pollination of fruit trees improved and the animals, such as sugar glider, pythons, and bandicoots, eat major pest of sugar cane, fruit and taro, such as rats and beetles. In sugar cane fields in the state of Queensland, Australia, nature-friendly farming practices including levelling of cultivated land and creation of wide, shallow, and grassy drainage ditches have slowed down water flow in the sugar cane fields. This farming practice has prevented soil erosion and improved soil fertility in the fields. Therefore, it has resulted in reducing cost of fertilizers. At the same time, it has improved quality of water flowing into the rivers and contributed to the retention of the quality in the river and coastal environment.

In Cambodia, Chumkiri forest providing ecosystem services to local communities such as food, water, and livelihoods was restored after the establishment of community forestry because of decrease of offences and recognition of roles and responsibilities of communities as custodians of their society and resources. Between 1980 and 1998, the forest resources were heavily degraded due to anarchical forest exploitation, and the loss of forest cover has caused soil erosion as well as the loss of wildlife and non-timber forest products, which caused a dramatic impact on the livelihood of local people. Thus, the Community Forestry Research Project established by the Forest Administration of the Ministry of Environment and the Royal University of Agriculture initiated the establishment of community forestry in 992 hectares of forest in Srer Knung Commune, Chumkiri District, Kampot Province in 2001. Village forest

management committees have been established in each village, and the committees have conducted conflict resolution, demarcation of boundary, incorporation of community forestry plan into the 5-year development plan of the commune, and others.

Target 15:

By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Strengthening the resilience of production landscapes and climate change adaptation

Good practices for strengthening resilience and adapting to climate change have been identified through case studies of the Satoyama Initiative. By combining both science and traditional knowledge, strategic establishment of Marine Protected Areas (MPAs) can enhance ecosystem resilience. Providing support to indigenous communities can also contribute to strengthening the resilience of production landscapes and food security. Traditional practices and new techniques can be combined in areas such as soil and water management, rehabilitation of degraded landscapes, safeguarding of agrobiodiversity, enhancing carbon sequestration, microclimate regulation and pest regulation.

In Sri Lanka, irrigation network of thousands of man-made lakes and ponds known as “tanks” has considerable potential for rehabilitation to deal with expected changes of rainfall patterns and drought. It has historically contributed to village food security, livelihood and environmental and biodiversity protection as well as community cohesion and well-being. These thousand years old “tanks” are part of an important indigenous land and water management system, and management of the cascades system of these “tanks” requires communal efforts and social harmony among upstream and downstream farmers. Thus, through strengthening local institutional capacity and collaboration, it is possible to sustain this traditional irrigation system protecting peoples’ livelihood and environment, and enhance climate change adaptation in local communities.

Traditional soil and water management practices are becoming important as adaptation measures. These practices include diversified cropping, minimum soil disturbance, direct seeding and planting, live or residue mulching, cover crops with deeper rooting crop including annual and perennial legumes, and micro-catchment water harvesting and re-vegetation. Traditional agriculture practices can also reduce adverse impacts of climate change on fragile ecosystems and encourage rehabilitation of degraded landscapes. In Rajasthan of India, a traditional rainwater-harvesting system has been created, consisting of simple concave mud barriers built across small uphill river tributaries. This collects water, encourages ground water recharge, and improves forest growth, while providing water for irrigation, domestic



use, livestock and wildlife (McNeely and Scherr 2001). Restoration of over 5000 rainwater-harvesting systems in 1000 villages has prompted the restoration of the Avari River and the return of native bird populations (Narain et al. 2005).

At the ecosystem or landscape level, the adaptive management of water, soil and agrobiodiversity is a crucial adaptation measure that requires communal efforts often regulated through social institutions. The need to replenish diversity in agricultural systems has encouraged community management of genetic resources and prompted the establishment of community seed banks to facilitate the revival and distribution of traditional and stress-tolerant crops among others. In Uttar Pradesh of India, the establishment of seed banks to facilitate the diversification of local food systems is one of the flood coping mechanisms (Wajih 2008). Depending on the situation, traditional practices have also had to be adjusted and combined with new technology.

To adapt to the impacts of climate change on an important marine ecosystem and ensure long term livelihood opportunities for local communities, an international NGO designed and implemented a marine conservation project based on both science and traditional knowledge in the Abrolhos region of Brazil. Scientific research indicates that fish may use multiple habitats throughout their lifecycles, and so it is crucial to protect multiple habitats to ensure ecosystem functionality. Thus, the marine conservation project was designed to protect multiple habitats and local cultural practices to contribute to the maintenance of healthy marine ecosystems and support the provision of ecosystem services. The scientific research also evaluates the effectiveness of management practices.

Strategic Goal E:

Enhance implementation through participatory planning, knowledge management and capacity building

Target 18:

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Promoting broad public understanding and appreciation of cultural and traditional values

The case studies of the Satoyama Initiative provide good practices for the recognition of traditionally important lands and the strengthening of traditional authorities through partnership with the government. This led to stronger stewardship of forest resources by user communities,

resulting in biodiversity conservation. The recognition of pre-existing community level management rules by the national resource management systems is a key element. Support to resource users was also critical in preventing loss of cultural and ecological landscapes and to protect local varieties of trees, fruits, vegetables, and ecosystems.

To respond to the loss of historical landscapes and the deterioration of environmental quality in Machida City, Japan, the local residents, farmers, and local governments joined forces to reintroduce traditional land use in publicly-owned historical lands. They succeeded in restoring cultural landscapes and improving biodiversity, with a clear increase in the number of plant species since the beginning of this management programme. Surveys conducted from 1996 to 2002 identified 680 species of native plants in the area, an increase of 89 species compared to the survey from 1986. The conservation area represents a mosaic landscape consisting of rice paddies, steep forests, vegetable farms, and residential areas in hilly zone with small valleys (or 'yato'). Local farmers familiar with traditional agricultural practices were put in charge of the management and restoration of "yato". It is implemented through multi-stakeholder collaboration including the Tokyo Metropolitan government, civil society groups, local farmers, academics, the private sector, and local residents.

The Potato Park located in the Cusco Valley, Peru is a unique model of holistic conservation of the Andean traditional landscape with a focus on conservation of agrobiodiversity developed by Asociacion ANDES. The Potato Park incorporates the best of contemporary science and conservation models and rights-based governance approaches. The main subsistence activity in the Potato Park is agriculture and animal husbandry. The landscape of the Potato Park is the result of millennia of interactions between human population and the environment described as "common-field agriculture". This "common-field agriculture" is a form of collective land management in which an assembly of farmers coordinates the production of crops and livestock grazing in managed fallow spaces among the designated sectors of a community: households have rights to parcels of land dispersed within common fields which are used by all for grazing and collection of resources. The spatial and sequential organization of land use in the Andes has been shown to be pivotal to maintaining a high biodiversity in the landscape. The model involves a community-led and rights-based approach to conservation based on indigenous traditions and philosophies of sustainability, and the use of local knowledge system, skills and strategies related to the holistic and adaptive management of landscapes, ecosystems and biological and cultural assets. A traditional Andean system is promoting a reciprocal relationship between the people of the Potato Park and their environment, enhancing the conservation and sustainable use of biodiversity, local livelihoods/human well-being and the ecological integrity of a landscape that is the product of a relationship over millennia.

Target 19:

By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Enhancing capacity building and education on sustainable resource use

Local capacity-building for resource and environmental quality management was conducted in the case studies of the Satoyama Initiative. Technical support from research institutions or academics was provided to assist local resource users. Strengthening institutional support for local resource users, as well as providing technical support to carry out, document, and understand the dynamics of traditional landscapes was vital to sustain traditional land-use systems.

In the Cordillera Administrative Region, Philippines, application of indigenous knowledge systems and practices on natural resource management has been increasing because of a project enabling communities to identify and characterize the land use and management of their territories with respect to human interaction, needs and values; conservation and management of biodiversity; and environmental quality and assess changes. Due to prevailing “research fatigue”, the widespread discrimination against traditional lifestyles and practice of rituals and commercial chemical-based farming and the attendant culture in the communities, the project consists with awareness raising through formal and informal sessions to discuss the distinct features of indigenous knowledge on sustainable use and resource conservation and the cultural practices that strengthen community cohesion and solidarity. These also served as a venue to learn and generate data on traditional resource management practices, production systems and changes through time in the communities. As a result of the project, 63 local community leaders concluded that they need to strengthen their customary laws and further develop their indigenous knowledge systems on sustainable use.

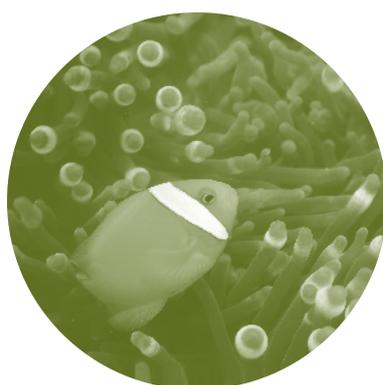
In the Lake Nyasa catchments of the South-Western part of the United Republic of Tanzania, conservation activities in the Lake Nyasa basin keep expanding not only in pilot villages but also outside villages since they were introduced in 2002. Due to dwindling livelihood opportunities and general dismay of socio-ecological production systems in both lowlands and highlands, both communities have formed partnership to improve the lake basin between lowlands and highlands. Various farmers' exchange visits between lowlands and highlands have been conducted to actualize their partnership, and Sokoine University of Agriculture Centre for Sustainable Rural Development and Mbinga district council supported this farmers' initiative. Instead of expanding shifting cultivation, farmer groups initiating this partnership have become involved in bee keeping, tree planting, aquaculture, and introduction and use of improved stoves aimed at reducing the use of fuel wood.



3.3 Implications for potential collaborative activities under IPSI clusters

Based on the review of the Satoyama Initiative case studies, the good practices have been extracted and used to illustrate possible activities that could be included in each of the clusters of the IPSI collaborative activities. The following table shows the five clusters and sub-categories, with a list of some of the concrete actions that have been highlighted through the Satoyama Initiative case studies.

five clusters	Sub-categories	Key actions chosen from case studies	Aichi Biodiversity Targets
Cluster 1: Knowledge Facilitation	1.1. Compiling knowledge and information	1.1.1. Archiving traditional knowledge for wider use through the establishment of “botanical gardens” specifically devoted to the production of plant material used in traditional medicine. (Benin)	13
		1.1.2. Mapping available environmental data through preparation of biodiversity maps as a reference for potential biodiversity offsets in Aichi Prefecture. (Japan)	2
		1.1.3. Compiling existing knowledge resources into publications such as environmental management handbooks and distributing them among farmers. (Nepal)	19
		1.1.4. Documenting and understanding the dynamics of land use to conserve the farming techniques and traditional land use systems of Wayanad through the People's Biodiversity Register (PBR) program. (India)	19



five clusters	Sub-categories	Key actions chosen from case studies	Aichi Biodiversity Targets
Cluster 1: Knowledge Facilitation	1.2. Communicating and exchanging knowledge	1.2.1. Communication and environmental education led by traditional authorities in collaboration with forestry agents and municipal authorities. (Benin)	1
		1.2.2. Exchange programmes between different resource-users such as upstream-downstream farmers' partnership for villagers to share insights and experiences in an attempt to establish mutual strategies for sustainable local resource management. (Tanzania)	4
	1.3. Partnering to apply knowledge	1.3.1. Establishing community groups for a common cause such as Community Forest User Groups (CFUG) and promoting a paradigm shift from government controlled forestry to active peoples participation. (Nepal)	4
		1.3.2. Securing representation of stakeholders through forming farmer's cooperatives and establishing linkage with the private sector. (Nepal)	18
		1.3.3. Applying traditional land-use techniques to perpetuate sustainable land-uses such as homegardens. (Sri Lanka)	7
	Cluster 2: Policy Research	2.1. Establishing a legal basis for promoting sustainable practices	2.1.1. Adjusting the legal frameworks to support local needs such as including sacred forests as part of the national protected areas system so as to attract public intervention and financing. (Benin)
2.1.2. Installing local government regulations for conservation and sustainable use such as the Aichi Prefectural Government's three-year project to develop its compensatory mitigation framework and guidelines. (Japan)			4
2.1.3. Recognition of indigenous peoples' rights to resources such as in Huascarán National Park where indigenous communities are accorded a special right to use natural pastures for cattle grazing provided it remains within the carrying capacity of the grassland. (Peru)			18
2.1.4. Providing a legal basis for sustainable community-based resource use such as forestry-related laws which provide a clear legal basis for community forestry. (Nepal)			2
2.2. Evaluating the multiple impacts of policies		2.2.1. Evaluating the effects of Protected Areas on ecosystems and people (socio-economic impacts of protected areas as well as the cultural dimensions associated with its management). (Brazil)	11
2.3. Providing incentives and disincentives for sustainable production		2.3.1. Introducing incentives and compensations for environmentally sustainable production such as agri-environment programmes of local governments which pays income losses and costs to farmers who undertake environmental activities. (Germany, Italy)	3

five clusters	Sub-categories	Key actions chosen from case studies	Aichi Biodiversity Targets
Cluster 2: Policy Research	2.4. Providing recognition for sustainable actions	2.4.1. Introduction of added value for environmentally sustainable products through eco-accreditation systems to distinguish nature-friendly agriculture produce from non-nature friendly agricultural produce. (Australia)	4
		2.4.2. Recognising the cultural and environmental value of traditional land uses by designating 'areas of remarkable landscape interest' under Cultural Heritage-related national laws. (Italy)	1
	2.5. Sustainable land and resource-use planning	2.5.1. Integrating the ecosystem approach into land-use planning through concepts such as Ecosystem Network plans and development of biodiversity maps. (Japan)	2
		2.5.2. Increasing costs for destruction of natural habitats through applying Compensatory Mitigation to enhance Ecosystem Networking (Aichi Method). (Japan)	3
		2.5.3. Developing regional environmental master plans to conserve and restore the natural, historical, and cultural environment. (Japan)	2
Cluster 3: Indicators Research	3.1. Developing tools to guide actions and to monitor progress	3.1.1. Developing measurable indicators of linkages between human well-being and SEPLS, including linkages between wild and anthropogenic components of landscape and ecosystems	19
Cluster 4: Capacity-building	4.1. Strengthening the role of traditional knowledge and management practices	4.1.1. Strengthening the roles of local and traditional authorities in forest and other resource management in order to foster stronger stewardship for biodiversity conservation. (Benin)	18
		4.1.2. Enhancing traditional institutional arrangements and collaboration between upstream and downstream farmers in the use of traditional cascade irrigation systems. (Sri Lanka)	4
		4.1.3. Strengthening local communities' participation in the management of wetlands and water resources for maintaining the ecological functions of wetlands which support their livelihoods. (Thailand)	6
	4.2. Strengthening capacity for ensuring environmental sustainability	4.2.1. Creating local capacity for marine conservation through participatory selection and management of marine protected areas. (Brazil)	6
		4.2.2. Stakeholder training and awareness raising activities regarding the cultural and ecological value of traditional land uses among farmers and citizens. (Italy)	1
	4.3. Strengthening capacity for income generation	4.3.1. Diversifying income sources for farmers by involving them in bee keeping, tree planting, fish culture, building hydro-mills, and introducing improved stoves that use less fuel wood. (Tanzania)	7
		4.3.2. Training farmers to grow high value products such as medicinal aromatic plant cultivation and management. (Nepal)	7

five clusters	Sub-categories	Key actions chosen from case studies	Aichi Biodiversity Targets
Cluster 5: On-the-ground Activities	5.1. Supplying sustainable products to the market	5.1.1. Linking local value-added products to wider markets through the creation of a production line and marketing strategy (Niger, palm tree products). Products can also be commercialized with an additional charge for environmental maintenance efforts. (Germany, fruit juice from traditional orchards)	4
	5.2. Applying low-impact production methods	5.2.1. Introducing wildlife-friendly production methods such as the EU co-financed Life+ Project which promotes bird-friendly cutting and maintenance of trees on communal lands. (Germany)	14
		5.2.2. Introducing low impact agriculture through cooperation between governments, non-governmental organizations, and farmers to retain tropical rainforest patches in fruit farms and to exterminate alien species to maintain a good environment for local species and to protect crops. (Australia)	8
		5.2.3. Domesticating wild plants to reduce pressure on wild resources such as integrating the production of medicinal aromatic plants into existing farming systems and home plant nurseries. (Nepal)	13
	5.3. Valuing underutilised resources	5.3.1. Investing in new uses of underutilised forest resources such as utilising woodchips obtained from privately owned watershed areas as biomass fuel at a new power plant. (Japan)	7
		5.3.2. Restoring natural habitats on underutilised forestry lands through afforestation in economically nonviable artificial forests. (Japan)	5
	5.4. Participatory resource management	5.4.1. Engaging resource users in overall forest management including regular patrolling by community forest users, grazing controls, hunting controls, rewarding informants of illegal activities, forest fire control, thinning, and planting. (Nepal)	4
		5.4.2. Involving volunteers in forest management activities such as vegetation management, infrastructure work (installation of signs), restoration of abandoned areas into wildlife habitats, and wildlife intervention. (Japan)	5
	5.5. Introducing an institutional structure for resource management	5.5.1. Establishing a resource management body within the community by allocating management responsibility to elected members such as legal interventions, communication, and forestry activities on the ground. (Cambodia and Niger)	14
		5.5.2. Restoring traditional knowledge and partnerships for resource use and management such as the restoration of ancient irrigation technologies. (Sri Lanka)	18

These actions can serve as a basis for exploring synergies among IPSI members, and developing future IPSI collaborative activities including capacity building, providing policy support tools, or for considerations on incorporating new activities within individual members' organisations. Additionally, although this constitutes an extensive list of activities that could be implemented to promote sustainable use of biodiversity in SEPLS, it can also be used as a starting point for discussions with IPSI members and other stakeholders on what IPSI could further strengthen to make tangible impacts on the ground.

4 Conclusions and way forward

The review of the Satoyama Initiative case studies has illustrated the variety of activities needed for the successful management of SEPLS based on sustainable use of biodiversity. By promoting the implementation of these activities in a locally appropriate manner, the Satoyama Initiative can bring about proper recognition of the value of traditional knowledge systems as well as participatory resource management for the maintenance of ecological functions within production landscapes and seascapes.

From an international policy perspective, the Satoyama Initiative is therefore a useful tool, among others, to fulfil the three Rio Convention - on Biodiversity, Climate Change and Desertification - and other conventions through biodiversity conservation, promotion of sustainable resource use, climate change adaptation, prevention of land degradation, strengthening resilience, wetland protection, and improvement of ecosystem connectivity. As a result of the Satoyama Initiative's efforts to date, the Parties to the CBD have already recognized the "contribution that the Satoyama Initiative is working to make in creating synergies among the various existing regional and global initiatives on human-influenced natural environments" and have invited "Parties, other Governments and relevant organizations to support the International Partnership for the Satoyama Initiative, as appropriate" at the Eleventh Meeting of the Conference of the Parties (COP11) to the Convention on Biological Diversity in October 2012 (Decision XI/25, paragraph 7). In addition to this report, numerous resources under the Satoyama Initiative provide materials for considering actions to take for the sustainable use of biodiversity in production landscapes and seascapes. The next step would be to take these ideas forward and to translate them into local actions. IPSI is an active and useful platform which can support these endeavours through the following roles:





Enhancing synergies and collaborations on SEPLS management

By implementing twenty two collaborative activities, IPSI contributes to fostering synergies among the users of SEPLS through knowledge facilitation, policy research, and indicator research. It also advances the maintenance of SEPLS through capacity building and on-the-ground activities.

Demonstrating innovative approaches and tools that strengthen linkage between SEPLS and human well-being

IPSI serves as a platform for demonstrating new approaches and tools to strengthen linkages between SEPLS and human well-being, thus contributing to the integration of biodiversity values in wider development strategies and planning processes. IPSI's activities promote knowledge and practices to secure diverse ecosystem services and encourage exploration of new forms of sustainable resource management.

Promoting revision and communication on policy changes related to SEPLS

IPSI contributes to the revision of National Biodiversity Strategies and Action Plans (NBSAPs) of its member countries by providing good practices and sharing experience on policy implementation related to SEPLS. A number of countries including Cambodia and Nepal are in the process of integrating the concept of SEPLS into their national biodiversity strategies.

Promoting knowledge generation and facilitation through a multi-stakeholder platform

IPSI has been functioning as an international platform to consolidate knowledge on sustainable use of production landscapes. As of March 2013, IPSI has 132 member organizations from diverse sectors including private companies, academic organizations, UN and international agencies, indigenous or local community organizations, NGOs, and national and local governments. IPSI's case studies, video programmes, and website contribute to raising awareness on the importance of SEPLS.

Monitoring and evaluating progress and impacts on SEPLS at all scales

IPSI contributes to monitoring and evaluation of SEPLS at all scales by supporting on-the-ground projects to maintain, rebuild, and revitalise SEPLS, and by developing measurable indicators of resilience and traditional knowledge. The indicators highlight linkages between human well-being and the socio-ecological production landscape, and IPSI encourages their on-the-ground application.

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This bamboo paper contributes to biodiversity conservation through valuation of bamboo, bamboo forest maintenance, and the restoration of Japanese satoyama.

