Chapter 1

Toward mainstreaming concepts and approaches of socio-ecological production landscapes and seascapes (SEPLS): lessons from the field

Lead authors: Suneetha M. Subramanian[1], Shamik Chakraborty[1], Kaoru Ichikawa[1]

Contributing authors: Netra Kumari Aryal[2], Devon Dublin[3], William Dunbar[1], Guido Gualandi[4], Katharina Gugerell[5], Pia Kieninger[6], Kuang-Chung Lee[7], Jinlong Liu[8], Hwan-ok Ma[9], Caecilia Manago[1], Ikuko Matsumoto[10], Federico Lopez-Casero Michaelis[10], Yoji Natori[3], William Olupot[11], Bishnu Hari Pandit[12], Parameswaran Prajeesh[13], Ai Takahashi[10]

[1] United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS), Japan
[2] Nepal Agroforestry Foundation (NAF), Nepal
[3] Conservation International, Japan
[4] Romualdo del Bianco Fundation, Italy
[5] University of Groningen, Faculty of Spatial Sciences - Department of Spatial Planning & Environment, The Netherlands
[6] University of Natural Resources and Life Sciences, Vienna (BOKU), Austria
[7] National Dong-Hwa University, Taiwan
[8] Centre of Forestry, Environmental and Resources Policy Study, Renmin University of China
[9] International Tropical Timber Organization (ITTO), Japan
[10] Institute for Global Environmental Strategies (IGES), Japan
[11] Nature and Livelihoods, Uganda
[12] Kathmandu Forestry College, Nepal
[13] M. S. Swaminathan Research Foundation, India

1. Introduction

The term "socio-ecological production landscapes and seascapes" (SEPLS) has been used to refer to areas with "dynamic mosaics of habitats and land and sea uses where the harmonious interaction between people and nature maintains biodiversity while providing humans with the goods and services needed for their livelihoods, survival and well-being in a sustainable manner" (IPSI Secretariat 2015). SEPLS can be found in many parts of the world—with many different socio-economic contexts—where humans are directly linked with nature through various forms of resource use including primary industries, subsistence activities, tourism and others. In SEPLS, biodiversity and ecosystems support humans with food, fuels, shelter, cultural values and other tangible and intangible services while humans support biodiversity and ecosystems through sustainable management of natural resources. Many systems have evolved through such mutual human-nature relationships over a long time, accumulating traditional knowledge useful for sustainable management that can be built on for further development.

Given its multifaceted nature, SEPLS management calls for a holistic approach, as promoted through the Satoyama Initiative (Figure 1). This often means multi-sectoral participation at the landscape scale. Furthermore, activities for SEPLS conservation often cover multiple dimensions,
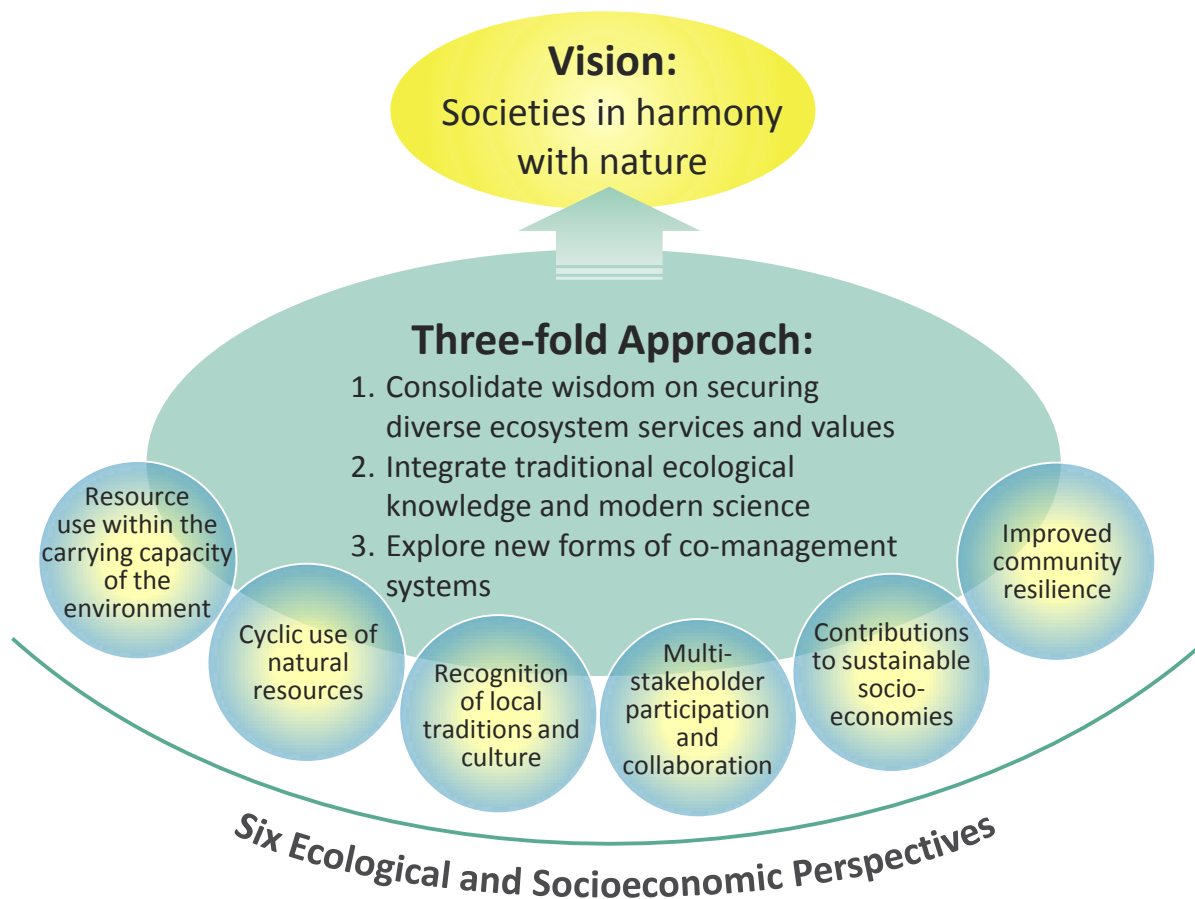
Vision:
Societies in harmony with nature

Three-fold Approach:
1. Consolidate wisdom on securing diverse ecosystem services and values
2. Integrate traditional ecological knowledge and modern science
3. Explore new forms of co-management systems

Resource use within the carrying capacity of the environment

Cyclic use of natural resources

Recognition of local traditions and culture

Multi-stakeholder participation and collaboration

Contributions to sustainable socio-economies

Improved community resilience

Six Ecological and Socioeconomic Perspectives

Figure 1: Conceptual Framework of the Satoyama Initiative (Source: IPSI Secretariat 2015)

such as gender, poverty and deforestation, and incorporate traditional knowledge for sustainable management practices (UNU-IAS & IGES 2015). However, despite the increasing number and variety of innovative activities for sustainable SEPLS management, it is still far from being sufficiently integrated into mainstream landscape-management practices. Unless effective innovative activities become regular, ubiquitous and operated continuously at larger scales, it will be difficult to achieve sustainable development with harmonious human-nature relationships that safeguard ecosystems and biodiversity while increasing human well-being.

In this chapter, we summarise findings from a selection of case studies on mainstreaming concepts and approaches of SEPLS in decision-making processes. "Mainstreaming" here refers to larger-scale adoption of activities for SEPLS conservation. The mainstreaming process can happen at various levels. For example, at the relatively small social level of local community groups, efforts that have worked well in one place can be replicated in other areas, or mechanisms can be established at larger scales as part of policy-planning and implementation processes. Either way, it means an incorporation of activities and

associated principles of resource and ecosystem-service use into wider areas. Successful mainstreaming would ensure better visibility and attention for issues related to conservation of resources and their sustainable use, preservation and promotion of related knowledge, and cultural and livelihood values associated with SEPLS. This is especially important given the increasing global emphasis on locally-relevant solutions that meet the principles of sustainable development (Gu & Subramanian 2012).

This publication aims to highlight lessons on mainstreaming SEPLS activities from seven case studies contributed by members of the International Partnership for the Satoyama Initiative (IPSI). The case studies are from various parts of the world and cover a wide range of activities related to management of natural resources, as shown in Table 1. They were selected from submissions to a call for papers sent out on this theme. This chapter builds on discussions undertaken by the authors at a workshop held at the United Nations University Headquarters Building in Tokyo in May 2016. In this chapter we first summarise characteristic features of the mainstreaming efforts described in the seven case studies by identifying the focus of the activities and their socio-economic and environmental contexts. Then,

Table 1. Overview of the case studies

Chapter number	Authors	Sites	Major actors	Activities
2	Liu and Liu	H Village, Yunnan Province, China	University, research institutes, government, NGOs, donor agencies, local communities	Use of policies and development interventions that affect forest use from the perspective of activating traditional forest-related knowledge (TFRK) through community participation
3	Gualandi and Gualandi	Montespertoli, Tuscany, Italy	NPO, university, local council, government, farmers, processors, local stakeholders	Revitalizing ancient wheat varieties through coordinated links among producers, processors, consumers and other stakeholders
4	Kieninger et al.	Wachau, Austria	EU, government and state authorities (Federal state, province), local authority, market parties, civil society actors/NPOs	Use of policy tools and market mechanisms for conservation of cultural landscapes including subsidies for environmentally friendly farming, community development programmes and Geographical Indication for branding products
5	Lee et al.	Ciharaay Cultural Landscape, Hualien County, Taiwan	University, local management committee, farmers	Tailoring the concept of SEPLS to the national planning process on protected areas through designation and planning of the Ciharaay Cultural Landscape
6	Olupot and Isabirye-Basuta	Mabira Central Forest Reserve, Uganda	University, National Forestry Authority, NGO, local forestry organization	Documentation and evaluation of landscape values (attractions) and biodiversity characteristics for ecotourism in a Reserve Forest area
7	Kumar et al.	Wayanad, Kerala, India	Research institute, NGOs, farmers (indigenous people)	Four programs for conservation of agrobiodiversity and cultural diversity; livelihood improvement; and capacity building
8	Pandit et al.	Syafru (Rasuwa District), Kushadevi (Kavre District) and Shaktikhor (Chitwan District), Nepal	University, local government (e.g. VDC/DDC), district line agencies, local groups (including forest or buffer zone user groups), farmers	Development of local biodiversity strategies and action plans (LBSAPs) Domestication of endangered wild herb species

based on the success factors and challenges provided in the case studies, we highlight broad principles that enable successful implementation of mainstreaming activities.

2. Characteristic features of mainstreaming activities

Although diverse, the activities discussed and analysed in the seven case studies exhibit certain characteristics relevant to mainstreaming processes, some of which are extracted here to provide clues to success factors.

2.1 Focus of activities

The case studies describe activities that are diverse and often multiple in focus, showing that SEPLS conservation benefits from holistic resource-management approaches. Mainstreaming of SEPLS concepts in different contexts can

involve focus on different key needs as listed below. More detailed examples can be found in Table 2.

- Biodiversity conservation (including agricultural biodiversity) and resource management: Biodiversity conservation and resource management are a main focus in these case studies, indicating that the availability of a diverse range of resources is important for successful SEPLS activities. Also, particular species and varieties can be especially important as they are directly linked to local communities' livelihoods and well-being.

- Sectoral activities: A wide range of sectors (e.g., agriculture, forestry, fishery, tourism, conservation, small-scale industry, education) are involved in the management of SEPLS. Wise management interventions are often defined by the choice of sectors and the regulatory and incentive mechanisms within which resources are used. New values related to the landscape can be revealed through such management activities.

Table 2. Examples of focus of activities

Focus	Some examples from the case studies
Biodiversity conservation and resource management	- Conservation of near-extinct wild herb species *S. chiraita, V. jatamansi* and *R. austral* in Syafru, Nepal. - Conservation of plant genetic resources of crops including rice and tubers and of wild crop (landraces) in Wayanad, India
Sectoral activities	- Agriculture: Conservation of agrobiodiversity, a primary focus of activities in Wayanad, India. - Tourism and forestry: Enhancing forest use for ecotourism in Mabira, Uganda. - Small-scale industries: Millers, bakers and pasta makers as critical parts of a project to revitalise an ancient wheat variety in Tuscany, Italy.
Poverty alleviation and livelihood improvement	- Provision of economic benefits to the local communities through cultivation of endangered herbs in an LBSAP in Syafru, Nepal.
Cultural heritage, practices and preferences	- Indigenous landscape management as a main focus in the Ciharaay Cultural Landscape in Taiwan. - Traditional forest-related knowledge (TFRK) including culture, religion and ways of living with nature in H Village, China. - Vineyard landscapes in a World Heritage Cultural Site with rich biocultural diversity and long history in Wachau, Austria.
Social equity	- Women's traditional knowledge and ability to manage their surrounding environment in the village domain in Wayanad, India.

- Poverty alleviation and livelihood improvement: Addressing core security needs of the population such as food security and employment can ensure that stakeholders have a strong sense of ownership over natural resource management processes that can address biodiversity decline and diminishing ecosystem services. Promoting alternative livelihoods or adding value to products to ensure sustainable management can be viable ways for improvement of livelihoods in SEPLS that are facing degradation.

- Cultural heritage, practices and preferences: Social and cultural dimensions of landscape management form the basis for stakeholders' connection to the landscape, its resources, and land-use practices. They play an important role in strengthening people's motivation for sustainable management and can increase economic opportunities through value-added products.

- Social equity: Minority peoples often play an important role in managing and safeguarding biodiversity in SEPLS where they have lived for generations. Also, in many cases men and women have different knowledge associated with resource management, although women's knowledge is not as highly recognised or respected (Buechler & Hanson 2015; Turner and Turner 2008). Imbalances in the empowerment of minority groups and women can negatively affect SEPLS if these important actors are not sufficiently involved in their governance.

2.2 Influential factors

Mainstreaming activities and their implementation are broadly influenced by a range of socio-economic and natural factors, some of which are listed here. For examples from the specific case studies, please see Table 3.

2.2.1 Socio-economic factors

Different socio-economic factors have different effects on SEPLS management, influencing the success or failure of mainstreaming activities positively or negatively as described briefly below.

- Demographic characteristics: These can include social status, gender balance, age distribution, minority groups, migration patterns and others. For example, traditional practices by indigenous peoples and local communities or abandonment of farmland due to out-migration can have major effects on SEPLS.

- Literacy: Literacy is a key determining factor for mainstreaming. A low literacy rate may cause the adaptive capacity of a community to decline, as literacy can influence governance, institutions and management interventions in response to changes in the environment (Engle 2006).

- Knowledge on resource use and management (both traditional and modern): Traditional knowledge and related practices serve as important contributing factors for resilience in social-ecological systems (Ruiz-Mallén & Corbera 2013). Appropriately integrating or reconciling these knowledge systems with modern approaches to meet the challenges of sustainability allows more contextually-relevant management solutions to be developed.

- People's values: The people in a community have distinct individual or collective values regarding their surrounding environment, which may be reflected in their use and management of natural resources.

- Adaptive capacity of stakeholders: The capacity of communities to adapt to changes in their environment is related to their values, knowledge and attitudes toward change and innovation, and tends to maintain or increase their resilience (Folke et al. 2002).

- Institutions: Institutions at different levels from local to global, and their horizontal and vertical linkages, are influential factors for SEPLS management. These can

Table 3. Examples of influential factors

Factors	Some examples from the case studies
Socio-economic factors	
Demographic characteristics	- Indigenous people's needs, natural resource management skills, and cultural practices performed in their ancestral domains for development in H village, China. - Role of women related to their village homesteads, which, when well managed, can provide considerable ecosystem services in Wayanad, India. - Large out-migrating population requiring new opportunities for income generation through less-extractive use of natural resources in rural villages in Nepal.
Literacy	- Low literacy potentially leading to higher dependence on forests through extractive resource use practices, such as hunting and logging in Mabira Central Reserve Forest, Uganda.
Knowledge on resource use and management	- Integration of traditional knowledge and practices with modern knowledge and institutions to make the landscape culturally and ecologically resilient in the Ciharaay Cultural Landscape, Taiwan and Wayanad, India. - Knowledge and techniques to grow ancient wheat varieties with different properties from conventional ones in Tuscany, Italy.
People's values	- Cultural landscapes deeply rooted in the collective values of the society in Wachau, Austria.
Adaptive capacity	- Setting up a Biodiversity Management Committee and Peoples Biodiversity Register to increase the adaptive capacity of the Local Self Governments toward biodiversity-integrated development plans in Wayanad, India. - Specific classification and rules for forest management used by the Lisu People to adapt to today's commodity exchange and economic production in China.
Institutions	- Weak institutional arrangements may build weak links that can make implementation of sustainable land use strategies complicated and difficult in Wachau, Austria.
Economic activities	- Sustainable economic activities within the carrying and regenerating capacity of ecosystems as shown by ecotourism in Mabira, Uganda. - Improvement of livelihood opportunities through conservation and cultivation of rare and endangered herbs in village-based studies in Nepal.
Power structures	- Power structures within the family and in village-level governing bodies as major determining factors for mainstreaming SEPLS concepts in Wayanad, India.
Policies and planning	- A forest management plan that addresses overexploitation of resources through clarifying land use zoning and local communities' access to resources in Mabira Central Reserve Forest, Uganda. - Local Biodiversity Strategies and Action Plans (LBSAPs) under the Convention on Biological Diversity (CBD) framework for conservation and livelihoods in three rural areas in Nepal.
Natural factors	
Climate change	- Careful project design to address adaptation by conserving different indigenous crops in Wayanad, India.
Natural disasters	- Natural disasters such as landslides and flooding as barriers to long-term residence in villages, creating uncertainties that lead to unsustainable livelihood practices in rural villages in Nepal.

also include informal institutions such as norms within communities. Weak institutional arrangements may hinder sustainable land-use.

- Economic activities: SEPLS by definition are supported by economic activities with sustainable use of natural resources within the carrying capacity and regenerating capacity of the ecosystem. Factors for mainstreaming may include land-use strategies, alternative and new means of livelihoods, discovery of new values in the landscapes and its products, and exploration of new forms of marketing and distribution.

- Power structures: Power structures ranging from those within the family to governing bodies have a direct impact on sustainable land and natural-resource use. Decisions regarding rights and access to land, natural resources and benefit-sharing can be affected by power structures within the local community or at larger scales and should be informed by good knowledge.

- Policies and planning: To realise better SEPLS management and governance, policies related to land and resource use need to be context-sensitive and flexible in addressing common problems such as overexploitation and underutilisation.

It should be noted that some of these factors overlap to some degree—for example institutions, policies and planning and power structures. We have chosen to list them separately, however, to highlight subtle nuances that need to be captured under each of these topics.

2.2.2 Natural factors

Among the many natural factors that characterise and influence SEPLS, climate change and natural disasters were identified as having important effects on mainstreaming.

- Climate change: The impacts of climate change require planning and good management for improved resilience. They can have effects on many things, from production activities (e.g., decisions regarding type and yield of crops) to ecosystem conditions (e.g., vegetation, water availability and soil fertility).

- Natural disasters: Natural disasters such as landslides, earthquakes, volcanic eruptions, droughts and flooding, some of which may be related to climate change, demand good knowledge and adaptive capacity, and can even affect whether people will stay in an area to carry out their land-use practices or migrate to other areas in search of other livelihood options.

3. Overarching principles for mainstreaming

3.1 Challenges and success factors

A wide range of challenges and success factors for mainstreaming efforts were identified based on the experiences of the case study authors and their partners.

Major challenges include:

- Institutional mismatches and inadequate coordination between institutions and organizations at different levels (e.g., between local and regional) or within the same level of operation (e.g., between upstream and downstream actors in a watershed).

- Vertical and horizontal power dynamics leading to hierarchies, elite capture of benefits, unequal access to resources and related asymmetries.

- Perverse incentives such as subsidies that promote unsustainable practices (e.g., excessive use of chemicals in farming).

- Financial and economic pressures including lack of availability and access to funding for desirable activities.

Success factors include:

- Multi-stakeholder involvement and a participatory and inclusive approach.

- Open learning and dialogue between different knowledge systems to ensure that appropriate technological innovations are integrated into conventional and traditional SEPLS-management practices.

- Leveraging existing knowledge on resource use and management in order to foster endogenous development and minimise external-expert-driven management.

- Diverse production activities based on the needs of local community that mitigate risks from market perturbations.

- Shared vision, commitment and cooperation of stakeholders, with composite goals reflecting multiple functions of SEPLS and stakeholders' interests.

- Communication to consumers and other external users, and education about SEPLS values.

- Institutional flexibility, stability, networking and clear definition of roles.

- Funding with strategic planning and free, prior and informed consent to ensure that management activities are implemented with the active involvement of all stakeholders beyond the funding period.
- Joint implementation and monitoring of management interventions.

3.2 Principles for mainstreaming SEPLS concepts and approaches

Based on these challenges and success factors and lessons learned from the process, some broad principles have been identified for mainstreaming SEPLS concepts and approaches as described in the following sections.

3.2.1 Mobilise knowledge toward action

- **Integrate traditional and modern scientific knowledge of SEPLS in order to find appropriate solutions for the social, political and economic context**

  Human-nature relationships in many SEPLS have revolved around traditional knowledge, practices and beliefs, and many effective approaches promote their complementary use together with scientific knowledge and technology (Moller et al. 2004). Knowledge may be about certain crop varieties and cultivation methods, about the landscape itself or about resource management and governance among many others. While new knowledge should be constantly created and accumulated as seen in the case of Mabira Central Forest Reserve in Uganda, where researchers assessed its potential for ecotourism, traditional knowledge that is not documented must also be captured as it can be lost within a single generation despite being useful for management. Scientific knowledge can support public policy-making work in a way that helps to maintain or restore resilience by capturing traditional knowledge and making it relevant for land-use policies. Leveraging these two types of knowledge can be an effective means for successful management of SEPLS.

  In the case from Wayanad, India, where the researchers worked closely with local farmers, traditional practices were studied and their value and scientific validity investigated further. Results showed that they supported maintenance of agrobiodiversity, which is vulnerable to decline along with associated ecosystem services due to a range of politico-economic and demographic factors. In Tuscany, Italy, where the traditional wheat variety was successfully revived, modern knowledge held by experts such as agronomists, microbiologists and wheat experts was vital for the project. These experts linked with wheat

growers, processors and customers through dialogue to find the best ways to bring back know-how while also creating jobs and economic benefits for the farmers, a process that led to the comeback of heritage wheat in Tuscany, with associated environmental benefits. The study from the Ciharaay Cultural Landscape in Taiwan takes a unique approach in the designation of a "Cultural Landscape", a new category included in the Cultural Heritage Preservation Law based on IUCN's protected-area frameworks, through consolidation of traditional knowledge. This approach to knowledge helped to ground the three-fold approach of the Satoyama Initiative (Figure 1) in the study area.

- **Translate, transcribe and transform knowledge through inter- and trans-disciplinary approaches**

  The SEPLS covered in this volume have either already seen rapid degradation in the past few decades, or are vulnerable to changes that threaten their future sustainability. Thus, one vital step for successful mainstreaming processes is to capture the existing knowledge base for sustainable resource use, and to translate, transcribe and transform the knowledge into a form appropriate to the socio-economic and ecological context.

  For instance, the case study from Wayanad, India stresses transformation of practices in the field to more formal knowledge through a multilateral approach to action research and policy advocacy towards a sustainable and gender-equitable use of agrobiodiversity. The study demonstrates four case examples of application of multidisciplinary research involving ecology, economics and social sciences to capture the different dimensions of this knowledge for sustainable landscape use.

  The case of cultivating ancient varieties of wheat in Tuscany, Italy utilised different kinds of knowledge and expertise as a result of a multi-stakeholder approach through several levels of planning and management. The project started from academic research, and was then supported by cooperation between the university, the local council, the Ancient Grain Association, agriculturalists, millers and bakers. Their participation made it possible to create a whole chain of actors needed to create sustainable agricultural environments for a heavily commodified product such as wheat. The project was also able to address several biodiversity-related issues associated with the wheat agricultural system, such as loss of flora and fauna from pollution of aquifers, use of herbicides and pesticides and decrease in pollinators, in addition to conservation of native varieties of wheat.

3.2.2 Foster and leverage inclusive participation

- **Foster a participatory approach to create a shared vision and identify composite or inter-linked goals that address multiple objectives**

Multi-stakeholder involvement and participatory approaches have been key to grounding the concept of SEPLS in many case studies. This is because SEPLS entail diverse land uses, and local communities are supported by a bundle of ecosystem services from these mosaic landscapes through their engagement in diverse production activities. Without including a wide range of stakeholders it is not possible to capture the vital cultural and institutional linkages to SEPLS that ensure their long-term management for human well-being.

Multi-stakeholder engagement first requires a good understanding of diverse stakeholders (e.g., academia, local government, farmers and processors in the case from Tuscany, Italy), institutions (e.g., capacity-building for designation of cultural landscapes in the case from the Ciharaay Cultural Landscape, Taiwan) and traditional norms (e.g., forest management with traditional knowledge-based norms and rules of the Lisu indigenous people in the case from H Village, China) associated with natural resources and ecosystem services in the respective SEPLS. Next, there need to be measures to build trust and cooperative mechanisms between these stakeholders. Power dynamics and communication can be important factors here. Power dynamics can cause difficulties in identification of cooperative mechanisms, while good communication, on the other hand, is always important for full engagement of stakeholders.

In the case from the Ciharaay Cultural Landscape in Taiwan, where the landscape is made up of a mosaic of different land uses including rice terraces and irrigation channels, orchards, secondary forests, natural forests and streams, the authors conducted action research with a community-based participatory approach. This approach enhanced partnership with a village inhabited by the indigenous Amis people. In the case study, the authors try to capture cultural aspects of indigenous and traditional landscape management on the one hand, while explaining the concepts and purpose of "Cultural Landscape" protection on the other. Setting composite goals that explore the scope of the three-fold approach of the Satoyama Initiative, and following up with processes such as collaborative planning with the participation of other stakeholders including the government, has provided an opportunity to fully understand and conserve this type of diverse landscape.

A focus on needs-based activities, demonstrated in all the cases, encourages a higher sense of purpose in the community. For example, a need for locally self-sufficient, environmentally-friendly and healthy food has made the cultivation of ancient wheat varieties possible in Tuscany, Italy. On the other hand, economy-based activities for more income generation through domestication of endangered wild herb species in Nepal are contributing to reduce forest overexploitation. This relates to the concept of endogenous development, which is important for wise and successful management of SEPLS as particularly shown in examples where there is a close relationship with a forested landscape supported by a strong traditional knowledge base, such as in the case study of the Lisu people in H Village in China.

Creating a shared vision supported by sound leadership and commitment must be at the core of any management intervention for SEPLS, because activities in SEPLS can cover a broad spectrum of resource management including food production, conservation, cultural inheritance and others. Such a vision can be realised through goals with different time frames. Some land use practices may involve short-term interventions based on local conditions (e.g., cultivation of endangered wild herbs in the case from Nepal, employing environmentally-friendly practices for viticulture in the case from Austria, or for wheat production in the case from Italy), while also trying to address long-term and higher-level goals (e.g., conservation of biodiversity in agro-ecological systems, or establishment of a long-term harmonious relationship between people and nature through new management interventions).

- **Foster "collective efficacy"**

"Collective efficacy" is a term derived from the sociological literature, denoting the ability of members of a community to exhibit a high degree of social cohesion and intervene in the behaviour of other members in the interest of the community's well-being or for the common good (Sampson et al. 1997). Bandura (1998) explains it as people's shared belief in their collective power to produce a desired outcome. A landscape is formed reflecting the values and societal meanings that people attach to it, and so to make the landscape sustainable, it is critical that there is consensus and that this is reflected in the management of the landscape. The case from Wachau, Austria shows that community-based action can result in successful approaches that further motivate community members for collaboration. A need to foster collective efficacy among stakeholders is a primary need seen in the case from the Mabira

Central Forest Reserve in Uganda, which introduces a new type of non-extractive forest management through ecotourism for preserving the biodiversity of the forest.

Collective efficacy requires robust engagement among different stakeholders and should involve at least the following key points:

- **Build trust among stakeholders**

    Trust is vital to involve a wider spectrum of stakeholders (including women, minorities, consumers) and ensure equitable use of resources and sharing of benefits for livelihood development. For instance, the case from Wachau, Austria concerns sustainable regional development supporting SEPLS conservation, which requires building trust among different stakeholders within and across sectors. In these approaches—based on multi-sectoral networking and cooperation—trust within and between sectors is a vital attribute that binds the whole process together to strengthen the rural economy and quality of life, while also internalizing rural biodiversity connected to viticulture.

    The case studies from China, India and Nepal deal with landscapes where the spectrum of stakeholders is itself an important factor in landscape management. Some people are economically or socially marginalised, while resource use varies widely by gender and age. The Nepal case includes a variety of stakeholders who are affected or are going to be affected biodiversity loss, while the India case tries to include people through their connection to rice-paddy landscapes. The study on the Lisu forest-dwelling people in China, on the other hand, stresses a human-ecological perspective, involving religion, behaviour, etiquette and habits that ensure forest protection through cultural interaction with intrinsic values.

    The case from Italy takes a different approach, with strategic involvement of stakeholders— the local government and university, farmers, millers, bakers and the local community—to create new values, such as health benefits or genetic diversity in wheat, for growing ancient wheat varieties. The NPO that facilitates cooperation among stakeholders also ensures that higher prices paid by consumers are transferred to the farmers, thus ensuring protection of the heritage wheat landscape while making the whole process economically viable and ecologically sustainable.

- **Identify relevant institutions and define roles**

    Institutions, including organizations, laws, policies, financial mechanisms, customary rules and norms,

and others, play important roles in SEPLS and work at different levels from local to national to global. Institutions relevant to those involved in projects should be identified, with defined roles considering potential synergies and complementarities. This is important to avoid unnecessary overlaps or gaps that can occur between and within levels of stakeholder operation. For example, the case study from the Ciharaay Cultural Landscape in Taiwan concentrates on institutional arrangements for tailoring the concept of SEPLS to national planning processes, including exploring a feasible framework under which institutional arrangements should work. The case shows that an institutional approach is especially important and feasible where the rural population, key to bottom-up management, faces depopulation, aging and economic decline.

In some cases, sustainable governance of SEPLS may not be possible if laws and other policies do not work well for local and indigenous communities. These communities may have their own rules for survival and well-being shaped by traditional knowledge, as exemplified in the case from H Village in China. State power may create hierarchies, asymmetries and changes in power dynamics in the traditional forest-related knowledge (TRFK) system, and thus may not ensure long-term and sustainable forest resource management. Under such circumstances, sharing rights and responsibilities under the laws of the local authority may be a viable solution. Integration of traditional and modern knowledge, as discussed above, can help to guide the development of mutually-beneficial power dynamics.

Institutions are also important to ensure economic viability in SEPLS. Financial and economic pressures including lack of availability and access to funding for desirable activities often constrains communities pursuing them. In Tuscany, Italy, falling prices for products such as cereals, olives and wine have caused farmers in marginal areas to have less access to resources for environmentally-friendly farming including water and wood. As a result, the area has lost sustainability and local self-sufficiency in food production, eventually importing more than it produces, especially grains.

- **Engage higher political systems and get feedback**

    Continuous support from both local and higher-level government can help make projects effective in the long term. For example, the support of politicians and national and European Union agricultural systems is considered an important factor to ensure the mainstreaming process of SEPLS in ancient wheat-based agriculture in the case study from Tuscany, Italy. Although the study's project

started from academic research in a university and is now supported by cooperation between the Ancient Grain Association and the local council, who sponsor the project, without engaging the higher political system it would not be possible to get continuous support for this type of innovative project.

The case study from Nepal argues for the upscaling of policies to address the whole politico-administrative chain of wards, village development committee districts, zones or regions, finally linking them to national-level policies. This should be coupled with regular feedback to share knowledge learned at the grassroots level at higher political levels.

- **Encourage cross-learning among communities and other stakeholders for development of capacities and to raise awareness**

Transformation toward environmentally, economically and socially sustainable landscapes requires changes in people's values and behaviour. The case study from Wachau, Austria shows that financial compensation for the delivery of ecosystem services and improved environmental quality not only automatically results in behavioural changes in participating farmers, but can also result in a so-called "crowding-out effect", where farmers act in line with subsidy schemes' priorities because it is in their financial interest.

Peer-to-peer learning among communities and other stakeholders is one of the most effective ways for raising awareness and changing behaviour, which can lead to true transformation. For example, one of the main challenges to mainstreaming the concept of SEPLS in the Ciharaay Cultural Landscape in Taiwan is a lack of comprehensive ground-level work with data and learning shared among government, practitioners and researchers. This case study therefore stresses how collaborative planning through institutional capacity building involving social capital (relationships), intellectual capital (knowledge) and political capital (mobilisation), a framework described by Healey (1998), can be a viable means towards grounding the concept of SEPLS. Learning is promoted throughout the process. For the case study from Italy, where revitalisation of ancient wheat varieties was successful, similar revitalisation activities are being started in other areas, and the NPO involved is sharing experiences and also helping to create groups of farmers to work with local councils in these areas.

It is also necessary to increase awareness among consumers and external users about the values of SEPLS,

both environmental and economic, because they can support SEPLS through their purchase of products and services. For example, wild herbs from the villages of Shypru and Ramche in Nepal are bought and consumed in other towns and cities.

An open approach to learning is important for dynamic and adaptive landscape management. Lessons learned through international efforts such as the Satoyama Initiative and IUCN's protected area framework are well demonstrated in the Ciharaay Cultural Landscape case from Taiwan. The case has also been informed from its own backyard—the indigenous village landscape. Such openness to learning from all the different angles has made it possible to designate and protect the cultural landscape in Ciharaay.

3.2.3 Adaptive planning and management of activities

- **Establish long-term monitoring and periodic review**

SEPLS are dynamic in nature, and are maintained through adaptive co-management regimes, with interlinkages between natural processes such as geomorphological processes that work over a very long time scale, cultural processes that are influenced by people's values and can change within relatively shorter time scales, and political and economic factors, which change even faster. Mainstreaming requires envisioning changes over different time scales, involving changes both to the natural environment and to societies. For a management regime to be successful, it is necessary to constantly monitor the on-the-ground situation.

In the case study from Austria, for instance, the long-term effects of combining agricultural and nature-based policies with market-based instruments (such as regional branding) and civil society has been considered a major factor in the sustenance of cultural landscapes. Market-based instruments alone may not result in sustainable use of a dynamic cultural landscape and protection of its natural and cultural resources, so long-term monitoring of the effects of the combination is necessary.

Long-term monitoring is also stressed in the case from Taiwan as a vital mainstreaming process. It is argued that evaluation of the current situation needs to be adaptive based on the whole picture of the situation on the ground, with regular revision of the management plan based on local feedback. This means that a process involving long-term goals and medium-term planning based on short-term monitoring feedback can ensure grounding of SEPLS concepts.

- **Make sure replication efforts are flexible**

Mainstreaming involves replicating efforts and activities in other locations. Sensitivity to both ecological and social conditions is required during such efforts, meaning they must be:

- adaptable to the local context

- within the capacities of communities without degrading landscapes and cultures

While all of the seven case studies exemplify these characteristics in some way, they accomplish it differently. For example, the case from Taiwan tries to capture good practices by internalizing already-present indigenous landscape principles, while the case from Uganda tries to implement new alternative-livelihood practices, promoting ecotourism in a reserve forest area.

The case of the Lisu People in China illustrates that local context is one of the most important features to consider for replication, as development for the people must come from themselves—i.e., must be endogenous—rather than from external organizations and epistemic communities. This also ensures that replication efforts are within the capacity of the communities and do not degrade their cultures and associated landscapes. This case exemplifies the importance of local context where traditional forest-related knowledge (TFRK) is intricately related to local livelihoods through religion, beliefs, customs, daily life and land use. Without context-specific interventions, TFRK has a tendency to be marginalised, and without TRFK the forest ecosystem and well-being of the indigenous people face peril. On-the-ground assessments for understanding the local context are also a major feature in the case from Uganda, which tries to create new recreational values through ecotourism, a new approach in the region to address the problems of a degrading forest landscape.

Similarly, local context is emphasised in the Nepal case in terms of the Local Biodiversity Strategy and Action Plan (LBSAP) and the National Biodiversity Strategy and Action Plan (NBSAP). Efforts are made to remain within the capacity of the local communities, in order to avoid degradation of landscapes and culture. Local village residents in Nepal are heavily dependent on subsistence-level agriculture for their livelihoods, which are very closely linked to the biodiversity of their surrounding environments, so planning based on the local context has been considered as a main pillar for national biodiversity conservation.

4. Conclusions

Efforts to incorporate good practices and management strategies into policies and other institutional mechanisms while promoting sustainable local production practices and associated knowledge in line with the priorities of local communities require good knowledge and planning, as such efforts are often small in scale and seen as statistically insignificant within the larger scale of society. Increasingly, however, resource-management systems like SEPLS are being held up as examples that have managed to conserve a wide variety of actively-used natural resources while remaining economically profitable. Furthermore, such landscapes and seascapes have proven to help ecosystem functioning and provide sustenance and well-being to populations within policy parameters. This translates into sustainability in terms of various needs including food, health, water, energy, income and livelihoods. Increasingly, global policies have started re-emphasizing support and promotion of local practices and innovations, as demonstrated by concepts such as Green Economy (UNEP 2011; TEEB 2010), and in international biodiversity and development targets such as Aichi Biodiversity Targets and Sustainable Development Goals (SDGs).

In line with these policy developments, there has been a resurgence of enthusiasm for local and traditional production, processing and consumption practices. There is also interest in ensuring that lessons are shared between practitioners and various other stakeholders. Consequently, this is leading to greater awareness of products and services from SEPLS and greater adoption of these practices in policymaking and among society more broadly. This is well illustrated in the case studies presented here, as they convey challenges, frustrations and success factors that enable this mainstreaming process, and which are summarised by the principles found in this chapter. What is shown here is that while the creation and use of formal institutions such as government policy and economic mechanisms (e.g., certification programmes) are necessary and influential for mainstreaming concepts and approaches of SEPLS, making mainstreaming efficient and effective requires a lot of effort to build and increase awareness, capacity, trust and cooperation among all stakeholders. This effort ensures that activities are implemented in a way that fits their social and ecological settings and thus provide maximum benefits to people and the environment. It is also important to leverage existing resources, including both traditional and scientific knowledge, and to have a long-term vision and adaptiveness.

The diversity of activities and their socio-ecological contexts seen in just the seven case studies presented in this volume sufficiently indicates that it is not possible to produce

rigid prescriptions or "how-to" guidance to fit all types of mainstreaming activities. However, with the concrete examples shown in these case studies, we hope that readers will find this volume useful for learning lessons to use and share, and that it will encourage similar activities and their documentation in other contexts.

References

Bandura, A 1998, 'Personal and collective efficacy in human adaptation and change', in *Advances in Psychological Science: Social, Personal, and Cultural Aspects (Vol. 1),* eds JG Adair, D Belanger & K Dion, Psychology Press, Montreal, pp. 51-71.

Buechler, S & Hanson, A (eds.) 2015, *A political ecology of women, water and global environmental change (Routledge international studies of women and place)*, 1st edn, Routledge, Oxford.

Folke, C, Carpenter, S, Elmqvist, T, Gunderson, L, Holling, CS, Walker, B, Bengtsson, J, Berkes, F, Colding, J, Danell, K, Falkenmark, M, Gordon, L, Kasperson, R, Kautsky, N, Kinzig, A, Levin, S, Mäler, K, Moberg, F, Ohlsson, L, Olsson, P, Ostrom, E, Reid, W, Rockström, J, Savenije, H & Svedin, U 2002, 'Resilience and sustainable development: building adaptive capacity in a world of transformations', *Scientific background paper on resilience for the process of the World Summit on Sustainable Development on behalf of The Environmental Advisory Council to the Swedish Government*, Stockholm, viewed 16 September 2016, <http://era-mx.org/biblio/resilience-sd.pdf>.

Engle, NL 2006, 'Adaptive capacity and its assessment', *Global Environmental Change*, vol. 21, no. 2, pp. 647-656.

Gu, H & Subramanian, MS 2014, 'Drivers of change in socio-ecological production landscapes: Implications for better management', *Ecology and Society,* vol. 19, no. 1:41, viewed 16 September 2016, <http://dx.doi.org/10.5751/ES-06283-190141>.

Healey, P 1998, 'Building institutional capacity through collaborative approaches to urban planning', *Environment and Planning A*, vol. 30, pp. 1531-1546.

IPSI Secretariat 2015, *IPSI: The International Partnership for the Satoyama Initiative,* viewed 10 September 2016, <http://satoyama-initiative.org/wp-content/uploads/2015/11/20151007_ID-PDF_UNU-DL-flyer-EN-with-new-diargam.pdf>.

Moller, H, Berkes, F, Lyver, PO & Kislalioglu, M 2004, 'Combining science and traditional ecological knowledge: monitoring populations for co-management'. *Ecology and Society,* vol. 9, no. 3:2, viewed 16 September 2016, <http://www.ecologyandsociety.org/vol9/iss3/art2/>.

Ruiz-Mallén, I & Corbera, E 2013, 'Community-based conservation and traditional ecological knowledge: implications for social-ecological resilience', *Ecology and Society*, vol. 18, no. 4:12, viewed 16 September 2016, <http://www.ecologyandsociety.org/vol18/iss4/art12/>.

Sampson, RJ, Raudenbush, SW & Earls, F 1997, 'Neighborhoods and violent crime: a multilevel study of collective efficacy', *Science* vol. 277, no. 5328, pp. 918-924.

TEEB 2010, *The Economics of Ecosystems and Biodiversity: mainstreaming the economics of nature: a synthesis of the approach, conclusions and recommendations of TEEB*, viewed 10 September 2016, <http://doc.teebweb.org/wp-content/uploads/Study%20and%20Reports/Reports/Synthesis%20report/TEEB%20Synthesis%20Report%202010.pdf>.

Turner, NJ & Turner, K 2008, 'Where our women used to get the food: cumulative effects and loss of ethnobotanical knowledge and practice; case study from coastal British Columbia', *Botany* vol. 86, pp. 103-115.

UNEP 2011, *Towards a green economy: pathways to sustainable development and poverty eradication*, viewed 10 September 2016, <www.unep.org/greeneconomy>.

UNU-IAS & IGES 2015, *Generating collective knowledge on the conservation, management and sustainable use of socio-ecological production landscapes and seascapes - A summary of a review of 80 case studies under the International Partnership for the Satoyama Initiative (IPSI)*, United Nations University Institute for the Advanced Study of Sustainability, Tokyo, viewed 10 September 2016, <http://satoyama-initiative.org/wp-content/uploads/2016/02/IPSI-Case-Study-Review-Brochure-final-web.pdf>.