

Chapter 1

Introduction: Socio-ecological Production Landscapes and Seascapes



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Abstract This book presents up-to-date analyses of community-based approaches to the sustainable resource management of socio-ecological production landscapes and seascapes (SEPLS) in areas where a harmonious relationship between the natural environment and the people who inhabit it is essential to ensure community and environmental well-being as well as to build resilience in the ecosystems that support this well-being. This chapter introduces the key concepts and approaches, objectives, and organization of this book.

Keywords Socio-ecological production landscapes · Indigenous and local knowledge · Science–policy interface · Ecosystem services · Visualization · Mapping · Stakeholder analysis

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1.1 Socio-ecological Production Landscapes and Seascapes

A landscape can be defined as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe 2000). Socio-ecological production landscapes and seascapes (SEPLS) can be characterized by a mosaic of different ecosystem types: secondary forests, timber plantations, farmlands, irrigation ponds, wetlands, grasslands, beaches, and coastal zones, as well as human settlements. SEPLS are managed via interactions between ecosystems and humans to create various ecosystem services for human well-being (Japan Satoyama Satoumi Assessment (JSSA) 2010; Takeuchi 2010; Duraiappah et al. 2012). In Japan, the term *satoyama* is used for such landscapes (Fig. 1.1 top), while *satoumi* refers to such seascapes (Fig. 1.1 bottom). The term “cultural landscapes” is often used synonymously for similar landscapes where people have developed and sustainably managed the landscape over a long period of time. According to UNESCO (2008), cultural landscapes represent the “combined works of nature and of man” and are illustrative of the evolution of human societies and settlements over time. Examples of cultural landscapes include the rice terrace landscapes of the Philippines, the Black Forest mountain range in southern Germany, extensively used mountain grasslands in the European Alps, and the *dehesa* agroforestry landscapes on the Iberian Peninsula (Plieninger and Bieling 2012).

According to the Millennium Ecosystem Assessment (2005), ecosystem services are defined as benefits obtained from ecosystems, including provisioning services such as food and water; regulating services such as the regulation of floods, droughts, and diseases; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, and other nonmaterial benefits. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) extended the concept of ecosystem services to nature’s contributions to people (NCPs) which can capture all types of contributions by nature, whether these contributions result in gains or losses for humans. The notion of NCP also recognizes the central and pervasive role that culture plays in defining all links between people and nature and in emphasizing and operationalizing the role of indigenous and local knowledge in understanding NCPs (Fig. 1.2). IPBES identified 18 such categories for reporting NCPs within a generalized perspective organized into three partially overlapping groups: regulating, material, and nonmaterial NCPs. Even though the concept of NCP is formally approved by IPBES and used in IPBES assessments, NCP is still quite a new concept and requires a transitional period to be widely acknowledged. Therefore, this book uses the term ecosystem services to represent various tangible and intangible values provided by nature.

The categories in gray are part of the framework but not the focus of Díaz et al. (2018). Concepts pointed to by the arrowheads replace or include concepts near the arrow tails. Concepts in dotted-line boxes are no longer used; following the present view of the Millennium Ecosystem Assessment community, supporting ecosystem services are now components of nature or (to a lesser extent) regulating NCPs.



Fig. 1.1 Illustrations of satoyama (top) and satoumi (bottom) (Saito and Shibata 2012)

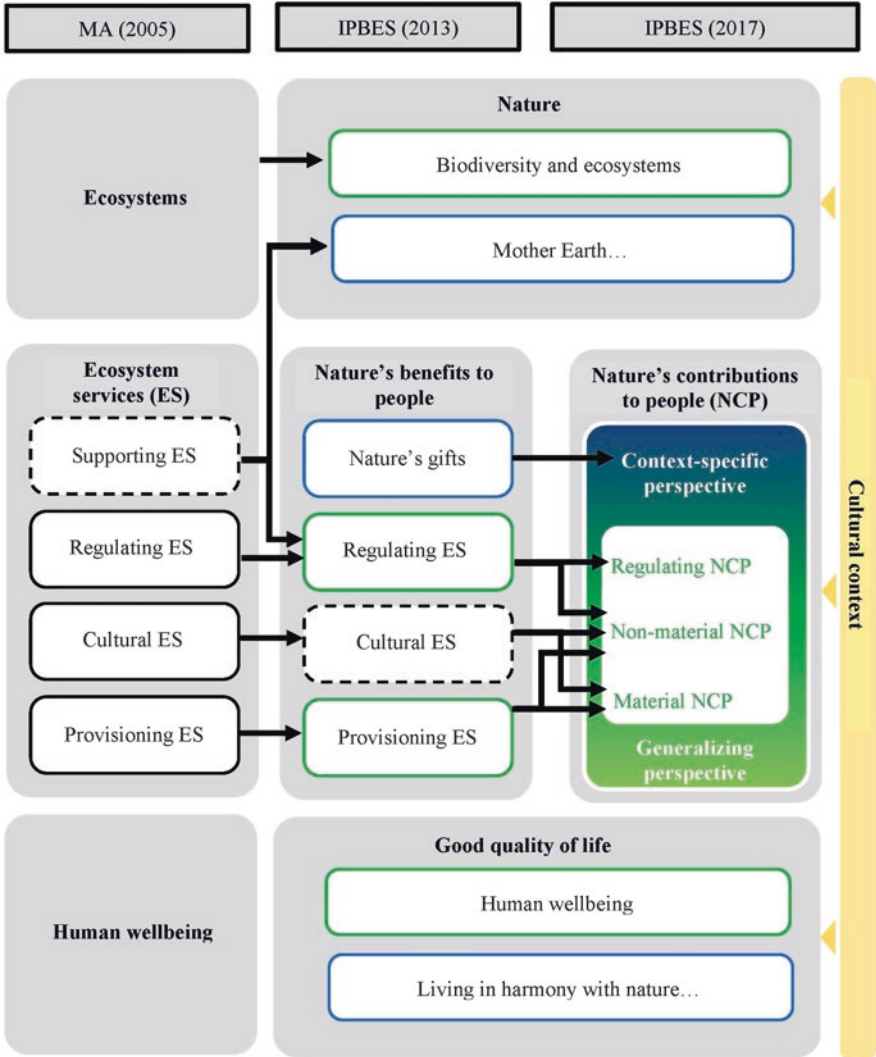


Fig. 1.2 Evolution of nature’s contributions to people (NCPs) and other major categories in the IPBES conceptual framework (1) with respect to the concepts of ecosystem services and human well-being as defined in the Millennium Ecosystem Assessment (2) (Modified from Díaz et al. 2018)

1.2 Challenges and Opportunities for Contemporary SEPLS

1.2.1 Challenges

According to the IPBES Global Assessment (IPBES 2019), the rate of global change in nature during the past 50 years is unprecedented in human history even though the rate of change differs between regions and countries. The direct drivers of change in nature with the largest global impact have been changes in land and sea use, the direct exploitation of organisms, climate change, pollution, and invasions of alien species. These five direct drivers are in turn underpinned by societal values and behaviors that include production and consumption patterns, human population dynamics and trends, trade, technological innovations, and local to global governance.

The Asia–Pacific region is home to nearly 60% (4.5 billion) of the current global population, 52% (400 million) of the 767 million global poor, and as much as 75% of the global population of 370 million indigenous people. Most of the latter have distinct but increasingly threatened traditions and cultures and have been maintaining their livelihoods in harmony with nature and managing landscapes and seascapes for generations (IPBES 2018). In addition to rapid economic growth, globalization, urbanization, infrastructure development, unsustainable use, and invasive alien species, the IPBES Asia–Pacific Regional Assessment (2018) highlighted a decline in traditional agrobiodiversity, along with its associated indigenous and local knowledge, due to a shift toward the intensification of agriculture with a small number of improved crop species and varieties.

The Japan Biodiversity Outlook (Japan Biodiversity Outlook Science Committee 2010) and Japan’s National Biodiversity Strategy and Action Plan (Ministry of the Environment, Japan 2012) have recognized four biodiversity crises that have been faced by Japan in recent years. The first crisis stems from development, overexploitation, and water contamination. This crisis has been particularly influential; however, the situation has been mitigated by the regulation of developmental activities and the slowing of economical development. The second crisis is caused by the reduced use and insufficient management of SEPLS. This tendency continues to intensify due to depopulation and the aging of populations in rural areas in Japan. Factors contributing to the third crisis include invasive alien species and chemical substances introduced by humans. Climate change, as the fourth crisis, has reinforced the effects of the other crises, causing serious concern regarding certain particularly vulnerable ecosystems.

1.2.2 Opportunities

IPBES Global Assessment (IPBES 2019) stressed that “goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories, and goals for 2030 and beyond may only be achieved through transformative

changes across economic, social, political, and technological factors.” It is necessary for us to conserve, restore, and use nature sustainably while simultaneously meeting other global societal goals via extensive efforts to foster transformative change. Transformations toward sustainability can be triggered by the following key leverage points: (1) visions of a good life; (2) total consumption and waste; (3) values and actions; (4) inequalities; (5) justice and inclusion in conservation; (6) externalities and telecoupling; (7) technology, innovation, and investment; and (8) education and knowledge generation and sharing (IPBES 2019). The transformation pathways will vary depending on the context, with different challenges and needs in developing and developed countries. Therefore, “risks related to inevitable uncertainties and complexities in transformations toward sustainability can be reduced through governance approaches that are integrative, inclusive, informed, and adaptive” (IPBES 2019).

In the Asia–Pacific region, regional cooperation for the transboundary conservation of threatened landscapes and seascapes is expanding and showing positive outcomes (IPBES 2018). Biodiversity-rich and threatened terrestrial, marine, and wetland ecosystems transcend political boundaries. Transboundary conservation initiatives take different forms including upstream–downstream river basins initiatives (e.g., in the Mekong Delta Basin), ridge-to-reef arrangements (coral reef conservation and management through community-based approaches emphasizing land–sea connectivity), and regional cooperative agreements (IPBES 2018).

As one such transboundary/international conservation initiative, the Japanese Government and United Nations University launched a new international initiative called “the Satoyama Initiative,” which aims to promote sustainable production landscapes and seascapes via a broader global recognition of their value (Takeuchi 2010). This initiative promotes developing an international network of organizations working on SEPLS to share knowledge and best practices on a global scale to alleviate some of the problems caused by the loss of biodiversity. Globally Important Agricultural Heritage Systems, coordinated by the Food and Agriculture Organization, is another international initiative that promotes public understanding, awareness, and the national and international recognition of agricultural heritage systems including SEPLS.

1.3 Sustainability Science Research and SEPLS

Understanding SEPLS and the forces of change that can weaken their resilience requires the integration of knowledge across a wide range of academic disciplines as well as from indigenous knowledge and experience. Moreover, given the wide variation in the socio-ecological makeup of SEPLS globally, as well as in their political and economic contexts, individual communities will be at the forefront of developing appropriate measures for their unique circumstances. This in turn requires robust communication systems and broad participatory approaches.

Sustainability Science (SuS) has emerged as a new transdisciplinary academic discipline in the last decade and offers a new, broad-perspective approach to deal with complex, long-term global issues, such as human-induced climate and ecosystem changes. It aims to promote solutions that contribute to rebuilding a sound relationship between human societies and the environment (UNESCO 2017). SuS research is highly integrated, participatory, and solution driven and, as such, is well suited to the study of SEPLS. Using case studies, literature reviews, and SuS analyses, this book explores various approaches to stakeholder participation, policy development, and appropriate actions for the future of SEPLS. It provides communities, researchers, and decision-makers at various levels with new tools and strategies for exploring scenarios and creating future visions for sustainable societies.

This book presents up-to-date experience and analyses of various approaches to the sustainable resource management of SEPLS, primarily based on experiences in Asia.

1.4 Objectives and Organization of the Book

SEPLS are areas in which the majority of inhabitants rely on the well-being of the landscape or seascape ecosystem. By definition, a harmonious relationship between the natural environment and the people who inhabit it is essential to ensure community and environmental well-being as well as to build resilience in the ecosystems that support this well-being. Understanding SEPLS and the forces of change that can weaken their resilience requires the integration of knowledge across a wide range of academic disciplines as well as from indigenous knowledge and experience. Moreover, given the wide variation in the socio-ecological makeup of SEPLS around the world, as well as in their political and economic contexts, individual communities will be at the forefront of tailoring the approaches necessary to their unique circumstances. Including SuS research approaches and integration of indigenous and local knowledge systems and scientific knowledge, this book explores various approaches to stakeholder participation, policy development, and appropriate action for the future of SEPLS. By providing such approaches and tools, this book shows how decision-makers and policy planners can promote robust collaborations between different stakeholders that will contribute to the effective implementation of conservation and development policies for sound resource management in SEPLS.

While Chaps. 2–5 cover specific case studies of land/seascapes in Japan (Chaps. 2–4) and in Bangladesh (Chap. 5), Chaps. 6–8 consist of a series of review articles that explore lessons learned from assessing resilience in SEPLS (Chap. 6), solutions for the sustainable management of SEPLS in Asia (Chap. 7), and the effectiveness of biodiversity science–policy interfaces (SPIs) from local to global scales (Chap. 8). The book highlights various approaches to navigate the sustainable resource management of SEPLS from local to global scales.

Focusing on marine systems, *Chap. 2* examines the interrelationships between sectoral policy interventions by various marine-related ministries and the entire structure of integrated ocean policies. Focusing on the Sekisei Lagoon, Okinawa Prefecture, on the southeastern tip of the Japanese archipelago, this study demonstrates clear structural and functional interlinkages between relevant sectors, further highlighting the close connections between various stakeholders at the ecological level.

Chapter 3 focuses on engaging tourists in addressing the issue of invasive fish species (carp) via a choice experiment survey conducted in Amami Oshima, Japan, to quantify the willingness of tourists to participate in invasive carp removal in nature-based tourism.

Given the rapid urbanization of the Asian region, we also focus on approaches to ensure sustainability in urban contexts. Using an example from the city of Toyama in Japan, *Chap. 4* highlights how urban systems can move toward sustainability using an envisioning method and further identifies pathways to reach such visions. The chapter focuses on participatory approaches in urban contexts and identifies ways of bringing together various perspectives to enable planning.

Chapter 5 highlights how local institutions and traditional knowledge can be incorporated when addressing the sustainable use and conservation of biodiversity, focusing on experiences from the Sunderbans area in Bangladesh.

Chapter 6 dwells on this issue as it narrates experiences from the Satoyama Initiative in the development and use of indicators of resilience in SEPLS in different regions of the world. This indicator toolkit is being used to assess, consider, and monitor the circumstances of a landscape or seascape, identifying important issues and ultimately improving their resilience.

Chapter 7 identifies various categories of solutions for the sustainable management of SEPLS based on the experiences of partners from the South, East, and Southeast Asian countries of the International Partnership for the Satoyama Initiative.

Chapter 8 provides a review of the effectiveness of different biodiversity SPIs, which play a vital role in navigating policies and actions with a sound evidence base. Based on a systematic review of 96 SPI studies from local to global scales, this chapter examines the SPIs in terms of their perceived credibility, relevance, and legitimacy.

Chapter 9 consolidates Chaps. 2–8 to identify key messages and future actions to improve the science–policy–society interface for SEPLS, including future research directions.

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