

How multiple values influence decisions on sustainable use in socio-ecological production landscapes and seascapes (SEPLS)

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1. Introduction

Changes in land and sea uses are the major drivers of global biodiversity loss (IPBES 2019). To halt biodiversity loss caused by impacts from unsustainable land/sea use practices, it is first necessary to recognise that there are multiple actors who influence the way landscapes or seascapes are used, managed and governed. The priorities of these multiple actors are often diverse, with interactions between differing priorities leading to varied management outcomes. These could be conflicting when the priorities of certain actors dominate during interactions, or when the priorities of some actors are altogether ignored, but surface due to the impacts of decisions on them. The outcomes could also result in cooperation when trade-offs between priorities are identified, negotiated and solutions based on compromise found.

The outcomes—whether conflicting or cooperative—of socio-ecological interactions between different actors have implications for both the sustainable use of resources and human well-being. Not all cooperative outcomes necessarily result in sustainable use and improved human well-being, as the subscription to a particular vision/principle by all relevant actors may result in decisions with negative consequences. Some stark examples include the promotion

of monoculture plantations or widespread high chemical input agricultural practices (Cannell 1999, Shiva 2016).

Therefore, integrating or accounting for multiple values related to nature and its uses while incorporating concepts of well-being, brings to the fore both areas that are contested and those where consensus is possible, and makes the reasons for particular policy and implementation designs visible to larger audiences. The benefits of incorporating multiple values of nature (hereinafter referred as “MVN”) are more easily viewed and are relevant in the contexts of socio-ecological production landscapes and seascapes (SEPLS) that are characterized by multiple actors and where management decisions are influenced by the different actions of respective actors.

Through presenting the experiences of selected IPSI partner case studies in this volume, our focus is to highlight the various ways that multiple actors in SEPLS value nature, how contributions from nature are perceived by these actors, and how this translates to governance of SEPLS, in particular to sustainable use of natural resources, sustenance of biodiversity and ensuring the well-being of different stakeholders in the landscape or seascape. Table 1 gives an overview of the case studies, and Figure 1 illustrates the locations of the landscapes and seascapes covered.

Table 1. Overview of the case studies

Chapter (country)	Title (author)	SEPLS and related values	Decision-making context
Chapter 2 (Mauritius)	Recognising the local values of coastal wetland biodiversity for sustainable economic and livelihood development at Résidences La Chaux 'Barachois', Mauritius (Déja et al.)	Coastal wetlands with traditional <i>barachois</i> coastal lagoons established for fish rearing and segregated from the ocean by permeable stone walls. Highly valued for food and feed, mitigation of natural hazards, medicinal value of coastal vegetation, source of ornament crafts, and recreation purposes.	Abandonment of <i>barachois</i> and increase of waste dumping in lagoons, wetland restoration vis-à-vis natural feed aquaculture enterprise, fragmented governance across ministries and limited government support to on-site management.
Chapter 3 (Ecuador)	Framing cultural ecosystem services in the Andes: <i>Utawallu</i> as sentinels of values for biocultural heritage conservation (Sarmiento and Cotacachi)	The Imbakucha Basin and its watershed include the largest Andean lake in Ecuador and mountain landscapes maintained by ancestral practices of indigenous communities whose livelihoods are associated with their spiritual beliefs and cultural perceptions of nature.	Constructing the narrative for a biocultural approach to conservation of protected areas around the Imbakucha Basin indigenous territory in response to the indigenous people's plea to conserve their sacred sites.
Chapter 4 (Ghana)	Empowering communities for natural resource management: the case of Community Resource Management Areas (CREMA) in Western Ghana (Osei-Owusu and Frimpong)	Community resource management Areas (CREMA) established in high forest zones with mosaics of diverse forest types and agriculture land of mainly cocoa. A Community Biodiversity Value Typology (CBVT) is used to measure multiple values of CREMA relating to consumption, production, naturalistic, aesthetic symbolic, moralistic, educational and training, and ecosystem services.	Understanding the communities' perception of the socio-ecological value of CREMA to better communicate these associated values within the communities and for designing a more robust management system.

Chapter (country)	Title (author)	SEPLS and related values	Decision-making context
Chapter 5 (Colombia)	The San Antonio Forest Key Biodiversity Area Governance Scheme: collective construction based on differences (Quintero-Ángel et al.)	A productive and biodiverse forest landscape with a mosaic of ecosystems and land uses, including villages, crops, forests, pastures and private properties containing luxury country houses and small farms. Stakeholder surveys found nature is perceived as governed spaces for ecological conservation; or as sources of ecosystem services, income sources, life, refuge from city life and well-being.	Protected area corridor, issues in law enforcement, land-use conflicts, habitat loss and water pollution, yet lack of useful information on threats. Thus, need to construct a participatory governance scheme that represents the different visions of nature.
Chapter 6 (Mexico)	Landrace maize diversity in <i>milpa</i> : a socio-ecological production landscape in Soteapan, Santa Marta Mountains, Veracruz, Mexico (San Vicente Tello and Jönsson)	Conserving landrace native maize diversity through cultivation by indigenous people in <i>milpa</i> , a polyculture system practiced on mountainous tropical zones with high humidity, which is representative of Mexican indigenous people's worldviews of nature being important landscapes that encapsulate MVN.	Expansion of hybrid maize cultivation replacing native varieties, adaptation of native varieties to changing climatic conditions and the need for understanding of MVN perceived by the farmers of the <i>milpa</i> production.
Chapter 7 (Spain)	Enhancing communication and co-learning in socio-ecological landscape management through elicitation of local communities' visions and values (Díaz-Varela et al.)	Mid-range mountainous area with priority habitats including raised bogs, blanket bogs and Atlantic wet heathlands, which are developed for traditional use as livestock grazing pastures, resulting in cultural landscapes rich in habitats and endemic species. A difference in perceptions of MVN found conservation agencies more for intrinsic value of ecosystems and local people for instrumental and relational values related to their livelihoods.	European Nature 2000 Network site, communal forest land (MVMC) governed by the MVMC Community Assemblies. Conversational approach needed to resolve conflicts from differing visions, restore common trust and provide a common language.
Chapter 8 (Bangladesh)	"The Sundarbans is our mind": An exploration into multiple values of nature in conversation with traditional resource users (Titumir, Paran and Pasha)	The world's largest single-tract mangrove ecosystem combined with forest, coastal and wetland, enriched with high biodiversity of uniquely adapted aquatic and terrestrial flora and fauna. Direct and indirect use values drawn from indigenous knowledge of traditional resource users (TRUs) whose livelihoods are mainly fishing or collecting wood, honey, shells and crabs.	Sundarbans mangroves declared as an Ecologically Critical Area (ECA), which neglects the rights of inhabitants and is not effectively enforced.
Chapter 9 (Chinese Taipei)	Towards an integrated multi-stakeholder landscape approach to reconciling values and enhancing synergies: a case study in Taiwan (Lee, Karimova and Yan)	Two indigenous settlements located on the east coast of Taiwan along a tropical forest watershed, with the terrestrial Amis community cultivating farmlands in the middle reaches of the watershed, and the rice-cultivating coastal Kavalan community located in the lower reaches of the watershed down to the Pacific Ocean. Both communities shared the same priority for the relational value of nature but lacked a cross-border communication, while supporting local authorities prioritized either intrinsic, instrumental or relational values of nature mainly based on their sectoral goals and lacked a cross-sectoral coherence.	Reconciling socio-ecological value perceptions of multi-interest stakeholders to develop a new cross-border and cross-sector institutional capacity.

Chapter (country)	Title (author)	SEPLS and related values	Decision-making context
Chapter 10 (Uganda)	Direct use values and nutritional potential of selected wild edible plants from Teso-Karamoja Region, Uganda (Ojelel et al.)	Dryland landscape comprised of mainly woodlands, grasslands and shrublands in eight forest reserves and home to 99 wild edible plants. The direct use values of these plants and the nutritional potential of five commonly used species is presented.	Need to conserve wild edible plants which are disappearing from landscapes and for documentation of their associated indigenous traditional knowledge.
Chapter 11 (Philippines)	Re(Connecting) with the Ifugao Rice Terraces as a socio-ecological production landscape through youth capacity building and exchange programs: A conservation and sustainable development approach (Serrano et al.)	A UNESCO World Cultural Heritage site and FAO Globally Important Agricultural Heritage System (GIAHS), the Ifugao Rice Terraces are located on landlocked and generally mountainous landscape characterized by thick forests, creeks and streams that are tributaries to major rivers. Transferring of associated economic, cultural and ecological values derived from rice terraces to youth is priority to ensure sustainable management.	Although designated as a UNESCO World Heritage site and FAO GIAHS, the rice terraces are facing pressures of insufficient management due to abandonment, unregulated tourism activities and out-migration of youth. Thus, there is an urgent need to document, educate and disseminate the landscape's associated values so as to build human capacity for management and create sustainable livelihoods.
Chapter 12 (India)	Mainstreaming Community-Conserved Areas (CCAs) for biodiversity conservation in SEPLS - A case study from Nagaland, India (Edake, Sethi and Lele)	Located at the heart of Nagaland at an altitude of 1,900 m, the area is characterized by the Tizu River and sub-tropical wet hill forest primarily overlapping with the sub-tropical pine forest that harbors many endangered and threatened species of the Indo-Burma hotspot. Villages of the Sema tribe, whose livelihoods are mainly shifting cultivation of timber, medicinal plants and non-timber forests products, also practice farming for subsistence and wildlife hunting. Traditional intimate relationship with nature exists based on spiritual foundation of the interconnectedness of God, people and nature.	The Nagaland state, where the majority of natural habitats are placed under private or communal lands overseen by village councils, is facing challenges of unregulated resource overexploitation including excessive wildlife hunting. Need to link the CCAs, revive traditional conservation practices, develop community-based ecotourism initiatives and formalize and mainstream a network of CCAs.

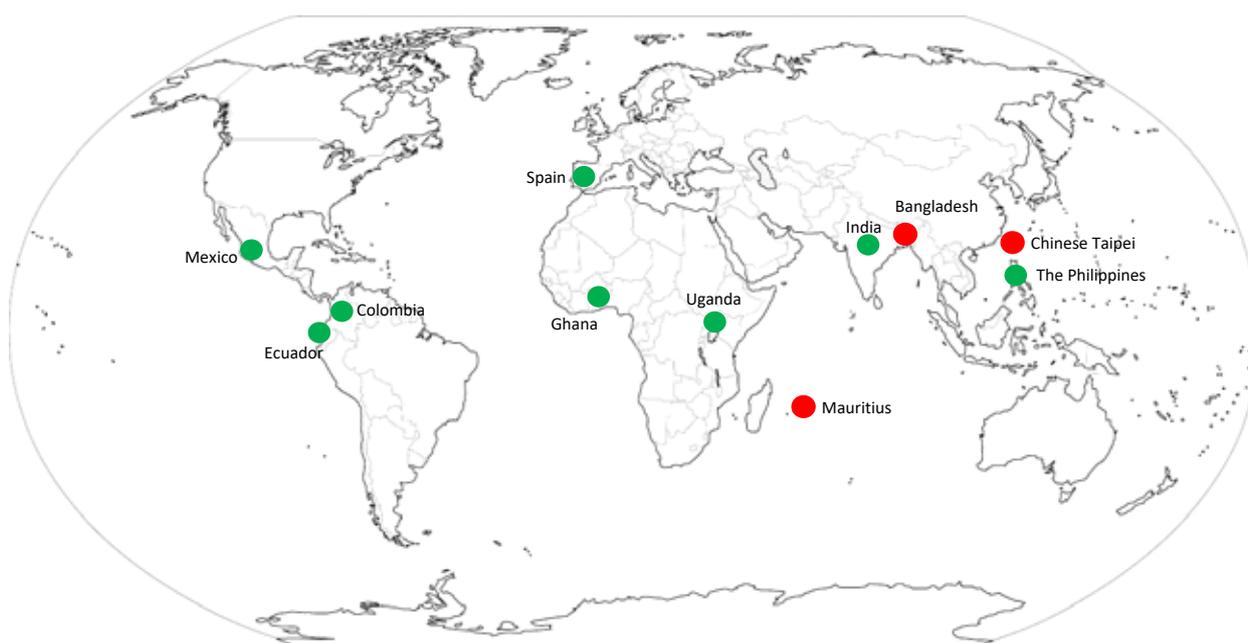


Figure 1. Locations of the case studies presented in the Satoyama Initiative Thematic Review Volume 5 (green: landscape; red: mixture of landscape and seascape) – 4 in Asia, 3 in Africa, 1 in Europe, 3 in Central and South America.

1.1 Multiple Values of Nature (MVN)

Recently, there has been a growing acknowledgment of the need to bring in the perspectives of all possible stakeholders and actors who impact (and conversely are impacted by) socio-ecological systems, resulting in different outcomes (IPBES 2016; Pascual et al. 2017). The Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) is currently undertaking an assessment (“Methodological assessment regarding the diverse conceptualization of multiple values of nature and its contributions, including biodiversity and ecosystem functions and services”) to explore ways to incorporate multiple values in valuation methods and approaches for decision-making vis-à-vis nature and nature’s contributions to people (NCP). The NCP concept is an extension of the ecosystem services concept whereby nature is seen as not just commodified services for human consumption, whether provisioning, regulating or others, but also as providing benefits that could overlap or fall between these categories. Therefore, a pluralistic valuation and assessment of these benefits is called for (Pascual et al. 2017). Such a nuanced approach to integrating multiple conceptualizations of nature requires a new narrative accounting for the diverse benefits that humans derive from nature. Towards this, the IPBES has clarified a few basic concepts that are highlighted below:

1.1.1 Dimensions of ‘values’

The word “value” has interrelated but distinct dimensions and is understood and analyzed differently in the biophysical sciences, social sciences, economics, and from indigenous and local knowledge perspectives. Moreover, the word “value” has different meanings. It could be a *principle or core belief* associated with a general worldview or local cultural context (e.g. living in harmony with nature vis-à-vis nature as a provider of inputs required for a good quality of life) or a *preference*, which is a choice of a particular state over others (e.g. monocrop plantations to mosaic landscape use). It could be considered the *importance* of something for itself or others, now or in the future, regardless of proximity (e.g. sacred value of a species in a landscape), or be understood as a *measure* where nature’s contributions to people (NCP) can be directly quantified and monitored in biophysical or

economic terms (e.g. economic value of timber) (Pascual et al. 2017, see Fig. 2). Often there is a policy tendency for this measurement to be translated to monetary terms, and the economic value manifested by the market dynamics of global trade or payments for ecosystem services (PES).

1.1.2 Types of ‘values’

Values are of different types:

- Values can be non-anthropocentric, such as **intrinsic values**, which are independent of any human experience and evaluation. An intrinsic value is viewed as an inherent property of the entity (e.g. an organism) and not ascribed or generated by external valuing agents, such as human beings.
- They can also be anthropocentric, such as **instrumental values**, which often relate to nature’s contributions to people and refer to the value attributed to something as a means to achieve a particular end.
- Another type of anthropocentric value can be **relational values**, which reflect symbolic relationships with natural entities. They reveal elements of cultural identity, social cohesion, social responsibility and moral responsibility towards nature.

It should be noted, however, that one same entity can be the object of different values. For instance, maize that is grown for human consumption can have an intrinsic value, because it contributes to genetic biodiversity. It also has an instrumental value to those consuming it, as it provides them nutrition. Consuming and producing maize may also be the source of a relational value for people, due to the crucial role of maize in some cultures (Chapter 6). Furthermore, maize could also become part of the agrobiodiversity related with ritual and spiritual observance (Chapter 3).

1.1.3 Types of valuation methods

Taking into account the plurality of worldviews and the diversity of values, valuation methods should be multidimensional and multifaceted, integrating methodologies where necessary, drawing from multiple data sources over time to provide more comprehensive assessments and contextual explanations for how and why

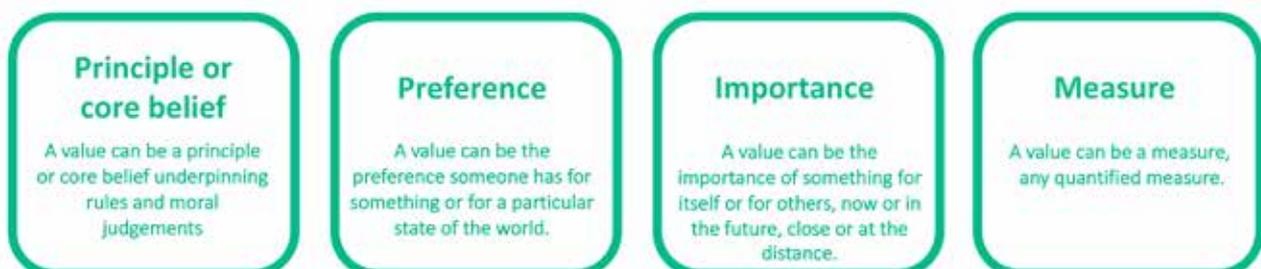


Figure 2: Dimensions of ‘values’ (IPBES) (Pascual et al. 2017)

values are perceived, formed and changed. A comprehensive valuation could include a combination of unidimensional methods of valuation and/or adopt integrated approaches in capturing plural values. Unidimensional methods of valuation have specific foci and elicit specific values such as:

- **Socio-cultural** – eliciting values of nature held by social groups and focusing on the role of nature in culture and social reproduction
- **Economic** – eliciting values held by individuals through evaluating the price of given aspects of NCP
- **Health** – valuation focusing on the effects of NCP on human health
- **Indigenous and local knowledge/Holistic valuation systems** – emphasising relationships and dynamics established among people and nature regarding the regeneration or reproduction of the systems of life of Mother Earth for living well; these include indigenous valuation approaches
- **Biophysical** – usually a numerical amount denoted by a magnitude, quantity, or number determining allegedly objective measurements of the ecological value of NCP

Plural valuation methods, on the other hand, integrate various foci, through identifying the different types of values present in a given context. This is the task that has been achieved in the empirical chapters presented in this review.

2. SEPLS and Multiple Values

SEPLS are areas with “dynamic mosaics of habitats and land and sea uses where the harmonious interaction between people and nature maintains biodiversity while providing humans with the goods and services needed for their livelihoods, survival and well-being in a sustainable manner” (IPSI Secretariat 2015). Six key perspectives have been identified as necessary to the promotion of SEPLS: (1) resource capacity within the carrying capacity of the environment; (2) cyclic use of natural resources; (3) recognition of the value and importance of local traditions and cultures; (4) multi-stakeholder participation and collaboration; (5) contributions to socio-economies; and (6) enhancing community resilience. Based on these characteristics, SEPLS’ vision of multiple functions of a landscape or seascape and its use is determined in alignment with these functions through promoting an integrated approach of multi-stakeholder co-management and benefit-sharing arrangements. Even while equity is not guaranteed across SEPLS, they certainly provide the opportunity for different stakeholders to pursue and sustain fulfilling livelihoods that are pegged to the sustained availability of resources and various ecosystem functions.

This then translates into improved well-being outcomes, such as access to food security, health and energy security and cultural needs. It therefore follows that in order to better understand the integrity of a socio-ecological system with multi-functional uses such as a SEPLS, a more plural and inclusive approach that accounts for the well-being priorities of different constituents of the system is needed.

2.1 Multiple values in SEPLS

To highlight the diversity of values that may be contained and further prioritized in a SEPLS, we mapped the prominent values identified across the 11 different case studies in this volume (SITR vol. 5). During the case study workshop, authors of the respective chapters were requested to identify three types of core values from their respective SEPLS, i.e. *intrinsic, instrumental and relational values*. These values were further segregated into (1) Principles (e.g. core beliefs), (2) Importance (3) Preferences and (4) Measures, broadly outlining the dichotomy between use and non-use values. To recognize these multiple, plural values—though there is overlapping to certain extent—we adopted the above approach where authors provided case-specific examples and narratives under each column, classifying most commonly identified values under 12 segments. Thereafter, an attempt was made to quantify the diversity of values from SEPLS, simply by counting the frequencies of narratives identified under each component (see Fig. 3).

As such, and quite expectedly, instrumental values, especially in the categories of *importance* and *measures*, were found to be strongly recognized within the SEPLS. These were enriched by diverse stakeholders’ perceptions and multiple uses of production landscapes, where landscape productivity and functions (e.g. fish production, rice cultivation, water retention) are directly linked with human well-being and sustenance. Moreover, instrumental values within NCP are often quantified through monetary indicators of consumption, which contribute to local livelihood and support income generation, and thereby, are easily recognized. The appreciation of relational values, in particular, *principles*, or core beliefs that underline the traditional and customary relationship between humans and nature, followed as the next most recognized. A number of case studies reported sacred sites, religious beliefs, customary rituals, indigenous/local knowledge and practices which contributed to the sustainable management of SEPLS (Chapters 3, 6, 12) with non-consumptive uses. While these values cannot be quantified in economic terms, their recognition is vital. As argued by Christie et al. (2019), both instrumental and relational values directly contribute to quality of life, which possibly explains the overwhelming recognition of these values. Contrarily, intrinsic values, which are inherent in nature and independent of human

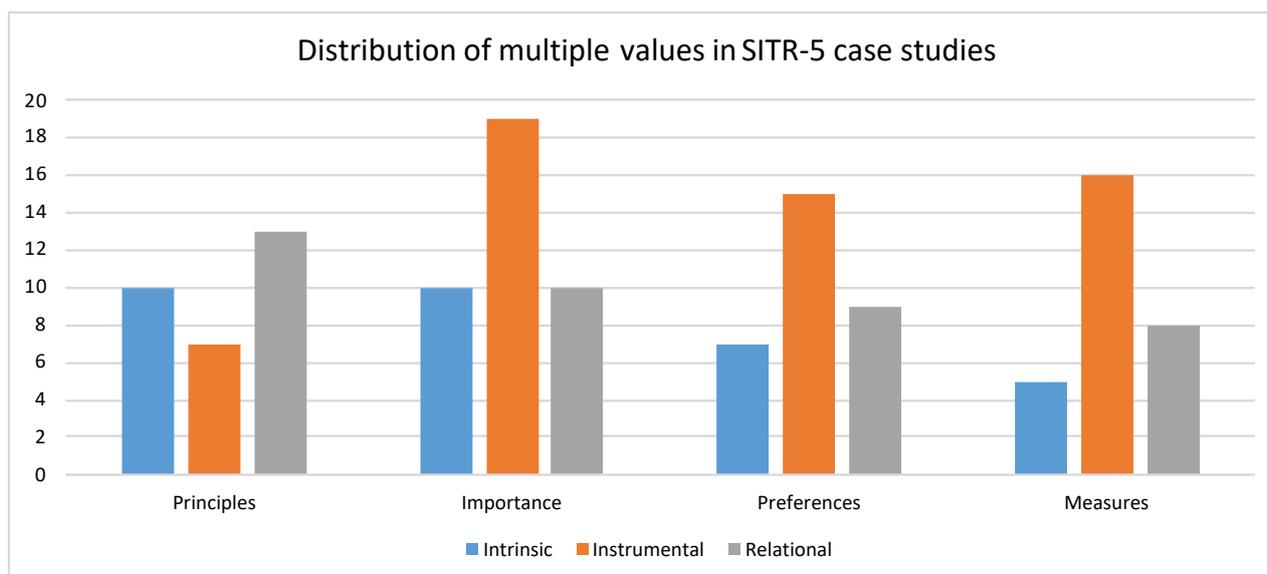


Figure 3: Tentative distribution of different values identified during the case study workshop

experience and evaluation, found lesser mention. One possible reason is the broadness of the concept, which, at times, is difficult to conceive at the scale of a SEPLS. Nevertheless, authors provided several important narratives about intrinsic values of SEPLS, including perspectives on dimensions of planetary awareness and related worldviews (e.g. perceiving conservation in terms of global carbon storage or biodiversity conservation) and cultural context (iconic values, heritage areas which are inherent values of SEPLS and not necessarily dependent upon local community experiences and uses). Furthermore, since SEPLS are primarily utilitarian spaces, relational and instrumental values tend to have primacy over inherent values.

As argued by Pascual et al. (2017), NCP are associated with a wide range of values. Some of these values, nonetheless, depend on individual and/or collective experiences and the way people interpret nature and its contributions. Within the case studies, the representation of MVN are captured through analyzing different narratives provided by the authors during the case study workshop. In brief, these narratives range from general appreciation for nature and nature's biophysical and economic contributions, to symbolic associations, traditional practices and dependence on nature for goods and services. To understand the diversity of values, we summarize the key narratives from different case studies in Figure 4 and in the following paragraphs.

2.1.1 Instrumental values of SEPLS

The Sitr case studies identified a large number of instrumental values of SEPLS, which can be roughly characterized as consumptive and non-consumptive

uses of nature and nature's contributions. This, in other words, refers to the human use of natural resources – including flora, fauna, water, and soil, to the benefit of the communities within the SEPLS. Almost all the case studies recognized the values of different productive landscapes, including forests, agricultural and coastal areas, either under *importance* or *preferences*. Examples include provisioning of food (Chapters 6, 7, 10, 11, 12), fuelwood, water (Chapters 3, 5, 7), fisheries (Chapters 2, 9), wild food and medicines, education and tourism (Chapters 9, 12). In general, there is strong overlap between *importance* and *preferences*; however, authors argue that some of these NCP, e.g. locally grown organic food (Chapter 3) and locally produced honey (Chapter 7), are favored over market or farm-based supplies. Similarly, some studies further mention the *preference* of particular production landscapes, e.g. rice terraces (which produce food and tourism revenue) over forests (Chapter 11). Importantly, most of these values are easily quantifiable, either in economic or biophysical terms, and therefore also find mention under *measures*. Examples include quantity of fish catch, food production, water quality and quantity, and species richness, which also determine the productive functions of SEPLS.

2.1.2 Relational values of SEPLS

Relational values with nature are dependent on cultural, community, or personal identities. Therefore, these values are unique and place-specific, unlike instrumental values. Authors identified a number of relational values across the case studies, often citing different community experiences, customary practices and symbolic/iconic values of nature. Within the identified relational values, those related to

principles account for a large portion, including forest rights and the right to self-determination of indigenous communities (Chapters 3, 12), sense of place/place-attachment (e.g. ancestral land, heritage, Chapters 3, 5, 7, 11), and sacred landscapes and religious significance (Chapters 11, 12). At the same time, authors reported on the *importance* of relational values in spiritual well-being (Chapters 3, 11), quality-of-life and way of life (Chapters 2, 3), place-attachment (or place rootedness) and traditional knowledge (Chapters 5, 6), all of which are highly valued by local communities. With regards to *preferences*, studies mentioned the aesthetic qualities of SEPLS, including opportunities for recreation (e.g. Chapters 2, 7), spiritual satisfaction (Chapters 11, 12) and sense of heritage (Chapter 3), as important values that are preferred by the communities, in contrast to an altered state. It is, however, difficult to quantify relational values through an appropriate non-economic measure. Authors, nonetheless, identified some indirect ways (proxy) to measure relational values.

These include, but are not limited to, transfer of traditional knowledge (Chapter 11), number of tourists visiting SEPLS (Chapter 3), and number of young people returning to the SEPLS (Chapter 9).

2.1.3 Intrinsic values of SEPLS

Intrinsic values of SEPLS are values that are inherent to a particular landscape, or a combination of mosaic landscapes, that are not related to any human values involved in the landscape. These values are often articulated by people however to accommodate several planetary concerns, worldviews and general perceptions. For example, healthy forests have a inherent value, but are considered by stakeholders to contribute to biodiversity conservation and maintain the global climate. Within the case studies, we observed a general and homogeneous mention of intrinsic values. For instance, biodiversity conservation was referred to by several authors as an intrinsic value of their respective

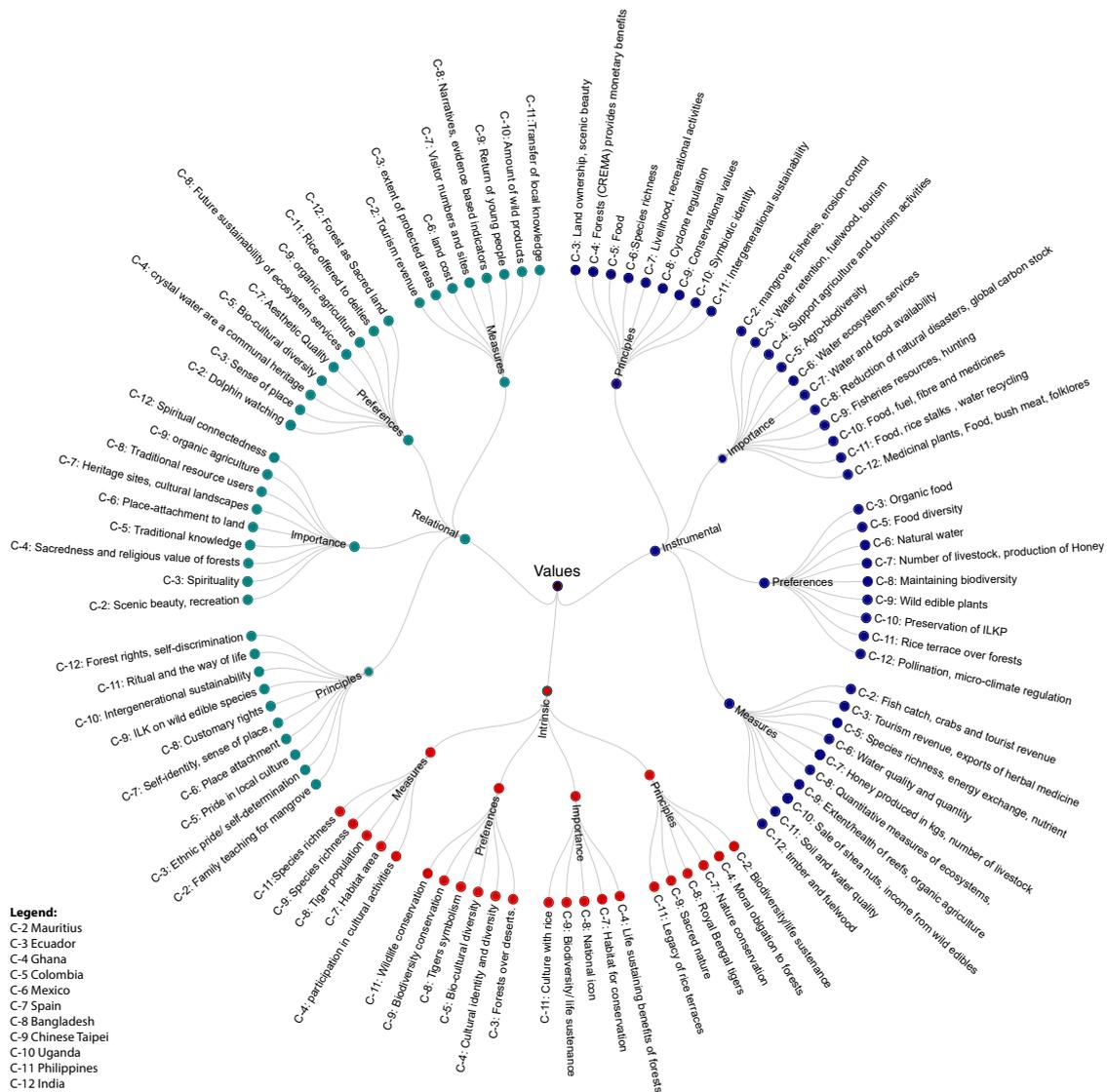


Figure 4: Diversity of Values in SEPLS captured through case studies of SITR Volume 5

SEPLS, which falls under *principles, measures* as well as *importance* (Chapters 3, 6, 8, 9, 11). An example provided in Chapter 8, identifies the protection of Sundarban mangroves in Bangladesh as facilitating conservation of the tiger, which is both a national icon and globally threatened species. Similarly, in Chapter 11, authors mention the legacy of rice terraces and their positive impacts on culture and life, which are certainly not limited to the SEPLS, but also contribute to the larger bio-cultural diversity of the region and the country. The identified intrinsic values, however, tend to be instrumental and relational values of SEPLS. Nevertheless, this value identification exercise shed light on how the understanding of multiple values of nature can directly contribute to decision-making and sustainable management of SEPLS.

2.2 Sustainable use and multiple values in SEPLS

Sustainable use of resources in SEPLS is typically influenced by the actions of different stakeholder groups that operate or exert influence in the area; the types of decisions that are made on use and management of the landscape or seascape; the presence of formal and informal institutions that enable inclusive governance and bridging between divergent perspectives and identify least harmful trade-offs; and the socio-political contexts wherein the stakeholders operate, including legal frameworks and power dynamics of political ecology at various levels of governance. A schematic representation of this interplay of factors is illustrated below in Figure 5.

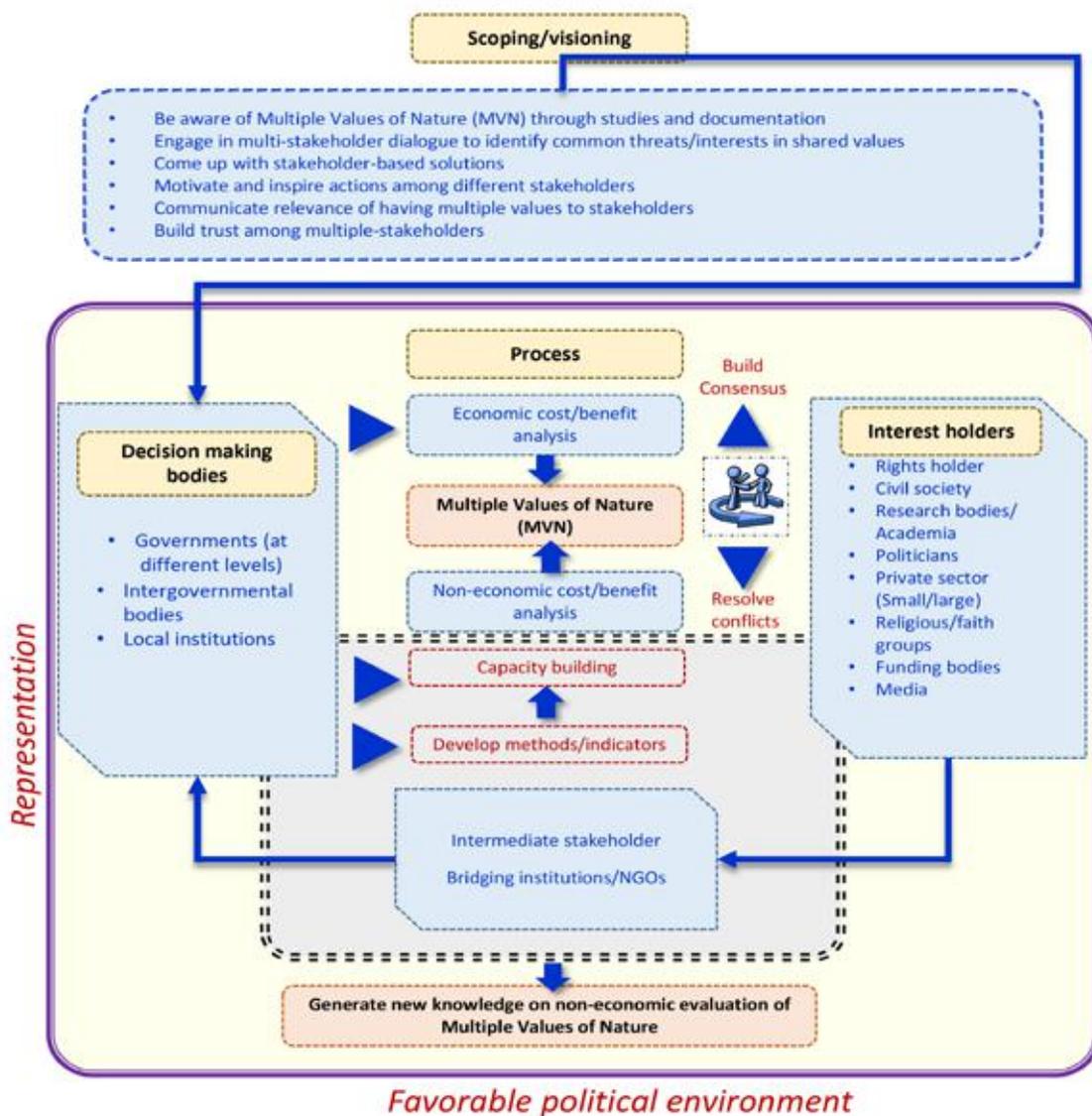


Figure 5: Schematic representation of process that could be adapted to ensure the integration of multiple of values in decision-making related to SEPLS

The figure highlights that within a socio-ecological context, and within particular socio-political environments, several interest holders are present, some being direct stakeholders, while others have an influence on decisions made within the system. These actors interact in various ways and express their priorities to use and manage resources and the landscape, leading to consensus-based outcomes or conflicts. In either case, resolution towards a cooperative outcome is desired and requires active involvement of dominant decision-making bodies (from customary bodies to local governments to higher levels of governance). The case study experiences point out that in order to ensure desirable outcomes for both biodiversity and people, it is essential that these decision-making bodies represent multiple interests and ensure the full and effective participation of all relevant interest holders in the consensus-building process. Acknowledging that this is not common practice, it is clear that appropriate methodologies to capture multiple values of nature are required, and the capacities of those involved in negotiations and decision-making processes need to be built to undertake such plural approaches to decision-making on use of SEPLS. Affinities and congruences are needed also with the decision-taking bodies at the local level, who have to strongly back the making of decisions in faraway legislative contexts and adapt them to situated actions.

3 Stakeholders and Decision-Making Contexts In SEPLS

Decisions relating to use and management of SEPLS are made as a result of different interactions between stakeholders – either hierarchical when dominant actors prevail, or deliberative where more inclusive interactions result in decisions reflecting the concerns from several actors. In the SEPLS context, decisions are made across different levels – administrative, geographical and cultural – by stakeholders who share interests and concerns on either governance, biophysical or social issues (see Fig. 6).

3.1 Decision making process

The process of decision-making, however, is not a neatly boxed process and is often iterative and influenced by several dynamic factors that change over time. Decisions may be made for different time scales that reflect visions for well-being and occur within particular social, political and legal contexts – this implies that if the law decrees a particular form of cultivation, or if there is a situation of political unrest, the choice of production methods would be in line with these contexts, rather than aligned to ecological principles or social preferences of the local community. Unlike climate factors that are changing at planetary scale, the political, religious or economic climates are changing sporadically or ephemerally (Sarmiento 2017) which affects the micro-economic dynamics on the local markets. This reaffirms the need to ensure context specific planning (whether economic or landscape planning) with sufficient focus on bio-cultural specificities. On the positive side, social preferences have resulted in diversity and specialization in produce and products from SEPLS (Gu & Subramanian, 2012; Sitr Vol. 3, UNU-IAS & IGES 2017; Sitr Vol. 5 case studies). At the local level, decision-making is influenced by cultural factors and by concerns of income and various development needs (Sitr Vol. 4, UNU-IAS & IGES 2018; Sitr Vol. 5 case studies). When government policies, social preferences and the priorities of local populations are in accordance, evidence shows that the likelihood of achieving sustainability-related goals of economic prosperity, social equity and conservation of natural resources is higher.

3.1.1 Decision-making contexts

The decision-making contexts identified from the case studies include:

1. Formal or informal decision-making processes
Decisions are often made through formal or informal institutional processes, involving local/ traditional

Administrative	Geographical	Cultural
<ul style="list-style-type: none"> • Global (every country) • International (combination of some countries) • Regional (countries located in same geographical region) • National • Sub-national /Provincial / Prefectural • Local – household, clan/tribes 	<ul style="list-style-type: none"> • Watershed • Landscape • Seascape 	<ul style="list-style-type: none"> • Ethnicity • Tribal • Historical

Figure 6. Levels of decision-making in SEPLS management: Decision-making contexts and stakeholder typology

Table 2: Stakeholders and interest holders in management of SEPLS

Governance	Economic Actors	Ownership and rights holders	Thought leaders	Influencers
<ul style="list-style-type: none"> Regional governments (e.g. EU) National governments Sub-national / Local governments Politicians 	<ul style="list-style-type: none"> Producers / Farmers, Forestry, Fishers Consumers Urban residents Business sector/ Corporations Tourism sector 	<ul style="list-style-type: none"> Local communities Indigenous peoples Landowners Local schools/ Children 	<ul style="list-style-type: none"> Chiefs and elders (traditional leaders) Religious and spiritual groups NGOs Research institutions/ Universities International Organizations 	<ul style="list-style-type: none"> Media Women's groups Youth Culinary chefs (Food culture) Cultural Sector – Artists, Musicians, Fashion Designers, Dancers

leadership and/ or governments. Depending on the strength of institutions and the spatial scale in which they operate, the process may be top-down (led by national or sub-national policy bodies) or bottom-up (led by local institutions), and sometimes involve a mix of legal and customary measures to ensure compliance (Chapters 4, 7, 9, 12).

2. Long-term or short-term focused
Decisions are being made to meet short term objectives, that often focuses on economic interests but less on socio-ecological resilience. Decisions are also being made with a view to ensure long term sustainability of activities and resources. The latter is usually the case where both human wellbeing and natural resource use and management are considered together in planning and management with outcomes that target both conservation and development priorities. It focuses on proactive engagement of the communities and various actors in the upkeep of the landscape. As a consequence, there is considerable reflection and investment on capacity development for youth and various actors in appropriate contexts that are sensitive to stakeholder realities (Chapters 3, 8, 11).
3. Identifying leverage points to promote action
In some cases, monitoring of the outcomes of decisions as a continuous process is considered an important aspect of ensuring a dynamic and flexible approach to landscape management. Some approaches include identifying key performance indicators/ goals; ensuring constantly that the interests of various actors are balanced; that local priorities and international goals are coherent and further, investing in advocacy activities to garner support to implement decisions (Chapters 2, 5, 6, 10).

3.1.2 Stakeholders and interest holders in SEPLS

Stakeholders and interest holders in the SEPLS from the case studies of this volume are identified and summarized

as follows (not in any order of importance, nor exhaustive, Table 2):

3.2 How to bring multiple values to decision-making: Reconciling mismatches in values

We identified guiding principles in six mutually-reinforcing tiers that could help bring MVN to decision-making concerning SEPLS, drawing on an analysis of the contents of the eleven case studies, as well as the discussions among the authors and experts during the case study workshop (see Fig. 8). Firstly, it is vital to identify the values of nature that stakeholders share as a common principle (tier 1), which provides the foundation for subsequent actions. Concurrently, and especially when knowledge on MVN is limited, MVN need to be comprehensively documented (tier 2) and shared with key stakeholders (tier 3). Then, stakeholders are able to strengthen collaboration, building on a collective understanding of their common or conflicting interests pertaining to MVN (tier 4). Decision-makers could better understand MVN (tier 5) if they have information on MVN (tier 3) that is specifically and effectively targeted at them, or if they are involved in a collaborative mechanism (tier 4). Landscape institutions (tier 6) that embrace the first five tiers can encourage decision-making that takes fuller account of MVN. Below we describe how these principles and corresponding tools and measures were reportedly useful to address mismatches in the recognition of MVN in decision-making under different contexts (see Fig. 7 and Table 3).

Tier 1. Center on nature's values as a common principle:

Communications centering on the values of nature that indigenous peoples and local communities (IPLCs), decision-makers and other stakeholders share as a common principle reinforce the subsequent five tiers. The rights of 'Mother Nature' codified in constitution in Ecuador and Bolivia enabled policy coordination across ministries. Likewise, the recognition of the notion of 'Mother Earth' embedded in the worldview of IPLCs enables conservation actions that resonate with their own values. In a more practical sense, formal institutions that recognize IPLCs' traditional norms,

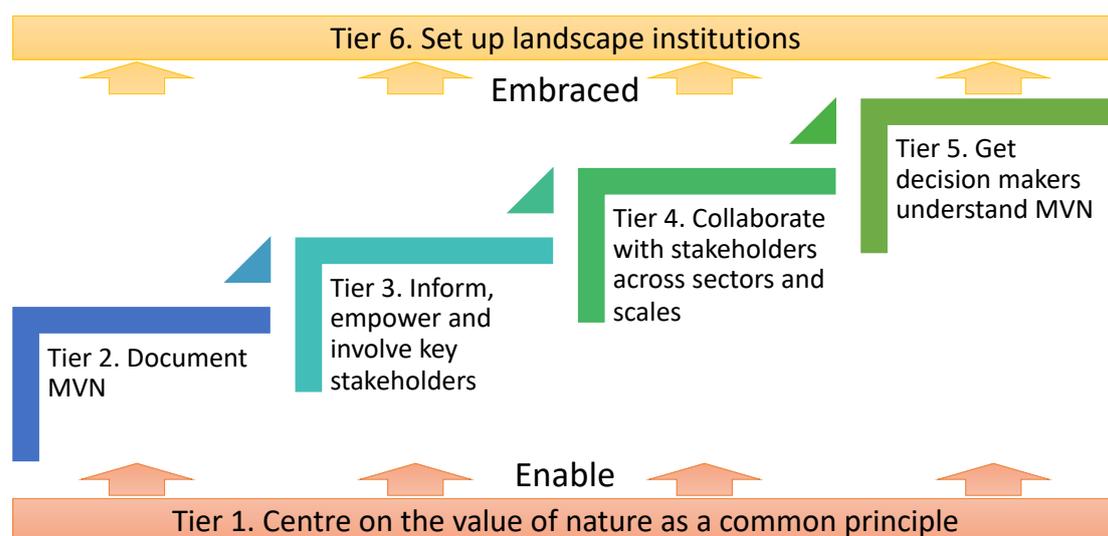


Figure 7. Guiding principles for bringing MVN to decision-making

taboos and customary practices contributing to sustainable land and resource management can encourage IPLCs to become leading actors.

Tier 2. Document MVN: Where information on MVN is not readily available, or the values of one or a few stakeholder groups disproportionately dominate over others in decision-making on SEPLS, it is vital to document MVN as perceived by multiple stakeholders as the basis for informed actions. Often cultural values are vital for IPLCs, but also are implicit and thus tend to be overlooked by decision-makers. Ethnographic or social surveys, as well as ‘people’s biodiversity registers’ (Chapters 4, 10) that record traditional knowledge concerning biodiversity are effective and powerful tools to better understand cultural values. Science and technologies, including economic valuation and laboratory analysis of food nutrition, or multiple evidence-based approaches, can help make such implicit values more explicit and transmissible across stakeholders. The SEPLS Indicators of Resilience are employed to identify multiple values of different landscape components that underpin landscape resilience (Chapter 5).

Tier 3. Inform, empower and involve key stakeholders: Participatory and iterative processes to document MVN (tier 2) can effectively inform, empower and involve key stakeholders. Such a process starts with knowing relevant stakeholders, e.g. through stakeholder mapping or institutional capacity assessment. On that basis, multi-stakeholder value elicitation exercises that involve key stakeholders in documenting MVN help them build collective understanding on their common and conflicting interests in nature’s values (Chapter 3). Participatory biodiversity assessment involving local communities is a useful tool to

document traditional knowledge on species or lands, and thereby to provide communities with an opportunity to rediscover the intangible values of nature. Community-based ecotourism enterprises turn intangible values of nature into tangible ones for local communities through tourists’ payments. Often youth involvement is a key issue for the sustainability of SEPLS, as youth are increasingly leaving SEPLS, mostly in rural settings, for higher education and income in cities (Chapter 11). Tablet-based virtual modules on indigenous people’s life and knowledge, combined with real exchange visits between indigenous and urban youths, are effective to transfer indigenous knowledge and values of nature across generations and spaces.

Tier 4. Collaborate with stakeholders across sectors and levels: Focused efforts to inform, empower and involve stakeholders (tier 3) can lead to their mutually reinforcing relationships. Strategic interventions, such as participatory project appraisals and communication strategies to build mutual trust, are likely to yield enhanced collaboration among stakeholders across sectors and scales (Chapters 2, 4, 5, 9).

Tier 5. Get decision-makers to understand MVN: One way to convince decision-makers on MVN is to involve them in a collaborative scheme (tier 4). It also was found effective to target specific policies or decision-making bodies to influence. Such approaches include continuous dialogue with the government authority that holds the highest stake, e.g. fisheries department for seascape management, and providing an evidence base for formulating a results payment policy. Comprehensive reports on MVN, such as the case studies provided in this volume, can also be useful to make decision-makers understand MVN.

Table 3. Tools and measures that were found helpful to follow the six tiers and the key mismatches addressed, drawing on the cases reported in this volume

TOOLS AND MEASURES	KEY MISMATCHES ADDRESSED
Tier 1. Center on nature's values as a common principle	
<ul style="list-style-type: none"> • Rights of 'Mother Nature' codified in constitution (C-3) • The notion of 'Mother Earth' embedded in indigenous people's world view (C-3, 5, 6) • Reinvigorate traditional norms, taboos and customary practices (C-4, 8, 12) 	<ul style="list-style-type: none"> • Encourage policy coordination across ministries • Connect the principles held by local actors with conservation efforts
Tier 2. Document MVN	
<ul style="list-style-type: none"> • Ethnographic/ethnobotanical/social surveys (C-3, 6, 7, 11); people's biodiversity register (C-12) • Laboratory analysis of wild edible plants (C-10) • Multiple evidence-based approach (C-8) • Resilience assessment (C-5, 12) 	<ul style="list-style-type: none"> • Understand different value perceptions and priorities among stakeholders; increase understanding of cultural values that encompass traditional knowledge and indigenous people's worldview • Provide scientific evidence on the nutritional value of traditional food from the wild • Integrate scientific and traditional knowledge to demonstrate value plurality • Understand the functions and values of different landscape components that underpin landscape resilience
Tier 3. Inform, empower and involve key stakeholders	
<ul style="list-style-type: none"> • Stakeholder mapping (C-7); institutional capacity assessment (C-9) • Multi-stakeholder value elicitation exercise (C-3, 4, 9); participatory biodiversity assessment (C-4) • Community-based ecotourism enterprise (C-12) • Contextualized tablet-based module (C-11) • Indigenous and urban youth exchange programme (C-11) 	<ul style="list-style-type: none"> • Identify relevant stakeholders and their capacities and relationships • Build collective understanding on common and conflicting value perception that provides the basis for collective action; document and revive traditional knowledge • Provide an alternative livelihood and raise awareness of instrumental value of nature • Make indigenous youth better aware of the value of their traditional knowledge and distinctive culture; familiarize urban youth with indigenous culture
Tier 4. Collaborate with stakeholders across sectors and scales	
<ul style="list-style-type: none"> • Participatory project appraisal and governance (C-2, 4, 5) • Build mutual trust and communication strategy (C-7) 	<ul style="list-style-type: none"> • Reconcile conflicting interests and draw on capacities of various stakeholders • Address communication gaps among stakeholders
Tier 5. Get decision-makers to understand MVN	
<ul style="list-style-type: none"> • Involve decision-makers in collaborative scheme (C-4) • Targeted lobbying (C-2) • Identify policy to influence, e.g. results payment (C-7) • Present case study paper to the government authorities and other stakeholders 	<ul style="list-style-type: none"> • Encourage decision-making backed by better knowledge on MVN • Provide evidence base for a financial mechanism • Enhance understanding on different value priorities and interests among stakeholders
Tier 6. Setup landscape institutions	
<ul style="list-style-type: none"> • Multipurpose cooperative (C-2), CREMA (C-4), participatory governance scheme (C-5); CCA (C-12) • Category V protection complying with IUCN guidelines (C-3) • Multi-stakeholder platform that engage stakeholders across borders and sectors, landscape action plan (C-9) 	<ul style="list-style-type: none"> • Effective landscape management—encourage autonomous action and complement government's limited capacity • Integrate cultural aspects into conservation efforts • Encourage coherent policies and actions across sectors and borders

Tier 6. Set up landscape institutions: Institutional arrangements for sustainably managing SEPLS are found across the world. These can take various forms, such as the community resource management areas (CREMA) in Ghana (Chapter 4), the community conservation areas (CCAs) in India (Chapter 12) and the participatory governance scheme proposed in Colombia (Chapter 5). Such landscape-level institutions that embrace the first five tiers can ensure decision-making that takes fuller account of MVN. Along this line, some practical tools were identified such as the IUCN Category V protected areas proposed in Colombia and the multi-stakeholder platform that engages stakeholders across sectors and community borders in Taiwan.

4 Challenges and Gaps in Incorporation and Conclusions

The major challenges identified in the case study experiences that continue to impede efforts in taking up pluralistic approaches to managing SEPLS include :

1. **Insufficient attention to capture MVN**
Efforts and methodologies to capture and build on MVN for the management of SEPLS are still not widely deployed. The case studies presented in this volume illustrate a wide variety of means to capture MVN. However, they mostly are still progressing to involve a more comprehensive set of stakeholders and to embed MVN in policies and actions. The frameworks and process need continuous improvement to encourage the participation of a wider range of stakeholders, to accommodate their diverse perspectives, and to present such information to decision makers in a concise manner. More participatory and inclusive approaches that involves co-learning methods need to be encouraged to ensure more effective and equitable management of SEPLS.
2. **Asymmetric capacities of different stakeholders**
This relates to differences in the knowledge and understanding of MVN and further indicating a need to develop appropriate communication strategies and awareness among stakeholders on the benefit of inclusive planning and management, methods to negotiate between conflicting values and importantly, identify expertise and resources to undertake such comprehensive approaches to capacity building.
3. **Incoherence in policy and governance framework**
Policies are often sector oriented and governance framework is diverse and fragmented resulting in loss of opportunities to synergize and achieve inter-related objectives. This calls for urgent policy action to ensure policy coherence across multiple levels of governance.

Experiences from the cases show that the efforts for recognising and incorporating multiple values in decision-making build vital enabling conditions for the sustainable management of SEPLS. This is because such efforts engage and compel multiple stakeholders, at and/or across local, national, and global levels, to promote better understanding of and take into consideration each other's perspectives and interests towards use and management of resources in the landscape and towards well-being priorities. This increases the likelihood of obtaining more equitable outcomes. It also helps to identify what resources are required to achieve different parameters of a good quality of life for the population, especially if those are indigenous peoples rooted in ancient ritualized traditions of landscape stewardship.

At the policy level, such approaches help harness local perspectives and inform high level policy-making that is sensitive and better aligned to local contexts. They help refocus benefits of production and conservation activities from merely economic gains to economic-plus benefits, including intangible ones such as sense of place and livelihood security. Such plural approaches to capturing benefits from landscapes also bring to attention the multifunctional nature of SEPLS that have nurtured human-nature co-existence over time. These approaches enhance synergistic planning and implementation by various policy agencies, enabling policy coherence and inter-sectoral cooperation, forming the basis of the move towards transformative change that is being envisaged globally (IPBES 2019).

Transformative changes are seen as a necessity to shift away from the *status quo* and proactively adopt at multiple levels, measures and approaches that embrace integrated planning and implementation and are respectful of the rights, responsibilities and equity of all stakeholders. Applying SEPLS approaches for integrated and holistic management could provide the opportunity and platform for different stakeholders and interest holders to understand MVN, thereby spurring them to bring about transformative change for biodiversity conservation, thus improving resilience of their landscapes and seascapes, and ultimately progress towards the global target of a society in harmony with nature.

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