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UNU-IAS Policy Report

Socio-ecological Production Landscapes: Relevance to the Green Economy Agenda



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**Socio-ecological Production
Landscapes:
Relevance to the Green Economy Agenda**

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United Nations University Institute of Advanced Studies (UNU-IAS)



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Message from the Director

Two decades have passed since nations of the world assembled in Rio de Janeiro and agreed to adopt a sustainable development (SD) agenda, promising to chart a development path that is equitable, environmentally just and economically rewarding. We now stand at a crossroads looking for the right path towards the world we want. The prognosis is not encouraging. According to many studies conducted by research or policy bodies, we seem to have made some progress, but still fall far short of what is required to sustain current levels of well-being. Negative environmental trends continue to be exacerbated by human interventions—primarily led by a model of unsustainable and conspicuous consumption

The unsustainable conversion of natural capital for supporting this emerging consumer culture while ignoring the ecological consequences to economies and other aspects of well-being has become quite entrenched. The extraordinary emphasis on developing produced capital appears to have overwhelmed all other aspects of natural capital required for our well-being.

On the positive side, there is expanding awareness and a growing acknowledgement of this gap in our planning and implementation processes. There is a recognized need for development metrics that extend beyond GDP, the current indicator. Increasing resolve to align production activities with environmental and equity considerations, and efforts aimed at reforming global institutional structures to create more synergies and effective implementation of relevant policies are welcome signs of change.

Research and capacity building activities at the United Nations University Institute of Advanced Studies (UNU-IAS) have examined various aspects related to the rubric of governance challenges in achieving SD—from a focus on broad-based development and well-being at the community level, equity issues related to urbanization and its implications for environmental resources, to innovations that could aid in achieving global goals for policy-making for SD. This report analyses the potential of social-ecological landscapes to contribute to the green economy discourse, and suggests that they can indeed catalyse action towards better employment, bio-cultural diversity and ecosystem functioning.

Our broader research indicates that despite the exalted nature of global goals, they become relevant only when defined and shaped into pragmatic objectives and actions. This would require cooperative action by all stakeholder groups, implying that future policy processes need to ensure their relevance at various levels to guarantee successful implementation. This is no easy task, but by no means an impossible one. Current accepted standards of practice and business norms must be re-oriented to include a more consultative policy setting with all major actor representatives. It would require designing regulations that acknowledge the need for balance among all forms of capital, and incentives that provide equitable access to resources and services to all.

There are a number of expectations from processes linked to Rio+20 and beyond, particularly on how the decisions will be transformed into action and results. UNU-IAS stands ready to work with its existing and future collaborators to transform our aspirations into reality as we move forward in translating the sustainability agenda into action.

Govindan Parayil,
Director, UNU-IAS and Vice-Rector, UNU
June 2012

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Executive Summary

Socio-ecological production landscapes (SEPLs), if managed effectively, can provide a wide range of ecosystem services that help contribute to the livelihoods and well-being of local communities, and the achievement of the Millennium Development Goals and relevant national development policies. Drawing insights from a variety of case studies, this report examines the historical and political context in which SEPLs have evolved as well as the challenges and opportunities in promoting SEPLs for the green economy.

The analysis suggests that the achievement of broad-based sustainable development requires policy reforms that adequately recognize the values of SEPLs and incorporate those values in socio-economic planning and decision-making. It should be emphasized that promoting SEPLs is not for the sake of nostalgic traditionalism. Rather, it seeks to identify innovative ways of resource management that respect the needs and rights of local communities while creating added value to the products of SEPLs to help them find a better place in the national and global markets. The challenge facing policymakers is how to allocate resources and provide incentives to facilitate such efforts.

Policymakers should be aware that improved SEPLs not only contribute to food security but create job opportunities for the population. There is a clear need to set in place stable and effective institutions comprising a consortium of relevant stakeholders to enable good governance of SEPLs. Appropriate economic instruments are to be developed with a better understanding of their implications throughout supply chain processes. Finally, the need for raising awareness about the benefits of human-nature co-existence cannot be over-emphasized. It is important that policies be designed to suit the specific contexts in which SEPLs have evolved so as to facilitate a more locally relevant approach to sustainable development and a green economy.

Keywords: green economy, socio-ecological production landscapes, biodiversity, well-being, sustainable development, poverty reduction

1. Introduction

Socio-ecological production landscapes (including both terrestrial and aquatic, hereafter SEPLs) can be defined as 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.¹ They can be found in many regions of the world with various names such as *muyong*, *uma* and *payoh* in the Philippines, *mauel* in Korea, *dehesa* in Spain, *terroirs* in France and other Mediterranean countries, *chitemene* in Malawi and Zambia, and *satoyama* in Japan. Some of these areas are formally recognized as protected landscapes/seascapes under the IUCN protected area category V, World Cultural Heritage sites, Biosphere Reserves, Globally Important Agricultural Heritage Systems as well as Indigenous and Community Conserved Areas. Many others remain unrecognized, yet they play a vital role in the vernacular conservation of both biological and cultural diversity.

This report examines the relevance of SEPLs to the green economy in the context of sustainable development and poverty eradication, which is one of the major themes of the United Nations Conference on Sustainable Development to be held in June 2012 (UNCSD2012 or Rio+20). For the purpose of this report, a green economy is defined as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP 2010: 418–9). Case studies contributed by the members of the International Partnership for the *Satoyama* Initiative (IPSI) indicate that SEPLs, if managed effectively, can provide a wide range of provisioning, regulating, cultural and supporting services. They help contribute to the livelihoods and well-being of local communities, and the achievement of the Millennium Development Goals (MDGs) and relevant national development policies.

However, as pointed out in the Paris Declaration on the “*Satoyama* Initiative” (see Appendix 2), some SEPLs have been abandoned as a result of rural depopulation and ageing populations, while others are increasingly threatened in many parts of the world due to various pressures such as unplanned urbanization, industrialization and increase in population/resource demand. The loss or degradation of these landscapes inevitably leads to a decline in the various ecosystem services that they provide, with serious consequences for the local and broader communities that rely on them. In some cases, SEPLs may not fully provide for the various needs of local communities and could thus be abandoned as people move to urban areas in search of employment and better living conditions (Takeuchi et al. 2003; Duraiappah et al. 2012). As such, there is a need for a range of options to support indigenous and local communities in continuing to maintain these landscapes, as they have done for generations.

Drawing lessons from some of these case studies, this report primarily seeks to analyse challenges and opportunities faced by local communities in sustaining SEPLs upon which their livelihoods depend. It also attempts to explore the mechanisms by which these SEPLs can be woven into the socio-economic policy framework. The objective is not only to raise awareness of the values of SEPLs but also to discuss broad policy solutions to promote SEPLs for achieving the goals of sustainable development and poverty reduction. As every SEPL has its distinctive bio-cultural characteristics specific to local environmental and

¹ This definition was developed based on the work of the Japan *Satoyama Satoumi* Assessment (JSSA), which defines *satoyama* and *satoumi* landscapes as dynamic mosaics of managed socio-ecological systems producing a bundle of ecosystem services for human well-being (Duraiappah et al. 2012: 26). Recognizing that such landscapes can be found in many parts of the world, the term “socio-ecological production landscapes” started to be used to describe target areas of the *Satoyama* Initiative. The Global Workshop on the *Satoyama* Initiative, which was held at the Headquarters of the UNESCO in Paris in January 2010, discussed the concept of SEPLs in the global context. The definition used in this report is a direct quotation extracted from the Paris Declaration on the “*Satoyama* Initiative” (see Appendix 2).

topographical conditions, to avoid over-generalization we group 17 case studies into five categories according to their broad ecosystems and main production activities. Table 1 provides an overview of socio-political contexts as well as challenges and opportunities related to each case study. The details of these case studies can be found in Appendix 1. Given the limited scope of the selected case studies, the report has an empirical focus on terrestrial ecosystems, which include agro- and community forestry, rice agro-ecosystem, inland water systems, agro-pastoralism and mountain ecosystems.

The selected case studies were contributed by IPSI members as well as organizations and individuals working on SEPLs, and recomposed by the authors with additional information to highlight the historical and political contexts in which these SEPLs have evolved, and the main challenges and opportunities they face (Appendix 1). In contextualizing these case studies, the authors adopt the analytical framework of political ecology to engage both political and ecological dimensions of environmental issues and the dynamic interplay between local, national and global forces that have shaped the SEPLs.² Political ecology is applied to the study of SEPLs because it provides a useful framework for understanding the cross-scale linkages between stakeholders in resource management and associated power relations (Zimmerer and Bassett 2003). This helps to avoid the romanticization of SEPLs as homeostatic and apolitical entities, and to open a more meaningful dialogue between the rural and the urban, the periphery and the centre, as well as the local and the global. Such a dialogue is greatly needed as SEPLs not only provide ecosystem services for local communities but for a larger population outside their boundaries. Indeed, SEPLs are increasingly influenced by external actors and events, and by national and international development policies and programmes.

To understand the contemporary dynamics of human-nature interactions in relation to SEPLs, this report examines the impact of major historical events on patterns of resource use, livelihood strategies and institutional arrangements. Particular attention is paid to the evolution of land tenure systems and government policies affecting agriculture, forestry, fisheries and other sectors. Although the development trajectories of each country are different, there is a growing tendency towards economic integration and trade liberalization, which characterizes the current era of globalization. The process of market integration has on the one hand created new opportunities for economic growth, and has on the other hand contributed to the alienation and homogenization of SEPLs in many countries. Smallholder farmers are among the most vulnerable and find it increasingly difficult to sustain traditional ways of life in the face of modernization and globalization. Here it should be emphasized that the analysis presented in this report does not argue for the promotion of SEPLs for the sake of nostalgic traditionalism. Rather, it seeks to identify innovative ways of resource management that respect the needs and rights of local communities while creating added value to the products of SEPLs to help them find a better place in the national and global markets. The challenge facing policymakers is how to allocate resources and provide incentives to facilitate such efforts.

The rest of the report is organized as follows. Section 1 examines how interactions among stakeholders and events have affected the conservation, utilization and management of each category of SEPLs. Section 2 highlights the factors that enable or hinder policy changes in relation to the promotion and protection of SEPLs. The report concludes with policy suggestions to promote SEPLs for a green economy and sustainable development.

² Political ecology is an interdisciplinary field of study that links politics and economy to problems of environmental control and ecological change. See Robbins (2004) for a comprehensive introduction of the field.

Table 1 Summary of the case studies³

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
I. Agro- and community forestry	<p>Cambodia</p> <p>Socio-political context: A former French colony, gained independence in 1953, civil war between the Khmer Rouge and government forces (1973–1993), post-war reconstruction towards decentralization and democratization</p> <p>Major food and agricultural commodities: Rice, cassava, indigenous cattle meat, pigmeat, maize</p> <p>Major agricultural export commodities: Soybeans, rubber, rice milled, maize, palm oil</p>	<p>The Dornak Neak Ta Thmor Puan community forest</p> <p>Wat Chas Village, Kampong Cham</p>	<p>Landscapes: Mountainous</p> <p>Major products: Rice</p> <p>Challenges: Post-war reconstruction has transformed forests from a military asset into internationally traded commodities (Le Billon 2000). Cambodia has developed a thriving forestry sector that features corrupt government officials, client-patron relationships, military involvement, exclusion of local communities and disregard for environmental standards (De Lopez 2002: 365).</p> <p>Opportunities: International donors seek to use aid conditionality to promote the legalization of the forestry sector and community forestry development. First nationwide commune/sangkat council elections were held in 2002, and these councils play an important role in implementing community forest activities.</p> <p>Landscapes: Flat, dotted with mounds, surrounded by small woodlands</p> <p>Major products: Rice</p> <p>Challenges: Overuse of agrochemicals and monocropping</p> <p>Opportunities: Re-introducing traditional farming techniques</p>

³ For details of the case studies, please refer to Appendix 1.

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
	<p>Nepal</p> <p>Socio-political context: A parliamentary monarchy since 1990, civil war (1996–2006) between government forces and Maoist rebels</p> <p>Major food and agricultural commodities: Rice, vegetables, indigenous buffalo meat, potatoes</p> <p>Major agricultural export commodities: Lentils, nutmeg, mace and cardamom, tea, wheat</p>	<p>The Patale community forest in Lamatar Village Development Committee, Lalitpur District</p>	<p>Landscapes: Mountainous</p> <p>Major products: Rice</p> <p>Challenges: Civil war has relegated community forestry to a lower level of political priority, and the proposed amendments to the Forest Act of 1993 may constrain the autonomy of community forest user groups (CFUGs) and increase bureaucratic control over forest resources (Fisher 2010; Sunam et al. 2010). Other challenges include equitable sharing of forest benefits among users.</p> <p>Opportunities: If appropriate policy and compliance mechanisms are maintained, CFUGs can become effective institutions in managing and utilizing forest resources for both subsistence and commercial purposes. They can also become viable local institutions for promoting democracy and delivering rural development services.</p>
	<p>Sri Lanka</p> <p>Socio-political context: A former British colony, gained independence in 1948. The post-colonial governments have maintained a strong policy focus on promoting smallholder agriculture particularly in relation to irrigation and rice production. The Sri Lankan civil war (1983–2009) caused hardships to the population, the economy and the environment of the country.</p> <p>Major food and agricultural commodities: Rice, tea, coconut, natural rubber, chicken meat</p> <p>Major agricultural export commodities: Tea, rubber, cinnamon, coconut desiccated</p>	<p>Kandyan homegardens</p>	<p>Landscapes: Wet zone, low land valleys</p> <p>Major products: Food items (e.g., sweet potato, taro, yam), fruits, ornamentals, vegetables, medicinal plants, timber trees, spices, cash crops (e.g., avocado, cocoa, cloves, coconut)</p> <p>Challenges: Traditional farming practices had earlier been considered backward and thus marginalized (Ulluwishewa 1991). Urbanization, population growth and inappropriate land development also pose threats.</p> <p>Opportunities: In recent years, the Sri Lankan government has attached greater policy importance to local food production as a means to meet the impending food shortages. Several programmes have been introduced to strengthen home-gardening, self-employment and other income generating activities.</p>

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
	<p data-bbox="198 1096 225 1509"></p>	<p data-bbox="198 872 569 1096">The <i>Owita</i> agro-ecosystem (<i>Owita</i> means land lots located between home gardens and paddy fields that grow a mixture of crops to supplement farmers' diet)</p>	<p data-bbox="198 205 569 872">Landscapes: Wet zone, low-lying areas Major products: Rice, betel leaves, root and tubers (taro, innala, yams, sweet potato), leafy vegetables, low country vegetables, brinjal, cucumber, bitter gourd, yardlong beans, banana Challenges: The <i>Owita</i> system has been neglected since Sri Lanka started adopting a free market economy in 1978. Opportunities: The Department of Agriculture and the Ministry of Environment and Natural Resources of Sri Lanka have proposed a new project to study the <i>Owita</i> system and develop strategies to conserve local varieties of plants and crops.</p>
	<p data-bbox="580 1096 607 1509">Mexico</p> <p data-bbox="661 1096 951 1509">Socio-political context: A former Spanish colony, gained independence in 1821. A series of agrarian reforms were carried out following the Mexican Revolution (1910–20) but it was not until the 1990s that legal framework was established for multiculturalism and indigenous peoples' rights. Major food and agricultural commodities: Cattle meat, chicken meat, sugar cane, maize, tomatoes, green chillies and peppers, mangoes, avocado, maize Major agricultural export commodities: Beer of barley, tomatoes, avocado, green chillies and peppers</p>	<p data-bbox="580 872 715 1096">Community-based forest enterprises in Ixtlan de Juarez, Oaxaca</p>	<p data-bbox="580 205 1260 872">Landscapes: Mountainous Major products: Maize, sugar cane, tomatoes Challenges: Until recently the incentives for introducing community-based forest management remained perverse as indigenous communities were often seen as an impediment to Mexico's modernization and its economic integration with the rest of the world (Diego Quintana et al. 1998: 4). Opportunities: The electoral <i>Usos y Costumbres</i> reforms were carried out in the state of Oaxaca between 1992 and 1998, which gave local communities the autonomy to decide on the use and benefit-sharing of forest resources.</p>

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
<p>II. Rice agro-ecosystem</p>	<p>Cambodia</p> <p>Socio-political context: As mentioned on p.9</p> <p>Major food and agricultural commodities: As mentioned on p.9</p> <p>Major agricultural export commodities: As mentioned on p.9</p>	<p>Western Siem Pang</p>	<p>Landscapes: Trans-border protected forest area with trapaengs (seasonal pools)</p> <p>Major products: Rice</p> <p>Challenges: Sizeable areas of agricultural land have been converted for commercial production of timber and sugar since the early 1990s.</p> <p>Opportunities: Birdlife Cambodia, in collaboration with the Forestry Administration, has initiated several projects aiming at strengthening community-based natural resource management.</p>
	<p>Cuba</p> <p>Socio-political context: A former Spanish colony, gained independence from the US in 1898. The export-oriented, capital intensive model of development that emerged before and after the Cuban Revolution (1953–9) created problems of trade dependency, inequitable land tenure, food insecurity and environmental degradation. The model was forced to shift towards organic farming following the collapse of Cuba's trading partners in the Soviet bloc.</p> <p>Major food and agricultural commodities: Sugar cane, tomatoes, pigmeat, mangoes, cow milk</p> <p>Major agricultural export commodities: Sugar, cigar, orange juice, grapefruit juice</p>	<p>Organic farming</p>	<p>Landscapes: Island country with tropical climate</p> <p>Major products from SEPLs: Sugar cane, rice, tomatoes</p> <p>Challenges: It remains to be seen whether the Cuban government will be able to resist the re-imposition of the export-oriented, capital intensive development model under the pressure from the US and the global trading system (Gonzalez 2003: 725–32).</p> <p>Opportunities: The ecology group of the University of Havana is working with farmers through education and training towards achieving the dual goal of minimizing rice loss while enhancing the quality of bird habitats and food security.</p>

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
	<p>Japan</p> <p>Socio-political context: Post-war high growth period (1955–75) was marked by the decline of the agricultural sector. Entering the 1990s, there has been growing concern over the aging of rural population and the possible threat to food security.</p> <p>Major food and agricultural commodities: Rice, cow milk, pig meat, chicken meat, apples</p> <p>Major agricultural export commodities: Cigarette, pastry, infant food, apples</p>	<p>Reintroduction of oriental white storks in Toyooka City, Hyogo Prefecture</p>	<p>Landscapes: Archipelago, mountainous</p> <p>Major products: Rice</p> <p>Challenges: Wartime logging and post-war land use changes led to a drastic decline in population of oriental white storks.</p> <p>Opportunities: The re-introduction project began in 1955 and achieved success in 1989. The Ministry of Agriculture, Forestry and Fisheries enacted the “Basic Act on Food, Agriculture and Rural Areas” in 1999 with the aim to fulfil the multifunctional role of agriculture in food supply, land conservation, employment and preservation of cultural tradition. This has created incentives for organic farming and the development of other eco-friendly farming practices.</p>
<p>III. Inland water systems</p>	<p>Malawi</p> <p>Socio-political context: A former British colony, gained independence in 1964. The rapid growth of the plantation sector (notably tobacco) led to the alienation of customary land to larger landowners. Recent development policies seek to address this bias by placing more emphasis on rural livelihood improvement and poverty reduction.</p> <p>Major food and agricultural commodities: potatoes, maize, cassava, tobacco, bananas</p> <p>Major agricultural export commodities: palm oil, rubber, cocoa butter, pastry</p>	<p>Small-scale catchment management in Chindozwa</p>	<p>Landscapes: Landlocked country, Lake Malawi catchment area</p> <p>Major products: Cotton, tobacco, maize, cassava, fishery</p> <p>Challenges: Things started to change in the late 1980s due to the growing concern of deforestation, spurred by crop failure caused by the cassava mealy bug disaster and the concomitant clearing of new fields in the area. With the influx of temporary food aid, villagers have begun to substitute cassava with maize, and fishers have turned to more effective gear in order to earn more cash for maize purchase.</p> <p>Opportunities: Community-based conservation efforts such as reforestation have emerged. The combination of farm and non-farm sources of income helps the fishing communities to adapt to adverse conditions.</p>

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
	<p>Thailand</p> <p>Socio-political context: Since the early 1950s, government policies and foreign aid were directed towards rural development and pacification of northeast Thailand through infrastructure investment.</p> <p>Major food and agricultural commodities: Rice, natural rubber, cassava, sugar cane, mangoes</p> <p>Major agricultural export commodities: Rice, natural rubber</p>	<p>Local livelihood in the Lower Songkhram Basin</p>	<p>Landscapes: Riverine</p> <p>Major products: Rice, fish</p> <p>Challenges: Traditional subsistence farming has been gradually overtaken by more intensive agriculture oriented towards external markets, which has caused a notable decline in the productivity of the seasonally flooded forest.</p> <p>Opportunities: Co-management measures are being developed between multiple stakeholders for sustainable fisheries in the watershed.</p>
	<p>Kenya</p> <p>Socio-political context: A former British colony, gained independence in 1963. Irrigation projects have been a preferred policy option for modernizing agricultural production, minimizing food deficits and imports and ameliorating the impacts of drought.</p> <p>Major food and agricultural commodities: Cow milk, cattle meat, tea, maize, mangoes</p> <p>Major agricultural export commodities: Tea, coffee, vegetables, cigarettes, tobacco</p>	<p>Eastern African wetlands and lower floodplains</p>	<p>Landscapes: Wetlands, floodplains</p> <p>Major products: Mango, cashew, banana, maize, sorgho, sesame, rice, maize</p> <p>Challenges: The intensive development of the upper catchment has brought about many environmental challenges in the Tana River Delta. The resulting productivity loss of the lower Tana River floodplains has seriously affected the livelihoods of the riverine communities. A proposed biofuel project will also cause negative impact on the wetland-dependent economies.</p> <p>Opportunities: The Kenya Wetlands Biodiversity Research Team (KENWEB) seeks to engage various stakeholders in developing co-management strategy and action plans by recognizing the value of traditional management systems and empower local communities in resource management.</p>

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
<p>IV. Agro-pastoralism</p>	<p>China</p> <p>Socio-political context: The most populous country, tension between development and conservation looms large. Ownership and stewardship are contested issues with the expansion of nature reserves in rural and peri-urban areas.</p> <p>Major food and agricultural commodities: Pigmeat, rice, wheat, tomatoes, apples</p> <p>Major agricultural export commodities: Garlic, tomato paste, tea, apples, dry beans</p>	<p>Ke'erqin National Natural Reserve, Inner Mongolia</p>	<p>Landscapes: Semi-arid temperate zone, grassland, native elm forest and wetlands</p> <p>Major products: Maize, mung beans, livestock raising (sheep and cattle)</p> <p>Challenges: Past reforms such as the Household Responsibility System have taken insufficient consideration of the carrying capacity and ecosystem integrity of the pastures (Wu and Du 2008).</p> <p>Opportunities: The UNEP/GEF Siberian Crane Wetland project sought to engage multiple stakeholders and enhance capacity building through training, participatory planning and restoration of traditional culture.</p>
<p></p> <p>Socio-political context: Colonial policies restricted the movement of pastoral communities, and the sedentarization process continued after independence.</p> <p>Major food and agricultural commodities: As mentioned on p.14</p> <p>Major agricultural export commodities: As mentioned on p.14</p>	<p>Kenya</p> <p>Kitui District (the Kamba people) □</p>	<p>Landscapes: Over two-thirds of the country is arid or semi-arid</p> <p>Major products: Maize, beans, pigeon peas, cassava, sweet potatoes</p> <p>Challenges: Sedentarization and recent forest conservation policies have limited the access and use of forest resources, which increases the vulnerability of the pastoral communities to climate stress (Owuor et al. 2011: 50–52).</p> <p>Opportunities: To cope with drought, farmers have taken advantage of the spatial variations by having farms in different zones, and by accessing food and fodder produced in other agro-ecological zones through market and kinship networks.</p>	

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLS
<p>V. Mountain ecosystems</p>	<p>Philippines</p> <p>Socio-political context: A former colony of Spain and the US, gained independence in 1946. About 15–20 per cent of its population is recognized as indigenous peoples</p> <p>Major food and agricultural commodities: Rice, pigmeat, bananas, coconuts, tropical fruits</p> <p>Major agricultural export commodities: Coconut oil, banana, pineapples</p>	<p>Ifugao Province, the Cordillera Administrative Region, Northern Luzon</p>	<p>Landscapes: Archipelago, mountainous</p> <p>Major products: Rice</p> <p>Challenges: Despite increased foreign interest in the Cordillera landscape and its peoples, the post-independent government continued to enforce the stereotypes of the <i>Igorots</i> as being backward so as to justify resource-based development (McKay 2006).</p> <p>Opportunities: Following the enactment of the Indigenous Peoples' Act in 1997, various efforts have been made to promote greater understanding of indigenous knowledge systems and practices on natural resource management to engage communities in the formulation and implementation of development plans.</p>
<p></p>	<p>Peru</p> <p>Socio-political context: A former Spanish colony, gained independence in 1821. Its agrarian system consists of plantations on the coast as well as large landed estates and peasant communities in the highlands.</p> <p>Major food and agricultural commodities: Chicken meat, rice, potatoes, cow milk, cattle meat</p> <p>Major agricultural export commodities: Coffee, asparagus, grapes, dry chillies and peppers</p>	<p>Potato Park (<i>ayllu</i> system), Quechua communities</p>	<p>Landscapes: The coast to the west, the highlands in the middle and the tropical Amazon jungle to the east</p> <p>Major products: Rice, potatoes</p> <p>Challenges: The indigenous peoples of Cusco have been associated with under-development and poverty and seen as obstacles to Peru's development (Garcia 2005).</p> <p>Opportunities: The ANDES launched the Potato Park project in 2000 seeking to establish an alternative model to improve local livelihoods and conserve biocultural heritage. Several economic collectives have been established. Other initiatives include development of the Local Biocultural Database, partnership with the International Potato Centre and agro-ecotourism.</p>

Ecosystem Services	Country Information	Case Studies	Characteristics of SEPLs
	<p>Spain</p> <p>Socio-political context: The process of decentralization and Europeanization has accelerated following Spain's transition to democracy in the late 1970s and accession to the European Economic Community in 1986. Great regional disparities can be found in Spain due to ethno-territorial diversity.</p> <p>Major food and agricultural commodities: Olives, pigmeat, grapes, cow milk, tomatoes, potatoes</p> <p>Major agricultural export commodities: Wine, virgin olive oil, tangerines, oranges, pigmeat</p>	<p>The Agras field system in Galicia</p>	<p>Landscapes: Mountainous inland, banks and terraces on the coast</p> <p>Major products: Wheat or rye, turnips and potatoes</p> <p>Challenges: The reorientation of agricultural activity towards dairy farming and forestry, combined with rural depopulation, land consolidation and urban development, has contributed to the homogenization and simplification of the Galician landscape.</p> <p>Opportunities: The Government of Galicia issued the Act on Landscape in 2008 and presented its landscape strategy in 2011, which constitutes an opportunity to identify, conserve and promote the traditional landscapes as a means of fostering regional development and identity.</p>

2. Analysis of Case Studies

2.1 Agro- and community forestry

Agroforestry is one of the oldest land use practices in human history (Nair 1993). It refers to “a form of land use where woody perennials interact biologically and/or economically in the same area with crops and/or animals. These elements can be associated simultaneously or sequentially, in zones or intermixed” (Somarriba 1992: 234). The case studies from Cambodia, Nepal, Sri Lanka and Mexico indicate growing support for community-based forestry and agroforestry as a means to promote decentralization and alleviate poverty. Two major forces are driving this trend. One is that of international donors who upheld structural adjustment programmes as the ideal solution for the reconstruction of post-conflict countries (Hughes 2009; Moore 2000; Adedeji 2001). Market liberalization and political democratization are at the core of the neo-liberal vision of development. The other force is a blend of neopopulism and anti-developmentalism that advocated bottom-up approaches to sustainable development and resources management (Rich 1994; Guthman 1997: 60). These two forces are not necessarily incompatible. Following the adoption of the Millennium Development Goals in 2000, the much-criticized neo-liberal aid regime has gradually given way to a new one that emphasizes poverty reduction and good governance (Murray and Overton 2011: 313-6). Although embracing populist rhetoric and goals, the new aid regime is designed to strengthen the legitimacy of the state so as to continue with the development of free market capitalism (*ibid.*: 316). Studies from elsewhere suggest that community forestry is often constrained by efforts to maintain centralized control over forest resources (through the principles of scientific forestry) and by a political economy oriented towards commercial timber production (Gauld 2000; Klooster 2000; Sato 2000).

In the case studies from Cambodia and Nepal, new administrative units such as community forestry committee and community forest user groups were introduced as a means to promote devolution of forest management to local communities. In practice, however, devolution of control over forests has been limited in areas where commercially valuable timber can be grown and harvested (Davis 2005). The recent civil war in Nepal (1996–2006) has also relegated the legislation and regulation of community forestry to a lower level of political priority (Fisher 2010: 26). Furthermore, there has been concern over the proposed amendments to the Forest Act 1993 in Nepal, which are directed to constrain the autonomy of CFUGs and increase bureaucratic control over forest resources (Sunam et al. 2010). By contrast, community-based forest enterprises have been relatively successful in the Ixtlan de Juarez municipality, the State of Oaxaca, Mexico. This is because the legal system recognizes and protects indigenous peoples’ rights, and local communities are given the autonomy to decide on the use of forest resources and sharing of benefits arising therefrom. In Sri Lanka, community forestry has been implemented on a smaller scale than agroforestry (Ranashinghe and Newman 1993; Zoysa 2001). In order to increase food self-sufficiency, there has been a policy shift towards supporting traditional mixed cropping systems. Several government programmes have been introduced to promote home-gardening, self-employment and other income generating activities. The Mexican and Sri Lankan cases indicate that community (agro)forestry based on traditional communal land use systems may provide a more effective way of achieving poverty reduction and social equity.

2.2 Rice-field agro-ecosystem

The worldwide decline in natural wetlands has led to a growing interest in the conservation value of rice fields as breeding habitat for waterbirds. Researchers are working closely with conservation groups and rice farmers to identify ways to maximize the ecological benefits of rice fields while minimizing the agronomic costs of creating such habitats (Elphick 2010). The case studies cover three countries: Cambodia, Cuba and Japan, where efforts have been made to promote organic rice farming at either local or national levels. They represent alternative farming strategies to those of the Green Revolution that rely on extensive use of agrochemicals and machinery. In the case of Western Siem Pang protected area of Cambodia, the community-based initiatives were designed to help subsistence-dependent communities to better cope with the negative effects of the country's post-war reconstruction. But in a rapidly changing economic landscape, the expansion of land concessions might undermine the efforts to promote sustainable resource management especially when the latter becomes economically unviable. The case of Cuba is an exceptional one. The shift towards organic farming was a direct response to growing food shortages and the fossil fuel crisis following the collapse of Cuba's major trading partners in the Soviet Union and Eastern Europe. Although significant achievements have been made over the past two decades, challenges remain whether Cuba will re-adopt a capital-intensive, export-oriented agricultural model under the pressure of the United States and the global trading system. At the meso-level, the reintroduction project of oriental white storks in Toyooka City, Hyogo Prefecture is a typical example of Japan's rural revitalization movements. To address problems of food insecurity and rural depopulation, the Japanese government enacted the "Basic Act on Food, Agriculture and Rural Areas" in 1999, with the aim to fulfil the multifunctional role of agriculture in food supply, land conservation, employment and preservation of cultural tradition. By promoting white stork friendly organic farming products and ecotourism, the Hyogo prefectural government and Japan Agricultural Co-operatives (JA) have discovered a novel way to stimulate rural economy, which emphasizes the need to establish local identity for better integration with the mainstream market.

2.3 Inland water systems

Inland water systems such as lakes, rivers and wetlands are multiple-use common pool resources "that are used for different types of extractive and nonextractive purposes by different stakeholder groups and are managed under a mixture of property rights regimes" (Steins and Edwards 1999: 242). There are four basic property rights regimes: open access, private property, communal property and state property; and resources are often managed by a combination of these regimes (Berkes et al. 2006: 356). Management of common pool resources in Malawi, Thailand and Kenya highlights the tension between multiple stakeholders and how such tension is likely to be solved.

The catchment area where the Chindoza Village of Malawi is located is characterized by multifunctional land use, and the combination of farm and non-farm sources of income helps to improve food security and well-being of the fishing communities. However, the rapid development of fishing and other natural-resource-based industries has made it difficult to sustain traditional land use practices. Recent development policies in Malawi have placed greater emphasis on increasing food security and diversifying rural opportunities and incomes. Multi-stakeholder initiatives are also emerging to address deforestation and promote sustainable use of natural resources. In the Lower Songkhram Basin of northeastern Thailand, small scale irrigation systems have been gradually overtaken by

intensive farming oriented towards external markets. To protect seasonally flooded forests on which the local economy is heavily dependent, it is necessary to develop co-management strategies among communities, NGOs, government agencies and other stakeholders. Some community initiatives have been carried out but need to be supplemented by legislative measures and research to help formulate sustainable fishery management in the basin. In the Tana River Delta of Kenya, an interdisciplinary team – the KENWEB – is working with various stakeholders in developing a co-management strategy and action plan for tropical wetlands. To achieve efficient co-management, it is important to recognize the value of traditional management systems and empower local communities to ensure that they have a fair share of benefits and responsibilities in managing the wetland resources.

2.4 Agro-pastoralism

Pastoralist societies are facing unprecedented challenges posed by population growth, loss of communal herding lands, sedentarization, urban migration and periodic dislocations caused by drought, famine and civil war (Fratkin 1997). The precarious situation requires governments and the international donor community to develop better strategies to help these societies adapt to changing economic, policy and climate conditions. The case studies on pastoralist communities living in Inner Mongolia of China and Kitui District of Kenya highlight the coping strategies needed for community development and sustainable land management in the arid and semi-arid regions.

The community development project carried out at the Ke'erqin National Nature Reserve in Inner Mongolia sought to engage local pastoralists in the planning and implementation process. Efforts have been made to harmonize the relationship between development and conservation. In order to create incentives for sustainable grassland management, policymakers are urged to respect Mongolian nomadic culture and encourage small-scale collective property rights systems better suited for local conditions (Li et al. 2007; Wu and Du 2008). In Kitui District of Kenya, the Kamba people have adapted traditional knowledge and institutions to cope with increasingly severe droughts. By having farms in different agro-ecological zones and interacting with other pastoral groups, the Kamba people are able to meet their nutritional needs and alleviate poverty in adverse climate conditions. These local strategies should be given equal consideration when developing adaptation measures in Kenya.

2.5 Mountain ecosystems

Hillside and mountainous regions are prone to poverty due to their inaccessibility, fragility and marginality (Ellis-Jones 1999). Traditional smallholder farming is an essential component of the local economy, which is increasingly under the pressure of modern industrial mono-agriculture. Smallholder farmers in the mountainous areas of the Philippines, Peru and Spain are undertaking various efforts to improve local livelihoods and preserve biocultural heritage of the local communities.

The *Igorot* people were once marginalized by the colonizers and the post-independent government of the Philippines. Their rights are now recognized and protected by the Indigenous Peoples' Act. Two locally-based NGOs are working towards promoting community development within the framework of indigenous peoples' rights and ecosystems approach. The initial achievements of their project have captured the attention

of government agencies, which may lead to the up-scaling of the project to larger areas. Similarly in Peru, indigenous rights movements demanded territorial autonomy and respect for customary laws. A locally-based NGO – the ANDES – launched the Potato Park project seeking to establish a community-led, rights-based development model. To strengthen the local economy, several economic collectives have been established to conserve and sustainably use biological resources. Through collaborative partnership with the International Potato Centre, communities of the Potato Park seek to conserve and promote native potato varieties through repatriation and bridging scientific and traditional knowledge. In the case of Galicia, Spain, traditional land use system underwent rapid changes in the second half of the twentieth century as a result of market integration, rural depopulation and urban development. The government of Galicia has begun to develop strategies to identify, conserve and promote traditional landscapes as a means of fostering regional development and identity. This echoes with the broader trend in Europe towards increasing the multi-functionality of landscapes and seeking regional solutions for regional problems.

3. Drivers of Change in Socio-ecological Production Landscapes

The evolution of SEPLs is driven by a number of interrelated factors, which include not only environmental events such as droughts, flooding and introduction of invasive alien species but also a number of social forces and policy changes to be discussed below. These social drivers may precipitate environmental changes and conversely provide means to adapt to environmental changes. As the case studies suggest, SEPLs are shaped by the interactions among various stakeholders and events that have affected their conservation, utilization and management. The dynamic interplay between local, national and global forces in the evolution of SEPLs can be summarized as follows.

3.1 Political imperatives

The modern process of nation-state building is a dominant driver in the transformation of SEPLs. From the perspective of political ecology, the state can be understood not only “as a site for the production of a definitive vision of (modern) nature”, but also “as a political context within which struggles over the properties, meanings, and values of nature are being constantly expressed, managed, and partially regulated” (Whitehead et al. 2007: 20). The thirteen countries we have reviewed represent different political and economic systems. Yet, the states of these countries have similarly pursued the goals of modernization through large-scale social engineering, aiming at influencing popular attitudes, social behaviours and resource management. The state-sponsored social engineering often serves as a powerful agent of homogenization, uniformity and market-driven standardization orchestrated by global capitalism (Scott 1998). Some examples include agricultural expansion and water resource development during the Khmer Rouge (1975–79), the promotion of monocultural rice farming and large-scale irrigation in post-colonial Sri Lanka, the push for agribusiness development in rural Thailand, and the sedentarization processes in China and Kenya. These policy attempts have left a lasting effect on the SEPLs, and it is not until recently that policymakers have begun to develop more opportunities for local income generation and the promotion of household food security.

Take Thailand as an example. The country is a major producer and exporter of rice, natural rubber and horticultural products such as fruits. Since the late 1990s, a jump in exports can be observed as Thailand became a WTO member in 1995 and recovered from the Asian financial crisis of 1997–8 (Figure 1). This trend is also in line with the Thai government’s “kitchen of the world” policy (1999), which aims to promote the export of Thai agricultural products and encourage the opening of Thai restaurants abroad. At the same time, efforts have also been made to promote farmers’ self-reliance and income of rural households as nearly half of the population is employed in the agricultural sector (FAO 2011). By paying greater attention to the needs of rural communities and forging partnerships with society, the Thai government seeks alternative ways of development that are more democratic and equitable (Connors 2005). The rise of localism in Thailand can be read as a response to the homogenizing tendencies of globalization. More significantly, it opens up the political space and allows reform-minded individuals to advance the agenda of the rural poor, thus paving the way for the revitalization of SEPLs.

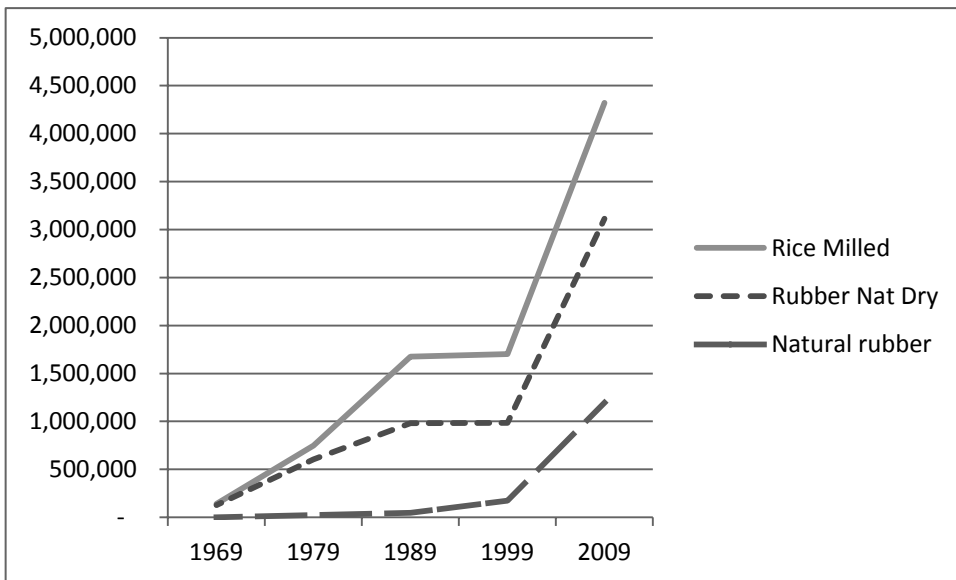


Figure 1 Major export commodities of Thailand (USD1000), data source: FAOSTAT

The trend towards “localism” can also be observed in post-conflict countries such as Cambodia and Sri Lanka. As shown in Figure 2, the political turmoil of the 1970s took a great toll on the production of Cambodia’s staple food – rice. It was not until 1995–6 that the country achieved self-sufficiency in rice (Nesbitt 1997: 107). To improve food security and reduce poverty in Cambodia, bilateral, multilateral and non-governmental organizations have initiated a number of rural development programmes since the early 1990s (Curtis 1998). Some useful lessons can be learned in terms of how to deliver and distribute programme benefits more effectively with the engagement of local communities (Charnya et al. 2001). The establishment of *commune/sangkat* councils may provide a decentralized organizational structure to implement rural development programmes. Yet, their credibility as “engines of development” remains questioned due to the common perception that commune authorities lack political will and interest in local development (Öjendal 2005:305–7).

In Sri Lanka, as Figure 3 shows, there was a drop in the harvest area for all the major agricultural commodities (i.e., rice, tea, coconuts and natural rubber) between the late 1970s and the early 1990s, which coincided with the outbreak of civil war in the country. Nevertheless, the decreasing production and exportation of coconuts over the past decade have less to do with the civil war but more with the unscrupulous conversion of land for housing development and the relatively high cost of fertilizers (BBC 2010). The Sri Lankan government has indicated the possibility of increasing crop production further as some areas in the former war zone have been converted into agricultural fields (Sirilal and Hull 2011). Furthermore, several government programmes have been introduced to promote home-gardening, self-employment and other income-generating activities as a means to prevent food shortages. Most of the homegarden products are kept for home consumption while others (e.g., timber and cash crops) are sold for additional income at the market. Spices such as cinnamon are produced both in plantations and in homestead farms. They fetch a good value in the export markets and have been traditional export earners.

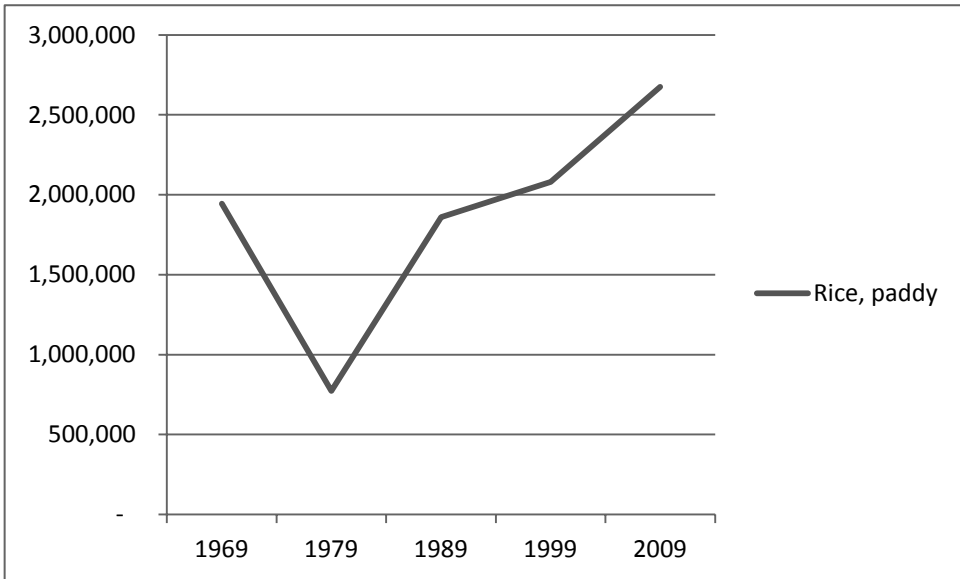


Figure 2 Harvest area for rice in Cambodia (ha)
data source: FAOSTAT

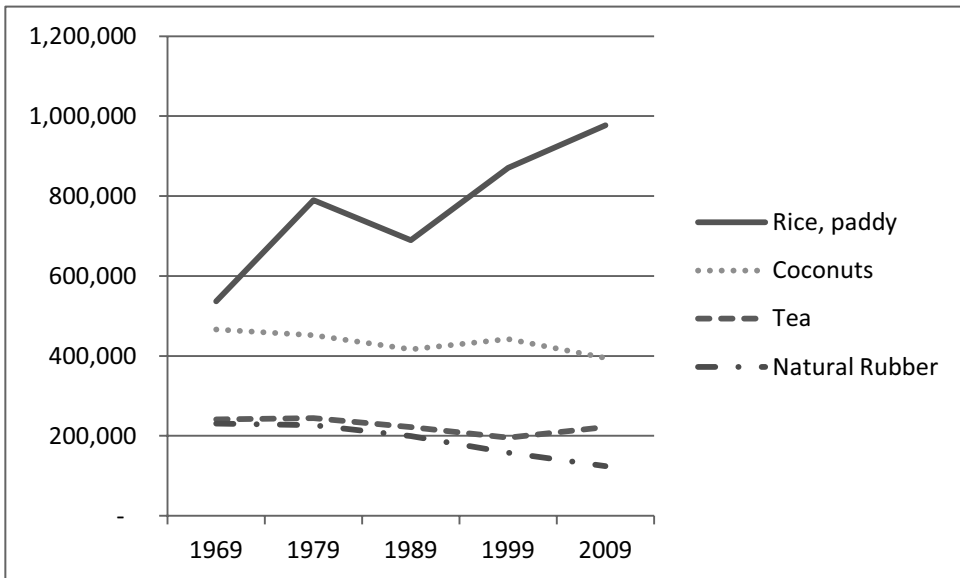


Figure 3 Harvest area for major agricultural commodities of Sri Lanka (ha)
data source: FAOSTAT

As mentioned earlier, national policies are often influenced by multilateral and bilateral development agencies. For example, the Green Revolution that swept across the Third World during the 1960s and 1980s was driven by an international consortium of donor agencies, government and non-profit organizations and research institutions, with the aim of increasing

agricultural production in the global south and averting hunger-led political insurrection during the Cold War (Parayil 2003). The post-war development of agribusiness in northeast Thailand was reflective of such influences. Another example is community forestry, which is being promoted as a means of decentralization, poverty reduction and good governance in countries such as Cambodia and Nepal. However, such reform measures have not been so effective in changing the underlying political economic structure, which have resulted in an ushering of self-serving policies, especially those related to land use conversions contravening to the well-being aspirations of the people.

In addition, variations in ideological affiliations also affect decisions related to land uses, as access to produce from different markets determines what needs to be produced in a country. Cuba provides a good example here. Its affiliation with the Soviet bloc during the 1960s and 1980s created an export-oriented, capital intensive model of development. This model was forced to change following the collapse of the Soviet bloc. In response to growing food shortages and the fossil fuel crisis, the country has moved towards organic farming and has forged ties with Venezuela, a main source of development aid and energy resources. Despite achievements made by the organic farming movement, Cuba continues to rely on food imports to feed its population and is vulnerable to the fluctuation in world food prices and natural disasters (e.g., hurricanes). The current government has put forward a reform plan with the aim to raise production and exports, cut import demand and make the state financially sustainable, but its implementation remains a major challenge (The Economist 2012).

3.2 Market integration and trade liberalization

The process of market integration and trade liberalization has accelerated in the current era of globalization, which increasingly links SEPLs to external market forces. The challenge here is to create added value to the products of SEPLs to help them find a better place in the national and global markets. The case of Galicia, Spain illustrates how market integration has contributed to regional development on the one hand and the transformation of traditional agrarian landscapes and their main products on the other. At the national level, however, there remains a strong link between the production of culturally significant food commodities and the exportation of such processed, value-added products. Spain is one of the major producers of olives and grapes while at the same time one of the major exporters of olive oil and wine. This linkage is also evident in Sri Lanka (e.g., tea and coconuts) and the Philippines (e.g., bananas and coconuts). Despite the great benefits derived from agricultural trade liberalization, it remains unclear how much of these benefits are flowing back to SEPLs. Attempts by communities in Nepal and Kenya indicate efforts to leverage accessible market forces to improve local livelihoods. By contrast, as seen in the cases of Peru and Mexico, conscious efforts are made to partially delink with broader market forces to retain sovereignty over land, resources and economy.

Multilateral or regional economic groupings also contribute significantly to the determination of production systems. Trade regimes such as those under the WTO enabled producers to gain preferential access to new markets, setting the stage for specialized production over multifunctional production systems. As can be seen from Thailand and Cambodia, since accession to the WTO, emphasis has been given on new crops (e.g., oil palm) and other primary products based on comparative advantage of natural endowments. Conversely, the multilateral regime has brought in cheaper substitutes to dominant crops, making their

cultivation untenable or uneconomical. For instance, the Tonga people of Chindozwa, Malawi have begun to substitute their staple food cassava with maize with the influx of food aid. The cautiousness with which the Japanese farmers view the Trans-Pacific Strategic Economic Partnership Agreement (TPP) negotiations is reflective of this concern, particularly due to the fact that the commodity under question (i.e., rice) and its production is inherently linked to Japan's cultural identity (The Economist 2011; Ohnuki-Tierney 1994).

Market mechanisms such as branding and certification have managed to propel the revitalization of SEPLs by creating awareness and effective demand for produce from such landscapes. This is evidenced by the enthusiasm with which organic and speciality foods are traded. In Hyogo Prefecture, Japan, for example, as part of the effort to reintroduce oriental white storks, the prefectural government has introduced the Hyogo Reliable Brand to accredit agricultural products that use fewer agrochemicals (Nakagai 2010). The Toyooka municipal government has also introduced the "flying stork" certification system to promote rice farming practices free of, or with less, agrochemicals. The marketing strategy has proven successful. Stork-friendly rice farming was awarded the 2010 Environmental Minister's Award by the Green Purchasing Network of Japan for its clear demonstration of added value of biodiversity conservation to consumers and the strong collaboration among local governments, farmers and distributors. These certified organic products can be sold at higher prices in a niche or larger market, thus contributing to livelihood improvement and rural revitalization in depopulated and ageing regions of Japan. also. The case of Toyooka points to the fact that products and services of SEPLs could be better utilized to generate market value that also needs to be transferred back to the maintenance of these landscapes.

3.3 Changes in demography and ways of life

Changes in demography, production systems and socio-cultural spheres also affect the changes in land use. The past few decades have seen a marked increase in agricultural productivity thanks to state-sponsored Green Revolution programmes, which have relied primarily on the development of higher-yield varieties of crops (i.e., wheat, rice, corn/maize), extensive irrigation schemes, inorganic fertilizers, agrochemicals and fossil-fuel-based farm machinery (UNEP 2011: 40). These modern farming practices are energy-intensive and monocultural, which have caused biodiversity losses and a drastic decline in agricultural labour force. Alternative farming practices such as promoting organic rice farming to conserve biodiversity (Cambodia), addressing food security challenges (Cuba) as well as revitalizing the depopulated rural areas (Japan) are gaining ground. Similar efforts are also being made in Galicia, Spain to conserve and promote traditional agrarian landscapes as a means of fostering regional development and identity.

It is worth noting that in developed countries such as Japan and Spain, the post-war decline of the agricultural sector (in terms of both employment and its contribution to national income) has been, to some extent, compensated by a substantial increase in overall productivity (Figure 4 and 5). Conscious efforts are also being made to preserve traditional food and farming cultures as a means to strengthen national identity. In developing countries such as Peru and Malawi where SEPLs are still living traditions, many food-related cultures and values have been passed on through unique local expressions (e.g., *ayllu* in Peru, *dendi* in Malawi). In Kitui District of Kenya, the Kamba people have adapted traditional knowledge and local institutions to cope with adverse weather conditions (e.g., droughts). Policymakers will need to be more sensitive to customary values and practices, and design future policies suitable for local contexts.

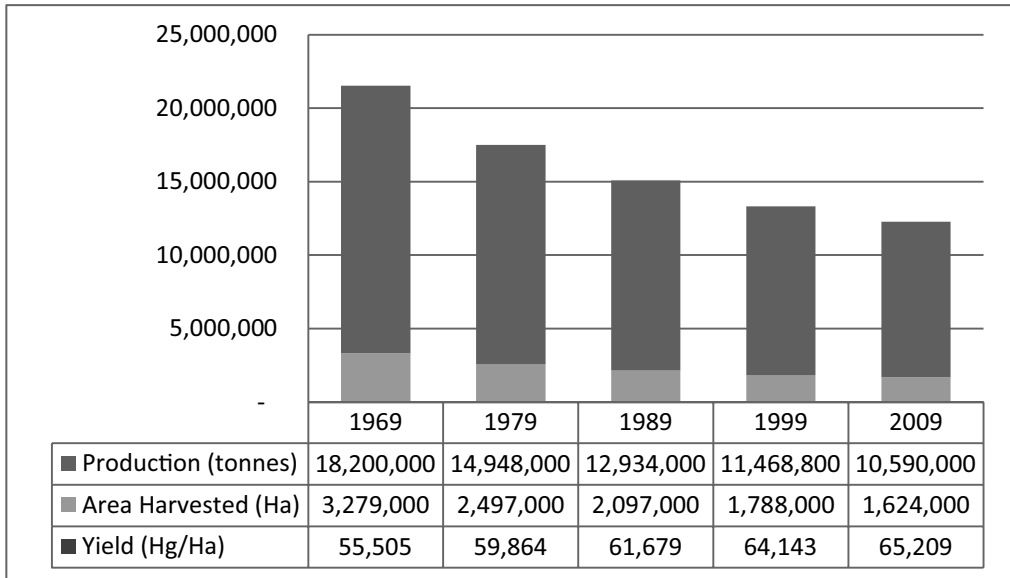


Figure 4 The change in rice production and harvest area in Japan
data source: FAOSTAT

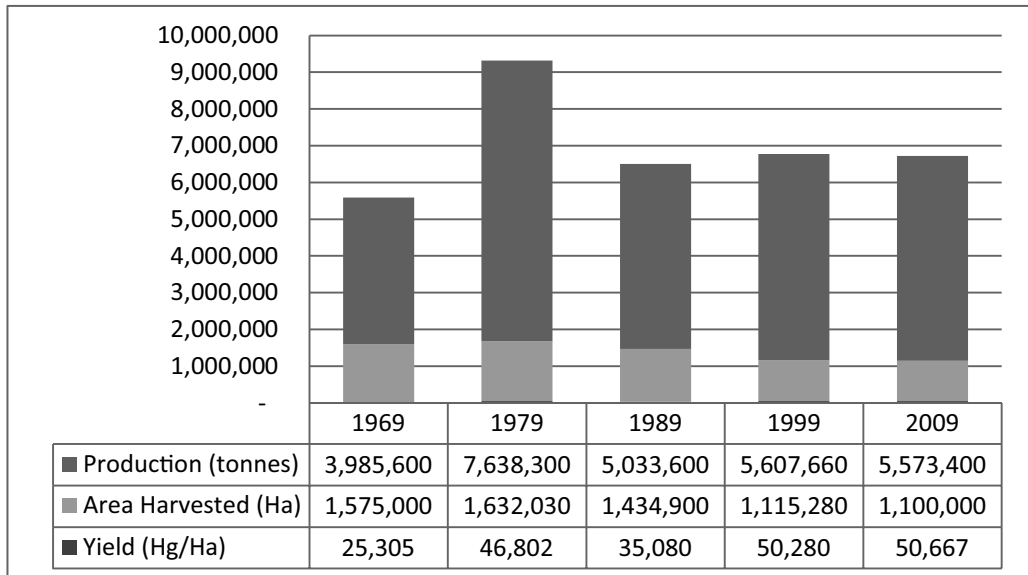


Figure 5 The change in grapes production and harvest area in Spain
data source: FAOSTAT

3.4 Legal systems and autonomy

The international indigenous rights movement has gained momentum since the 1980s, and has been demanding territorial autonomy and respect for customary laws. The movement has achieved positive results in the State of Oaxaca, Mexico and the Philippines where legal frameworks have been established for multiculturalism and indigenous rights. By asserting indigenous or communal rights, the communities sought to stem the loss of their territories and demanded their right to follow customary production processes. More recently, the government of Peru has also passed the Law on Prior Consultation with Indigenous Communities (*Ley de Derecho a la Consulta Previa a los Pueblos Indígenas*), which marks a historic step in recognizing the rights of indigenous peoples in Peru and their stake in the decision-making process for large-scale natural resource development projects (Nomi 2011).

Legal challenges also exist in how to improve land tenure rights of smallholder farmers whose livelihoods depend on common pool resources such as forests, lakes and pastures. The foregoing analysis on agro- and community forestry and inland water systems have highlighted the need to develop co-management strategies among various stakeholders and the importance of securing the rights of communal land ownership so as to give local communities a fair share of benefits and responsibilities in managing natural resources. The case of Inner Mongolia, China suggests that policymakers should respect Mongolian nomadic culture and promote small-scale collective property rights systems suitable for local contexts (Li et al. 2007; Wu and Du 2008).

4. Green Economy and Socio-ecological Production Landscapes

To reiterate a point made earlier, SEPLs are not merely idyllic landscapes but utilitarian ones where hard decisions are made on production activities based on natural endowments and human skills. These landscapes contribute to the local, national and global economy and are sensitive to changes and pressures outside their contexts. Therefore, political, economic or social changes get reflected in the production and harvesting processes. This also implies that in times of rapid social and environmental changes, these landscapes can be highly vulnerable, with serious consequences to livelihoods and ecological integrity.

Policymakers should be aware that improved SEPLs not only contribute to food security but also create job opportunities for the population. Modelled studies conducted by United Nations Environment Programme (UNEP) suggest that investments aimed at greening agriculture could create 47 million more jobs than the business-as-usual (BAU) scenario in the next 40 years (UNEP 2011: 37). The transition towards green agriculture would require national and international policy reforms and innovations that will facilitate greater participation by smallholder farmers, co-operatives, and local enterprises in food production value chains (*ibid.*). Studies by FAO also suggest that the transition to greener and more sustainable farming practices is expected to increase the GDP of the primary sector by 20 per cent more than the BAU scenario would in 2050 (Herren et al. 2012: 31). To facilitate such a transition, changes in policy interventions are required in terms of both fiscal measures (e.g., subsidies, taxes and public R&D) and regulatory actions (e.g., standards, mandates and certification procedures) (*ibid.*: 32–33). Further to these studies, we provide the following policy suggestions specific to SEPLs.

5. Policy Suggestions

SEPLs have the potential to play an important role in the national economy. The promotion of SEPLs addresses social equity, and economic and environmental concerns. It is thus important to promote activities that enhance livelihood security and growth prospects while at the same time sustain and enrich ecosystems and ecosystem services. This dovetails into discussions related to enhancing resilience of such systems, which requires SEPLs to be able to cope with and adapt to natural and anthropogenic shocks (van Oudenhoven et al. 2011). Depending on possible socio-ecological interactions, a typology of four scenarios can be identified (Figure 6). Scenario A is considered to be most ideal, in which social and ecological benefits are both high, as in the case of well-managed SEPLs. However, it is also likely to be the case that not much production occurs *in situ*, suggesting a high dependence on imported food and goods. Scenario B represents the case of overuse, in which social benefits are gained at the cost of ecological health. Scenario C is associated with the case of under-use, which can be exemplified by the case of protected areas where biodiversity is high but people benefit little from it. Under-use of SEPLs could also lead to Scenario D in which both ecosystem services and social well-being decline. Each of these scenarios pertains to a set of drivers identified in the foregoing analysis. For instance, decisions regarding import of commodities or the types of crops to grow and related land uses are based on political compulsions, market responses, demographic changes or legal obligations and privileges. Future studies may wish to further explore these scenarios and related drivers, and how they may be arranged.

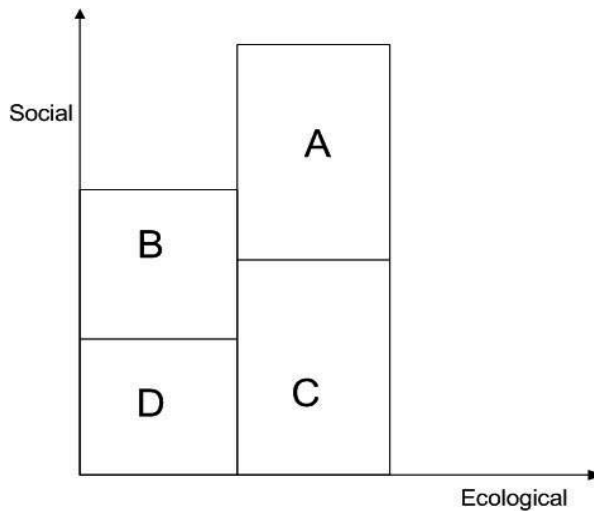


Figure 6 Typology of social and ecological benefits of development

There is a clear need to set in place stable and effective institutions comprising a consortium of relevant stakeholders to enable good governance of SEPLs, as exemplified by the initiatives of the Kenya Wetlands Biodiversity Research Team (KENWEB). This would also require appropriate integration of traditional and modern systems of natural resource management to ensure two-way interactions between local communities and policymakers.

It is necessary to develop appropriate economic instruments with a better understanding of their implications throughout the supply chain processes. The relevance of conventional

incentives including subsidies and taxes is being reassessed in the light of evidence revealing the negative impact of abuse of inputs and resources on the environment and social well-being (MA 2005; TEEB 2010: chapters 8–9).

Despite their good intentions, certification schemes often tend to be expensive and beyond the capacity of local communities. However, the role of certification in advancing awareness about SEPLs and their products cannot be ignored. Solutions should be introduced such as decentralized certification systems that would increase the value of SEPL products while at the same time are inexpensive to both producers and consumers (May 2008).

Finally, the importance for raising awareness about the necessity of human-nature coexistence cannot be over-emphasized. Both policymakers and citizens should realize that SEPLs can provide means of gainful employment and maintain/enhance environmental resources. This would require investing in effective and creative outreach and capacity building for different stakeholders to show how benefits can be derived from such coexistence.

In conclusion, the case studies examined in this report, although limited in number and scope, suggest that the achievement of broad-based sustainable development requires policy reforms that adequately recognize the values of SEPLs and incorporate those values in socio-economic planning and decision-making. The role of appropriate technological and process innovations (in terms of social transactions, market mechanisms, credit systems, etc.) also needs to be further explored. Future work will need to examine the appropriateness of various instruments and interventions that would enable the revitalization and sustenance of SEPLs. It is important that policies be designed to suit the specific contexts in which SEPLs have evolved so as to facilitate a more locally relevant approach to sustainable development and a green economy.

Appendix 1

CASE STUDIES

The following case studies were contributed by IPSI members as well as organizations and individuals working on SEPLs, and recomposed by the authors with additional information to highlight the historical and political contexts in which these SEPLs have evolved, and the main challenges and opportunities they face. The facts and opinions expressed in the case studies are those of the original contributors unless otherwise referenced or specified.

1. Agro- and Community Forestry

CAMBODIA

Cambodia is endowed with rich natural resources, notably tropical forests, agriculture and fisheries. Since the French colonial time, forest reserves have been established for conservation purposes while production forests were set aside for timber extraction (De Lopez 2002: 363). After Cambodia gained independence in 1953, the State Forestry Administration was set up to develop forest policy and management systems. By 1970, forest cover accounted for about 13.2 million hectares or 73 per cent of Cambodia's total land area (Thoeun 1998). However, an estimated 1.4 million hectares of forests were lost between 1973 and 1993, a period when illegal logging earnings were used to finance the prolonged civil war between the Khmer Rouge guerrillas and government forces (De Lopez 2005: 35–6). The trend of deforestation has continued unabated and even accelerated since 1994 as post-war reconstruction has transformed forests from a military asset into timber – one of the most valuable and internationally traded commodities (Le Billon 2000: 785–6). Like other forest-rich countries in the Asia Pacific region, Cambodia has developed a thriving forestry sector that features corrupt government officials, client-patron relationships, military involvement, exclusion of local communities and disregard for environmental standards (De Lopez 2002: 365).

To address these problems, international donors have sought to use aid conditionality to promote the legalization of the forestry sector. Early reforms have focused on the restructuring of the forest concession systems through the introduction of new legal instruments such as the Sub-decree on Forest Concession Management (1999). More recently, community forestry development has attracted growing attention from donors and the Cambodian government, particularly after the first nationwide commune/sangkat council elections in 2002. The commune-level elections were hailed as an important step towards decentralization and democratization. One of the main roles of the commune/sangkat councils is to prepare and implement community forestry activities, which constitutes part of the five-year commune development plan under the national Seila Program.⁴ The case study of Domnak Neak Ta Thmor Puan community forest illustrates the organizational structure and functions as well as constraints of the commune councils.

⁴ Launched in 1996, the Seila Program of the Royal Government of Cambodia is a government initiative that aims at strengthening local governance for poverty reduction in the context of decentralization reforms.

The Domnak Neak Ta Thmor Puan community forest⁵

The Domnak Neak Ta Thmor Puan community forest is located in Srer Knung Commune, Chumkiri District in the southern province of Kampot with an area of 992 hectares. The mountainous area is rich in forest and other natural resources. However, illegal logging and land grabbing activities had caused a major decline in forest cover and quality during 1980 and 1998, which jeopardized local livelihoods, increased poverty and impaired ecosystem functions. This precarious situation caught attention of the community forestry research project (CFRP), which was jointly established by the Forestry Administration of the Ministry of the Environment and the Royal University of Agriculture, and was funded by the International Development Research Centre (Canada) and the Regional Community Forestry Training Centre (based in Thailand). In 2001, the CFRP together with relevant institutions launched the community forestry project in Srer Knung Commune. The commune council administers three villages: Prey Yav, Tbeng Pork and Damnak Chnuol with a total population of 2,960. It has five members including one first deputy chief who is responsible for the economic section and natural resource management. Under the support of the commune council, a locally-elected community forestry committee was established. The first deputy chief of the commune council is directly involved in community forestry committee as a representative of local authority, and plays an important role in solving land conflicts according to laws and regulations. The community forestry project also gained technical support from the CIDSE, a Belgium-based international alliance of Catholic development agencies. Despite the progress made, obstacles remain in the way of successfully implementing community forestry activities. These include limited capacity of commune councils, lack of financial resources and misuse of power/authority for personal gains, which need to be addressed in the future.

Wat Chas Village, Kampong Cham⁶

The case of Wat Chas Village typifies a mosaic of various land use oriented more towards agriculture and forestry. During the period of the Khmer Rouge (1975–79), large areas of forest were cleared for agricultural expansion and massive water reservoirs were built to supply irrigation water for rice production. Today, agriculture remains the primary land use in Cambodia. More than 70 per cent of the total population rely on agriculture and its related activities (e.g., livestock raising, fisheries and aquaculture) to earn their livelihood. With the introduction of modern agricultural technologies, crop yields have been significantly increased. However, farming practices that rely on agrochemicals and mono-cropping have been identified as unsustainable both from an ecological and an economic standpoint. It is thus important to re-introduce traditional farming techniques such as composting and multi-cropping to steer the management of natural resources in a more sustainable direction.

Wat Chas village in eastern province of Kampong Cham has a total area of 60 hectares including 48 hectares of rice fields, 5 hectares of vegetable orchards and 7 hectares of woodlands and settlements. The settlements are surrounded by small woodlands or homegardens where villagers can find firewood, building materials, food and medicinal plants (Figure 7). The village lies on a flat landscape dotted with mounds. The mounds are mainly used for growing vegetables such as mung beans and Chinese cabbage. Villagers grow rice during the wet

⁵ For original case study, please refer to Marady et al. (2012).

⁶ For original case study, please refer to Siriwattananon et al. (2010).

season and keep the paddy fields fallow after harvest. It is a common practice to burn plant residues in order to clear the land for the next farming season. However, these plant residues, together with farmyard manures, can be composted into organic fertilizers, which not only help enhance fertility and water-retaining capacity of soil, but also reduce farmers' reliance on costly and environmentally-damaging chemical fertilizers. Currently, there are 24 compost boxes in Wat Chas Village, each of which can produce 4.8 cubic metres of compost. Villagers are also making an effort to change the farming systems from mono-cropping to multi-cropping, which allows them to grow two or more crops on the same parcel of land during a single growing season. It is an effective way of optimizing land use and productivity, and thus contributing to the enhancement of both biodiversity and human well-being.

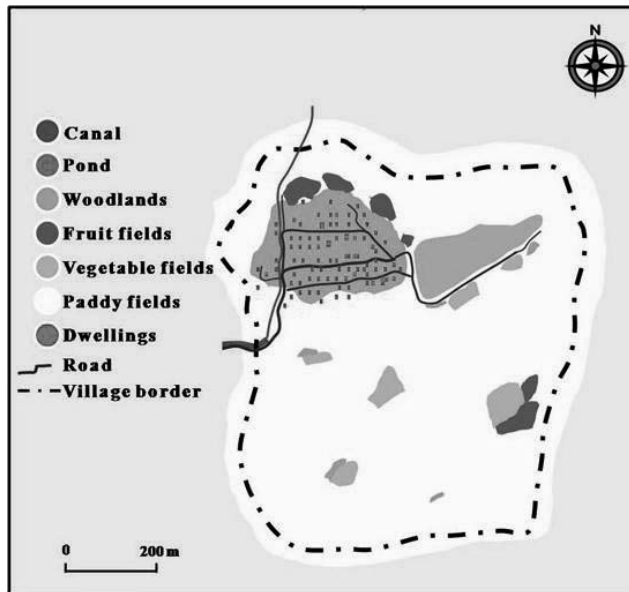


Figure 7 Land use map in Wat Chas Village, Siri wattananon et al. (2010: 116)

NEPAL

Community Forestry⁷

Nepal is a landlocked country situated between China and India. Because of climatic and altitudinal variations, Nepal is a globally important biodiversity hotspot for flora and fauna alike. About 39 per cent of the mountainous country is covered with forests, a quarter of which is managed by the community forest user groups (CFUGs). The concept of CFUGs was introduced in the 1987 Decentralization Act and was given a legal basis with the enactment of the Master Plan for the Forestry Sector of 1988 and the Forest Act of 1993. According to the Forest Act and associated regulations, CFUGs are legal, self-regulating bodies having full power, authority and responsibility to protect, manage and utilize any part of a national forest with minimal interference from the Department of Forests. The benefits of selling and distributing forest products belong to the CFUGs while land ownership remains with the government.

⁷ For original case study, please refer to Adhikari (2011).

Before the introduction of CFUGs, Nepal had been experimenting with community forestry for about a decade, with the initial focus on the transfer of forest management responsibility to village-level government bodies known as *Panchayat*. The reform was a response to the international community's call for integrated rural development through political decentralization and public participation (Guthman 1997: 57). However, it did not involve significant devolution of decision-making power, nor did it involve increased legal access to forest products (Fisher 2010: 23). The effectiveness of the *Panchayat* system was called into question as it tended to be dominated by the traditional elite in rural society. Furthermore, the boundaries of *Panchayats* did not match up exactly with the boundaries of community forest resources and customary use rights (Fisher 2010: 24). By the end of the 1980s, the demand for a more participatory, bottom-up approach to development was mounting high, which was in line with the neo-liberal structural adjustment reforms prescribed by the International Monetary Fund and the World Bank (Guthman 1997: 57–62). This led to further devolution of forest management to communities and private owners, thus the adoption of CFUGs.

The Patale community forest in Lamatar Village Development Committee, Lalitpur District is one typical example of CFUG. Established in 1994, it has a total land area of 104.6 hectares with a population of 881. The Patale CFUG has its own constitution and decision-making body – the executive committee. It has prepared a five-year Community Forest Operational Plan with the technical support from the district forest office. The Plan includes provisions for forest conservation, silvicultural activities, and the utilization and distribution of forest products. The Patale CFUG derives income from the following sources: selling spring water to *Bainsdobdevi* Drinking Water Company, sales of forest products, membership and visitors' fees as well as financial support from other organizations. Besides forest conservation and management, the Patale CFUG has also contributed to social development activities such as infrastructure development, cultural preservation and the promotion of ecotourism.

Despite progress made in the past three decades, community forestry in Nepal still faces mounting challenges such as equitable sharing of forest benefits among users. If appropriate policy and compliance mechanisms are maintained, CFUGs can become more effective institutions in managing and utilizing forest resources for both subsistence and commercial purposes. Additionally, if given higher autonomy and devolution of power, CFUGs can become viable local institutions for promoting local democracy and delivering rural development services by creating income generating activities, and establishing partnerships with NGOs and private sector service providers.

SRI LANKA

Sri Lanka is an island country located in the Indian Ocean to the south of the Indian subcontinent. It can be divided into three agro-climatic zones based on rainfall distribution: a wet zone in the southwest, a dry zone in the north and southeast, and an intermediate zone between the two. Since colonial times (1815–1948), Sri Lanka has developed a dual economy that features an export-oriented plantation sector and a subsistence-oriented smallholder sector (Moore 1989: 179). The plantation agriculture has caused serious deforestation in the highland catchment areas in the mid-country region of Sri Lanka, which has left a lasting effect on its socio-ecological landscape (Wickramagamage 1998: 2016). Nevertheless, the colonial legacy

has also left the rural areas with a well-developed transport and communication network. This, combined with government welfare and subsidy schemes, has prevented large-scale rural-urban migration while at the same time helping to increase food self-sufficiency (Moore 1989: 185–6).

The post-colonial governments of Sri Lanka have maintained a strong policy focus on promoting smallholder agriculture, particularly in relation to irrigation and rice production. The policy bias towards rice is due to the fact that rice is the staple food of Sri Lankans and domestic production can substitute imports thus saving government expenditures (Yapa 1998: 103). It is also because, for the ruling elites, the revival of an authentic, family-farming and rice-based traditional Sinhalese culture forms a key component of Sri Lanka's nation-building project (Moore 1989: 188–9). Towards this end, monocultural rice farming and large-scale irrigation have been promoted as part and parcel of the modernization of Sri Lanka's agricultural sector. By contrast, traditional farming practices such as homegardens and shifting cultivation have been considered backward and therefore marginalized, which has led to the disintegration of village agro-ecocomplex system (Yapa 1998: 108; Ulluwishewa 1991). In recent years, however, the government of Sri Lanka has placed more policy importance on local food production as a means to meet the impending food shortages in the event of extreme climatic conditions (The Sunday Times 2011; Samath 2011). Several programmes have been introduced to strengthen home-gardening, self-employment and other income generating activities (Perera 2011). The following two case studies exemplify the promise and challenges of promoting traditional farming practices in the context of the above policy changes.

Kandyan homegardens⁸

Kandyan homegardens can be found in the mid-country wet zone of Sri Lanka, notably in Kandy District. During the colonial era, much of the natural forest in the highlands was cleared for plantation establishment. Today, tea and rubber plantations remain the dominant land use in the region, which is followed by paddy rice farming and homegardens in the low land valleys. Most of Kandyan homegardens are privately owned and managed as a small holding with an average land area of 0.4 hectares. They are characterized by a mixed cropping system comprising a variety of perennial food crops, fruits, vegetables, medicinal plants, timber trees, spices, cash crops and animal products. Most of these products are kept for domestic consumption, while others (e.g., timber and cash crops) are sold for additional income, which is particularly useful during off-seasons and droughts. About 70 per cent of the households living in the area have homegardens, which provide 30–50 per cent of household income. This is quite high considering the fact that a relatively small amount of labour is needed for managing the homegardens. In terms of other ecosystem services, homegardens and other forms of agroforestry systems supply over 50 per cent of timber and 80 per cent of fuelwood for both domestic and industrial use. The high biodiversity and the socio-economic values associated with homegardens contribute significantly to sustainable land management. As such, most conservation programmes in Sri Lanka now include homegardens as a component. However, urbanization, population growth and inappropriate land development pose great threats to the long term survival of Kandyan homegardens. It is thus important to strengthen the resilience and adaptability of the Kandyan homegarden systems in the coming years so that they can continue to provide valuable ecosystem services and other socio-economic functions for local communities and beyond.

⁸ For original case study, please refer to Pushpakumara et al. (2010).

The *Owita* agro-ecosystem⁹

The *owita* agro-ecosystem is a unique peri-urban land use system, which can be found in the low-lying areas between homegardens and paddy fields in the wet zone of Sri Lanka. Jamburaliya Village in the Western Province is one such example. The village is located about 20 kilometres southeast of the capital city Colombo. The majority of the population residing in the region are Sinhala Buddhists with the rest being Sinhala Catholics, Muslims and Tamils. The areas where the *owita* system can be found have been predominantly inhabited by lower middle class households, who work in small plantations of rubber, coconut or cinnamon to earn their living. The *owita* systems are cultivated throughout the year to supplement the diet and income of farmers. Cash crops such as betel leaves, roots and tubers are either sold in the local market or shared with neighbours. The *owita* systems receive very little external input for crop production thanks to the continuing use of traditional farming techniques for nutrient recycling and crop disease control. However, this agro-ecosystem has been neglected since Sri Lanka's shift to a market economy in 1978. Recent government policies on local food production have provided opportunities to revive the *owita* system. The Department of Agriculture and the Ministry of Environment and Natural Resources of Sri Lanka have proposed a new project to study the traditional *owita* system in detail and develop strategies to conserve local varieties of plants and crops. Further studies are needed to help understand and utilize the *owita* system to improve human well-being in peri-urban areas of Sri Lanka.

MEXICO

Mexico is considered as a mega-diverse country, which exhibits high species richness at a global level (Ceballos et al. 1998). Its varied topography is composed of six major categories: tropical rainforest, tropical dry forest, cloud forest, temperate pine-oak forest, deserts and grasslands (Robson 2007: 269). The conservation of forests and biodiversity in general has been pursued mainly through a national system of protected areas, which account for 13 per cent of the national territory (CONANP 2010). In fact, a greater part of Mexico's forest habitats and terrestrial biodiversity can be found in areas inhabited by indigenous communities and *ejidos* (Robson 2007: 280). *Ejidos* refer to rural communities that hold land collectively under the traditional land tenure system, which was painstakingly restored through a series of agrarian reforms following the Mexican Revolution (1910–20). *Ejidos* are composed of private agricultural parcels and commons, the latter of which harbours 80 per cent of Mexico's remaining forest (Alix-Garcia et al. 2005: 220). As such, it is important to expand conservation efforts beyond protected areas and give local communities a greater role in the sustainable management of the country's forest resources.

To accommodate this paradigm shift, Mexico's agrarian reform should be designed to benefit the smallholders by addressing their concerns over land tenure and access to natural resources. However, until recently the incentives for introducing community-based forest management remained perverse as indigenous communities were often seen as an impediment to Mexico's modernization as well as its economic integration with the rest of the world (Diego Quintana et al. 1998: 4). This attitude started to change in the early 1990s with the emergence of a "politics of recognition" in Mexico, which sought to formally recognize cultural diversity and indigenous peoples' rights (Muñoz 2004). The State of Oaxaca stands out as the most progressive in establishing a legal framework for multiculturalism. It was the result of a bargaining process between indigenous actors who

⁹ For the original case study, please refer to Wijsekara and Hunter (2010).

demanded greater autonomy and the ruling elites who wanted to solve the problems of legitimacy and governability (Muñoz 2004). The institutional changes paved the way for the development of community-based forest enterprises, as illustrated in the following case study.

Community-based forest enterprises in Ixtlan de Juarez, Oaxaca¹⁰

Located in southwestern Mexico, the State of Oaxaca is known not only for its species-rich tropical and temperate forests but also for its high percentage of indigenous population. Due to its mountainous terrain, Oaxaca has more municipalities than any other state in Mexico, among which about three-quarters are governed under a traditional electoral system known as *Usos y Costumbres* (uses and customs). *Usos y Costumbres* is rooted in indigenous systems of community service that attach particular importance to elders, open assemblies and consensus. The electoral *Usos y Costumbres* reforms were carried out between 1992 and 1998, resulting in the legal recognition of indigenous peoples' rights to autonomy and the establishment of the community and the municipality as the territorial space for its exercise (Muñoz 2004: 418–9). This has contributed to efficient decision-making on community issues related to natural resource management, including the definition of rules governing access to forest resources, the planning and construction of road networks, the production of sawn timber and the obligation of community members to participate in forest conservation activities.

Take the Ixtlan de Juarez municipality as an example. The *Asamblea General* (General Assembly) has the ultimate authority to decide on community issues including drawing up the Forestry Management Plan. The Plan demarcates areas where logging activities are allowed and where trees must be protected. The profits from the community-based forest enterprises are distributed equally among community members, and the rest is reinvested to provide social benefits such as roads, school buildings and rural medical centres, as well as into the enterprises' infrastructure such as trucks, sawmills and cranes. The way in which profits are reinvested is decided by the *Asamblea General* (Figure 8). Although being autonomous in managing their forests, the communities in Ixtlan de Juarez have maintained a good relationship with regulatory and supportive agencies such as the Ministry of the Environment and Natural Resources and the National Forestry Commission. They also receive support from international NGOs such as the World Wildlife Fund. The case of Ixtlan de Juarez of Oaxaca highlights the importance of community ownership and governance in promoting better livelihoods and environmental stewardship. It remains to be seen how such community-based forest management can be promoted as a key aspect of Mexico's future conservation policy.

¹⁰ For original case study, please refer to Matsuzaki and Wong (2010)

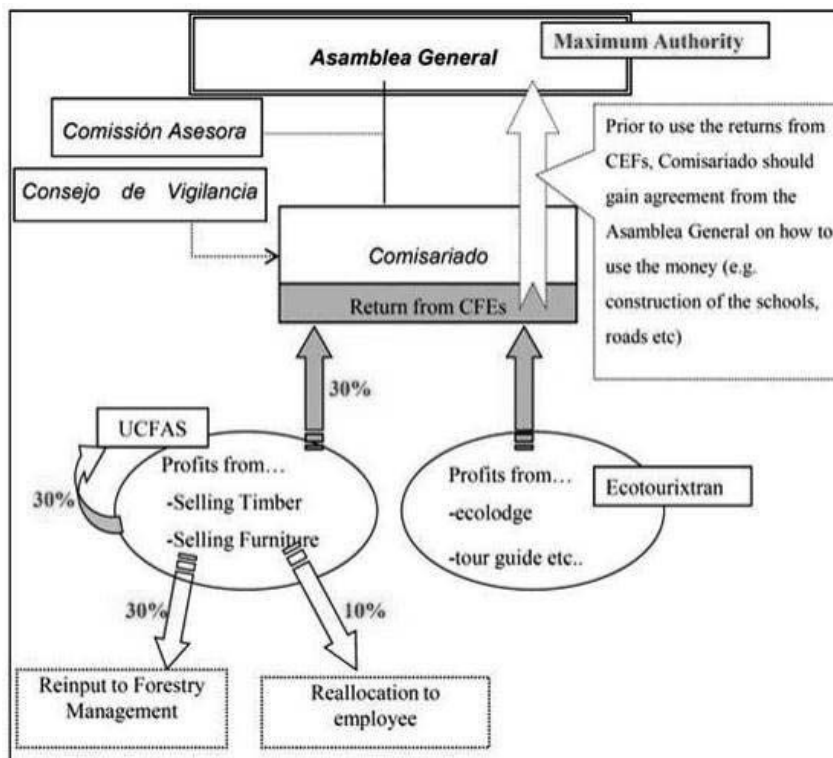


Figure 8 The flow of the community-based forest enterprises profits within the community, Matsuzaki and Wong (2010)

2. Rice Agro-ecosystem

CAMBODIA

Western Siem Pang¹¹

Western Siem Pang (WSP) in northeast Cambodia is part of the trans-border protected forest areas in Indochina, which comprises a mosaic of semi-evergreen and evergreen forest patches that harbour a wealth of biodiversity including some of the most important and unique bird communities in Southeast Asia. Dry Dipterocarp Forest is the predominant vegetation of the WSP protected area. It produces wood and non-timber forest products for surrounding villages. The forested landscape features the *trapaengs*, or seasonal pools, which provide both water and foraging resources in the dry season. The villagers rely on the *trapaengs* for fishing and hunting activities. In the wet season (May to December), rice cultivation is a main source of livelihood (Figure 9). The paddy fields also provide important habitats for water birds and other wetland-dependent species.

The traditional land use practices have met with unprecedented challenges since the early 1990s when post-war reconstruction began in Cambodia. The government has sought to capitalize on its forest resources by granting land concessions to agricultural and extraction

¹¹ For original case study, please refer to Costello and Vorsak (2011).

industries. Under such circumstances, sizeable areas of agricultural land have been converted for the commercial production of timber and sugar. The loss of access to and the depletion of natural resources are perceived by the local communities as the greatest threat to their livelihood. To mitigate the negative effects of economic development on biodiversity and community well-being, Birdlife Cambodia, in collaboration with the Forestry Administration, has initiated several projects aiming at strengthening community-based natural resource management. For example, networks of site support groups were established to promote the exchange of experience and expertise among various stakeholders. The focus of these conservation initiatives is to minimize the degradation of *trapaengs* and maintain their functionality. Accordingly, the *Trapaeng* Management Protocol was developed, which prohibits tree cutting, the use of poison and other actions that would impair the ecosystem health of *trapaeng*. Through community engagement, sustainable resource management practices are being developed to help conserve biodiversity and improve local well-being.

ACTIVITIES	Months												
	1	2	3	4	5	6	7	8	9	10	11	12	
Rice farming					←						→	←	→
Harvest wood for sales	←		→							←			→
Fishing in trapaengs & channels	←				→						←		→
Collect tree husks		←	→										
Harvest timber for house construction	←		→									←	→
Chicken & pig raising	←												→
Presence of more birds in trapaengs				←	→							←	→
Presence of mammals in the forest						←	→						
Cattle farming	←												→
Festivals and ceremonies	←	→	←		→	←	→						
Collecting NTFPs	←		→	←		→	←		→	←		→	←
Shortage of food										←		→	
Garden planting (corn, cucumber etc)						←		→					

Figure 9: A "Season Calendar" was produced in consultation with village groups to determine when food shortages may be more prevalent leading to greater pressures on *trapaengs*. Birdlife International

CUBA

Rice cultivation and bird conservation¹²

Cuba is an island country in the Caribbean lying in the middle of important waterbird migration corridors, including the Atlantic and Mississippi flyways. Cuba's tropical climate is well suited for rice cultivation and rice has been a staple food of Cubans since colonial times. Before the Revolution (1953–9), Cuba's economy remained highly dependent on the sugar industry for export earnings, which had created the problems of trade dependency, inequitable land tenure, food insecurity, and environmental degradation (Gonzalez 2003: 689–696). During the first three decades following the Cuban Revolution, these problems were exacerbated by the export-oriented, capital intensive model of agriculture development adopted by the Cuba government. This development model was forced to change following the collapse of Cuba's major trading partners in the Soviet Union and Eastern Europe (Vandermeer et al. 1993). In response to growing food shortages and fossil fuel crisis, the Cuban government began a major shift in its development strategy towards organic farming with the aim to minimize the input of agrochemicals and machinery while maintaining productivity and ecosystem health (Perfecto 1994). Under the agrarian reform, large state farms were reorganized into smaller units of agricultural production, and dispersed parcels of state land were distributed to workers and private farmers to grow self-provisioning crops such as rice. The use of natural fertilizers and low-impact harvesting methods has turned the rice paddies into productive bird feeding grounds in addition to natural wetlands.

While the past two decades have seen a significant increase in the population of various waterbirds, there have emerged conflicting concerns over the use and management of natural resources. Rice farmers are concerned about crop losses presumably caused by waterbirds, whereas conservationists are concerned about the implications of agricultural activities for the bird community. In order to bridge the gap in understanding, the ecology group of the University of Havana has carried out research since 1978 to gain knowledge about the relationship between rice cultivation and bird conservation. The research finds that birds are an important biotic component of the rice agro-ecosystem, especially concerning the energy flow and nutrient cycle between the rice paddies and nearby wetlands. Through an active environmental education programme, wetland training workshops and the development of local groups called "Wetland Friends", the research team seeks to gradually change the attitudes of farmers and work together with them towards achieving the goal of minimizing rice loss while enhancing the quality of wildlife habitat.

The greatest challenge to achieving this goal, however, lies not so much in attitude change as in Cuba's future economic direction.¹³ Despite achievements made by the organic agricultural reform, it remains to be seen whether the Cuban government will be able to resist the re-imposition of a capital-intensive, export-oriented agricultural model in the face of overwhelming political and economic pressure from the United States and from the global trading system (Gonzalez 2003: 725–32). Future research will need to take into consideration the contingent nature of Cuba's organic farming system and develop policy instruments to make it more resilient to external pressures.

¹² For original case study, please refer to Mugica-Valdés et al. (2011).

¹³ This paragraph represents the authors' opinion.

JAPAN

Reintroduction of the oriental white stork in Toyooka City¹⁴

About two-thirds of Japan's land area is covered by forests, and cultivated land covers only 12 per cent of it, of which 36 per cent are rice paddies (Fujioka et al. 2010). Although their total surface area is relatively small, rice paddies produce the country's most important food crop and provide important foraging habitats for waterbirds such as waterfowl, storks and cranes (Fujioka et al. 2001). The past decades have witnessed a significant decline in the population of the species foraging on small organisms in flooded rice fields (Amano 2009). Oriental white storks, for instance, became extinct in 1971 as a result of the negative impact of agricultural policy changes. Once a common species in the Japanese archipelago, the oriental white storks were regarded as harmful birds for agricultural production and were killed in large numbers during the Meiji era. The Toyooka Basin in Hyogo Prefecture was one of the last breeding areas for oriental white storks, and a hunting ban was introduced in 1908. The population of oriental white storks recovered once but had decreased significantly since the Second World War. Habitat loss is considered as the one of the primary reasons for the species' decline (Naito and Ikeda 2001). Wartime logging destroyed the nesting areas of the storks and post-war land use changes had accelerated the process. As a means to increase crop productivity, agrochemicals were widely used, which contaminated the forage and feed environment of the storks. This, combined with continued habitat degradation, had led to a further decline in storks' population until the last ones disappeared from the wild in 1971.

Conservation of the storks began in the early 1950s when the Japanese government designated oriental white storks as a national natural monument. At the local level, Hyogo Prefecture launched a project to conserve the storks with local communities in 1955 and started breeding the storks in captivity in 1965. However, it was not until 1989 that the first breeding was successful. Entering the 1990s, there were growing concerns over the aging of rural population and the possible threat to food security. To address these problems, the Ministry of Agriculture, Forestry and Fisheries announced the "Basic Direction of New Policies for Food, Agriculture and Rural Areas" in 1992 and enacted it into law in 1999. The objective of the law is to stabilize food supply and to promote an integrated approach to sustainable agricultural development and rural revitalization. This policy change has created incentives for organic farming and a supportive environment for the reintroduction of storks. In 1999, a reintroduction centre known as Hyogo Prefectural Homeland for the Oriental White Stork was established in Toyooka City. The captive population has increased since then, reaching 100 in 2002. Acclimation training of the storks began in 2003, which was followed by a pilot release of the storks in 2005.

The reintroduction project has also gained support from local communities, though some still hold ambivalent feelings about the storks. For the farmers, the storks form part of the local heritage while they are sometimes considered as causing harm to the crops (Honda and Yamaji 2006). These negative feelings may slowly subside as the ecological importance of storks gains wider recognition. The development of tourism and eco-friendly farming practices has the potential to stimulate the rural economy. Despite a decrease in total output, the organic farming products could be sold at higher prices in a niche or larger market, thus contributing to the improvement of local livelihoods, and hopefully attracting the younger population to engage in new farming activities.

¹⁴ For original case study, please refer to Ohsako (2010).

3. Inland Water Systems

MALAWI

Malawi is a landlocked country located in south-eastern Africa. More than 80 per cent of its population (approx. 12 million) depend on agriculture for their livelihood. In pre-colonial times, Malawi's economy was dominated by subsistence agriculture. After the establishment of the British Protectorate in 1891, a plantation economy was developed with initial success but the subsequent price collapse of coffee, cotton and tobacco led to a policy shift towards promoting peasant production of export crops (Kydd and Christiansen 1982: 356–8). Since Malawi gained independence in 1964, however, the relatively favourable market conditions contributed to the rapid growth of the plantation sector (notably tobacco). Throughout the post-independence period to the end of the 1980s, Malawi's agrarian policy was featured by the alienation of customary land to a growing class of larger landowners who specialized mainly in tobacco production (Ellis et al. 2003: 1498). Recent development policies sought to address this bias by placing more emphasis on rural livelihood improvement and poverty reduction. A number of options have been discussed, including (1) increasing the output of maize, the staple food crop, through the spread of hybrid maize varieties; (2) increasing food security by diversifying food crops such as cassava, sweet potatoes, beans and groundnuts; (3) promoting the cultivation of cash crops, e.g., cotton, burley tobacco or new crops like paprika and soybean, as an export-led indirect means to improving food security; and (4) promoting nonfarm activities in order to diversify rural opportunities and incomes (Ellis et al. 2003: 1498).

Unlike elsewhere in the country, local economy of Northern Region and Lake Malawi catchment area is dominated less by the plantation sector than by fishery, cassava shifting cultivation and labour migration economy.¹⁵ Lake Malawi is the third largest lake in Africa, and it forms most of the eastern border of Malawi with Tanzania and Mozambique. Fish caught from Lake Malawi provides nearly 75 per cent of the animal protein annually consumed, and fisheries represent a significant source of off-farm employment for the country's population (Derman and Ferguson 1995: 131). The debate over the control of the lake's environmental resources began in the late 1920s, which centred on issues relating to the rights of fishing communities amidst the rapid expansion of non-African commercial fishing industry as well as the development of tourist and recreational facilities (Chirwa 1996: 353). The colonial government intervened by introducing regulations to restrict the development of large-scale commercial fishing, but these regulations were never effectively implemented (Chirwa 1996: 377). Neither was the colonial government able to control the leasing of lake front lots to land developers, which adversely affected the livelihood of lakeshore fishing communities and the environment (*ibid.*). Malawi's fishing industry continued to expand in the post-colonial era with the emergence of migrant-worker-turned-entrepreneurs, who invested their savings in importing nets and boats and in employing labour to form fishing units (McCracken 1987: 428–9). Contrary to the conventional view that this has caused irreversible destruction to indigenous fishing practices, studies reveal that they have survived in a modified form better suited for the changing socio-economic conditions (Nakayama 2008).

Small-scale catchment management in Chindozwa, northern Malawi¹⁶

Take the Chindozwa Village as an example. The village is located near the Nkhata Bay on

¹⁵ The authors would like to thank Dr. Setsuko Nakayama for sharing this information.

¹⁶ For original case study, please refer to Nakayama (2010).

the west shore of Lake Malawi with a population of around 1,000, the majority of whom speak the Tonga language. The area is a narrow strip of land, 2 kilometres in length from the top of Kamphimbi Hill to the lakeshore, bordered by two streams flowing from the hill to the lake. Major land use types include slash and burn agriculture field, fallow, grassland and residential area, which result in the following vegetation types: garden dominated by cassava (*Manihot esculenta*), shrub vegetation, grassland, middle forest and tall forest (Figure 10) (Kalindekafe et al. 2000). Local livelihood depends mainly on cassava cultivation, fishery, employment in Nkhata Bay and remittance from migrant labour. Cassava is the staple food of the Tonga, which is normally served as a thick porridge (*nsima*) together with a side dish of relish (*dendi*) (Van Velsen 1964: 13). The ideal *dendi* consists of fish, which symbolizes well-being that can only be achieved through integrated management of terrestrial and aquatic resources. Local understanding of land-lake connectivity is played out in various rituals with the central tenet being that trees call the rain that connects the crop field and the lake via the stream, calling the fish back into the lake.

Chindozwa Village is among the last to replace the use of torch with paraffin lamps in *usipa* (an endemic species) fishery. Things started to change in the late 1980s due to the growing concern of deforestation, spurred by crop failure caused by the cassava mealy bug disaster that swept across east and southern Africa, and the concomitant clearing of new fields in the area. With the influx of temporary food aid, villagers have begun to substitute cassava with maize as porridge ingredients, and fishers have turned to more effective gear in order to earn more cash for purchasing maize. Meanwhile, community-based conservation efforts emerged such as reforestation through the Chindozwa Home-based Initiative, which is rapidly expanding its partnerships to neighbouring villages, various government agencies and local NGO/NPOs. The case of the Chindozwa Village indicates that multifunctional land use contributes to food security and community well-being by the optimization of ecosystem services. The combination of farm and nonfarm sources of income helps the fishing communities to adapt to adverse conditions.

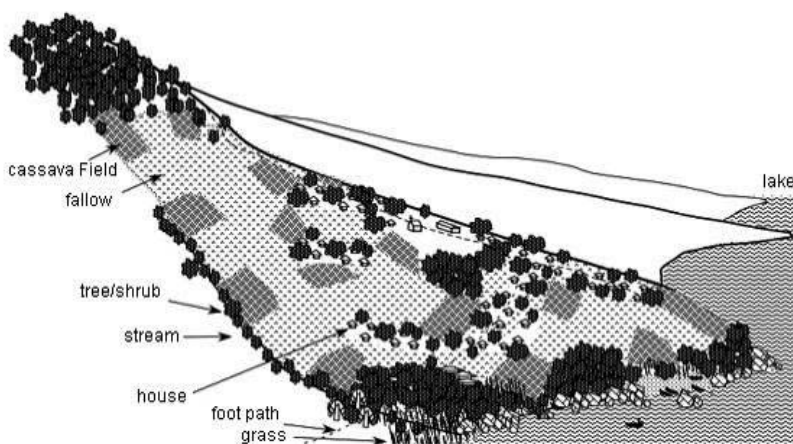


Figure 10: A schematic figure of topography and land use in Chindozwa, northern Malawi, Nakayama (2010)

THAILAND

Local livelihood in the Lower Songkhram Basin¹⁷

Thailand is located in the centre of the Indo-China peninsula with its eastern border largely defined by the Mekong River. The catchment area of the Mekong River and its tributaries extend over six countries: China, Myanmar, Thailand, Lao People's Democratic Republic, Cambodia and Viet Nam. Multiple stakeholders (e.g., the riparian governments, resource-dependent communities, enterprises and development agencies) have been involved in the development and management of water resources in the Mekong region, making it one of the world's most contested waterscapes (Molle, Foran et al. 2009). The Songkhram River is a tributary of the Mekong, which has a length of 420 kilometres running through the northeastern fringes of Thailand. Since the early 1950s, the remote rural areas of northeast Thailand received increased attention from the Thai government as well as a number of foreign agencies (notably those of the US) who were concerned about its continuing poverty and escalating political unrest (Dixon 1977). Consequently, government policies and foreign aid were directed towards rural development and pacification through investments in key infrastructure projects such as the construction of large-scale hydropower stations and irrigation facilities. A key component of this modernization project was to promote the commercialization and diversification of the agricultural economy (Goss and Burch 2001). Over the past three decades, several large agribusiness ventures have established a presence in the Songkhram River basin, buying up large amounts of land at cheap prices and occasionally encroaching on common land, which led to many instances of conflicts between local communities and the companies. Despite the government's push towards agribusiness-led development, these projects have largely failed, becoming idle assets across the region (Blake et al. 2009).

By contrast, small scale irrigation systems using farmers' own pumps or flood recession trap ponds have proven sustainable over the last 20 years. Wet paddy rice is the most commonly grown crop (principally glutinous rice varieties), plus smaller areas of cash crops such as sugar cane, tomato, melon and maize. However, traditional subsistence farming is gradually overtaken by more intensive agriculture oriented towards external markets. As a result of intensive farming and illegal fishing practices, there has been a notable decline in the productivity of the seasonally flooded forest. The local economy is heavily dependent on products originating from the seasonally flooded forest including fresh and fermented fish, wild plants, cultivated vegetables and large livestock. The villagers living in the Songkhram River basin have tried to address these problems by setting up many fish conservation zones, establishing community rules prohibiting destructive fishing gears, and building habitats for fish. These community management activities have received support from local state agencies and temples. However, co-ordination and co-operation among parties concerned are still inadequate. In order to explore appropriate fisheries co-management measures, a stakeholder workshop was held in August 2005, which was attended by 86 participants representing government agencies, NGOs, small- and large-scale fishers, and local community leaders. It was suggested that laws and legislation should be reviewed and/or revised, occupational opportunities/alternatives should be developed and relevant research should support the formulation of sustainable management of fisheries (Khumsri et al. 2005). How to implement these suggestions remains a major challenge for the years to come.

¹⁷ For original case study, please refer to Ministry of Natural Resources and Environment, Thailand (2011).

KENYA

Eastern African wetlands and lower floodplains¹⁸

Kenya is located in East Africa and over two-thirds of the country is classified as arid or semi-arid (Hamerlynck, Nyunja et al. 2010). Like elsewhere on the continent, irrigation projects have been a preferred policy option for modernizing production, minimizing food deficits and imports, and ameliorating the impact of drought (Moris 1987). While damming and water abstraction have contributed to economic development to some extent, they have also caused major reductions in the downstream and coastal availability of freshwater, and altered seasonal flooding that is crucial to the maintenance of floodplain agriculture, fisheries, pasture and forests (Snoussi et al. 2007). The Tana River is the longest river in Kenya (about 1000 kilometres), which rises in the Aberdare Mountains to the north of the capital Nairobi and winds its way southeast towards the Indian Ocean. Development of the river began in the 1960s and to date five hydropower dams have been built in its upper reaches including Kindaruma(1968), Kamburu(1975), Gitaru(1978), Masinga(1981) and Kiambere(1988). These dams alone produce about 75 per cent of the power needs of Kenya and are also a major source of drinking water for the capital Nairobi.

The intensive development of the upper catchment has brought about many environmental challenges in the Tana River Delta such as a reduction of flooded surface area and a decrease in the amplitude and duration of the flood peaks (Hamerlynck et al. 2010: 56). The resulting productivity loss of the lower Tana River floodplains has seriously affected the livelihoods of the riverine communities, who are primarily engaged in recession agriculture, fisheries and livestock keeping activities. More recently, a plan has been proposed to transform 20,000 hectares of the 130,000 hectares Tana River Delta into sugarcane plantations for the production of biofuels (Sielhorst et al. 2008: 39). If implemented, this will significantly reduce freshwater outflow to the ocean, causing negative impact on the local wetland-dependent economies.

In order to find an optimal balance between different uses of wetland resources, it is necessary to develop integrated management tools that take into account the economic objectives while at the same time respect the needs of local users. This requires an interdisciplinary approach that could provide a better description of the biodiversity values of the wetland, a hydrologic and a spatialized hydraulic model of the wetland, a detailed analysis of the practices and socio-economic strategies of various stakeholders, and a quantification of their water demand. The Kenya Wetlands Biodiversity Research Team (KENWEB), a multidisciplinary team of wetlands biodiversity experts, hydrologists and anthropologists, is working towards developing such a toolkit in the Tana River Delta and the Lower Rufiji Valley in Tanzania. Through a variety of research and capacity building activities, the KENWEB attempts to engage various stakeholders in developing a co-management strategy and action plan for tropical wetlands. To achieve efficient co-management, it is important to recognize the value of traditional management systems and empower local communities in resource management so that they can have a fair share of benefits as well as responsibilities in managing wetland resources.

¹⁸ For original case study, please refer to KENWEB (2011).

4. Agro-pastoralism

CHINA

With a population of 1.3 billion, China is the world's most populous country and the tension between development and conservation looms large. The scale of ecological degradation in China calls for stronger government commitment to nature conservation. However, issues such as ownership and stewardship have long been contested and negotiated between state authorities and local people, and will be even more so with the continuing expansion of nature reserves in China's rural and peri-urban areas (Coggins 2003: 5). By 2008, China had established 2,538 nature reserves with a total area of 1,489,430 square kilometres, or over 15 per cent of the country's land area (Quan et al. 2011: 780). China's nature reserve system draws heavily on the models of the United Nations Biosphere Reserves and the World Conservation Union (IUCN), which recognize human demands on the environment as compared to the US model of wilderness (Weller 2006: 77). The main difference between the Chinese conservation practices and their international counterparts lies in the degree of community involvement in the management and decision-making of protected areas (Coggins 2003: 16). Other issues include obscure laws and regulations, lack of funding for management and inadequate planning and monitoring (Liu et al. 2003; Quan et al. 2011).

Integrating community development with the management of grasslands at Ke'erqin Nature Reserve, Inner Mongolia, China¹⁹

To address these problems, various initiatives were launched with the financial support from international environmental organizations, as exemplified by the community development activities carried out at the Ke'erqin Nature Reserve in the Inner Mongolia Autonomous Region. As part of the UNEP/GEF Siberian Crane Wetland project, these community activities aimed to develop a community-based co-management scheme that links biodiversity conservation with local economic development. The main strategy of co-management is to provide feasible economic alternatives to help reduce the dependence of local communities on the natural resources of the nature reserve (Zhang and Wang 2004: 313–4). The Ke'erqin Nature Reserve was established in 1985 and was designated as a National Nature Reserve (NNR) in 1995. Located in the semi-arid temperate zone, the Ke'erqin NNR is mainly composed of grassland, native elm (*Ulmus macrocarpa* var. *mongolica*) forest and wetlands supporting a total of 175 species of birds. The huge variety of cranes and storks is of particular conservation value of the reserve.

One unique feature about the Ke'erqin NNR is that its core zone overlaps with most of the settlement area of the Beizifu community. The community consists of four hamlets with a population of 890 (233 households), 95 per cent of whom are ethnic Mongolians. Farming (maize and mung beans) and livestock raising (sheep and cattle) are the main income sources. In recent years, off-farm income has sharply increased, and more and more young people are seeking jobs in the city. During a baseline survey before the start of the three-year project (2007–2009), villagers of the Beizifu ranked degradation of natural resources including pastures and wetlands, and lack of rainfall as major threats to their livelihoods. In order to develop an integrated community development plan, the research team sought to engage multiple stakeholders and to enhance capacity building through training, participatory planning and restoration of traditional culture. In 2008, the Ke'erqin Grassland Protection and Development Association was established with the mandate to

¹⁹ For original case study, please refer to Liu et al. (2012).

manage and maximize the use of the revolving loan funds for the greater benefits of local communities. The Association was initially joined by 67 households, and expanded to 134 households by the end of the project. Although some progress has been made in improving the mutual understanding and trust between local communities and government officials, challenges remain as to how to create incentives for long-term sustainable management of grassland. Past reforms such as the Household Responsibility System have had limited effect in mitigating the “tragedy of the commons” due to intensive livestock raising, wire fencing and land conversion to farming (Wu and Du 2008). This growth-oriented development approach takes insufficient consideration of the carrying capacity and ecosystem integrity of the Inner Mongolian pasture (Li et al. 2007). For future conservation policies to be more effective, policymakers may consider promoting small-scale collective property rights systems suitable for Mongolian nomadic culture (ibid.).

KENYA

About half of the world’s pastoral population live in the dryland areas of Africa where rain-fed agriculture is precarious (Fratkin 2001: 3). These pastoral communities have developed their own strategies to cope with drought, yet they are often perceived as backward and destructive by the post-colonial governments and development agencies (Oba 2001; Warren 1995). As such, the past decades have witnessed a gradual shift from nomadic pastoralism to sedentary crop-livestock farming, posing great challenges to food security, natural resource management and human welfare (Ekaya 2005). In Kenya, colonial policies restricted the movement of pastoral communities, and the sedentarization process continued after independence with a focus on environmental conservation and the introduction of new “modern” techniques (Owuor et al. 2011: 49).

Drought-coping strategies of farmers in Kitui District, Kenya²⁰

The Ukambani region (Figure 11), for example, has been the object of intense scrutiny and repeated interventions by international and national “experts” for over a century (Rocheleau et al. 1995b). The region is in close proximity to Nairobi in east-central Kenya and is mainly inhabited by the Kamba people, who have developed “a mix of private and common property rights, integrated crop-livestock systems, spatially separated holdings, flexible patterns of settlement and mobility, and mutual reciprocity arrangements” to cope with drought (ibid.: 1040). However, sedentarization and recent forest conservation policies have limited the access and use of forest resources, which increases the vulnerability of the pastoral communities to climate stress (Owuor et al. 2011: 50-2).

In response to increasingly severe drought, the Kamba people living in Kitui District (eastern part of Ukambani) have adapted traditional knowledge and institutions to better meet their nutritional needs. Owing to differences in altitude, the semi-arid landscape in Kitui can be divided into three main agro-ecological zones: a dry, sparsely populated lowland area; a warm midland area; and a sub-humid densely-populated highland area. Farmers have taken advantage of the spatial variations by having farms in different zones, and by accessing food and fodder produced in other agro-ecological zones through the market and kinship networks. In managing seasonal variations in rainfall and drought, the agro-pastoralist Kamba people interact with pastoral groups in the following ways: firstly, by moving cattle to the plains during the wet season and nearer to the hill during the dry season; secondly, by trading

²⁰ For original case study, please refer to Morimoto et al. (2012).

with each other during drought; and thirdly by using forest products and services provided by the hill (Owuor et al. 2011: 49). Local institutions have also proven to be instrumental in engendering coping strategies. In Kitui, most women belong to traditional self-help groups known as *myethya*. A typical *myethya* group has about 20–30 members who usually meet once a week and participate in tree planting, soil erosion control and income generating activities. These institutions are deeply embedded in the local culture and are governed by customary rules through which traditional knowledge is created, preserved and regenerated. The case of Kitui illustrates the need to support indigenous coping strategies as a means to improve nutrition and alleviate poverty in the arid and semi-arid regions. Policymakers should build on these local strategies and interactions to develop flexible policies rather than imposing adaptation measures from above (Owuor et al. 2011: 49).

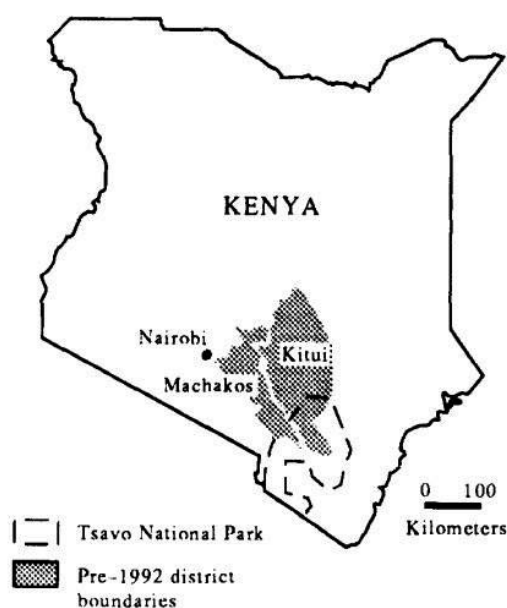


Figure 11: Ukambani, Kenya Rocheleau et al. (1995a: 1039)

5. Mountain Ecosystems

THE PHILIPPINES

Community Development in Ifugao²¹

The Philippines is an archipelago composed of more than 7,100 islands and islets, making it one of the world's most ecologically and culturally diverse countries. About 15–20 per cent of its population is recognized as indigenous peoples, one-third of whom live in the Cordillera Central Mountain Range of the northern island of Luzon (Holden 2005: 420). Since the Spanish colonial period, the peoples of the Cordillera have been collectively termed as *Igorots* despite considerable ethno-linguistic heterogeneity among the uplanders (Finin 2008: 11). The Spanish and American colonizers positioned the *Igorots* in the “tribal

²¹ For original case study, please refer to Daguitan (2012).

slot” somewhere between ordinary peasants and “backward” primitives, which had in effect tied these indigenous peoples to the remote yet resource-rich mountain area (McKay 2006). The colonial imaginary of the Cordillera as a place of native cultures had attracted great attention from Western anthropologists and the like, who populated the rice terraces of Ifugao through writings and photographs (SITMo 2008: 7–9). Despite increased foreign interest in the Cordillera landscape and its peoples, the post-independent government continued to enforce the stereotypes of the *Igorots* as being backward so as to justify resource-based development in the mountains (McKay 2006: 300). In response to government claims over the upland resources (e.g., timber, minerals and hydropower), the *Igorots* engaged lawyers, historians and anthropologists in the struggle to gain recognition for their customary property rights (ibid.: 301). The awakening of the collective ethno-regional consciousness helped to forge a movement for regional autonomy, which led to the creation of the Cordillera Administrative Region in 1987 (Finin 2008: chapter 9). But it was not until the enactment of the Indigenous Peoples’ Act in 1997 that a legal framework was established for the recognition and protection of indigenous peoples’ rights to ancestral domain/land, to self-governance and empowerment, to cultural integrity, and to social justice and human rights (ADB 2002: 13–4).

Since then, various efforts have been made to promote greater understanding of indigenous knowledge systems and practices on natural resource management and to engage communities in the formulation and implementation of development plans. For example, two Cordillera-based organizations, the Montanosa Research & Development Centre and the Tebtebba Foundation, initiated a project in 2008 in partnership with five *barangays* (villages) in the municipality of Tinoc, Ifugao – a UNESCO World Heritage Site. The project aimed to promote community development within the framework of indigenous peoples’ rights and ecosystems approach. Through workshop discussions and key informant interviews, the project team was able to gather substantial information on traditional resource management practices and their changes over time. To disseminate the findings, the First *I-Tinek* Land Summit was held in early 2010, which sounded the alarm on the erosion of traditional knowledge. It also highlighted the challenges of environmental degradation resulting from chemical monocrop farming, decreased land security due to privatization of communal lands, and waning authority on customary law. To address these problems, various community initiatives were undertaken including (a) seed exchange among women which increased traditional rice varieties from six to eight (b) community campaigns to strengthen traditional labour exchange groups (*ubbo*), (c) active protest against bulldozing of forestlands, and (d) recognition of the superiority of custom law over state law on land and resource management. Through networking and advocacy, the project captured the interest of government agencies, which supported the up-scaling of the project on the municipal and provincial levels.

As the project moves to the next step, it will continue to pursue comprehensive land use planning to ensure that the people of Tinoc have the rights to own and develop their lands, territories and resources. They should also receive legal recognition and protection for their customs, traditions and land tenure systems. And finally, free and prior-informed consent should be obtained from affected communities, as provided for in the UN Declaration on the Rights of Indigenous Peoples.

PERU

Peru is divided by the Andes Mountains into three main climatic zones: the coast (*costa*) to the west, the highlands (*sierra*) in the middle and the tropical Amazon jungle (*selva*) to the east. Its agrarian system consists of plantations on the coast as well as large landed estates (*haciendas*) and peasant communities in the highlands, with the latter two having an enduring conflictual relationship (Kay 1982: 142). The loss of communal land to the *hacienda* forced some peasants to become labour-service tenants on *haciendas* or work as wage labourers on the coastal plantations (ibid.: 144). The agrarian reform carried out by the military government between 1969 and 1980 sought to change such skewed land tenure structure by reorganizing agricultural enterprises and the peasantry into collective units of production. The reform was least successful in the highlands where ecological conditions were more favourable for smallholder farming than large-scale agriculture. The 1980s and 1990s witnessed a wave of neoliberal reforms in Peru's agricultural sector, which led to the privatization of co-operatives, reduction of subsidies and the participation of new actors (e.g., NGOs) in research and provision of information (Ortiz 2006: 482–3). This coincided with the emergence of an indigenous rights movement in Latin America, which demanded territorial autonomy and respect for customary laws (Stavenhagen 2002: 34–39).

Potato Park²²

In 1995, the Association for Nature and Sustainable Development (ANDES) was established in Cusco aiming to protect and develop Andean biological and cultural diversity through a community-led, rights-based approach. Located in the southern highlands of Peru, Cusco is the historic capital of the Inca Empire and was declared as a UNESCO World Heritage Site in 1983. Although the historical and cultural importance of Cusco is widely recognized, its inhabitants, like other indigenous peoples in Peru, have been associated with under-development and poverty, and presented as “archaic obstacles” to the development of a “modern” nation-state (García 2005: 4–18). To counter this negative view of indigenous peoples, the ANDES launched the Potato Park project in 2000 seeking to establish an alternative development model to improve local livelihoods and conserve biocultural heritage. The landscape of the Potato Park is organized by ecological zones and the exchange of products allows for the fulfilment of livelihood needs across the zones. This kind of practice is termed as “common-field agriculture” whereby an assembly of farmers co-ordinates the production of crops and livestock grazing in managed fallow spaces (Godoy 1991).

Authority of the Potato Park is shared between six Quechua communities, each of which elects one chairperson to co-ordinate the management work according to the *ayllu* system. *Ayllu* can be understood as a community of individuals sharing the same interests and objectives. The main objective of the *ayllu* is to attain well-being by maintaining a reciprocal equilibrium between one's natural and social environment. Based on these principles, local communities have developed subsistence mechanisms (e.g., agriculture and animal husbandry) and social relations to adapt to environmental changes. Several economic collectives have been established with the objective to build a solid local economy by conserving and sustainably using biological resources. These collectives include the Potato Arariwas (a seed repatriation and conservation collective), the Tika Tijillay women's video collective, the Naupa Awana craft collective, the Willaqkuna guides collective, and the Sipaswarmi Medicinal Plants Collective. Other initiatives include developing the Local

²² For original case study, please refer to Argumedo and Wong (2010).

Biocultural Database, the restitution of genetic variability of native potato crops through partnership with the International Potato Centre, and agro-ecotourism to generate income and incentives for conservation and the promotion of regional ordinances.

SPAIN

There has been growing concern in Europe over the loss of diversity, coherence and identity associated with the rapid transformation of traditional landscapes, which has culminated in the adoption of the European Landscape Convention in 2000 (Marc 2005). The Convention is aimed at promoting landscape protection, management and planning, and organizing European co-operation on landscape issues (article 3). It establishes legal principles for the development of national landscape policies as well as measures to be taken at the supranational level (Déjeant-Pons 2006: 365). Although regional variations exist, some general trends in European landscape development can be observed. These include society's demand for multifunctionality of landscapes, the inclination of farmers to meet this demand if economically profitable, growing political and public support for ecologically sound management, and decentralization of landscape ruling and legislation which favours regional solutions (Vos and Meekes 1999).

The *Agras* field system in Galicia²³

In Spain, the process of decentralization and Europeanization has accelerated following its transition to democracy in the late 1970s and the accession to the European Economic Community in 1986. Due to ethno-territorial diversity, great regional disparities can be found in Spain and the Galicia Autonomous Community is among the poorest regions of the country (Moreno 2002). Located in northwest Spain, Galicia has been historically an agrarian society featured by small scale farming (*minifundía*) and a highly dispersed population living in scattered homesteads (Máiz and Losada 2000: 67). The traditional land use system of the Galician region is characterized by multiple and integrated use of the landscape and the main crops include wheat or rye, turnips and potatoes or maize (mainly in the coastal areas) (Calvo-Iglesias et al. 2006: 338). Bouhier (1979) distinguished five basic types of agrarian systems or structures that existed in Galicia in the period of 1950–60 (Figure 12): landscape of fields surrounded by the Northern Mountains (*bocage*), banks and terraces on the coast (*bancales y terrazas*), vineyards on terraces in the gorges of the Miño and Sil rivers (*vinedos en terrazas*), the *openfields* of the southeastern mountains and *agras* field systems that mainly extend through the valleys and flatlands of the interior of Galicia. *Agra* refers to contiguous arable fields belonging to different owners that are delimited from the rest of the territory with small stone walls (Corbelle-Rico et al. 2010: 158). The use of the *agras* was subject to collective standards established by the rural community, which regulated the type of crop grown, the planting and harvesting schedule, crop rotation within the *agras* and the grazing of livestock on stubbles.

Until the second half of the twentieth century, Galicia was not so much affected by industrialization and agricultural modernization as other parts of Spain and Europe. Since the 1960s and especially after the European accession, there has been a reorientation of agricultural activity towards dairy farming and forestry (Calvo-Iglesias et al. 2009). This, combined with rural depopulation, land consolidation and urban development, has contributed to the homogenization and simplification of the Galician landscape. The impact

²³ For original case study, please refer to Calvo-Iglesias et al. (2011).

of these socio-economic changes on the *agras* system has been uneven with some being completely transformed while others showing a high degree of resilience. In order to raise the awareness and promote the value of traditional agrarian landscapes, the Government of Galicia issued the Act on Landscape in July 2008. Within this juridical framework, the Government of Galicia presented its landscape strategy in August 2011 to develop landscape protection, management and planning instruments and to integrate these instruments into territorial planning policies and daily management (The Government of Galicia 2011). This constitutes an opportunity to identify, conserve and promote the traditional landscapes as a means of fostering regional development and identity.

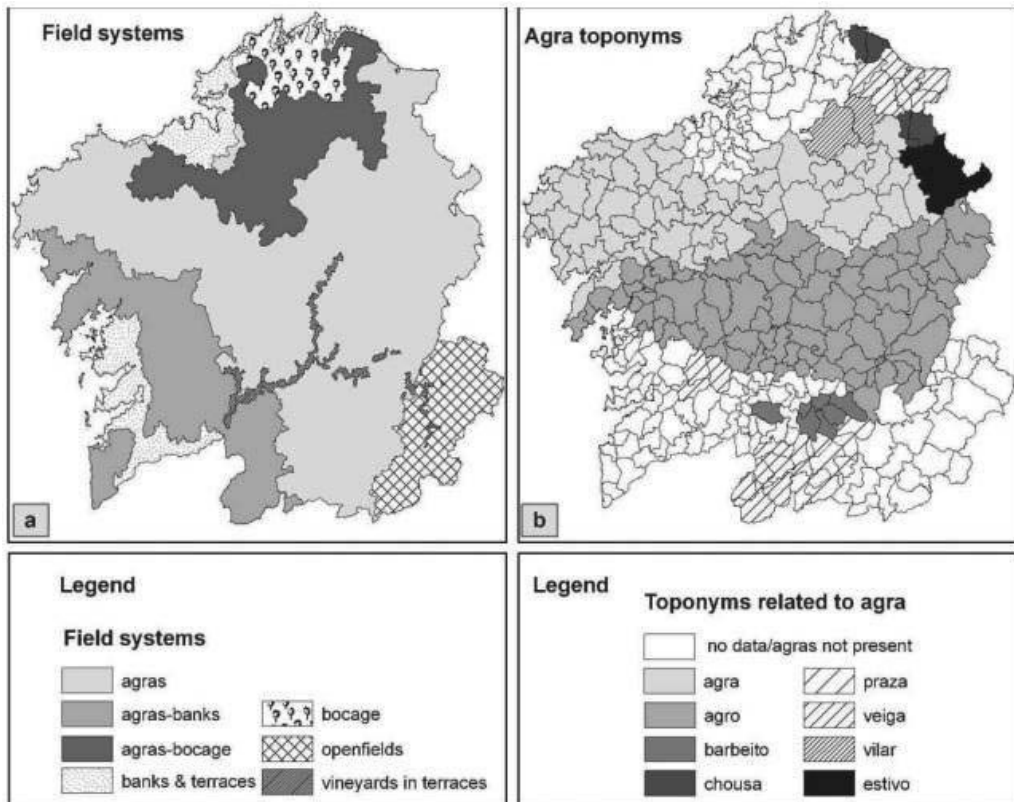


Figure 12: Domains of agrarian structures identified by Bouhier (1979) in Calvo-Iglesias et al. (2012: 3)

Appendix 2

PARIS DECLARATION ON THE "SATOYAMA INITIATIVE"

1. The Global Workshop on the *Satoyama* Initiative was held at the Headquarters of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris from 29 to 30 January 2010. It was organized by the Ministry of the Environment of Japan (MOE-J) and the United Nations University-Institute of Advanced Studies (UNU-IAS), and co-organized by UNESCO, the United Nations Environment Programme (UNEP), and the Secretariat of the Convention on Biological Diversity (SCBD). The Global Workshop built on the two preparatory workshops held in Asia, the first in Tokyo on 25 July 2009, and the second in Penang, Malaysia, on 1-2 October 2009 (see reports at www.satoyama-initiative.org).

2. The objectives of the Global Workshop were to discuss the *Satoyama* Initiative's concept and define the elements of activities to be included in the Initiative. Participants in the workshop included members of the Bureau of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) and the Bureau of the CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), and biodiversity and community development experts from intergovernmental and governmental agencies, academic institutions, and non-governmental organizations, in particular those working very closely with indigenous and local communities. The meeting was open to the public and co-chaired by Prof. Kazuhiko Takeuchi, Vice Rector, UNU, Dr. Spencer L. Thomas, Chair of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), CBD, Ms. Somaly Chan, Director, International Convention and Biodiversity, Department of the Ministry of Environment, Cambodia, and Prof. James H. Seyani, Director General, National Herbarium and Botanic Gardens of Malawi.

3. Participants of the Global Workshop welcomed with appreciation the efforts of the Government of Japan and UNU-IAS in developing and putting forward the *Satoyama* Initiative. Opportunities for the participation of Parties, other governments and relevant organizations in this initiative were noted. The Government of Japan and UNU-IAS have developed and maintained an internet-based portal site for the *Satoyama* Initiative. They have conducted more than 20 case studies based on literature review and through local stakeholder workshops held in Malawi, Cambodia, Mexico, Peru and other countries during 2009.

4. The primary outcomes of the Global Workshop were the Co-Chair's Summary and this Paris Declaration, which broadly reflect the discussions among participants, and not necessarily the opinion of their respective countries or organizations. The annex to this declaration contains a description of the *Satoyama* Initiative, its objectives, headline activities and mechanisms for its operationalization. Participants at the Global Workshop requested the Co-Chairs to jointly submit this Declaration to the Fourteenth Meeting of the SBSTTA, to be held in Nairobi from 10 to 21 May 2010, and the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity, to be held in Aichi-Nagoya, Japan, from 18 to 29 October 2010.

Annex

THE “SATOYAMA INITIATIVE” FOR THE BENEFIT OF BIODIVERSITY AND HUMAN WELL-BEING

1. “Socio-ecological production landscapes”²⁴ 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. These landscapes have proven sustainable over centuries and are considered living examples of cultural heritage. A number of studies indicate that management of these landscapes is compatible with the Ecosystem Approach and the Addis Ababa Principles and Guidelines on the Sustainable Use of Biological Diversity²⁵ and could be a tool for implementing the post-2010 target of the CBD. In these landscapes, natural resources are used in a cyclical manner within the carrying capacity and resilience of ecosystems; the value and importance of local traditions and cultures are recognized; and the management of natural resources involves various participating and co-operating entities and contributes to local socio-economies. These landscape management practices are conducive to maintaining an optimal balance of food production, livelihood improvement and ecosystem conservation.

2. Socio-ecological production landscapes are found in many regions of the world under various names such as *muyong*, *uma* and *payoh* in the Philippines, *mauel* in Korea, *dehesa* in Spain, *terroirs* in France and other Mediterranean countries, *chitemene* in Malawi and Zambia and *satoyama* in Japan. Some of these areas are formally recognized as protected landscapes/seascapes under the IUCN protected area category V, World Cultural Heritage sites, Biosphere Reserves, Globally Important Agricultural Heritage Systems, and/or Indigenous and Community Conserved Areas. They all have in common the wise and sustainable use of biological resources in accordance with traditional and, in some cases, modern cultural practices.

Benefits

3. Information presented in the workshop and from case-studies in the literature indicates that when they are managed effectively, socio-ecological production landscapes provide a wide range of provisioning, regulating, cultural and supporting services, and thus contribute to livelihood and human well-being of local communities, and the achievement of the Millennium Development Goals (MDGs) and relevant national development policies. They also provide members of local communities a sense of their roots and identity. In addition, they can contribute to the mitigation of and adaptation to climate change, inter alia, by conserving and enhancing carbon sinks and reservoirs, reducing greenhouse gas emissions, and increasing resilience to adapt to the negative effects of climate change at the landscape or territorial scale. These socio-ecological production landscapes can make an important contribution to the implementation of the Convention on Biological Diversity. They can also play an important role in achieving connectivity/corridor conservation across wider landscapes by making linkages between other protected areas.

²⁴ Socio-ecological production landscapes are certain kinds of biocultural landscapes. In the context of this declaration, they include seascapes.

²⁵ Annex II of decision VII/12 of the Conference of the Parties to the Convention on Biological Diversity.

Issues

4. Some socio-ecological production landscapes have been abandoned as a result of rural depopulation and ageing populations, while others are increasingly threatened in many parts of the world due to various pressures such as unplanned urbanization, industrialization and increase in population/resource demand. The loss or degradation of these landscapes leads inevitably to a decline in the various ecosystem services that they provide, with serious consequences for the local and broader communities that rely on them. In some cases, socio-ecological production landscapes may not fully provide for the livelihood of local communities and could thus be abandoned as people move to urban areas in search of employment and better living conditions. There is therefore a need for a range of options to support indigenous and local communities in continuing to maintain these landscapes, as they have done for generations.

The Initiative

Overall description and objectives

5. Measures are urgently needed to support and, where necessary, revitalize or rebuild socioecological production landscapes including through broader global recognition of their value and by addressing the issues identified above. The *Satoyama* Initiative has been developed to respond to these needs. Its overall objective is to promote and support socio-ecological production landscapes to maintain their contribution to human well-being and the three objectives of the Convention on Biological Diversity.

6. The *Satoyama* Initiative recognizes the importance of other ongoing initiatives dealing with socio-ecological production landscapes and seeks to provide a platform for co-operation and support.

7. The Initiative can also be considered as a tool, consistent with the Ecosystem Approach, for the implementation of the proposed post-2010 Strategic Plan of the Convention, in particular the 2020 targets relating to the sustainable management of all areas under agriculture, aquaculture and forestry; the reduction below critical ecosystem loads of pollution from excess nutrients (nitrogen and phosphorus) and other sources; the management of the multiple pressures on vulnerable ecosystems impacted by climate change and ocean acidification; the improvement of the status of crop and livestock genetic diversity in agricultural ecosystems and of wild relatives; the raising of awareness of the role of biodiversity; the safeguarding or restoration of terrestrial, freshwater and marine ecosystems that provide critical services, and contribute to local livelihoods; the guarantee for all of adequate and equitable access to essential ecosystem services; the protection of traditional knowledge, innovations and practices, as well as the rights of indigenous and local communities; and the increase of capacity (human resources and financing) for implementing the Convention.

Specific goals/activities

8. The *Satoyama* Initiative aims to

- (a) Enhance understanding and raise awareness of the importance of socio-ecological production landscapes for livelihoods and the three objectives of the Convention. This goal will be met by
 - (i) Collecting, analysing, synthesizing and comparing case-studies, and distilling lessons learned for dissemination through a searchable online database and other means, and for use in capacity-building activities;
 - (ii) Undertaking research on ways and means to: (i) promote wisdom, knowledge and practice which enables us to enjoy a stable supply of diverse ecosystem services; (ii) build bridges for inter-cultural communication between traditional ecological knowledge systems and modern science; (iii) explore a “New Commons” or new forms of co-management while respecting traditional communal land tenure where necessary; (iv) revitalize and innovate socio-ecological production landscapes; and (v) integrate results in policy and decision-making processes;
 - (iii) Developing measurable indicators of resilience associated with linkages between human well-being and the socio-ecological production landscape mosaic, including linkages between wild and anthropogenic components of landscape and ecosystems; and applying these indicators to contribute to the implementation of the ecosystem approach; and
 - (iv) Increasing awareness by promoting education, information dissemination, and document production about these landscapes,
- (b) Support and expand, where appropriate and as part of the implementation of the post2010 Strategic Plan, socio-ecological production landscapes, building on activities in subparagraph (a) above. This goal will be achieved by:
 - (i) Enhancing capacities for maintaining, rebuilding and revitalizing socio-ecological production landscapes, including through regional capacity-building workshops and support for on-the-ground projects and activities;
 - (ii) Collaborating with and/or strengthening synergies with local community organizations, national governments, donor agencies, and NGOs, other UN agencies and organizations dealing with socio-ecological production landscapes in the implementation of their respective activities related to the Initiative,
- (c) Collaborate with other initiatives and programmes which are operating in this area such as *inter alia* GIAHS and those of IUCN and UNESCO.

Supporting mechanisms

9. An International Partnership will be established and strengthened, with links to national/sub-national and regional partnerships, to carry out the activities identified by the *Satoyama* Initiative. The International Partnership will be open to all organizations dealing with socio-ecological production landscapes to foster synergies in the implementation of their respective activities, as well as others planned under the Initiative.

10. In order to facilitate the activities proposed for the *Satoyama* Initiative, it is important to:

- (a) Identify and develop potential windows and mechanisms to finance, including through innovative financing mechanisms such as the payment for ecosystem services, the implementation of the Initiative and support the International Partnership-related projects and activities;
- (b) Mobilize the financial resources needed for implementing the Initiative, including support for the International Partnership for the *Satoyama* Initiative;
- (c) Facilitate consultations among partner organizations, including on the processes of the proposed General Meetings for the International Partnership for the *Satoyama* Initiative, in order to facilitate cooperation and create concrete collaborative programmes and activities among partner organizations, including regional collaboration/co-operation, with a view to generating synergies in the programme implementation by such partner organizations; and
- (d) Report on relevant achievements to the CBD SBSTTA and Conference of the Parties in accordance with the items on their respective agendas and the multi-year programme of work for the Conference of the Parties, and as part of the review of the Millennium Development Goals in 2015.

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UNU-IAS Policy Report

Socio-ecological Production Landscapes: Relevance to the Green Economy Agenda

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Socio-ecological production landscapes (SEPLs), if managed effectively, can provide a wide range of ecosystem services that help contribute to the livelihoods and well-being of local communities, and the achievement of the Millennium Development Goals and relevant national development policies. Drawing insights from a variety of case studies, this report examines the historical and political contexts in which SEPLs have evolved as well as the challenges and opportunities in promoting SEPLs for the green economy.



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