Chapter 9

Synthesis: Managing Socio-ecological Production Landscapes and Seascapes for Sustainable Communities in Asia

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Abstract While Chaps. 2–5 covered specific case studies of landscapes and seascapes in Japan (Chaps. 2–4) and Bangladesh (Chap. 5), Chaps. 6–8 consisted of a series of review articles on sustainable management approaches relating to land/seascapes that explored lessons learned from assessing resilience in socio-ecological production landscapes and seascapes (SEPLS) (Chap. 6), solutions for sustainable management of SEPLS in Asia (Chap. 7), and the effectiveness of biodiversity science–policy interfaces (SPIs) from local to global scales (Chap. 8). These chapters are summarized here according to their objectives, materials/study sites, methods/tools, spatial scales, and key actors. Then, the implications for the United Nations Convention on Biological Diversity (CBD) Post-2020 Global Biodiversity Framework are discussed using key leverage points of transformations toward sustainability identified by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment: (1) visions of a good life; (2) total consumption and waste; (3) values and action; (4) inequalities;

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(5) justice and inclusion in conservation; (6) externalities and telecoupling; (7) technology, innovation, and investment; and (8) education and knowledge generation and sharing.

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

9.1 Summary of the Book

Broadly, this book highlights various approaches to achieving the sustainable use of resources and development for socio-ecological production landscapes and seascapes (SEPLS) from local to global scales. While Chaps. 2–5 covered specific case studies at landscapes and seascapes in Japan (Chaps. 2–4) and Bangladesh (Chap. 5), Chaps. 6–8 consisted of a series of review articles that explored lessons learned from assessing resilience in SEPLS (Chap. 6), solutions for sustainable management of SEPLS in Asia (Chap. 7), and the effectiveness of biodiversity science–policy interfaces (SPIs) from local to global scales (Chap. 8). These chapters are summarized in Table 9.1 according to their objectives, materials/study sites, methods/tools, spatial scales, and key actors.

Focusing on the Sekisei Lagoon, Okinawa Prefecture, at the southeastern tip of the Japanese archipelago, Chap. 2 examined the inter-relationships between the sectoral policy interventions by various marine-related ministries and the entire structure of the integrated ocean policy. This study developed the SES schematic, which summarized and visualized the main ecosystem structures, functions, use types, and stakeholders relating to the lagoon. This SES schematic can be used as a boundary object to facilitate knowledge exchange between various stakeholders, including policy makers, practitioners, and researchers, to share a common understanding of the current situation, and to co-create policy interventions for sustainable uses of not only the Sekisei Lagoon but also other types of ecosystem or natural capital.

Chapter 3 focused on quantifying the willingness of tourists to participate in invasive carp removal in nature-based tourism in Amami Oshima, Japan. The study found that most tourists would avoid participating in carp removal activities as a tour option without any financial discounts but that over one third of tourists were willing to work for carp removal based on their own motivations. This result suggests that tourists could play an important role in invasive alien species management.

Using the example of the city of Toyama in Japan, Chap. 4 focused on a participatory approach of backcasting scenario-making to identify ways of bringing together various perspectives for sustainable urban planning. The chapter concluded that, when governed in certain ways, citizen participatory approaches can realize a fairly good balance between diverged processes and converged outcomes of backcasting scenario-making on the issue of urban sustainability transitions.

Chapter 5 highlighted how local institutions and traditional knowledge can be incorporated when addressing sustainable use and the conservation of biodiversity, focusing on experiences from the Sundarbans area in Bangladesh. Following MEB approaches, the chapter concluded that human sociality-based conservation

Table 9.1 Objectives, materials, methods/tools, spatial scales, and key actors in Chaps. 2–8

Chapter	Objectives	Materials/study sites	Methods/tools	Spatial scale	Key actors
Chapter 2	Mapping the policy interventions on marine social-ecological systems	A case study of the Sekisei Lagoon, Southwest Japan	The Social-Ecological Systems (SES) schematic: an integrated diagram of the inter-relationships between the main ecosystem structures, ecosystem functions, ecosystem use types, and stakeholders	Local scale	Includes central and local governments, fishermen, fish processors, marine cultural services users, and marine energy/resource developers
Chapter 3	Evaluating tourist opinions concerning participating in invasive carp removal in nature-based tourism	An experimental survey in Amami Oshima, Japan (343 questionnaires returned by mail)	A choice experiment on canoe tours to evaluate tourists' willingness to pay for tour options as a means of promoting canoe tours	Island scale	Tourists, tour operators, and the local government
Chapter 4	Backcasting scenario-making for sustainable urban transformation	A case study in Toyama, Japan	Backcasting scenario-making via a citizen participatory workshop	Local (city) scale	Citizen participants
Chapter 5	Proposing actions and policy alternatives to reverse the process of degradation and to move toward transformative harmonious human–nature interactions	A case study of the Sundarbans in Bangladesh	A conceptual framework of SEPLS, human sociality, and sustainability Multiple evidence-based (MEB) approaches	A transboundary mangrove ecosystem on the great delta of the Ganges	Indigenous peoples and local communities (IPLCs), property right owners, governments, factories, and shrimp cultivators

(continued)

Table 9.1 (continued)

Chapter	Objectives	Materials/study sites	Methods/tools	Spatial scale	Key actors
Chapter 6	Lessons from “Indicators of Resilience in SEPLS”	A total of 34 landscapes and seascapes around the world	The indicators of resilience in SEPLS (20 resilience indicators)	Local (community) scale	Local community, indigenous and local knowledge holders, local governments, and policy makers
Chapter 7	Reviewing place-based solutions for conservation and the restoration of social-ecological production landscapes and seascapes in Asia	A total of 88 case studies from the International Partnership for the Satoyama Initiative (IPSI) in the South, East, and Southeast Asian regions	A societal-based solution scanning approach	From local to national scales	Academia, public sector, community, and non-governmental (civic and private sectors)
Chapter 8	Reviewing the effectiveness of biodiversity SPIs	A total of 96 SPI studies worldwide	Systematic literature review Key features of SPIs	From local to global scales	Government and academia as facilitators of SPIs

practices positively impact resilient indicators and help achieve the Aichi Biodiversity Targets.

Chapter 6 examined applying the resilience assessment process using an indicator-based approach at 34 sites (communities) of SEPLS in different regions of the world. The measurement criteria are defined by individual communities, and therefore, the outcomes are specific to those communities when understanding the multiple aspects of resilience and changes over time and identifying important issues for improving the resilience of a community. The most prominent benefit found when using the indicators is their value as a convening tool, bringing together multiple stakeholders in a landscape or seascape.

Chapter 7 identified various categories of place-based 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 Satoyama Initiative (IPSI). Sharing knowledge of various place-based solution types in different social-ecological contexts helps provide more purposeful and deliberate designs of SEPLS with multiple benefits.

Chapter 8 reviewed the effectiveness of biodiversity SPIs by examining the different features of effective SPIs, including capacity building, trust building, adaptability, and continuity. The chapter concluded that effective, interdisciplinary SPIs and timely and relevant inputs for policymakers are required to ensure more dynamic, iterative, and collaborative interactions between policymakers and other actors.

9.2 Implications for Transformative Changes toward Sustainability

The 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 through extensive efforts that foster transformative change. Transformations toward sustainability can be triggered by following key leverage points: (1) visions of a good life; (2) total consumption and waste; (3) values and action; (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). Regarding these leverage points, Table 9.2 summarizes relevant approaches and insights linked to these leverage points as highlighted by the different experiences captured in this book. The Convention on Biological Diversity (CBD) has also been advocating the need to have a systems approach to address conservation and human well-being

Table 9.2 Leverage points and relevant approaches/insights provided by the book

Leverage points	Relevant chapters	Relevant approaches and insights from the chapters
(1) Visions of a good life	Chapters 4 and 5	<ul style="list-style-type: none">– Participatory approach of backcasting scenario-making (Chap. 4)– MEB approaches (Chap. 5)– Importance of IPLCs in the conservation and management process (Chap. 5)
(2) Total consumption and waste	Chapters 2, 3, and 6	<ul style="list-style-type: none">– SES schematics can holistically summarize the main ecosystem structures, functions, use types, and stakeholders (Chap. 2)
(3) Values and action		<ul style="list-style-type: none">– Perception of nature-based tourism for the removal of invasive species (Chap. 3)– The resilience indicator toolkit approach helps communities to define their aspirations, take stock of their ecosystem integrity and resources, and identify strategies to achieve goals under indicators that are defined by the community and suited to their context (Chap. 6)
(4) Inequalities	Chapters 6, 7, and 8	<ul style="list-style-type: none">– The resilience assessment includes indicators for governance and social equity such as social equity (including gender equity) (Chap. 6)
(5) Justice and inclusion in conservation		<ul style="list-style-type: none">– The inclusion of community-based mapping exercises into resilience assessment workshops (Chap. 6)– Inclusion is one of the subcategories under institutional and governance solutions (Chap. 7)– Credibility, relevance, and legitimacy of SPIs (Chap. 8)– Inclusion of policy perspectives into research projects (Chap. 8)
(6) Externalities and telecoupling	Chapter 2	<ul style="list-style-type: none">– SES schematics can capture externalities and telecoupling by covering a wide range of users beyond the target landscapes and seascapes including the transport and energy/resource development sectors (Chap. 2)
(7) Technology, innovation, and investment	Chapters 5 and 7	<ul style="list-style-type: none">– Innovation and diversification of livelihood patterns including innovative techniques in agriculture (Chap. 5)– Technological solutions are one of the key solution types to reduce the harmful impacts of various drivers of ecosystem change, as well as underinvestment in the development and diffusion of technologies, and could increase the efficiency of resource or ecosystem use (Chap. 7)
(8) Education and knowledge generation and sharing	Chapters 2 and 7	<ul style="list-style-type: none">– SES schematics can visually facilitate role sharing and knowledge sharing between different relevant stakeholders across scales (Chap. 2)– Knowledge and cognitive solutions are another key solution type to address insufficient knowledge or the poor use of existing knowledge concerning ecosystem services and addresses information gaps and incorporates other forms of knowledge and information (Chap. 7)

needs and has been emphasizing the need to embark on transformative change and manage transitions toward sustainable pathways (CBD 2017, 2018).

9.3 Afterword: Future Research Directions

This book presents contemporary experiences and analyses of community-based approaches to the sustainable resource management of SEPLS primarily based on experiences in Asia. The different cases highlight several pertinent issues regarding land/seascape approaches. First, empirical evidence illustrating the relevance of landscape approaches to the conservation of natural resources, contributions to economies, and sustainable livelihoods is compelling. The landscape approach is by nature an integrated approach that cuts across sectoral divisions and various policy priorities (e.g., environment, rural development, water management, health, and food security) and has a systemic focus on both the ecological and social dimensions within the land/seascape.

This implies that the interconnectedness of natural and human systems is highly entrenched in such areas and that the utilization and management of resources, even if driven by contextual priorities, have certain broad similarities, including those related to maintaining the multifunctionality of the landscape and ensuring a diversity of resources, a diversity of income sources based on primary production and services, and endogenous approaches that integrate traditional and modern practices and knowledge to ensure more sustainable outcomes. However, the experiences related in this book also indicate that sustaining such an ideal and idyllic scenario is fraught with various challenges ranging from policy drivers, changing priorities of the local population, demographic changes, the impact of distant market forces, the erosion of traditional practices, the homogenization of cropping practices, and changes in land use.

Addressing these challenges requires a comprehensive approach beginning with a clear understanding of changes in the natural resources and in the various drivers of change and of the implications for a good quality of life for the population. Possible solutions and pathways for the development that are participatory and inclusive in nature and ensuring a good alignment between macro policy goals and landscape level priorities need to be identified and implemented. New solutions may require the creation of flexible legal frameworks that protects the interests of, and reduces political constraints for, collaborative efforts in land/seascapes (Plieninger et al. 2018). This also implies an enhanced mandate for future research priorities focused on integrated approaches to landscape management to build inventories on the management, natural state, and drivers of change; to develop methodologies that further high fidelity scenarios developed using participatory approaches involving stakeholders on the ground; and to ensure that actions are taken at multiple scales, including local, regional, and beyond, and are aligned with new conceptual and

policy concepts related to nature's contributions to people and sustainable development goals (Saito and Ichikawa 2014; Saito 2017). A global IPBES assessment identified similar gaps in knowledge, research, and resources (IPBES 2019). It is clear from the case studies in this book that it is possible to compare various policy outcomes from real-world experiences. Such experiences also highlight the utility of incorporating other ways of knowing, including data and trends of natural resources as observed by local communities, well-being parameters, and related drivers of change that can enhance existing knowledge of these subjects.

The effectiveness of any policy is reflected in how it is adopted and deployed by the people who are considered the most proximate stakeholders, whether in terms of resource proximity and/or impacts of outcomes. To ensure adoption, it is important that policies are sensitive to the priorities and challenges of such stakeholders. The chapters in this book provide a snapshot of possible approaches to streamline local and mainstream socio-ecological goals. We hope that it will serve to foster more creative thinking and support toward the revitalization of dynamic socio-ecological systems, enabling locally led conservation actions and broad-based development across different regions of the world.

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