

Chapter 6. Policy options and capacity development to operationalize the inclusion of diverse values of nature in decision-making^{1, 2}

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This chapter should be cited as: Kelemen, E., Subramanian, S., Nakangu, B., Islar, M., Kosmus, M., Nuesiri, E., Porter-Bolland, L., De Vos, A., Amaruzaman S., Yiu E., and Arroyo-Robles, G. (2022). Chapter 6: Policy options and capacity development to operationalize the inclusion of diverse values of nature in decision-making. In: Methodological Assessment Report on the Diverse Values and Valuation of Nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Balvanera, P., Pascual, U., Christie, M., Baptiste, B., and González-Jiménez, D. (eds). IPBES secretariat, Bonn, Germany. <https://doi.org/10.5281/zenodo.6522359>

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¹ This is the final text version of Chapter 6. A laid-out version of the full assessment report will be made available in the coming months.

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Executive summary

Embedding the diverse values of nature into decision-making involves a better recognition of the values held by different stakeholders and their consideration in decisions on use and management of natural resources. These values depend on stakeholders' worldviews, socio-cultural-environmental contexts, and the scale at which they operate. Consequently, possibilities for mismatches or concurrence between priorities of stakeholders arise in decisions relating to the use and management of nature that can impede or facilitate effective policy implementation. *Considering, weaving, co-creating, and integrating nature's diverse values into policies and decisions helps achieve just and sustainable futures.* Different assumptions, interests, sources of evidence, values (including those related to nature) and implementation tools influence choices of action of policymakers. Therefore, understanding how to operationalise the integration of the values of nature into policy decisions could lead to better outcomes for biodiversity and human well-being.

The overarching objective of *Chapter 6* is to provide options which enable a system wide transformation towards just and sustainable futures by incorporating nature's diverse values in decisions made by diverse actors. Four specific goals have been identified as part of this overall objective: (1) to assess how the values of nature are incorporated in policy instruments, in valuations supported by decisions and in biodiversity-related initiatives {6.2}, (2) to identify policy options within and across sectors that engage with diverse values of nature for transformative change {6.3}, (3) to highlight existing gaps and challenges and identify capacity development needs and options {6.4}, and (4) to guide the operationalization of nature's diverse values in decision-making {6.5}.

To achieve these goals, *Chapter 6* assessed evidence from different sources, including secondary assessment of literature reviews of preceding chapters and the IPBES Global Assessment {6.2, 6.5}, systematic searches of cross-national initiatives {6.2}, systematic and targeted literature reviews {6.3, 6.4 and 6.5}, structured information collated from the preceding chapters of the *values assessment* {6.4, 6.5}, and in-depth analysis of place-based case studies {6.3}.

1. Incorporation of diverse values of nature into decisions is currently limited within existing policies and policy instruments (*well established*). The priorities of different actors are included/excluded to different degrees when valuing nature for decision-making, depending on power asymmetries, representativeness, and socio-cultural factors, that are further limited by methodological constraints that cannot easily account for diverse values {6.2.1}. Understanding and identifying these limitations can help resolve mismatches between the multiple ways in which people value nature. Representation of stakeholder priorities can ensure the inclusion of diverse values in decision-making, which increases the potential to achieve just and sustainable outcomes {6.2.3}.

2. Choosing a narrow set of values in decision-making is more likely to limit the opportunities for transformative change and sustainable futures (*established but incomplete*). Operationalizing diverse values of nature in decision-making requires considering different needs, purposes, processes, capacities, tools, policies, decisions and knowledge systems of multiple stakeholders. This further helps achieve Sustainable Development Goals {6.5}. A progressive shift from a narrower to a more pluralistic values approach can already be recognized in several sectors and cross-sectoral initiatives (e.g., health, agriculture, conservation, and education) {6.3}. However, discrepancies exist between how (multiple) values of nature are framed at global level, and how they are operationalized on-the-ground owing to variations in political, economic, and socio-environmental factors that limit achieving the different policy goals {6.5}.

3. Policy instruments, that address the direct and indirect drivers of biodiversity loss, embed diverse values, stimulate institutional change, promote capacities, and are being implemented in an adaptive way across different sectors, have the highest potential to enable system-wide change towards sustainability (*well established*). Options exist in all four types of policy instruments (n=37 assessed): *Alternative economic models* (e.g., concepts like *Buen vivir* or degrowth) and *measures for economic growth* (e.g., Gross Happiness Index) are the most promising examples for economic and financial instruments (out of 13 instruments assessed in this type) {6.2.2, 6.3.3}. *Rights of nature* is outstanding for legal and regulatory instruments (out of 13 instruments assessed in this type) {6.2.2}. *Indigenous Community Conserved Areas* and *Other Effective Conservation Measures* are prominent examples for rights-based and customary instruments (in total four different instruments were assessed in this group) {6.2.2, 6.3.1.4}. *Co-management regimes* are the most promising among social and cultural policy instruments (out of seven instruments assessed in this type) {6.2.2, 6.3.1.4}. The transformative potential of policy instruments is highly dependent on how a given instrument is designed and applied in a specific context. Policy instruments that have been able to facilitate system-wide changes often use valuation methods and policy support tools in ways that allow for broader and more diverse engagement {6.2.2, 6.2.3}.

4. Socio-cultural, and customary-rights-based policy instruments, which show higher potential to operationalize diverse values than economic and legal instruments, are used to a limited extent in existing governance approaches (*well established*). Based on the assessment of 61 studies (some of them referring to more than one policy instrument), we found that among policy instruments that support transformative governance approaches, legal-regulatory (addressed in 82% of all studies assessed) and economic instruments (addressed in 37.7% of all studies assessed) are more frequently mentioned than socio-cultural (addressed in 18% of all studies assessed) or customary and rights-based instruments (addressed in 8.2% of all studies assessed) {6.2.2, 6.2.3}. As a group, these policy instruments engage multiple stakeholders, diverse values and knowledge systems, that support transformative governance approaches. By not utilizing them adequately, the potential to arrive at more inclusive and sustainable solutions are not sufficiently explored. To overcome this limitation, socio-cultural, and customary-rights-based policy instruments can be applied in combination with more frequently used legal and economic tools, as part of a policy mix.

5. Biodiversity-centered initiatives at multiple scales (e.g., United Nations and Organisation for Economic Co-operation and Development bodies, development agencies, global partnerships and science-policy interfaces, and non-governmental organizations) could act as bridging organizations or brokers of knowledge and values of nature (*well established*). Biodiversity-centered initiatives can foster the integration of diverse values into decisions relative to land use, ecosystems management, climate information services, investments in infrastructure, etc., through their capacity development, knowledge management, policy advocacy and stakeholder engagement activities {6.2.3}. Still, diverse values are more prominent in international biodiversity-centered initiatives, than in place-based implementation cases. The assessment of 46 international biodiversity-centered initiatives highlighted that their majority (91%) explicitly foster the use of policies and policy support tools to incorporate the diverse values of nature in governance. However, the analysis of place-based projects linked to the same initiatives indicated that only 23% of the place-based projects addressed intrinsic, instrumental, and relational values, 39% addressed two value dimensions, while the rest (37%) addressed only one value dimension. Positive association was found between the number of values that an initiative addresses and the number of transformative criteria met by the initiative, suggesting that incorporating diverse values in decision-making is a key aspect of transformative governance {6.2.3}.

6. Decision-making at different levels can be influenced to include and recognize nature's diverse values and nature's contributions to people via specific and targeted sectoral and cross-sectoral policy options that cut across multiple interests and stakeholder priorities (*established but incomplete*). For instance, policy options, such as swidden/agro-ecological farming, integrated approaches such as One Health and community health approaches, or biophilic urban planning offer robust and replicable processes towards sustainability. The assessment of these progressive policy options also indicates that including the well-being priorities of multiple actors enables more sensitive policy design and implementation {6.3}. New and emerging policy options and instruments *inter alia* Nature-based solutions, Ecological Disaster Risk Reduction, and Ecosystem-based Approaches focus on multifunctionality and inclusion of multiple perspectives of diverse actors. However, caution is needed to ensure that the catch-all phrasing does not dilute support for biodiversity and inclusion of voices of indigenous and local knowledge holders {6.3}.

7. International initiatives in the field of economics support the policy uptake of valuation by providing guidance on robust and relevant use of available valuation methods (*well established*). International initiatives to mainstream economic valuation, e.g., The Economics of Ecosystems and Biodiversity (TEEB), or the Wealth Accounting and Valuation of Ecosystem Services (WAVES) Global Partnership Program, among others, have contributed to capacity development and the improved use of economic valuation methods in policy decision support {6.2.3}. These initiatives recognize one or more types of values related to nature, while the tools they offer capture primarily the instrumental values associated with nature and consider trade-offs when there are winners and losers associated with a policy action {6.2.3}. They provide options to an improved policy uptake of economic valuation, which help create enabling conditions for more in-depth, system wide changes. However, there are other opportunities (i.e., engaging diverse knowledge systems, balancing different values perspectives, cross-scale interactions, and social learning) to effectuate sustainability-aligned values in the economic system {6.5}. Alternative economic paradigms that expand on dominant ways of measuring values – e.g., degrowth, steady state economics or care economics that include intrinsic values of nature – suggest that to avoid the future deterioration of the environment and human well-being, a shift from the mainstream, growth oriented economic paradigm is needed, which can only be achieved if individual behaviour and the institutional system is changed in parallel {6.3.2.3}. Treating material, social, spiritual and mental well-being as equally important – and accepting nature's diverse values – is a prerequisite for such a transformation {6.3.2.3}. However, there is yet only limited evidence on the place-based implementation of these alternative economic models.

8. Knowledge and operationalization gaps limit the opportunities to integrate nature's diverse values into decisions (*established but incomplete*). There are key data and research gaps (called together as knowledge gaps) and resource, information, and capacity gaps (called together as operationalization gaps) regarding the role of values and valuation in decision-making. These are particularly significant on valuation uptake in the decision cycle {6.2}. Examples of these gaps relate to limitations of global research programmes and data gathering efforts in understanding the ways of valuing the diverse values of nature in some contexts, cultures and across different generations or gender {6.4}. Limitations also exist in understanding the valuation approaches used by indigenous peoples and local communities, and in turn, this restricts the recognition and consideration of their values in decision-making {6.4}. Further knowledge gaps exist in the understanding of how the values of actors with different worldviews and social roles are expressed in decision-making. The lack of available literature limits the unravelling of underlying correlations, such as gender inequalities relative to the values of nature {6.4}. Values accounted for in future scenarios and the potential of valuation to address justice and power issues along sustainable pathways could also be further explored {6.4}.

9. Operationalizing diverse values of nature into policy decisions is more likely to occur when private and public actors have the capacities to do so (*established but incomplete*). Six capacity dimensions were identified which differentially address current barriers to integrate nature's values into decisions {6.1.2.4, 6.4.4}. *Motivational capacities* ensure that there is awareness of, and desire to, consider diverse values in decisions. These enhance the likelihood of actors developing positive attitudes and behaviour towards nature {6.4.4.1}. *Analytical capacities* enable selecting and using suitable tools to acquire and synthesise all necessary information on values and valuation {6.4.4.2}. *Bridging capacities* entail facilitation, learning and reflection skills, and provide a pluralistic value perspective to problem-oriented decision-making by bringing together different ways of knowing and fostering social learning processes {6.4.4.3}. These three types of capacities allow the diverse values of nature to be recognized and understood by all relevant actors taking part in decision-making. However, to effectively guarantee that nature's diverse values are mainstreamed into decision-making, three additional capacities need to be considered. *Negotiation capacities* entail being able to represent one's own interests, to make compromises, and to accept the views of others. By enhancing such capacities, more robust uptake of valuation results is likely to occur, especially when broadening the process of negotiation towards building relations and cooperation {6.4.4.4}. *Social networking capacities* include coordinating across scales and different social groups, managing expectations and risks, adapting, and acting. They can also offer social mechanisms to complement, or in certain cases even replace, some formal rules and standardization in governance decisions {6.4.4.5}. Finally, governance capacities refer to the ability to make accountable, encompassing, transparent, participatory, and law-abiding decisions. These capacities are important to ensure that fair institutions can be created to incorporate more diverse values of nature in an explicit and legitimate way {6.4.4.6}.

10. Capacity development, if carried out as an interactive and context specific process that evolves over time and leads to shared outcomes, offers opportunities to overcome the challenges emerging from knowledge and operationalization gaps (*established but incomplete*). Capacity development, as a process of co-learning between different stakeholders, can help transform top-down policy processes (the business-as-usual scenario) by enlarging the set of knowledge decisions are built on, and by acknowledging a wider range of values of nature {6.4.4}. This is also underlined by evidence on successful policy uptake cases, indicating that more progress was achieved towards transformative governance in cases where policy development and implementation were approached as a learning activity {6.2.2}. Co-learning approaches also enhance the reliability of the understanding of status, trends, drivers and impacts on nature and nature's contribution to people and help identify workable policy options {6.3.2.2}.

11. Educational approaches have developed pedagogical principles and methods oriented towards sustainability (*well established*). Sustainability aligned pedagogical principles and methods shift from merely individual learning situations towards situations enabling social and experiential learning that inherently tackles challenges in understanding and managing socio-ecological systems, that involves sensitization of 'learners' to diverse values of nature and priorities of actors in different contexts. These approaches call for transformative processes to be fostered in societies that build on different worldviews and contexts. That said, the adoption of such methods is still not widespread, although where adopted, multiple benefits to the environment and economy have been noted {6.3.2.2, 6.4.4}.

12. The diverse values of nature can be integrated into real life decisions through a dynamic process which realize, accept, and respect different values, and "weave" them together for just and sustainable futures following a set of guidelines (*established but incomplete*). Guidelines for the operationalization of nature's diverse values in real life decisions include: (i) contextualize the

social, economic, cultural and political decision-making framework and the diversity of stakeholders, (ii) design policies which take into account differentials in power, capacity, knowledge and perspectives of stakeholders to promote justice, (iii) represent diverse stakeholders and knowledge holders to reflect on diverse worldviews and values, (iv) engage interactively to promote co-creation and co-learning, (v) be driven by impact focusing on co-owned results, and (vi) reflect, learn and sustain practices, processes and outputs by linking them to aspirational futures and change pathways {6.5.5.2}.

13. Options for actions to operationalize diverse values will strongly depend on the specific context where the action takes place, considering different actors, stakeholders, their capacities, needs and specific type of social interactions and institutional framework, that could promote or hinder the uptake of diverse values in decision-making, policy design and implementation (established but incomplete). Figure 6.1 summarizes the characteristics, interventional levels, actors and actions to take under different decision-making contexts, from more contested to more enabling context {6.5.3}.

Context	Characteristics (types of social interaction and capacities)	Intervention levels	Actors	Actions
Contested	<ul style="list-style-type: none"> ● Institutional conditions and capacities ● Policy coherence and governance framework 	<ul style="list-style-type: none"> ● Administrative (Local / Subnational / National / International) ● Geographical (Spatial planning, land or sea use) ● Socio-cultural (Rights, power issues) 	<ul style="list-style-type: none"> ● Resource user, IPLC, local/subnational government, private sector + national government, civil societies, NGO, intergovernmental organization, donor + citizen, youth, media 	<ul style="list-style-type: none"> ● Building conditions and capacity development ● Work at different intervention levels to institutionalize diverse values in the use of approaches and policies ● Up-scale to more inclusive approaches
Challenging				
Conducive				
Enabling				

Figure 6.1. Operationalizing diverse values in different contexts: from more contested to more enabling.

14. Achieving the SDGs and progressing towards just and sustainable futures requires a shift in decision-making to better recognize the values of nature, both at the level of institutions and individuals (established but incomplete). Considering nature's diverse values helps to identify, address and balance trade-offs, understand the people that are behind them, and design more inclusive strategies to better address the needs of different actors for just and shared sustainable futures. Diverse values approaches can also help enhance policy coherence and equity. Six values-centred action points were identified to highlight where and by whom concerted action is possible towards more just and sustainable futures {6.5.2}. These include: (i) Recognizing the diverse values of nature and operationalizing them in decision-making; (ii) Improving policy coherence across sectors and scales around sustainability aligned values; (iii) Ensuring meaningful representation of stakeholders and diverse values; (iv) Enabling capacities to mainstream values into decisions; (v) Co-learning and

improved and transparent communication among stakeholders to develop shared values; (vi) Mobilizing resources for plural valuation and uptake.

15. Transformative governance calls for cross-sectoral thinking and synergistic planning approaches (*established but incomplete*). Sectoral and cross-sectoral approaches, including landscape management, multi-stakeholder platforms at different levels, new urban planning paradigms, alternative policies in agriculture and conservation, climate adaptation and mitigation strategies, and health and education, offer opportunities to reconcile multiple interests, values and norms while recognizing trade-offs and uneven power relations between stakeholders {6.2, 6.3}. *Table 6.1* summarizes available options for decision-makers across some key sectoral and cross-sectoral areas of intervention.

Table 6.1 Examples of options for decision-makers, which incorporate the values of nature into decisions and therefore enable incremental or transformative change for just and sustainable futures.

Sectoral and cross-sectoral areas of intervention	Examples of options available for different stakeholders
Climate change adaptation and mitigation	<ul style="list-style-type: none"> • Nature-based solutions (NSG, P, NGO, CG) ● • Ecosystem-based approaches (NSG, P, NGO, CG) ● • REDD+ (IO, NSG, NGO) ● • Tradable permits (NSG, IO) ●
Economy	<ul style="list-style-type: none"> • Alternative economic measures (IO, NSG) ● • Alternative economic models including degrowth and steady state economics (NSG) ● • Sustainable production and consumption (P, CG, NGO) ● • Circular economy (NSG, P, CG) ● • Ecological fiscal transfers (NSG) ● • Taxes on consumption (NSG) ● • Ecosystem accounting (NSG, P, IO) ● • Socially responsible investments (CG, P) ● • Biodiversity relevant taxes, charges and fees (NSG) ● • Commodity chain regulation (NSG, P) ●
Education	<ul style="list-style-type: none"> • Social learning (IO, NSG, P, NGO, CG) ●
Health	<ul style="list-style-type: none"> • Planetary Health approaches (IO, NSG) ● • One Health approaches (IO, NSG) ● • EcoHealth approaches (IO, NSG) ● • Community health approaches (IO, NSG) ● • Biophilic landscape planning (NSG) ● • Legislative control over pesticide use (NSG, IO) ●
Land use (incl. agriculture and nature conservation)	<ul style="list-style-type: none"> • Swidden agriculture (CG, P) ● • Rights of nature (NSG, NGO) ● • Payments for ecosystem services (IO, NSG, NGO, P) ● • Biodiversity financing (IO, NSG, NGO) ● • Commodity chain regulation (NSG, P) ● • Trade bans (NSG, IO, P) ● • Legal restrictions on natural resource use (NSG) ●
Marine, coastal and fisheries management	<ul style="list-style-type: none"> • Rights of nature (NSG, NGO) ● • Marine spatial planning (IO, NSG) ● • Marine protected areas (IO, NSG) ● • Locally managed marine areas (NSG, NGO, CG) ●
Urbanization and other large-scale infrastructure development	<ul style="list-style-type: none"> • Nature-based solutions (NSG, P, NGO, RU) ● • Ecosystem-based approaches (NSG, P, NGO, CG) ● • Biophilic planning (NSG, CG) ● • Ecological fiscal transfers (NSG) ●
	<p>Key change agents highlighted with acronyms:</p> <ul style="list-style-type: none"> • IO=intergovernmental organizations, • NSG=national and subnational governments, • P=private actors, • NGO=non-governmental and civil society organizations, • CG=citizen groups including (e.g., women, IPLCs, the youths etc.) <p>Colours refer to transformative (● green) or incremental (● orange) potential, while the orange options highlight those which rather maintain the status quo.</p>

6.1. Introduction

6.1.1. The rationale and mandate of this chapter

Moving towards just and sustainable futures has found more acceptance across a broad range of stakeholders. This has been further catalysed by the COVID-19 pandemic, which highlighted the interconnectedness of environmental health with the health and well-being of humans and of all other species (IPBES, 2020; Settele et al., 2020), and showed the inequities within societies that need to be overcome to ensure the mandate of ‘*no one is left behind*’ that the Sustainable Development Goals advocate. The urgency to transit towards sustainable futures has been emphatically stated in various assessments (IPBES, 2019b; SCBD, 2020; WWF, 2020), and these further indicate that a “transformative change” towards sustainability is required, a change that implies radical and system-wide changes to the way we operate politically, economically and socially in our interactions with nature (Bulkeley et al., 2020; IPBES, 2019b; SCBD, 2020). Governance has a critical role to play in transformative change, at least from three aspects: (i) governance can create enabling conditions which make room for systemic changes to emerge; (ii) governance can stimulate and lead the process of transformation; and (iii) to support the first two roles, governance itself can be transformed (i.e., governance regimes might need to go through a transformative change; Burch et al., 2019).

In the previous chapters of the *values assessment* the conceptual and methodological foundations of the diverse values and the plural valuation of nature has been laid down, uptake of valuation results in decisions has been analysed, and pathways for more just and sustainable futures have been assessed through a values-lens. The aim of this closing chapter is to *provide policy options which enable a systemic change towards just and sustainable futures by incorporating the nature's diverse values in decisions* made by diverse stakeholders³. To achieve this overarching aim, the specific objectives of *Chapter 6* are:

- to assess how the values of nature are incorporated in currently available policy options (see 6.2);
- to identify policy options – both for specific sectors and cross-sectoral initiatives – which are able to trigger transformative change by incorporating nature's diverse values in decisions (see 6.3);
- to highlight existing gaps and challenges, and to identify capacity development needs and options for different stakeholders (see 6.4); and
- to provide guidance on the operationalization of nature's diverse values in decision-making across different contexts (see 6.5).

³ This closing chapter of the values assessment was originally requested to explore capacity building needs and steps to respond to those needs, by building on the preceding chapters (IPBES/4/9, Scoping Document). The three key areas of analysis mandated to *Chapter 6* were: (i) the explicit acknowledgment of the different types of conceptualizations of nature and its benefits; (ii) the different types of valuation methodologies and approaches that are needed to reflect them; and (iii) their explicit incorporation into decisions and policymaking at different levels and within different contexts. All these aspects are addressed here and in preceding chapters of the assessment but the scope of *Chapter 6* has been expanded to respond to external review comments requesting further guidance for various decision-makers on the operationalization of the diverse values of nature in decisions, which is considered as a key component of transformative change as the IPBES Global Assessment highlighted.

The chapter is guided by four key questions and the related concepts and approaches (*Figure 6.2*). Through these four questions the aim is to explore how – through which governance processes and by which policy alternatives – is it possible to shift the *status quo* of restricted or limited nature valuation, focusing on the challenges and the available options to explicitly incorporate the diverse values of nature into policy and decision-making. The next subsections explain these guiding questions and the key concepts used in this chapter, based on targeted literature reviews and the interpretation of related concepts as defined in the previous chapters.



Figure 6. 2. The leading questions of Chapter 6.

Box 6.1. How “policy options” are understood in Chapter 6

Policy options are understood in this chapter as a combination of available policy support tools and policy instruments which can be applied in specific contexts and at given scales in a tailor-made manner. Policy support tools and policy instruments are defined here according to the IPBES Catalogue of Policy Support Tools and Methodologies (IPBES, 2017).

Policy support tools include approaches and techniques which are used to inform, support and improve policy decision-making and implementation at various scales (from the local to the international), focusing on the use and protection of nature. Policy support tools can build on various knowledge systems (including both scientific knowledge and ILK), and can provide assistance in assembling data, assessment and evaluation, engagement, policy instrument design, policy implementation and enforcement, capacity building and social learning.

Policy instruments are understood as the different interventions (formal rules, laws, social norms and processes etc.) made by decision-makers (governments and public authorities, intergovernmental organizations, companies etc.) to ensure that policy objectives are supported and achieved by influencing the behaviour of other stakeholders (Bemelmans-Videc et al., 1998; Persson, 2006). The IPBES catalogue differentiates among four different types of policy instruments (IPBES, 2017): (i) economic and financial instruments (financial incentives handling out or taking away economic resources), (ii) legal and regulatory instruments (formal rules, laws and regulations), (iii) rights-based instruments and customary norms

(including human and collective rights as well as customary norms and institutions of indigenous people), and (iv) social and cultural instruments (information-based instruments and voluntary or collective actions with an emphasis on the intertwined relationships between ecosystems and sociocultural dynamics).

6.1.2. Key concepts used in this chapter

6.1.2.1. Transformative governance

International policy processes are making a clear call for re-orienting institutions to foster a complete transformation towards sustainability goals (IPBES, 2019b; SCBD, 2020).

Transformative change realizes the need for the fundamental reorganization of paradigms, goals, and values, which is possible through innovative and holistic approaches to governance (IPBES, 2019a; Pelling et al., 2015; Visseren-Hamakers et al., 2021). Transformative governance can be defined as the approach to governing transformative change that enables ‘*the capacity to respond to, manage, and trigger regime shifts in coupled socio-ecological systems at multiple scales*’ (Chaffin et al., 2016). Transformative governance requires addressing a wide range of political, social, economic, and technological challenges by using the mix of instruments and tools that link across different values, knowledges, sectors, and scales (Göpel, 2016; Kelly et al., 2019; Kivimaa & Kern, 2016; Koh, 2020; Loorbach, 2014). This implies that decision-makers need to carefully consider whose values and worldviews are represented (Beck & Forsyth, 2020). Transformative governance can acknowledge the nature's diverse values by diversifying the range of values; by co-producing values of nature (e.g., through inclusive governance approaches that acknowledge under-represented voices and perspectives regarding sustainability); by institutionalising values at different scales of decision-making; and by acknowledging various levels of societal change, starting from the individual values towards broader, shared values (see *Chapter 5, Section 5.3*).

Policy options that can support sustainability transformations share some special features⁴ (*Annex 6.1*):

- **They address the *status quo*.** To halt biodiversity loss, policy options need to alter the underlying direct and indirect drivers – i.e., the ecologically harmful policies and their decision-contexts – through social processes and innovations (Colloff et al., 2017; Folke et al., 2010; Förster et al., 2020; Loorbach & Rotmans, 2010; Meadowcroft, 2009).
- **They incorporate diverse values.** Values can be conceived as socio-cultural resources in specific contexts to form views about sustainability goals and processes (Demski et al., 2015), therefore, values can function as leverage points for sustainability transformations (see *Section 5.3.3*) (Abson et al., 2016; Fischer et al., 2012). Acknowledging diverse values is possible via inclusive and informed governance, which builds on a robust evidence-base, empowers marginalized groups of stakeholders holding sustainability values, stimulates dialogue, learning and reflection, and co-produces knowledge on different value types (IPBES, 2019a; Visseren-Hamakers et al., 2021).
- **They foster institutional change.** Enhancing the learning and experimenting conditions within existing social and institutional networks can help overcome the institutional and legislative lock-ins that prevent sustainability transitions (Schreurs et al., 2019; Stevens

⁴ Transformative governance within policy instruments and initiatives (<https://doi.org/10.5281/zenodo.4331126>).

& Kanie, 2016). This way, institutional restructuring can go beyond the modification of policy, administration, legislation and institutions, and induce changes in behaviour, values, and culture as well (Kelly et al., 2019; Schreurs et al., 2019).

- **They improve the capacities of different actors.** The capacities of government actors to devise, implement and adapt new institutional arrangements (Förster et al., 2020), as well as of other actors (e.g., businesses, civil organizations or individuals) to support the intended changes (Colloff et al., 2017) is equally important. Transformation towards sustainability requires transformative literacy, which is the capacity of all actors to assess information about transformation processes, and utilise the information to get involved in the right stage of transformation processes (Göpel, 2016) (see *Section 6.1.2.4*).
- **They support integrative-adaptive governance.** Sustainability transformation goals are complex, uncertain, and constantly moving, so governance needs to enable continuous learning, experimentation, reflexivity, monitoring, and feedback (Borie et al., 2020; IPBES, 2019a). Coordination, integration and combination of policy instruments – i.e., a policy-mix approach (Koh, 2020)– can ensure that local solutions also have sustainable impacts at other scales and locations, on other issues, and in other sectors (Visseren-Hamakers et al., 2021).

These five main features will be used in the following *Section 6.2* as the key criteria to assess how far available policy options can support sustainability transformations.

6.1.2.2. Stakeholders

An effective consideration of diverse values into decision-making and policies requires supporting and creating enabling contexts for participation, deliberation and negotiation between and within different actors, pondering differing interests and values. A starting point for this is to map the relevant stakeholders. Those actors (incl. public, private and civil society actors) are considered *stakeholders* in *Chapter 6* who are involved in decision-making processes and implementation, either as influencing the decision-making process, or as being dependent on, and therefore facing the consequences of, the decisions. Asymmetries in power, information, and capacities among these stakeholders should be considered to understand who wins, who loses, and who has the power and responsibility to make changes in these relationships (Reed et al., 2009). Considering these aspects, several stakeholder groups have been identified, who may be categorized into three different (but not exclusive) categories according to their level of influence and affectedness (Chevalier & Buckles, 2008):

- **Influencers:** people and organizations who influence decision-making processes related to biodiversity and therefore have an impact on those who implement the decisions;
- **Affected actors:** people and organizations who are directly involved in (and dependent on) the implementation of biodiversity related decisions, and have their own stakes and interests (not directly targeted by this chapter);
- **Key players:** people and organizations who both can influence and become affected by decisions - that is, in certain contexts, they serve as influencers, while at the same time are involved in actual decision-making (Grimble & Wellard, 1997; Miles, 2017).

The assessment of policy options in this chapter is focused towards “influencers” and “key players” who can be considered as the main actors shaping policy decisions on nature. Many of the influencers and key players can also act as bridging organizations, i.e., they can enable the negotiation across multiple priorities and preferences of stakeholders regarding decisions on biodiversity (Berkes, 2009; Hahn et al., 2006). The stakeholder groups identified as the most relevant ones are shown in *Figure*

6.3 and explained in more detail in *Annex 6.1*. Please note that the major groups presented are not homogeneous but include diverse individuals and organizations, who – depending on the context and the exact decision to be made – might act in different roles. For instance, in a local resource use conflict self-sufficient farmers might be affected actors and large farms might be influencers, while in negotiations on agri-environmental subsidies both small and large-scale farmers might be considered as key players.

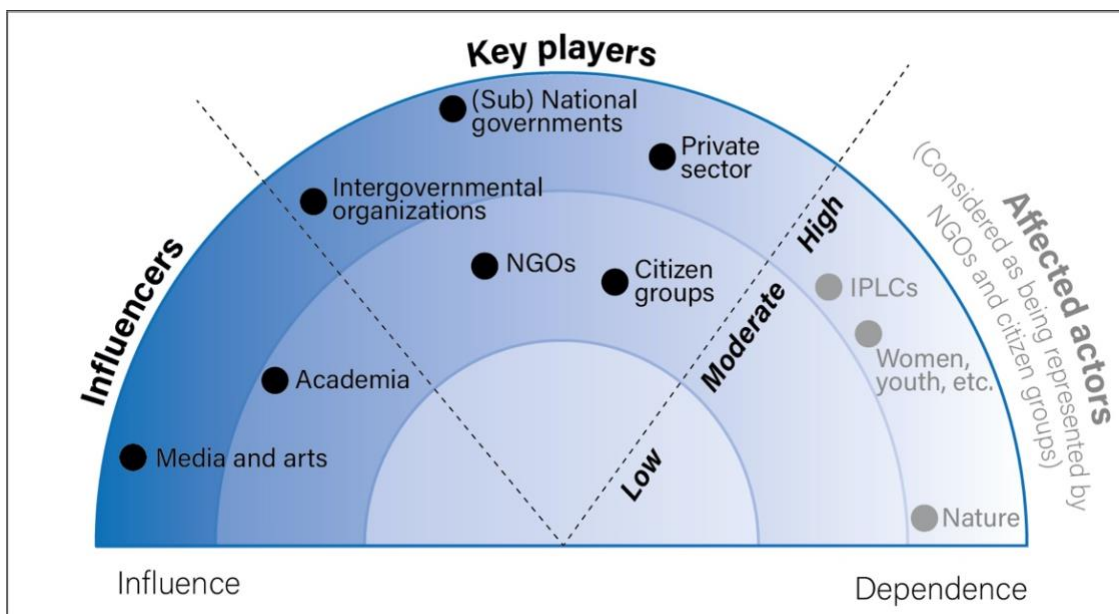


Figure 6.3. The stakeholder typology used in the chapter (based on Chevalier & Buckles, 2008).

The seven stakeholder groups written in black in the above *Figure 6.3* will be considered in the following sections as the main target groups, i.e., the key stakeholders to whom Chapter 6 aims to provide options and opportunities on how they could operationalize the multiple values of nature in their decisions (*Annex 6.1*).

6.1.2.3. Decision-making context and scale

Socio-cultural, political, and economic contexts vary hugely across the world, and determine which types of decisions are made by whom and how (Preiser et al., 2018; van Kerkhoff & Pilbeam, 2017). In some contexts, particular worldviews and their values are more dominant than others and some of them could be invisible, unrecognized and/or forbidden. Political decisions establish and enforce the formal rules of access and use of natural resources and the sharing or redistribution of benefits associated, and together with other environmental, cultural and social factors, they determine the general context of decisions regarding nature (Ostrom, 2009; Vatn, 2005). Contexts can be hindering or permitting the recognition and consideration of diverse values (as well as value holders or actors). Whether the context enables a good coexistence and acceptance of different worldviews and values, permits or restricts knowledge weaving and/or co-production in decision-making and policies, will depend on specific political, socio-cultural and institutional conditions, as well as on different types of capacities at place (Pascual et al., 2021).

Countries could encounter different challenges in including diverse values in decision-making depending on the socio-political realities in a society and hence, need tailored solutions (see *Section 6.5*). For example, in a context where there is a strong one-way communication from a dominant

worldview as well as restricted access to information that differs from it, where customary rights are neither recognized nor allowed, the ways and tools to support knowledge sharing and exchange could consider the establishment of safe spaces to avoid negative impacts such as repression and exclusion. Legal and regulatory instruments might be counterproductive in places where legal structures and enforcement are weak and characterized by distrust, especially if capacity development does not target governance and negotiation capacities. Economic and financial instruments might be similarly counterproductive in places where informal markets and reciprocal relationships are strong, financial mechanisms are not transparent, and funds are insufficient, especially if capacity development does not focus on analytical, bridging and motivational capacities. Addressing capacity gaps at the level of governance, institutions, and individual actors is a potential way to create more enabling contexts for diverse policy instruments (see *Section 6.4.4* and *6.5*).

One specific aspect of the context of decision-making is the scale at which the given decision is taken (Brondizio et al., 2009). Enhancing resilience and achieving sustainability requires the implementation of relevant policy options at appropriate scales to govern the demand and use of nature and nature's contributions to people (Cumming et al., 2013). However, interactions across different spatial, temporal, governance, and knowledge scales (that are not necessarily linear), raise several challenges to scaling out and scaling up existing policy options (Apostolopoulou & Adams, 2019; Cash et al., 2006; Wiegant et al., 2020). These include situations where:

- cross-scale interactions are not considered (policies and management decisions focus on just one single scale);
- cross-scale interactions are considered, but there is a spatial or temporal mismatch between policies and ecological and social processes targeted (or unintentionally impacted) by the given policies (Cumming et al., 2006; Ramiller & Schmidt, 2018; Roberts et al., 2018).
- cross-scale interactions are realized, but the heterogeneity of how different scales are perceived by stakeholders is not considered (Ahlborg & Nightingale, 2012). Influencers may frame a decision-making situation as being relevant at a specific scale, and therefore allocate power and authority to specific stakeholders (Lieshout et al., 2011).

Local level policy implementations show huge variability in their socio-cultural, geographical and political contexts, and consequently in the successful implementation of any policy option. Thus, mismatches in national and global policies and local implementation are a reality in many different contexts. Due to the complex nature of socio-ecological systems (Preiser et al., 2018), the contexts in which these mismatches occur, and implementation fail, can be hard to predict and generalize. As this is an IPBES assessment, the focus of this chapter is at global, sub-global (regional), and national scales, but by recognizing the importance of local context and scale mismatch, the potential of policy instruments at local scales is considered, particularly through the lens of on-the-ground-initiatives and valuation uptake cases (see *Section 6.2*) and policy implementation within specific sectors (see *Section 6.3*).

6.1.2.4. Capacities

How far transformations in biodiversity governance can reach is determined by the intersection of capacities available for different stakeholders in different decision-making contexts and scales (Förster et al., 2020). Capacity development is therefore considered as one of the main interventions (“levers”) that can tackle the underlying indirect drivers of nature deterioration (IPBES, 2019a). The capacity development concept applied in this chapter goes beyond the traditional view of one-way, top-down knowledge transfer towards social learning and knowledge co-creation. In these

approaches, knowledge is considered not as *something* that can be given or received, but rather as the shared outcome of an interactive and context-specific social process that evolves over time (Barth, 2002; Brown, 2004; Lang et al., 2012; Lotz-Sisitka et al., 2015; Roux et al., 2017; Wiek et al., 2011). Rather than transmitting information, capacity development focuses on reflection and change (Freire, 2000), and therefore contributes to transforming information into knowledge (Reyers et al., 2018; Selomane et al., 2019; Tengö et al., 2014). Capacity development in this broad sense is more accommodating to indigenous views and processes. In many indigenous cultures “capacity” is not seen as something fixed. Rather, someone can develop their role or responsibility by moving through a scale of knowledge and skill, which process is often linked to practicing mindfulness (ISE, 2019) and connectedness (Smith, 2012).

To apply an inclusive approach to capacity development six broad capacity dimensions have been defined in this chapter (*Figure 6.4*) based on existing frameworks for adaptive capacity to climate change (Gupta et al., 2010) and managing risk and vulnerability to natural hazards (Kuhlicke et al., 2011; Kuhlicke & Steinführer, 2015).

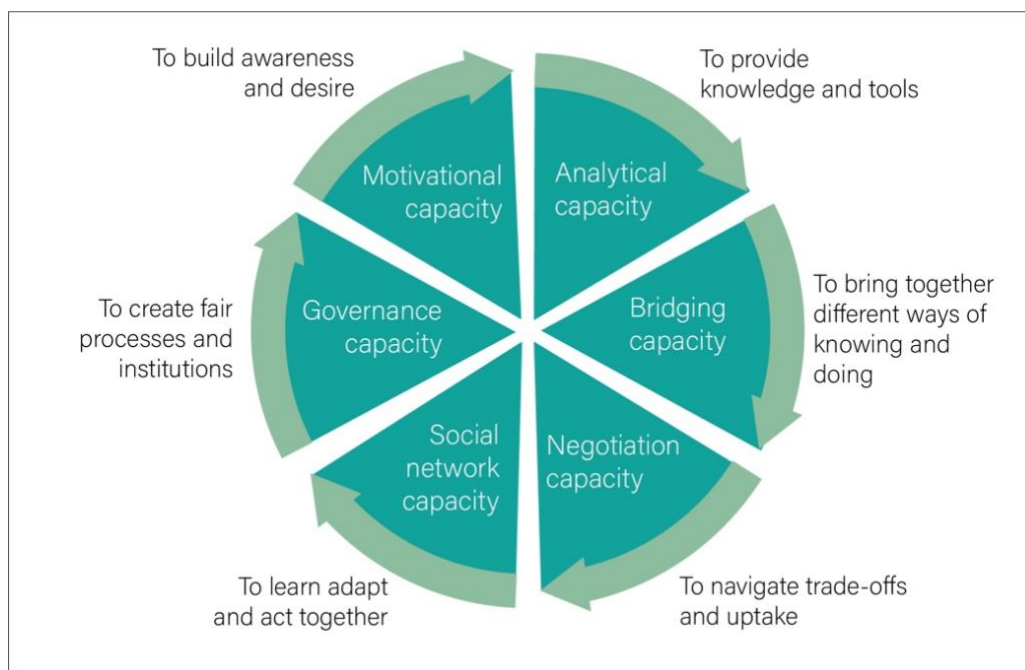


Figure 6.4. The capacity wheel.

Motivational capacities ensure that stakeholders (both individuals and organizations) have awareness of, and desire to, consider diverse values in decisions. Motivational capacities are strongly embedded into the cultural, economic, institutional and policy context (Balmford, 2002; Cormier & Gordon, 2001; Kent & Myers, 2001; Young, 2002). Motivation can have intrinsic sources (e.g., sense of meaning, internalized norms and social conventions, which are often rooted in socio-cultural relations and worldviews), and extrinsic sources (e.g., rewards or punishments, which can be established by formal rules and policy instruments) (Ryan & Deci, 2000), although organization studies found that intrinsic motivation is more strongly linked to positive attitudes and work performance (Gagné & Deci, 2005; Lawler & Hall, 1970; Schreurs et al., 2014).

Analytical capacities help select and use suitable tools to acquire and synthesise all necessary information on diverse values. Scientific methods – and valuation tools – carry a cognitive representation of the world, a theorization of action, and give legitimacy to specific values and

perspectives (Cabane & Tantchou, 2016; Carolan, 2009; Desrosières, 1998; Lascoumes & Le Galès, 2005). The relation between knowledge and decision-making is not straightforward or self-evident (Dessai et al., 2009; Dilling & Lemos, 2011; Matzek et al., 2014; Pullinger, 2014; Sutherland et al., 2014; Wesselink et al., 2013). To recognize and consider the nature's diverse values in decisions, valuation needs to be inclusive towards different forms of scientific and non-scientific knowledge (Cash et al., 2003; Mauser et al., 2013; Robertson & Hull, 2001).

Bridging capacities provide a pluralistic, value-based perspective to problem-oriented decision-making that bring together different ways of knowing and doing in a co-learning process. Facilitation is a crucial element of co-producing legitimate and credible knowledge for decision-making (Breslow, 2015; Kok et al., 2017; Lemos & Morehouse, 2005; Peterson et al., 2003; Turnhout, 2018; Voinov & Bousquet, 2010).

Negotiation capacities, targeted both at the individual and the organization level, can broaden the process of negotiation from enforcement to relationship building and cooperation (Fairman et al., 2012; Soliman & Antheaume, 2017), and therefore help navigating trade-offs between the values and interests of different stakeholders (de Magalhães et al., 2019). Negotiation capacities are also crucial in situations where trade-offs lead to conflicts among contrasting groups of winners and losers (Butler et al., 2013; Kovács et al., 2015; McShane et al., 2011; Turkelboom et al., 2018).

Social networking capacities support learning (Armitage et al., 2011; Bartlett et al., 2012; Reed et al., 2014), adapting (Simha et al., 2017) and acting together (Berkes, 2009; Reed et al., 2017). A governance system that builds on strong networks can effectively use social mechanisms (e.g., collective sanctions, social memory) to adapt, coordinate, and safeguard exchanges (Jones et al., 1997) and therefore can increase regional resilience (Luthe et al., 2012).

Governance capacities allow effectively resolving problems and fulfilling the needs of citizens by mobilizing resources, making decisions via analytic and deliberative functions, and implementing decisions via coordination and regulation (Christensen et al., 2016; Dang et al., 2016; Tan, 2019). Improving governance capacities contributes to good governance (Rothstein & Teorell, 2012), and ensures that fair policies and institutions exist, and decisions incorporate the values held by different stakeholders in an accountable, transparent, and reflexive way (González & Healey, 2005; van der Molen, 2018) (*Annex 6.1*).

These six capacity dimensions are used in *Section 6.4* to highlight how capacity development can help bridge the knowledge and operationalization gaps which limit the operationalization of multiple values of nature in decisions.

6.1.3. The main findings of the chapter

The assessment shows clear evidence that incorporating a more plural approach to valuation enables just and sustainable decision-making on nature and nature's contributions to people. It also allows better implementation of sustainable development policies, ensures higher coherence between different sectoral priorities and initiatives and more equitable involvement of different stakeholders. However, the use and effectiveness of various policy tools, instruments and methods is dependent on contexts (of scale, socio-political and environmental) and availability of various types of resources and capacities to different sets of stakeholders. It therefore is pertinent to ensure that a decision/policymaking cycle be cognizant of principles of inclusivity, equity and sustainability. This chapter is organized across assessments of the design and impact of existing policy tools/instruments and initiatives (see *Section 6.2*), of sectoral and cross sectoral initiatives (see *Section 6.3*), gaps and

challenges that limit plural approaches in decision-making (see *Section 6.4*) and finally identification of guidelines and approaches to operationalize the incorporation of diverse values in the policy cycle (see *Section 6.5*).

6.2. Existing and emerging policy options that leverage diverse values approaches for transformative governance

6.2.1. How diverse value approaches inform policies in different decision-making contexts

Section 6.2 takes an expansive view on policy options for operationalizing diverse values for transformative change and assesses several policy instruments and global initiatives for biodiversity conservation (see further details in *Annex 6.2*). It builds on three different sources of evidence: (i) policy instruments listed in the IPBES catalogue of policy instruments and analysed in the IPBES Global Assessment *Chapter 6*, (ii) scientific literature addressing brightspots in valuation uptake (building on the assessment of *Chapter 4* of the values assessment)⁵, and (iii) global and international initiatives governing biodiversity management at various scales. The section is divided into two main subsections.

Section 6.2.2 compiles a list of policy instruments from the IPBES catalogue of policy support tools and the IPBES Global Assessment and assesses their potential to contribute to system-wide changes through the different aspects of transformative governance (IPBES, 2017, 2019a). Additional examples drawn from *Chapter 4* and its’ “brightspot identification”⁶ have been reviewed to identify real life examples where policy instruments and support tools were successfully implemented in different contexts and scales to affect transformative governance.

Section 6.2.3 analyses global and large-scale conservation initiatives that are responsible for governing biodiversity management at various scales. For each of these, one case study that highlights transformative governance is identified, and then the context, scales, stakeholders, and values of relevance in these cases are assessed⁷.

The whole section builds on the key findings of the preceding chapters of the IPBES *values assessment*. Its starting point is the recognition that values influence public decision-making both through the institutions guiding such decisions as well as through public and stakeholder participation. The way that such participation is facilitated and conducted influences how the diverse values of biodiversity and nature will be acknowledged and addressed in environmental governance (see *Chapter 2*).

Different policy options represent different sets of values. Instrumental values of nature have often been accounted for through payments for ecosystem services (PES) and other economic instruments. Economic instruments drawing mainly on value monism have supported a wide range of biodiversity conservation outcomes (see *Chapter 2, 2.3*). Whilst there are multiple examples of management and conservation strategies for conserving the intrinsic values of nature, there are far fewer examples of relational values, which have also received less attention in scholarship (see *Chapter 2.2.1, 2.2.3*).

As *Chapter 4* highlights, the available policy options (i.e., the formal rules and informal norms) that guide the use of nature, reflect and reinforce the knowledge-power nexus of society, reveal much lower effective valuation of nature compared to the values currently expressed in the Sustainable Development Goals or by indigenous peoples and local communities. In particular, the formal rules

⁵ Brightspot Cases text analysis (<https://doi.org/10.5281/zenodo.4338411>).

⁶ Brightspot Cases text analysis (<https://doi.org/10.5281/zenodo.4338411>).

⁷ Transformative Governance within Policy Instruments and Initiatives (<https://doi.org/10.5281/zenodo.4331126>).

and regulations governing the global supply chains, and the natural resource extraction these regulations enable, reveal very different values of nature compared to the values expressed by indigenous peoples and local communities, generating conflicts around extractive projects (Amnesty International, 2019; Human Rights Watch, 2020; IUCN, 2019). Economic incentive-based policy approaches can intentionally and unintentionally affect people's environmental and pro-social values in that they can reduce intrinsic motivation for nature conservation, either directly or by increased emphasis on instrumental values (see 4.3.3).

Considering the above summarized findings of the preceding chapters, it is of high importance to understand how current policy approaches can be made more inclusive towards diverse values, and to identify innovative and holistic governance solutions which can foster transformative change (IPBES, 2019a; Pelling et al., 2015). Thus, whilst *Section 6.2* draws a broader focus on diverse value approaches informing policies in different decision-making contexts, stakeholders etc., (see 6.1), the ultimate interest is to understand how, when, for whom policies can support transformative governance as the way to facilitate transformative changes.

6.2.2. What policy options exist for affecting transformative governance

In *Section 6.2.2* a meta-analysis of 37 policy instruments was carried out using the five key components of transformative governance as the main assessment criteria, i.e., whether the policy instruments address the status quo, incorporates diverse values, foster institutional change, promote capacities, and are implemented in an integrative and adaptive manner (see 6.1.3). Policy instruments were defined and categorized according to the IPBES Catalogue of policy support tools and policy instruments (*Box 6.1*) (IPBES, 2017). The initial list of policy instruments was derived from the same source (IPBES, 2017). Additional policy instruments were added to this list after screening the IPBES Global Assessment (IPBES, 2019a). The main source of evidence used was the core text and the annexes of *Chapter 6* of the IPBES Global Assessment, and where evidence was scarce, additional targeted literature reviews were carried out (*Annex 6.2*). Results of this assessment are shared in the following four subsections, organized along the four categories of policy instruments (economic and financial, legal and regulatory, social and cultural, and finally rights-based and customary instruments).

Assessing how far policy instruments can support transformative or incremental change was challenging for several reasons. First, for many instruments there is a lack of detailed empirical evidence on place-based implementation. Second, in practice several policy instruments are implemented at the same time as part of a policy mix, hence the impacts of a single instrument are hard to identify as those usually emerge as a result of interplay between all the used instruments. Third, even where robust evidence is available for a single instrument, it often shows a high variability across the different contexts. This highlights that the extent to which a policy instrument supports transformative or incremental change depends largely on how exactly it is implemented and how much it aims to challenge the institutional settings that maintain the *status quo*. These challenges of evaluation lead us to choose the potential for change (either transformative or incremental) as the focus of our analysis.

In addition to the meta-analysis of the 37 policy instruments, *Section 6.2.2* also analysed the valuation “brightspots” assessed in *Chapter 4*. “Brightspots” were identified by *Chapter 4* through a comprehensive literature review of papers in the academic and grey literature where assessors could find evidence for valuation uptake in policy and practice. We selected “brightspots” that showed evidence of engaging diverse value approaches in policy, and further analysed them along dimensions of transformative potential (*Annex 6.1*). This assessment did not find sufficient evidence for

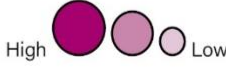


transformative governance in these cases. Rather, in demonstrating evidence for valuation uptake, the “brightspot” cases represented potential dimensions of transformative governance and illustrated some key themes for facilitating the transformative potential of policy instruments (*Figure 6.6*). Findings of the “brightspots” assessment are weaved into the policy instrument analysis to highlight how transformative governance has been facilitated in on-the-ground implementation of different policy instruments⁸.

6.2.2.1. Economic and financial policy instruments

Economic and financial instruments include regulations that financially incentivise or constraint specific activities by handing out or taking away economic resources (IPBES, 2017). Altogether 13 economic and financial instruments were assessed identifying their potential to incorporate diverse values and lead to change (*Table 6.2*). The subsection first sums up the assessment results for each of the 13 economic instruments, then key lessons regarding their on-the-ground implementation are shared based on the analysis of relevant “brightspot” cases.

⁸ It is important to note that “brightspot” examples were unevenly covering the four types of policy instruments. They were strongly focused (82 % of assessed studies) on legal and regulatory instruments, and to a much lesser extent (38.8%) on economic and financial instruments. Rights-based and customary instruments (8.2%) and socio-cultural instruments (18%) featured scarcely in the assessed literature. In terms of transformative dimensions, cases most often concerned the “integrative-adaptive” (85.2% of assessed cases) and “addressing diverse values” (82% of assessed cases) elements of transformation, while “addressing the *status quo*” (5.3%) and “capacity-building” (37.8%) were less frequently addressed.

Table 6.2 Comparing existing economic and financial policy instruments in terms of their transformative potential.

Potential for change	Name of policy instrument	Assessment criteria					Potential scale of implementation				Key influencers of implementation
		Address status quo	Incorporate diverse values	Foster institutional change	Promote capacities	Integrative & adaptive					
More transformative	Alternative economic models	●	●	●	●	●	-	■	-	-	●
	Alternative measures of human well-being	●	●	●	●	●	-	■	■	-	● ●
More incremental	Payment for ecosystem services	●	●	●	●	●	■	■	■	■	● ● ●
	Environmental subsidies (& eliminating harmful subsidies)	●	●	●	●	●	■	■	■	■	● ●
	Ecological fiscal transfers	●	●	●	○	●	-	■	■	-	●
	Ecosystem accounting	●	●	●	●	●	-	■	-	-	● ● ●
	Biodiversity financing (including ODA)	●	●	●	●	●	■	■	-	■	● ●
Maintaining status quo	REDD+	●	●	○	○	●	■	-	-	■	● ● ●
	Taxes on consumption	●	●	○	○	●	-	■	-	-	●
	Tradable permits	●	○	●	○	●	■	■	-	-	● ● ●
	Biodiversity relevant taxes, charges and fees	●	○	●	○	●	-	■	■	-	●
	Biodiversity offsets	●	○	○	○	○	-	■	■	-	● ●
	Derivatives trading and commodity futures	●	○	○	○	○	■	■	-	-	● ● ● ●
		Potential contribution to transformative governance 				Scale of implementation 				Key influencers 	

Description of economic policy instruments

Alternative economic models, e.g., the *Buen vivir* in Bolivia and Ecuador, the *Ecological Civilization* in China, or degrowth models realize that to avoid the future deterioration of the environment and human well-being, the current growth oriented economic paradigm needs to be replaced (IPBES, 2019a). Alternative economic models apply a diverse value approach, treating material, social and spiritual/mental well-being as equally important (Yan & Spangenberg, 2018), and put a strong emphasis on learning and developing capacities (Echavarría & Orosz, 2021; Wang et al., 2020). However, the evidence base is weak especially regarding place-based implementation, mainly because such initiatives only sporadically exist around the world.

Alternative measures of human well-being are also offered to overcome the challenges associated with the monistic and growth-oriented approach of the gross domestic product. Examples include the Gross National Happiness Index of Bhutan which combines equitable social development, cultural preservation and conservation of the environment (Verma, 2017), or the Genuine Progress Indicator which broadens gross domestic product calculations with the utility derived from non-market goods and services (e.g., unpaid work or nature's contribution to people), and the disutility emerging from negative externalities (e.g., costs of environmental degradation) (Berik, 2020; Talberth & Weisdorf, 2017). While such measures are increasingly used at national and subnational level, further work is needed to better incorporate nature and its contributions to people, and to ensure their application across multiple scales (Talberth & Weisdorf, 2017).

Payments for ecosystem services are market-based instruments to financially incentivize conservation action which are widely used and implemented in many different ways (Börner et al., 2017; McElwee, 2012; Salzman et al., 2018; Shapiro-Garza, 2013). While it can incorporate diverse values and can be accompanied by strong capacity development, high transaction costs as well as uneven power relations and unequal distribution of benefits can undermine its transformative potential (Berbés-Blázquez et al., 2016; Cáceres et al., 2016; Porras et al., 2013; Salzman et al., 2018; van Hecken et al., 2019).

Ecological fiscal transfers redistribute tax revenues from national to state or local governments by using ecological indicators to acknowledge ecological public functions and to fund local (subnational) conservation actions (Droste et al., 2017; Ring et al., 2011). Ecological financial transfers enable the decentralization of conservation efforts (IPBES, 2019a) therefore it can foster institutional change and contribute to a more inclusive and adaptive conservation practice. Ecological financial transfers are increasingly applied around the world (e.g., in Brazil, India or Portugal) (Busch et al., 2021), partly because their implementation might induce lower transaction costs compared to payments for ecosystem services as the existing fiscal system can be used for the transfers (i.e., no new allocation system is generated in most cases) (Ring, 2008; Ring & Barton, 2015; Schröter-Schlaack et al., 2014).

Environmental subsidies that apply positive incentives for conservation measures are widely used across the continents (e.g., agri-environmental schemes or financial support for local fisheries management). While good examples exist for subsidies incorporating diverse values of nature, fostering institutional change, offering capacity development and enabling local adaptation, these address only the direct drivers of biodiversity loss instead of the underlying causes (such as unsustainable production and consumption patterns). Despite governments having made commitments to eliminate those incentives which are harmful for biodiversity by 2020 (Aichi Target No. 3) and to develop and apply positive incentives for biodiversity conservation and sustainable use, ecologically inefficient and harmful subsidies still persist among others in the agricultural, fishery,

and energy sector, and are estimated to outweigh pro-biodiversity subsidies by a factor of 10 (IPBES, 2019a; OECD, 2017). To address the root causes of the current crisis and therefore enhance the transformative potential of environmental subsidies, the removal of perverse subsidies is critical (McElwee et al., 2020).

Ecosystem accounting (or natural capital accounting) includes a wide variety of methods and approaches which are used to incorporate the values of nature into public and business accounts, ranging from monetizing methods to more diverse approaches including also non-monetary units (Agarwala et al., 2014; Faccioli et al., 2016; Giampietro, 2014; Hooper et al., 2019; Lomas & Giampietro, 2017; Ten Brink, 2012). It is used in different ways and for different purposes; in some cases as a national indicator of non-monetary wealth (the green gross domestic product), in other cases as a national or subnational planning tool (Brown & Ulgiati, 1999, 2011; Franzese et al., 2014, 2019; Geng et al., 2013; Sumarga et al., 2015; Ulgiati et al., 2011). It provides new and nuanced information to decision-makers about stocks and flows of natural capital, which is important because in economic market mechanisms, these “externalities” are not visible in the price of commodities. The significance of the instrument is based on the premise that more information will result in better decision-making - still, it fits into the current economic paradigm and fosters transformation only if technical, negotiation and governance capacities are promoted (*Annex 6.2*).

Biodiversity financing in developing countries is mainly covered by international aid (IPBES, 2019a). Finance mobilized for conservation is below the level that is estimated to be globally sufficient, and evidence is scarce and inconclusive about both conservation outcomes and socio-economic impacts (Bare et al., 2015; Börner et al., 2017; Miller et al., 2013; Waldron et al., 2017). However, new trust fund and collective fund approaches (e.g., the Amazon Fund in Brazil) can have higher transformative potential if accompanied by capacity development and management follows an inclusive and adaptive approach.

Reducing Emissions from Deforestation and Forest Degradation (REDD+) compensates developing countries for reducing greenhouse gases emissions and at the same time aims to contribute to poverty alleviation and biodiversity conservation. While it is increasingly used in Latin America (Corbera & Brown, 2010; Osborne, 2011; Rival, 2013) and Africa (Namirembe et al., 2014), some key challenges - such as how to guarantee positive ecological and social outcomes - have yet remained unresolved (Atela et al., 2015; Lawlor et al., 2013; Murray et al., 2015; Reynolds, 2012). REDD+ has also been observed to contribute to a recentralisation of forest governance by bringing forests under renewed forms of government control (Abidin, 2015; Duchelle et al., 2014; Sunderlin et al., 2014; Vijge & Gupta, 2014).

Taxes on consumption can address both overconsumption and pollution, although very few examples exist where a consumption tax directly targets ecosystems or biodiversity (e.g., eco-VAT in Brazil, Farley & Costanza, 2010), and the literature is inconclusive in terms of their current environmental and social impacts (IPBES, 2019a).

Tradable permits, biodiversity offsets and biodiversity relevant taxes and fees aim at internalizing the negative environmental impacts of development and provide alternative financial sources to nature conservation by reallocating resources from the private sector (IPBES, 2019a). Derivatives trading and commodity futures (contracts that stipulate the price, volume, and date of transactions) can reduce risk but are also often the target of speculation and therefore can contribute to high price volatility and turbulence (Cooper, 2010). These instruments follow a more focused, market-oriented logic, and do not offer stimulus for institutional change or adaptive governance. Recent articles acknowledge that short term actions capitalizing mainly on policy instruments belonging to this third group (e.g.,

eliminating harmful subsidies, increased standards for green private investments or including bonus-malus schemes in environmental taxation) help mitigate the impact on biodiversity (see e.g., McElwee et al., 2020), but are insufficient to shift the current economic paradigm to one which is more aware of other values of nature.

Lessons learnt from on-the-ground implementation

The analysis of the “brightspot” cases highlighted that multiple and diverse criteria can be critical for facilitating transformative governance, especially for economic instruments. Policy support tools can help stakeholders to learn about a system through diverse value and knowledge perspectives, e.g., through assessing, discussing and prioritizing multiple and diverse criteria (Graziano et al., 2009; Hajkowicz et al., 2008; Karjalainen et al., 2013; Rohde et al., 2006). Multi-criteria decision-making and assessment engage multiple stakeholders in defining and assessing the measures and values by which to evaluate and monitor landscape change, and implement policy (Hajkowicz et al., 2008; Karjalainen et al., 2013). Multi-criteria approaches allow flexibly defining the assessment criteria, not requiring all of them to abide by similar underlying frameworks or scales, but to exist and be weighted as measures in their own rights (Ha et al., 2017). The participatory analytic hierarchy process is effective in supporting diverse value approaches in transforming governance, in part thanks to its ability to integrate variables with different underlying assumptions (Ananda, 2007; Rahman et al., 2015). Support tools such as social benefit-cost accounting (e.g., Xu et al., 2003), the preferred strategic alternative method (Barquet & Cumiskey, 2018), socio-cultural valuation (Iniesta-Arandia et al., 2015) and the stated preferences method (García-Llorente et al., 2011) give equal weight to different stakeholders’ interest by allowing benefits that are different in nature and scale to carry significant value in shaping decisions (Xu et al., 2003). They allow diverse criteria, informed by different worldviews, values and knowledge systems, to inform policy development and implementation support interaction, dialogue and negotiation among stakeholders (Barquet & Cumiskey, 2018; García-Llorente et al., 2011; Iniesta-Arandia et al., 2015), improve political debates (Xu et al., 2003), put political issues into a common context (Xu et al., 2003), help to surface, articulate and monitor trade-offs to diverse stakeholders (Ananda, 2007; García-Llorente et al., 2011; Rahman et al., 2015), and enhance the transparency of participatory processes and the public acceptance of policy decisions (Ananda, 2007; Rahman et al., 2015).

However, including diverse criteria in policy development and implementation is not a silver bullet. Certain values (such as economic values) may be more powerful or dominant in presenting the outcomes of valuation (Hajkowicz et al., 2008), and monitoring and evaluation using multiple criteria may be more expensive and complicated, which can undermine its uptake, sustainability, and effectiveness (Lovrić et al., 2018).

6.2.2.2. Legal and regulatory policy instruments

Legal and regulatory policy instruments include formal rules and regulations that legally regulate (prohibit, sanction or inhibit) certain activities (IPBES, 2017). Altogether, 13 legal and regulatory policy instruments were assessed to identify their potential for incorporating diverse values and their transformative potential (*Table 6.3*). The subsection first sums up the assessment results for the legal instruments, then key lessons regarding their on-the-ground implementation are shared based on the assessment of “brightspot” cases.

Description of legal policy instruments

One legal/regulatory instrument was found to have considerable transformative potential, the *rights of nature* approach, which is increasingly applied around the world (including e.g., countries like Ecuador, Bolivia, India or New Zealand) and has been assessed as having a considerable potential to enable transformative change. The recognition of nature's (or its specific entities') rights puts intrinsic and relational values in focus and often builds on indigenous peoples' worldviews (Akchurin, 2015; Borràs, 2016; Díaz et al., 2015; Gordon, 2017; Rühls & Jones, 2016). Implementing rights of nature via national constitutions⁹ (*Annex 6.2*) or laws creates room for institutional change by supporting co-management regimes and accepting the legitimacy of customary institutions (Strack, 2017; Takahashi et al., 2021). However, even if rights of nature are protected by law, it is challenging to avoid the oversimplification of IPLCs' value systems (Bidder et al., 2016; Griewald et al., 2017; Johnson et al., 2016) and to give voice to ecosystems in courtrooms (McNeill, 2016; Temper & Martínez-Alier, 2016).

⁹ Constitutions pluralistic value approach text analysis (<https://doi.org/10.5281/zenodo.4329704>).

Table 6.3 Comparing existing legal and regulatory policy instruments in terms of their transformative potential.

Potential for change	Name of policy instrument	Assessment criteria					Potential scale of implementation	Key influencers of implementation
		Address status quo	Incorporate diverse values	Foster institutional change	Promote capacities	Integrative & adaptive		
More transformative	Rights of nature						-	
More incremental	Legally protected areas						-	
	Locally managed marine areas						-	
	Marine protected areas and spatial planning							
	Multilateral agreements							
	Expanding food market transparency						-	
	Environmental public interest litigation						-	
Maintaining status quo	Environmental impact assessment						-	
	NBSAPs and other national legislation						-	
	Legislative control over pesticide use						-	
	Commodity chain regulation							
	Trade bans							
	Legal restrictions on natural resource use						-	
		Potential contribution to transformative governance High Low					Scale of implementation Global National Subnational Local	Key influencers Intergovernmental organization (Sub-)national governments NGOs and donors Private sector Civil society groups and communities

Legally protected areas have a traditionally narrow focus on the intrinsic values of nature, but with the increasing acceptance of co-management regimes and IPLC-led conservation initiatives (see also socio-cultural and customary instruments below) there is a tendency to apply more diverse value

approach and to promote local capacities and customary institutions, which contributes to better environmental outcomes, more equal benefit-sharing, and increased local well-being (Molnár et al., 2016; Moreaux et al., 2018; Neudert et al., 2017; Oldekop et al., 2016). This can also lead to a wider institutional change, although the potential for integration and adaptation depends also on the power and interest of other sectors.

Locally managed marine areas show very similar characteristics - their transformative potential seems to depend on the inclusion of indigenous peoples and local communities (Harkes & Novaczek, 2002; Wiadnya et al., 2011) and the availability of external support to build local capacities and enable institutional change (Warren & Visser, 2016). It is also reported that increasing monetization (e.g., through mass tourism on coral reefs or shrimp aquaculture in mangroves) can lead to the loss of sense of social value, with potential implications for ecosystem's health (Arias-González et al., 2017) (*Annex 6.2*).

Marine protected areas are differentiated in this analysis from locally managed marine areas by focusing on international waters and the high seas. While they have a strong potential to address the direct drivers of biodiversity loss in the oceans, more strategic siting, monitoring, and compliance is required (OECD, 2017) to stimulate institutional change, furthermore, addressing the fragmentation of the policy field is necessary to fully integrate the values of the marine environment into decisions. Marine spatial planning provides transparent, scientific-knowledge-based approaches to cross-sectoral prioritization and zoning, which can contribute to managing conflicts and creating legally accepted regulations to the use of oceans (Díaz-de-León & Díaz-Mondragón, 2013; IPBES, 2019a), although the active engagement of stakeholders with diverse knowledge and value systems is critical to rebalance the interests and the power relations regarding conservation and use (Frazão Santos et al., 2019; Secretariat of the Convention on Biological Diversity & Scientific and Technical Advisory Panel - GEF, 2012; Trouillet, 2020).

Multilateral agreements can foster capacity development and legal mainstreaming, but on the ground implementation is highly context dependent and sometimes suffer from policy fragmentation and weak enforceability. International examples from the field of environmental law include among others the Aarhus Convention and the Escazú Agreement which fosters both social and environmental justice by aiming to ensure the public's right to information, right to participation and right to remedy in environmental matters (IPBES, 2019c; United Nations, 2018).

National biodiversity strategies and action plans and other national laws and ordinances (*Annex 6.2*) are reported to have a varying (but often limited) capacity to engage indigenous peoples and local communities due to constraints of human and financial capital, and a strong reliance on mainstream scientific knowledge (Escott et al., 2015; Tengö et al., 2017).

Environmental public interest litigation allows citizens and non-governmental organizations to enter the court and file litigation to represent the public interest in cases of environmental degradation or pollution. While environmental public interest litigation can represent diverse values and interests in the legal process, it often remains a reactionary act if not embedded in a strong judiciary (Carpenter-Gold, 2015; Schall, 2008), and not accompanied by stricter environmental law and enforcement (Wang & Gao, 2010).

Environmental impact assessment is a process to evaluate the likely environmental (and associated social, cultural, health-related and economic) impacts of a development project. Incorporating uncertainty and adaptive management (CBD environmental impact assessment guidelines) into environmental impact assessment can establish an adaptive process more open to diverse values,

while combining environmental impact assessment with strategic environmental assessment can make room for institutional change. However, several challenges are acknowledged, especially for the inclusion of IPLCs (Craik, 2017; Quintero, 2012).

Expanding food market transparency (e.g., through reduced food taxes or public procurement rules) was initiated by several countries after the 2007-2008 financial crisis to reduce volatility (Clapp, 2009; Minot, 2014). Beside stabilizing prices, such interventions could merge social and environmental objectives (e.g., green public procurement in the European Union), qualifying the conventional view of transparency into notions of effective transparency that contributes to aligning business incentives to more positive socio-ecological outcomes (Stromberg & Ituarte-Lima, 2021). However, to enable integration and institutional change, food market transparency needs to expand to the whole value chain, target the most vulnerable groups, and respect cultural values and eating habits.

The legal control over pesticide use regulates the manufacturing, trade, use and disposal of pesticides through national and international regulations, but does not address the root causes that lead to the overuse of pesticides. To unlock its transformative potential, agroecology and other sustainable practices need to be upscaled (FAO, 2017; IPES-Food, 2015; Muller et al., 2017; Rockström et al., 2017). Traditional land use practices of indigenous peoples and local communities rely on a limited use of pesticides, and also contain remediation practices to reduce the impacts of pollution (Sandlos & Keeling, 2016), therefore their inclusion might contribute to knowledge and capacity development and a more integrated and adaptive approach to pesticide use.

Commodity chain regulations (e.g., land use moratoria or zoning for soybean production in Brazil) help manage telecouplings and reconcile nature and agriculture (Gibbs et al., 2015; Rudorff et al., 2011), but leakages might occur (Arima et al., 2011) and outcomes seem to depend on the economic pressure on natural resource use (i.e., commodity prices) (Harding et al., 2021). Stronger coordination across the value chain (i.e., long-term collaborative relationships and increased trust between value chain actors) is needed to enable a more integrated and adapted approach (dos Reis et al., 2020).

Trade bans - while can help reduce natural resource extraction and associated negative impacts (Ferretti et al., 2020) - often have unintended consequences on local livelihoods and well-being, e.g., by disrupting local customary institutions or informal food systems of wild species (Parker et al., 2020; Roe et al., 2020). Emerging government proposals call for compulsory standards (e.g., Kvarnström & Zurek, 2021). Capacity development and collaborative partnerships at local levels might help increase their transformative potential.

Legal restrictions on natural resource use are often associated with burdens and benefits unequally shared, especially if local resource users (e.g., IPLCs) are not central to the instrument, and their impacts are highly dependent on enforceability. Combining restrictions with financial incentives (e.g., through payments for ecosystem services or subsidies) and, adding a voluntary and/or collective component to the restrictions (Hayes et al., 2017; Sommerville et al., 2010) might create room for wider transformations, especially if local actors are involved in the design (Kaczan et al., 2017).

Lessons learnt from on-the-ground implementation

In the “brightspot” uptake cases, high degrees of participation and learning is common in the uptake or development of policy that can facilitate a shift towards transformative governance in legally protected areas and marine reserves. To better understand potential trade-offs requires learning from different stakeholders and engaging with different values and valuations of systems (e.g., Cuperus

et al., 2002; de Oliveira Leis et al., 2019). For example, successful examples of biosphere reserves involved multiple stakeholders in the design and implementation process through mutual learning facilitated by companion modelling (Bouamrane et al., 2016). This approach considers power relations between stakeholders, ensures dialogue and engagement, and contributes to a greater respect for collective, negotiated rules, lower enforcement costs, and sharing of costs and benefits (Bouamrane et al., 2016). In a similar example a multiple-criteria decision analysis process facilitated co-learning between diverse actors holding conflicting perspectives in a context with high scientific uncertainty (Karjalainen et al., 2013). Facilitated stakeholder dialogues, supported by structured and transparent analytical tools, enabled the considerations of different viewpoints preferences, which in turn helped the development of sustainable land management around the aquifer in question (Karjalainen et al., 2013). Insights from Portugal further reinforce that deliberative ecosystem service appraisal processes can support transformative governance (Lopes & Videira, 2018). Group deliberations - engaging different stakeholders and building on scientific and local and practitioner knowledge - led to changes in participants' initial mental models, generated new alternatives, expanded perceptions on affected ecosystem services, and supported the formalization of evaluation criteria and decision rules (Lopes & Videira, 2018).

To engage in social learning, boundary objects, such as companion models, are very useful. A commonly used boundary object that supports shared meaning-making and diverse value elicitation are spatial maps (de Oliveira Leis et al., 2019; Ioki et al., 2019; Rohde et al., 2006). Exploratory mapping can provide decision-makers with useful information about the values and knowledge of small-scale resource users, which can help identify potential conflicts and enhance support for protected areas (de Oliveira Leis et al., 2019). The use of participatory geographic information systems permits local people to contribute their knowledge of the local environment to create georeferenced composite maps and generate a better understanding and representation of their sense of place (Ioki et al., 2019). Developing alternative land use scenarios which combine local communities' knowledge with spatial information, can lead to a more sustainable, legitimate, and democratic decision-making and more effective land use plans (Ioki et al., 2019; Shen et al., 2015).

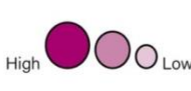







6.2.2.3. Social and cultural policy instruments

Social and cultural policy instruments include information-based instruments and voluntary or collective actions with an emphasis on the intertwined relationships between ecosystems and sociocultural dynamics. Altogether, seven social and cultural policy instruments were assessed (*Table 6.4*).

Description of the social and cultural instruments

The biggest potential to support transformative change was attributed to *co-management*. Although implemented in highly different forms across the world (Soliku & Schraml, 2020), co-management is likely increasing the positive ecological and socio-economic outcomes of protected areas by empowering local people, reducing economic inequalities, and maintaining livelihood benefits (Oldekop et al., 2016). It can ensure a more equal distribution of the costs and benefits of conservation and reconcile different values and interests, provided that trade-offs and uneven power relations are recognized and addressed (Fedreheim & Blanco, 2017; Kimengsi et al., 2019). Specific cultural and ecological contexts are important for successful co-management, making any model hard to upscale, although local leaders, social capital and incentives were found to be crucial factors of success.

Table 6.4 Comparing existing social and cultural policy instruments in terms of their transformative potential.

Potential for change	Name of policy instrument	Assessment criteria					Potential scale of implementation	Key influencers of implementation
		Address status quo	Incorporate diverse values	Foster institutional change	Promote capacities	Integrative & adaptive		
More transformative	Co-management	High	High	Medium	High	Medium	Subnational, National	Intergovernmental organization, (Sub-)national governments
More incremental	Environmental education	High	Medium	Low	High	Low	Subnational, National	Intergovernmental organization, (Sub-)national governments, NGOs and donors, Private sector, Civil society groups and communities, Academia and other educational bodies
	Certification and labelling	High	Medium	Medium	Medium	Medium	Subnational, National, Global	Intergovernmental organization, (Sub-)national governments, NGOs and donors, Private sector, Civil society groups and communities, Academia and other educational bodies
	Public information instruments	Medium	Medium	Medium	High	Low	Subnational, National	Intergovernmental organization, (Sub-)national governments, NGOs and donors, Private sector, Civil society groups and communities, Academia and other educational bodies
	Behaviour nudges for reduced consumption	High	Medium	Medium	Medium	Low	Subnational, National	Intergovernmental organization, (Sub-)national governments, NGOs and donors, Private sector, Civil society groups and communities, Academia and other educational bodies
	Socially responsible investments	High	Medium	Medium	Low	Low	Subnational, National	Intergovernmental organization, (Sub-)national governments, NGOs and donors, Private sector, Civil society groups and communities, Academia and other educational bodies
Maintaining status quo	Corporate social responsibility	Medium	Medium	Medium	Low	Low	Subnational, National	Intergovernmental organization, (Sub-)national governments, NGOs and donors, Private sector, Civil society groups and communities, Academia and other educational bodies
		Potential contribution to transformative governance 			Scale of implementation 		Key influencers <ul style="list-style-type: none">  Intergovernmental organization  (Sub-)national governments  NGOs and donors  Private sector  Civil society groups and communities  Academia and other educational bodies 	

Environmental education is designed to increase environmental literacy and positively influence the public attitudes towards nature. Since education in general conveys a specific value system, as well as the concepts of what knowledge is legitimate, and sets aspirations for what constitutes well-being, education has a strong influence on social norms and lifestyles. To increase the transformative potential of environmental education, there is a need to respect diverse ways of knowing and learning, including indigenous approaches, as well as experiential, sensory, or arts-based ways of cognition. These aspects also need to be considered in formal education systems (Beery & Jørgensen, 2018; Gerofsky & Ostertag, 2018; Slivka, 2016; White et al., 2018). Through education, we can also contribute to the redistribution of power and rights, so that all can assume responsibility and control over their lives and futures.

Certification and labelling are means for providing accurate, understandable, verifiable and reliable information to consumers to allow them to adjust their purchasing behaviour to a more sustainable level. Certification could better contribute to sustainability goals if targeted on areas of high nature conservation value (Hole et al., 2005), and social and economic development priorities. Governments

can facilitate the impact of certification schemes by promoting uptake and supporting strategic targeting through complementary policies (Tayleur et al., 2017).

Public information instruments, such as public guidelines or awareness raising campaigns, aim to foster more sustainable consumer choices by offering information on production characteristics or environmental and health implications of products. While they have a prior focus on instrumental values, information provided on, e.g., cruelty-free production, animal rights or the ethical considerations, allows for intrinsic and relational values to be represented. Still, the literature is inconclusive on the effectiveness of public information instruments, particularly for the average consumer who may not display strong environmental behaviours (Spaargaren et al., 2013; Stern, 2000).

Behaviour nudges for reduced (or more sustainable) consumption are implemented in the food, energy and water sectors, among others. Their architecture is highly heterogeneous, ranging from peer comparison, social norms and group identity to feedback on the (environmental, health or ethical) consequences of buying the product, among others (Bonini et al., 2018). Nudges can strictly speak to instrumental values or can also bring in the relational or intrinsic values of nature as framing conditions of consumption. Their effectiveness is highly context-dependent, and their implementation raises several ethical concerns related to transparency and paternalism (Raihani, 2013; Schubert, 2017). Combination with other instruments and increased transparency might help improve their transformative potential (Schubert, 2017).

Socially responsible investments combine a dominant financial logic with an ethical logic prioritizing environmental, social or sustainability impacts (Chatzitheodorou et al., 2019), which can complement but also compete with each other, depending on contextual factors (Yan et al., 2019). The goals of socially responsible investments can reflect diverse values, but these often follow an instrumental logic. Increasing transparency and improved consistency are important steps to increase the transformative potential of socially responsible investments (Widyawati, 2020).

Corporate social responsibility acknowledges that companies have the potential and responsibility to make a substantial contribution to arresting declines in biodiversity and ecosystems services. Several voluntary standards and instruments are in place, e.g., International Finance Corporation (IFC) performance standards on environmental and social sustainability, the extractive industries transparency initiative, the United Nations guiding principles on business and human rights, or the social licence to operate (Bice, 2014; Moffat et al., 2016; Prno & Scott Slocombe, 2012). Still, little progress has been achieved in terms of involving the business community in protecting biological diversity worldwide, partly because corporate social responsibility activities are often detached from everyday business operations (Addison et al., 2018; Bhattacharya, 2013; Overbeek et al., 2013).

Lessons learnt from on-the-ground implementation

Many brightspot uptake cases illustrated the willingness of communities, managers and other decision-makers to consider the socio-ecological complexity of the systems in which potentially transformative rights-based and socio-cultural policy interventions were applied (*Annex 6.1*). Recognizing the importance of diverse values, knowledge systems, and stakeholders, as well as polycentric governance systems (Misra & Kant, 2004; Ressurreição et al., 2012), already represents a recognition of intertwined, complex adaptive systems, and an attempt to build resilience in these systems (Biggs et al., 2015).

Other features of complex adaptive systems (Preiser et al., 2018) also informed the ways in which the different policy support tools were applied. Several studies highlighted the importance of context-dependency in designing good policy processes towards transformative governance (e.g., Misra & Kant, 2004; Mutenje et al., 2019). Similarly, acknowledging socio-ecological complexity means recognizing the importance of diverse values and worldviews in shaping feedback between ecological, cultural and economic processes (Preiser et al., 2018). Processes that link values and perceptions of different stakeholders, and that probe the interactions between social, economic and cultural diversity can help identify management priorities in complex systems (Iniesta-Arandia et al., 2015; Misra & Kant, 2004; Ressurreição et al., 2012). If such consideration of diverse values goes beyond a local system, they can recognize the radical openness of complex adaptive systems (Farjad et al., 2017; Ressurreição et al., 2012). For example, in the case of marine protected areas support in Europe, understanding how different values at different scales affect the complex relationship between changes of ocean biodiversity, ecosystem services and human well-being helped increase the effectiveness of cross-scale policy design (Ressurreição et al., 2012).

Policy support tools that foster collaborative learning, such as scenario-based methods and futures thinking, provide another option for navigating the uncertainty and dynamic nature of complex adaptive systems (Lovrić et al., 2018; Thompson & Friess, 2019). For example, in exploring the consequences of natural resource management actions informed by participatory multi-criteria decision analysis, participants in a mangrove-dominated system in Thailand revealed potential unintended consequences resulting from complex human-nature and stakeholder relationships. This allowed stakeholders to revise their preferences and facilitated a movement towards more effective mangrove management alternatives (Thompson & Friess, 2019).

Of the uptake cases assessed here, very few concerned customary and socio-cultural policy instruments. Yet the use of these instruments strongly aligns with the complex adaptive nature of socio-ecological systems, in particular its intertwined social and ecological relationality. For example, in the management of Ejido (agrarian form of collective property) in the Maya Zone of Quintana Roo, Mexico, internal customary rules acknowledge the complex, system-wide interactions and embrace diversity in tenure types and land use management options. As a result, forest with useful species was well-conserved, transitional forest for rotational agriculture, and areas linked to ancient Mayan civilization were managed in accordance with its cultural significance (Dalle et al., 2006).

6.2.2.4. Rights-based and customary policy instruments

Rights-based and customary instruments aim to strengthen collective rights and customary institutions of indigenous and local communities that promote an equitable and fair management of natural resources. Altogether 4 rights-based and customary instruments were assessed (*Table 6.5*), three of which can be considered as umbrellas for several diverse practices. A common feature is that all four instruments build on relational and intrinsic values and enable the interaction among (and reconciliation of) different values of nature. Although there is a growing tendency of implementing rights-based and customary instruments, they are not always well-integrated across sectors leading to policy incoherence and hindering institutional transformation. The legal recognition of customary instruments is key to the legitimization of ILK-based practices but combining them with other types of instruments might have adverse effects especially if integration happens in a top-down fashion (Borrini-Feyerabend, 2010; A. Kothari et al., 2013).

Table 6.5 Comparing existing rights-based and customary policy instruments in terms of their transformative potential.

Potential for change	Name of policy instrument	Assessment criteria					Potential scale of implementation	Key influencers of implementation
		Address status quo	Incorporate diverse values	Foster institutional change	Promote capacities	Integrative & adaptive		
More incremental	Other effective area-based conservation measures (OECMs)							
	ILK Revitalization							
	IPLC-led codes of ethical conduct							
	Free, prior and informed consent							
		Potential contribution to transformative governance			Scale of implementation		Key influencers	

Description of rights-based and customary policy instruments

Other effective area-based conservation measures (indigenous and community conserved areas and territories) are areas designated for nature conservation outside of legally protected areas, such as private protected areas, land stewardships, Indigenous Community Conserved Areas (ICCAs) or sacred natural sites. Incorporating customary institutions and management systems governed by IPLCs in other effective area-based conservation measures is important as they are based on local knowledge and encoded in complex cultural practices, relational values, usufruct systems, spiritual beliefs, kinship-oriented philosophies, and principles of stewardship ethics (Berkes et al., 2000; Fernández-Llamazares et al., 2016; Kohn, 2013; Walsh et al., 2013). Formal recognition of IPLC rights over their territories does not only address some of the human rights violations (Kohler & Brondizio, 2017) but it is also a critical factor to ensure the effectiveness of other effective area-based conservation measures, together with knowledge-sharing and mutual learning processes (Aerts et al., 2016; Irakiza et al., 2016; Jonas et al., 2017).

Indigenous Local Knowledge (ILK) revitalization policies contribute to recognizing and restoring customary institutions of indigenous peoples and local communities for ecosystem management (Aikenhead, 2001; McCarter et al., 2014; McCarter & Gavin, 2014; Tang & Gavin, 2016). Indigenous and local knowledge revitalization efforts are most effective when controlled and managed by the

communities involved (Fernández-Llamazares & Cabeza, 2018; McCarter et al., 2014; Singh et al., 2010; Sterling et al., 2017). Moreover, it is important that revitalization efforts consider the gendered nature of knowledge and the crucial role of women in knowledge transmission (Díaz-Reviriego et al., 2016).

IPLC-led codes of ethical conduct (e.g., Akwé:Kon Guidelines and The Tkarihwaí:ri Code of Ethical Conduct (Secretariat of the Convention on Biological Diversity, 2004, 2011)) set up inclusive participatory mechanisms and enable the interaction of different knowledge systems. They can contribute to empowerment and capacity development at the local level, but to fully operationalize this potential decentralized power in decision-making and cross-sectoral policy integration is necessary (Markkula et al., 2019).

Free, prior and informed consent (FPIC) principles allow indigenous peoples to give or withhold consent to a project that may impact their life and territories and creates a platform to negotiate the conditions under which the project is designed, implemented, monitored and evaluated. Although FPIC principles face several challenges, including context-dependent and inconsistent legal interpretations (Anaya, 2005; Dehm, 2016; Perreault, 2015; Pham et al., 2015), they help realize the simultaneous support of nature conservation and human well-being (Magraw & Baker, 2006; Page, 2004). The transformative potential of FPIC principles can largely be enhanced if IPLCs operationalize it through their own decision-making mechanisms (Papillon & Rodon, 2020; Schilling-Vacaflor, 2017).

6.2.2.5. Comparison across the different types of policy instruments

Based on the assessment of each individual instrument in the previous subsections, we can compare the different instrument types according to how far they are able to support system-wide changes (*Figure 6.5*). The upper segment of the figure indicates that over half of the economic and legal instruments, two-third of socio-cultural instruments, and all customary and rights-based instruments assessed had some potential to support system-wide changes (light and medium shade areas on the graph), although more incremental than transformative.

The lower segment of *Figure 6.5* compares the four instrument-families across the mean values of the criteria we used for the assessing their transformative potential. The figure highlights the different strengths and weaknesses of instrument-families, being customary and rights-based instruments the most capable of addressing diverse values.

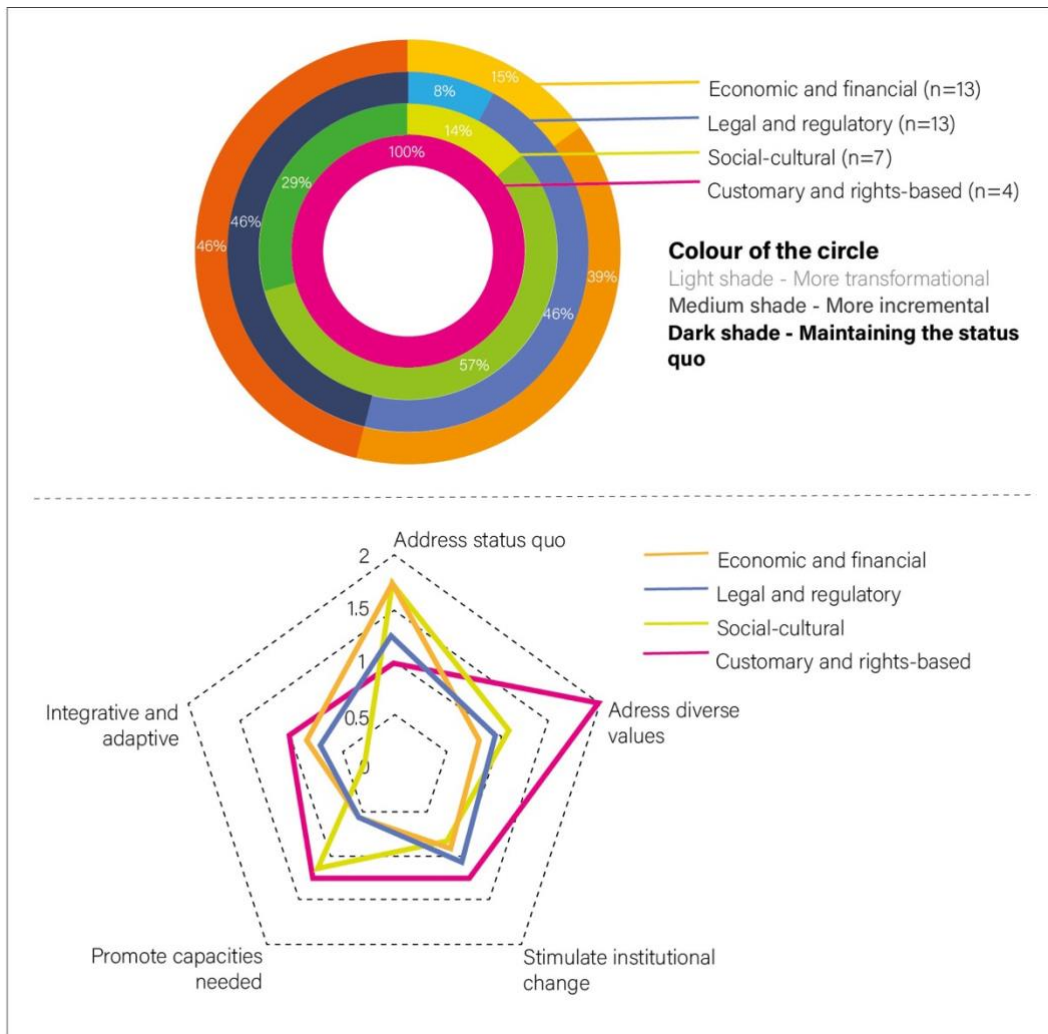


Figure 6.5. Comparing the potential of different types of instruments to support incremental or transformative change.

In addition, the analysis of the policy uptake “bright-spot” cases revealed three key themes for how policy instruments and support tools can engage diverse stakeholders, values and knowledge systems, and support dimensions of positive transformative governance (*Figure 6.6*).

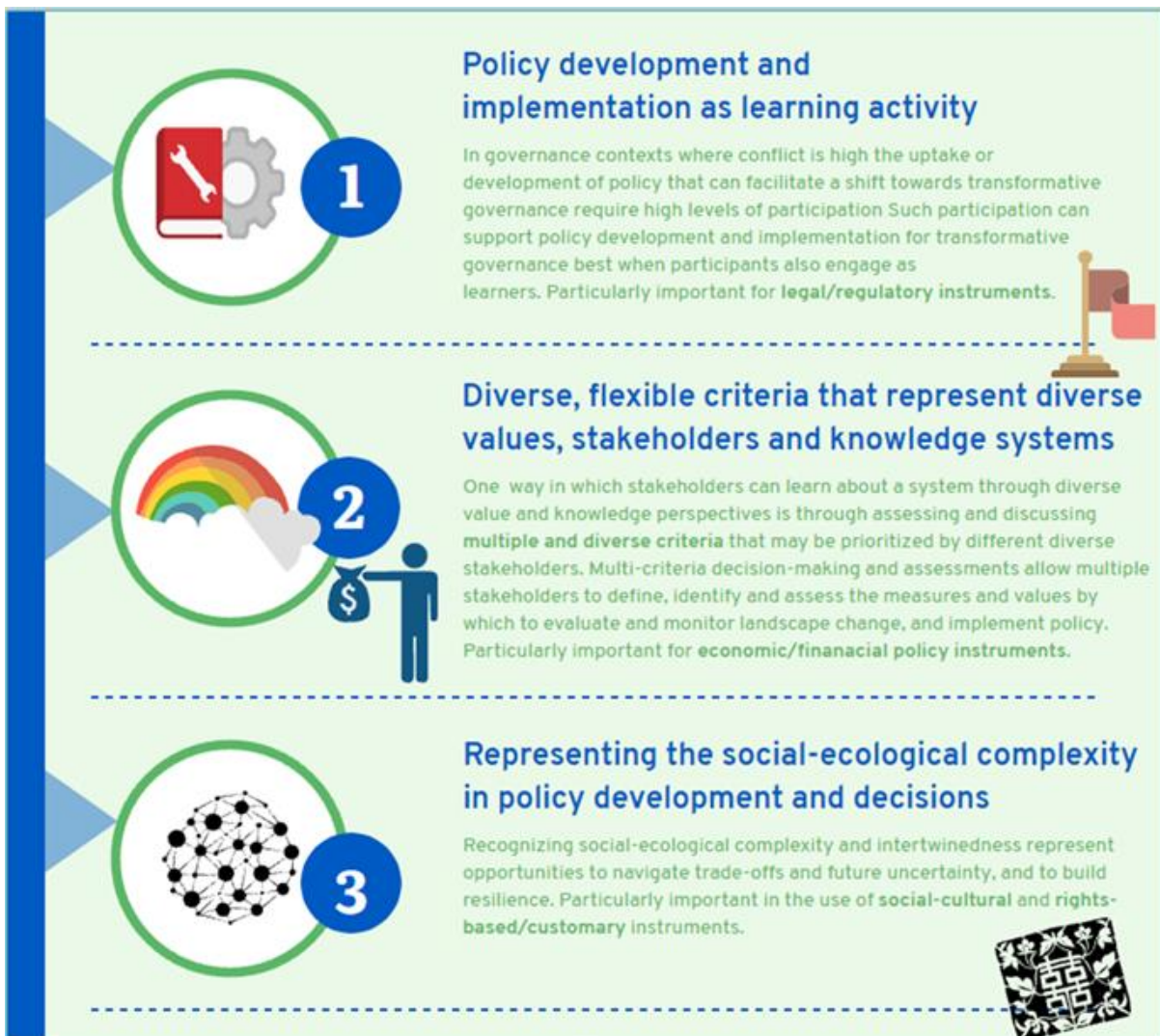


Figure 6.6. How to increase the transformative potential of policy instruments by engaging diverse stakeholders, values and knowledge.

6.2.3. Linking policy and practice: supporting transformative governance in cross-scale initiatives and projects

This section analyses global initiatives that are responsible for governing biodiversity management across various scales. A total of 46 global biodiversity-related initiatives were identified and screened through their websites (particularly the mission statements and “about us” sections) against the different dimensions of transformative governance (as defined in *Section 6.1.2.1*). To better understand how the diverse value approaches discovered during the screening exercise were operationalized in practice, one case study per initiative was identified and assessed in more depth (except 3 initiatives where no suitable cases were found).

Case studies were identified through a literature review that were associated to the different initiatives in each of the below three ways:

- Linked to knowledge management action, without any direct link, support, and/or influence from the initiatives.

- The case study is part of the initiatives' mainstreaming or capacity-building effort, with direct link, support, and/or influence from the initiatives.
- The case study is being inspired or influenced by the initiative, but no direct link (funding, assistance, etc.) between case study and the initiatives.

Case studies were then assessed against diverse value approaches and dimensions of transformative governance (i.e., how far they are able to address the status quo, address diverse values, stimulate institutional change, promote capacities, and act in an integrative and adaptive way), which was used to identify the different ways in which projects incorporated diverse value approaches in policy and practice. The detailed methodology and the list of assessed initiatives and case studies assessed are shared in *Annex 6.2*.

6.2.3.1. Cross-scale initiatives for biodiversity conservation

Nearly all of the initiatives (91%) alluded to diverse (i.e., more than one of the following list), holistic, health, economic, social and biophysical value approaches on their websites *Figure 6.7*. Instrumental (n=42, 91%) and relational (n=43, 93%) were more often reflected than intrinsic values (n=27, 59%). Initiatives spanned development, use (n=33, 72%) and conservation (n=38, 83%) decision-making contexts. They were focused on global challenges of agriculture (n=40, 87%), fisheries (n=36, 78%), protected areas (n=35, 76%), and large-scale and rapid transformation (n=29, 63% - overlapping with agricultural changes). Local knowledge was acknowledged in 28 initiatives (61%). Initiatives focused on mainstreaming, capacity building, policy/advocacy and stakeholder engagement (all engaged in at least two of these categories) and worked with multiple stakeholder groups, including national governments, donors and business. Most of them (n=41, 89%) have a direct policy focus, including policy formulation, policy recommendations, implementation, or advisory activities. In this sense, many of the assessed initiatives act as science-policy interfaces, i.e., they provide information, knowledge and guidance to national and sub-national policy decision-makers to support more robust, just and sustainable decisions.

The Economics of Ecosystems and Biodiversity was the only initiative that expressed solely one value category on its website (it should also be noted that the Economics of Ecosystems and Biodiversity's case descriptions mentioned more diverse values). All the rest of the initiatives considered at least 2 types of values, and on average 4 values were to a certain extent referred to. Among the types of values, intrinsic values were the least referred (27 initiatives covered explicitly intrinsic values), whereas instrumental and relational values were more often reflected (n=43 and n=42 respectively). While some initiatives articulated diverse values in their introduction, they were still classified as not considering diverse values due to the nature and work focus of the initiatives (e.g., the System of Environmental-Economic Accounting, SEEA, or the ValuES project).

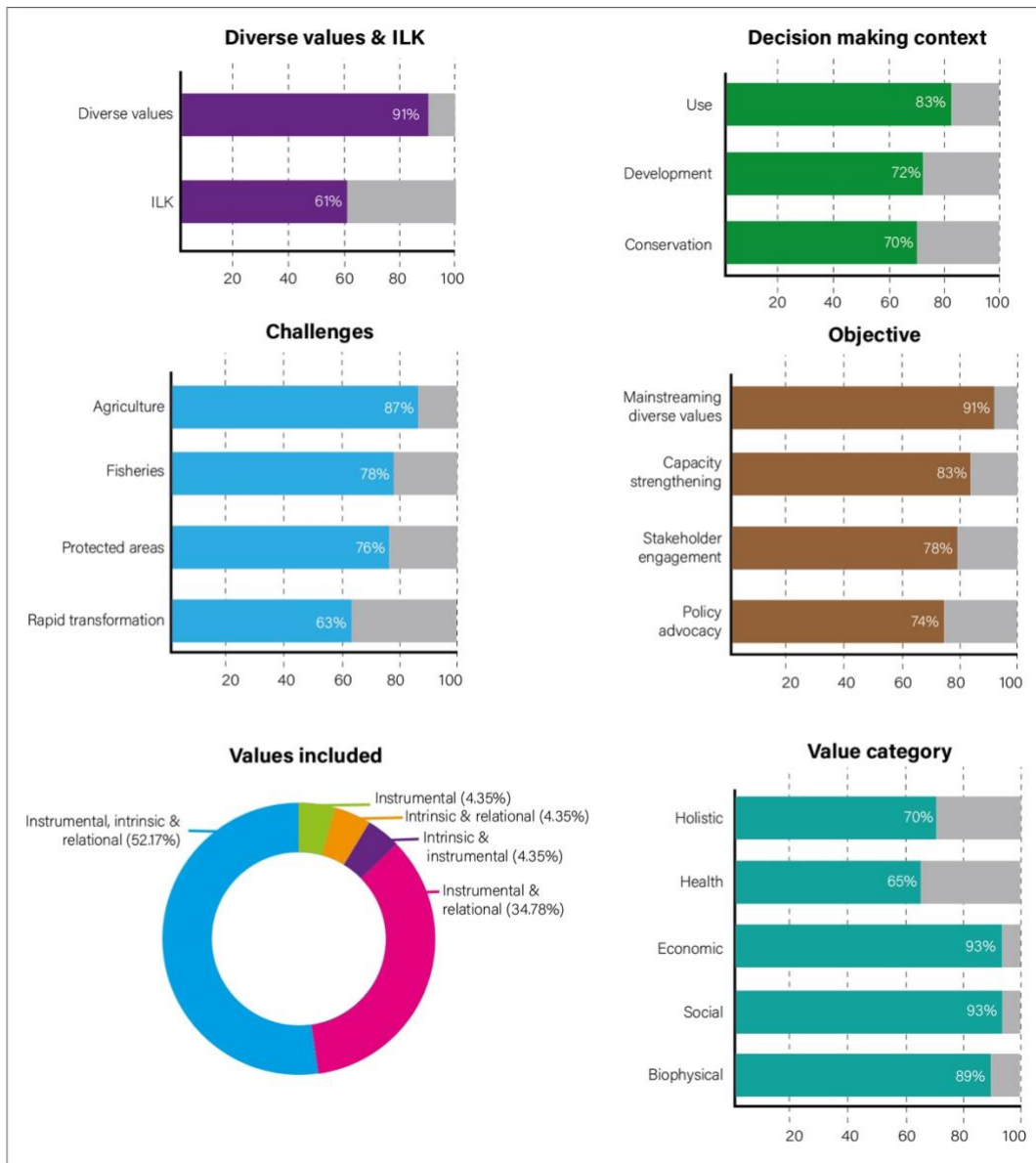


Figure 6.7. Characteristics of assessed initiatives, showing the proportion of initiatives (n=46) that accounted for diverse values and indigenous and local knowledge (ILK), addressed specific decision-making contexts, objectives, and challenges, and accounted for different value types and categories.

6.2.3.2. Case study assessment

The case studies show how cross-scale initiatives stimulate positive transformation in acknowledging and considering diverse values within the natural resources and biodiversity management. As many as 43 case studies were identified from the 46 initiatives assessed above spanning across the national and local scales.

Ten different groups of cases were identified in relation to transformation towards a governance more accommodative to diverse values. These are explained in *Table 6.6* and *Figure 6.8*.

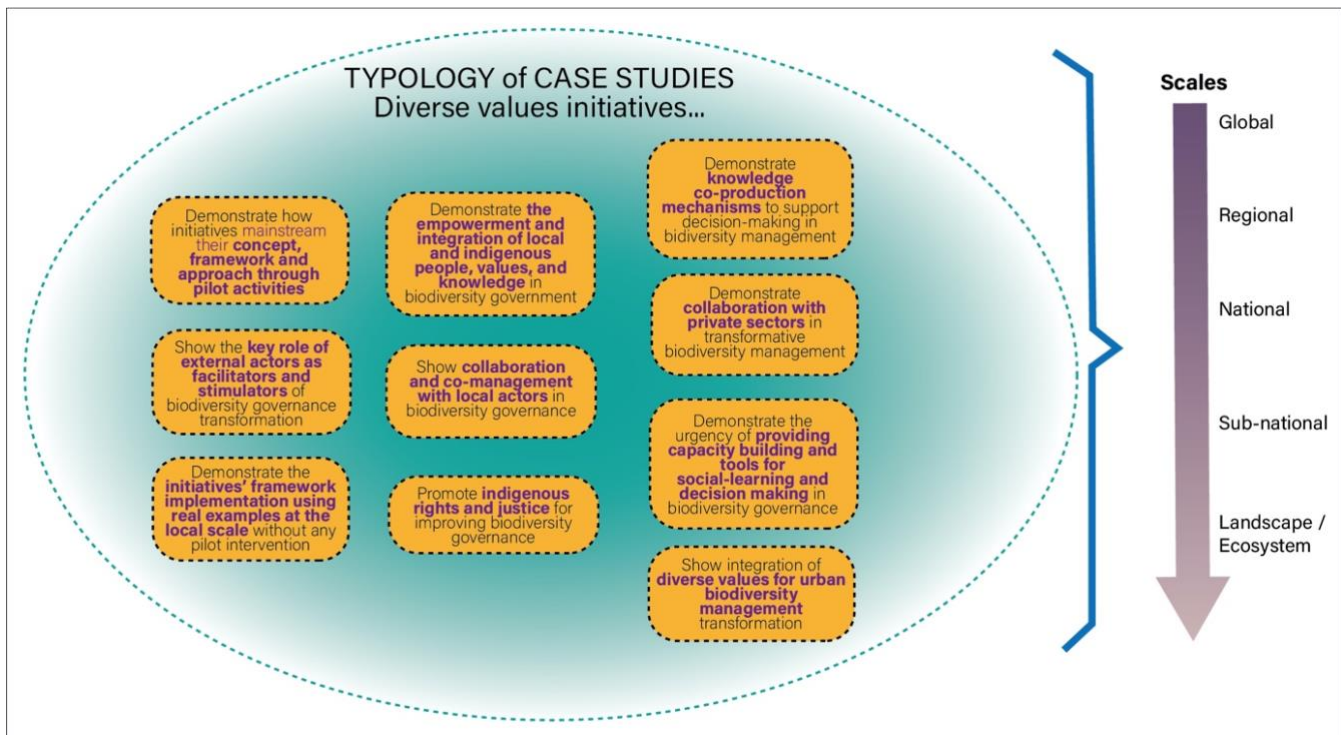


Figure 6.8. Overview of the different typologies of case studies identified in the review.

Many of the cases highlighted the importance of addressing nature's diverse values, particularly instrumental-relational values and instrumental-intrinsic-relational values (*Figure 6.9*). Except three cases related to relational values (SwedBio on Quito dialogues, Global Alliance for the Rights of Nature; Akwé Kon Guidelines of CBD) and one to instrumental values (Protected Planet), all cases addressed instrumental values within the governance process. Two case studies specifically address relational-intrinsic values (Akwé Kon Guidelines and rights for nature). And 13 cases address only instrumental values, of which six cases are related to ecosystem accounting processes (TEEB, SEEA and WAVES) and natural capital accounting and business involvement (Natural Capital Coalition, WBCSD, We Value Nature), two are related to certification (EBBC, World Bank), three to international policy support initiatives (HELI, OECD-Environment Directive and UNCCD) and city region food systems (FAO).

Most of the case studies (28 out of 43 case studies) highlight the urgency to involve indigenous peoples and local communities in conservation. Ten case studies did not explicitly address indigenous peoples and local communities but indicate the need to be inclusive of all actors in their transformative actions, such as indicated in the Future Earth's Knowledge-Action Network programme (KAN), Food and Agriculture Organization's city food region systems (CRFS), European Union Business @ Biodiversity Platform (EU B@B Platform), and The Economics of Ecosystems and Biodiversity, among others. Only nine cases do not specifically involve indigenous peoples and local communities, as they are more focused on environmental accounting (WAVES and SEEA), natural capital assessments (We Value Nature; Natural Capital Coalition), forest data (World Resources Institute Global Forest Watch), global and international environmental governance (SwedBio reflection on Quito dialogues, OECD); and biodiversity monitoring (Birdlife, Protected Planet (UNEP-WCMC & IUCN WCPA). The assessment, as other analyses from this section shows a dominance in *instrumental values*, whereas *intrinsic values* are the most underrepresented (22% of cases).

Out of 43 case studies, 27 on biodiversity management were identified as having high potential to stimulate transformative governance, as those case studies represent three or more transformative criteria (*Figure 6.9*). These include cases representing e.g., the Akwé Kon Guidelines; Conservation International; Economics of Land Degradation, EU Business @ Biodiversity Platform; EKLIPSE; Global Alliance for the Rights of Nature; GIZ; KAN-Future Earth Network; IUCN; IISD; Natural Capital Project; OPPLA; SNRD Asia; SEEA, UNEP; UNESCO; We Value Nature; WHO; and ValuES.

Most of the case studies prompted capacity-building (29 case studies, 67%), addressed the *status quo* (27 case studies, or 63%) and included diverse values approaches (25 case studies or 58%). Capacity building was enacted through awareness raising, data and tools utilisation, bridging interests through social learning processes, and acknowledgement and utilisation of traditional and local knowledge in biodiversity and natural resources management. Of the diverse value approaches, about one-third of the case studies (15 case studies, 34%) simultaneously address instrumental-relational values and 10 case studies (23%) addressed instrumental-relational-intrinsic values (*Figure 6.9*).

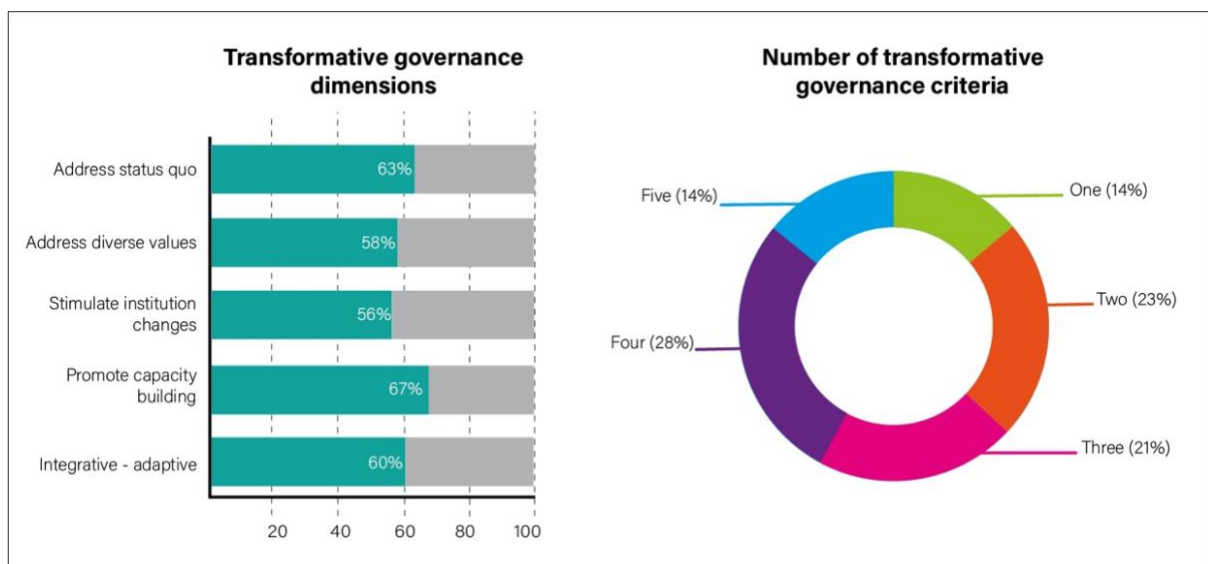


Figure 6.9. Proportion of case studies (n=43) addressing individual transformative governance dimensions (left) and that addressed one to five of these criteria (right).

Addressing the *status quo* related to the production-consumption process (i.e., agriculture, food, certification, accounting system) and promoting equity in the process of managing biodiversity and ecosystem services (i.e., river rights, traditional local knowledge, etc.). In terms of the integrative-adaptive process, projects involved collaborative approaches such as co-management and co-production of knowledge to address complexity and uncertainty in biodiversity and ecosystem services management. Case studies that acknowledge/address diverse values tend to be more integrative-adaptive and overlap in most cases. The assessment also shows a strong association between the values and transformative dimensions: initiatives that are more diverse also address more dimensions of transformative governance (*Figure 6.10*).

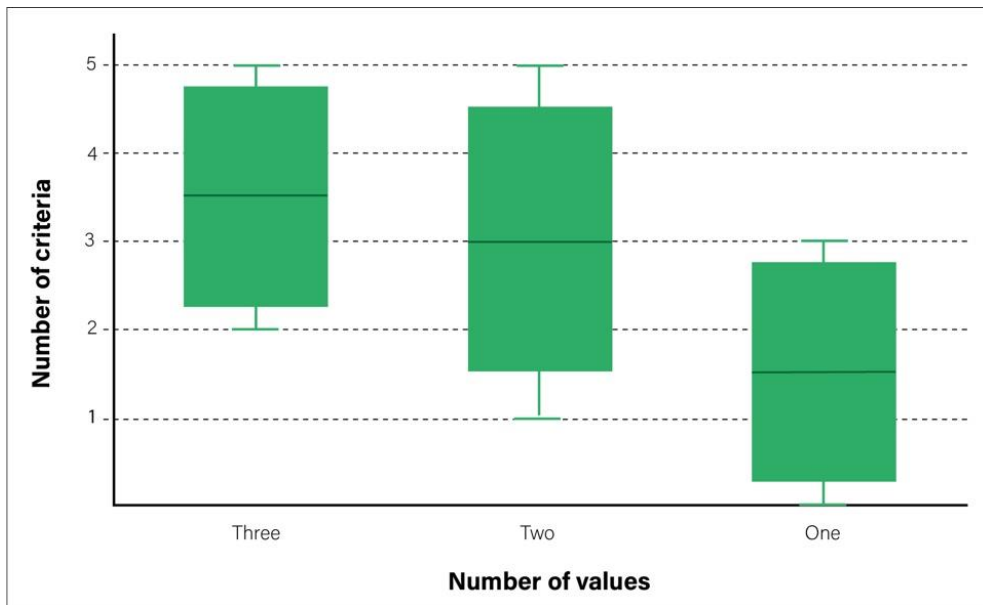


Figure 6.10. Average transformative change criteria in studies with one, two and three different value dimensions, respectively (n=43 case studies).

6.3. Policy options within and across sectors that engage with diverse values of nature for transformative change

This section aims at identifying the opportunities to trigger transformative change towards sustainability through policy options within and across sectors (identified as those most dependent on and with high impacts on nature). A systematic literature review (including academic and grey literature) of policy options was conducted that included identifying key words relating to various human well-being priorities (sectoral) and involve multiple challenges (cross-sectoral). The assessment was informed by the following guiding questions:

- How are diverse values of nature included in different sectors and/or cross-sectoral policies?
- How might the policy options contribute to transformative change towards sustainability?
- What are the benefits, challenges, gaps in the implementation of current policy options used across sectors from a diverse values of nature perspective?

6.3.1. Policy options within sectors

In this sub-section, we look at key issues related to planning and decision making within sectors linked to nature and human wellbeing and highlight the trends in policy options to address them.

6.3.1.1. Incorporating diverse values in decision-making for urban transformation

Urban transformation could denote emergent large-scale or rapid changes in cities (Feola, 2015) often with undesirable effects such as biodiversity loss and increasing disaster risks (Dhyani et al., 2018; Nehren et al., 2019a) and reduced interaction with nature, which negatively affects humans' health and well-being (IPBES, 2019a; Niemelä et al., 2011). Policy responses include limiting city sprawl through encouraging densification (Scott et al., 2016), creation of urban nature reserves, green corridors and parks (Barona et al., 2020; Feyisa et al., 2014; Grande et al., 2016; Stoltz et al., 2016), green infrastructure (Herzog, 2016; Madureira & Andresen, 2014), and using incentives to encourage landowners to preserve, restore or compensate for lost ecosystem functions (Apostolopoulou & Adams, 2019; Brink & Wamsler, 2018; Hostetler, 2020; Mees & Driessen, 2011; Simmonds et al., 2020).

Urbanization entails increasing settlement sizes and radical and broad-based changes to the form, metabolism, economy, demography and associated ways of life of settlements and ecosystems (Pickett et al., 2013; Wamsler et al., 2013). The “new urban transformation” may take the shape of peri-urban growth, declining urban densities and polycentric urban regions (McGranahan & Satterthwaite, 2014). Moreover, to cater to cities' large consumption needs, their hinterlands often undergo large economic and technological shifts, and such urban–rural linkages can drive transformation of entire landscapes (Nehren et al., 2019b). Nature experiences have been identified as critical for people's learning about and engaging in biodiversity conservation and sustainability (Beery et al., 2015; Marcus et al., 2016), but the changes in land-use cover and lifestyle associated with urbanization negatively affect people's experiences, sometimes referred to as the ‘*extinction of experience*’ (Botzat et al., 2016; Soga & Gaston, 2016). Several scholars warn of a negative cycle, where this lack of exposure can result in growing disaffection and poor understanding of nature – exemplified by nature phobias (Bixler & Floyd, 1997), and modernist preference for neat, uniform landscapes, which people might erroneously associate with ecosystem health (Kühne, 2012;

Nassauer, 1992; Niemelä et al., 2011). Policy responses have included biophilic planning and design (Beatley, 2011; Beery et al., 2015; Scott et al., 2016), targeting school children and youth for significant experiences in nature (Giusti et al., 2014; Zanini et al., 2020), and using the pedagogic function of the ecosystem services concept to *educate* decision-makers and the public (Beery et al., 2016).

Urban transformations can also denote transformations of urban governance, such as from a bureaucratized welfare state to a more entrepreneurial form of city management, or conversions between public and private space (Harvey, 1989; Healey, 2006). This may affect the distribution, access to, and experience of nature and ecosystem services, especially for poorer or racialized city dwellers (Anguelovski et al., 2019; Ernstson, 2013; Mullin et al., 2018; Villamagna et al., 2017). As a larger number of actors beyond local governments have emerged in steering the “urban sector” – including businesses, citizens, and different interest organizations – considering diverse values in decision-making is argued to make urban climate or environmental governance more efficient, responsive, fairer and more legitimate (Anguelovski & Carmin, 2011; Mayer et al., 2012; Renn & Schweizer, 2009). Policy responses include different techniques for citizen participation and dialogs (Brink & Wamsler, 2018; Mayer et al., 2012), mapping (Ertiö, 2015; Raymond et al., 2016), and co-production (Mees et al., 2016, 2017; Raymond, Giusti, et al., 2017). However, real participation of poorer segments is rare, unless they are specifically targeted, and more radical social change or resistance to such marketized or entrepreneurial governance arrangements might be more likely to emerge from civil society (Apostolopoulou & Adams, 2019; Brink & Wamsler, 2018; Woroniecki et al., 2020). Attempts to capture values of different stakeholders is done through assessment, valuation, participatory geo-spatial mapping (Brown & Fagerholm, 2015; García-Nieto et al., 2015; Paracchini et al., 2014; Tyrväinen et al., 2007; van Riper et al., 2012).

Other emerging policy options in the urban context include :

Nature-based solutions, which is an umbrella concept for working with and enhancing nature to help address societal challenges (Fink, 2016; Frantzeskaki et al., 2017; Seddon et al., 2020; Woroniecki et al., 2020), through ‘*an ecosystem services approach within spatial planning policies and practices*’ (Scott et al., 2016, p. 267). The approach emphasizes multifunctionality (Herzog, 2016; Madureira & Andresen, 2014) and includes a broad range of issues from climate mitigation and adaptation to recreational space, drainage management and ecological connectivity and habitats (Scott et al., 2016). As it is based on evidence-based understanding of local ecologies, it can include indigenous and traditional knowledge (Cohen-Shacham et al., 2019). However, with regards to including diverse values, the *catch-all* nature of the concept is also the biggest question mark, since nature-based solutions vary considerably regarding how much they support biodiversity (versus monocultures or green-grey structures) and to what extent they are designed and built by or consider knowledge of local communities (Seddon et al., 2020).

Ecosystem-based adaptation and disaster risk reduction (EbA and Eco-DRR) entail using the natural capacity of ecosystems to directly buffer against hazards (e.g., vegetation or wetlands regulating water to fight flooding, or trees providing shade and temperature reduction to fight heatwaves) as well as to indirectly increase people’s capacity to deal with such hazards (GIZ, UNEP-WCMC and FEBA, 2020). Used in harmony with other climate adaptation measures (Brink et al., 2016; Geneletti & Zardo, 2016; Kasecker et al., 2018; Lange et al., 2019; Nehren et al., 2019a; Sandholz, 2018), EbA and Eco-DRR may also result from conservation efforts or policy mixes based on intrinsic values of nature (Brink et al., 2016; Kasecker et al., 2018; Scarano, 2017; Wamsler et al., 2014). Cities with a strong focus on biodiversity conservation may find themselves in a good position to implement EbA e.g., Durban in South Africa (Roberts et al., 2012). While such synergies are often stressed, urban

authorities or park managers still need to balance trade-offs, through assessing species' suitability for different hazards (contribution to biodiversity, and user perceptions through a host of existing concepts and methodologies such as inclusive risk governance (Challies et al., 2016; Renn & Schweizer, 2009), community-based adaptation (Archer et al., 2014; Dhar & Khirfan, 2016; Forsyth, 2014), and participatory vulnerability assessments (Ahmed et al., 2012; OXFAM, 2002; Prabhakar, 2015; Rizvi et al., 2016; Wilk et al., 2018)).

Biocultural approaches – biocultural diversity, focusing on human perceptions and use of biodiversity across different cultural groups (Bermudez et al., 2017; Botzat et al., 2016; Brunet et al., 2020; Fischer et al., 2018; Fischer & Kowarik, 2018; Grande et al., 2016; Gunnarsson et al., 2017; Hand et al., 2016; Hwang & Roscoe, 2017; Sourdril et al., 2017; Voigt & Wurster, 2015; Wang et al., 2019; Zanini et al., 2020), biocultural approaches are gaining traction in global and local sustainability debates (Haider et al., 2020; Hanspach et al., 2020; McMillen et al., 2020; Merçon et al., 2019). Biocultural diversity describes the *inextricable link* between biological and cultural diversity (Cocks, 2010; Cocks & Wiersum, 2014; Maffi, 2007, p. 267) and the benefit for conservation (Maffi & Woodley, 2010). Recently, European researchers have attempted to *relaunch* biocultural diversity as a conceptual foundation for urban greenspace planning, capable of overcoming challenges of the ecosystem services paradigm, along with a suggested framework of indicators for assessing urban biocultural diversity (Buizer et al., 2016; Elands et al., 2018; Vierikko et al., 2016). Examples from the Global South also exist, e.g., focusing on cultural and spiritual relations of non-traditional indigenous people with both natural and human-created biodiversity in South Africa (Cocks & Wiersum, 2014) and cultural heritage and popular feasts of syncretic religions in Brazil (Mendonça, 2014). The reinvented, urban version of the biocultural diversity concept has an explicit normative focus, which goes beyond safeguarding cultural practices and values, aiming to re-connect people with nature and to enhance the diversity of nature as part of an urban transformation towards sustainability (Vierikko et al., 2017). It further enables migrants from rural areas to stay in touch with their practices, food and health resources – including related knowledge exchange between groups (Stålhammar & Brink, 2020; Vierikko et al., 2016).

Biocultural approaches commonly address intrinsic, instrumental and relational values (Hanspach et al., 2020) arising from a co-existence of different cultures (e.g., In terms of religion, race, place of origin, urban subculture) (Elands et al., 2018). However, methodological development and testing is needed in cities, with calls to produce actionable knowledge that consider questions of power, gender and transformations (Hanspach et al., 2020; McMillen et al., 2020).

Biophilia – biophilic design and perceived sensory dimensions centered around creating city environments that can stimulate and awaken humans' inherent love and longing for nature (Beatley, 2011; Beery et al., 2015; Scott et al., 2016) – and counter the stress related to urbanization (Bratman et al., 2019; Cox et al., 2017; Grahn & Stigsdotter, 2010; Hartig & Kahn, 2016; Stoltz et al., 2016), that includes prescribing time in nature called “green prescriptions” (Kaplan, 1995; Bell et al., 2019)

Recent understandings of nature and place values as long-term and premeditated, rather than immediate or direct (Marcus et al., 2016; Raymond, Kyttä, et al., 2017; Stoltz & Schaffer, 2018). Has led to an increased focus on direct, sensory or embodied experiences in nature (Beery & Jørgensen, 2018; Cooke et al., 2016; Gunnarsson et al., 2017; Raymond, Giusti, et al., 2017; Stoltz, 2019). This emerging research agenda comes with new methodological challenges – not least regarding how to consider diverse values or justice aspects in urban planning and research. requiring new methods, indicators and metrics, capable of balancing objective (e.g., blood pressure and heart rate) and subjective data (Bell et al., 2019; Raymond, Giusti, et al., 2017).

Another perspective is that of children and areas for experimental play, considering that such nature experiences in childhood are especially formative (Balmford et al., 2002; Barthel et al., 2018; Giusti et al., 2014, 2018). Policy examples include a child-centred perspective in urban planning, playgrounds that integrate natural elements for free play, app-based exploration of nature, and outdoor preschools.

Sustainable urban transformations (e.g., urban greening, densification, and climate adaptation) may also produce *undesired effect on* (access to) urban ecosystem services and biodiversity (Chu et al., 2017; Rice et al., 2020; Woroniecki et al., 2020). For instance, scholars note how the “Smart City” planning paradigm, or digitalization more broadly reduce people’s direct interaction and bonding with socio-ecological surroundings, with negative impacts on both health and affinity towards nature (Carmona, 2010; Colding & Barthel, 2017; Cox et al., 2017). Another notable risk is that of “green gentrification” or the displacement of poorer and often racialized or marginalized residents caused by greening the city (Checker, 2011; Pearsall & Anguelovski, 2016).

There are still many *gaps in knowledge*. While more studies have appeared in recent years, there is still a dearth of research on (diverse values of) informal greenspaces and informal settlements, outside the Western context, where cities will grow the most (Adegun, 2018; Botzat et al., 2016; Gopal & Nagendra, 2014; Ronchi & Arcidiacono, 2019; Roy et al., 2018; Rupprecht & Byrne, 2018; Satterthwaite, 2020; Shackleton et al., 2015; Stålhammar & Brink, 2020; Vollmer & Grêt-Regamey, 2013); remedies for the stress and lifestyle diseases associated with urbanization and digitalization that are fast becoming major public health issues (Bratman et al., 2019; Cox et al., 2017; Hartig & Kahn, 2016) requiring more research (Cox et al., 2017; Hartig & Kahn, 2016; Soga & Gaston, 2016); the role of future studies in enhancing diverse values of biodiversity in urban transformations, and the need for envisioned future systems to be more transparent, open and collaborative, while dealing with both normative values and systemic issues (Beck & Forsyth, 2020; Fazey et al., 2020; Wolfram et al., 2016). One example is how large-scale transformations (whether urbanization or “sustainable” transformation) is experienced from the perspective of traditional knowledge systems (Lam et al., 2020), and how such situated knowledge relates to normative, technical or scientific knowledge in urban environmental struggles (Brink et al., 2016; Forsyth, 2014; McMillen et al., 2020; Ruiz, 2018).

6.3.1.2. Incorporating diverse values of nature into land use decisions: Example of nuclear waste management

We highlight the utility of including diverse values of stakeholders in decisions related to land use through an example of nuclear waste disposal, generated during electricity production in Canada.

Nuclear systems represent a special challenge as the waste contains residual radioactivity and chemical toxicity that persists for a very long period of time, and radioactive waste management policies and approaches are often perceived as controversial (Bell, 2019; IAEA, 2020). Stakeholders are many, often have opposing views, and may be a source of conflict (Bell, 2019; Fischer et al., 2019; IAEA, 2018, 2020; Mayhew & Perritt, 2020; Seaborn et al., 1998). There is progress in the implementation of strategies for long-term used fuel management and deep geological disposal is the preferred option for nuclear waste management in several countries, (WNA, 2020a, 2020b).

Box 6.2. The case of the Canadian Nuclear Waste Management Organization and the consideration of indigenous knowledge.

The process to implement a long-term strategy for the management of used nuclear fuel in Canada, has a long history (Hare, 1977; Porter, 1978, 1980; Seaborn et al., 1998). In 2002, the Government of Canada, through the *Nuclear Fuel Waste Act*, assigned this responsibility to the Nuclear Waste Management Organization (NWMO). Canada's plan, known as Adaptive Phased Management (APM), was approved by the federal government in 2007. The plan emerged from a nation-wide dialogue with Canadian and indigenous peoples and is guided by the values and objectives they consider important for managing used nuclear fuel (NWMO, 2005). Since 2010, the Nuclear Waste Management Organization has been engaged in a site selection process to identify a site where Canada's used nuclear fuel can be safely isolated in a deep geological repository. The project will only be implemented with involvement of the interested indigenous communities in the area, and surrounding communities (NWMO, 2010, 2020a). Given the hazard to humans and non-human biota posed by the used nuclear fuel itself and considering the Adaptive Phased Management Project is expected to result in \$23B CAN (2015 dollars) in expenditures over 150 years that will have implications for social and economic conditions locally and regionally, it is easy to draw linkages to each of the 17 SDGs. The Nuclear Waste Management Organization recognizes that indigenous knowledge, including strong relational values to nature, will be essential in understanding the project's contribution to sustainable development (Fischer et al., 2015; FPP, 2020; Hill et al., 2020; IPBES, 2019a; NWMO, 2010, 2016; Woroniecki et al., 2020).

Policy considerations: Through the Impact Assessment Act, the federal government has confirmed the regulatory requirement to integrate indigenous and community knowledge, wherever possible, to support a sustainability-based assessment framework (ICCA, 2019). Indigenous peoples in Canada hold Aboriginal and Treaty rights recognized and affirmed by section 35 of the Constitution Act. Recognizing these rights, in 2005, the Nuclear Waste Management Organization established the Council of Elders and Youth, an independent advisory body of indigenous elders and youth from across Canada who have been instrumental in the development of Nuclear Waste Management Organization policy. These policies formally committing that indigenous knowledge will inform all aspects of the Nuclear Waste Management Organization's work while ensuring that indigenous knowledge is respected and protected, and that the nuclear waste organization will contribute towards reconciliation (Díaz et al., 2015; Hill et al., 2020; Tengö et al., 2014; TRC, 2015). The Nuclear Waste Management Organization also issued an Environmental Responsibility Statement that promotes the commitment that diverse values, including the inter-relationships between human-ecological systems, will be accommodated (NWMO, 2020b).

Building organizational apacity: Consistent with the literature, indigenous community members and The Council of Elders and Youth have confirmed to the Nuclear Waste Management Organization that opportunities to learn and work together will establish the reciprocal foundation of trust and respect essential for success (Arctic Council, 2015; Council of Elders and Youth, 2016; Croal et al., 2012; Eckert et al., 2020; Muir, 2018; Tengö et al., 2017; The Nature Conservancy, 2017). Acknowledging that ‘integration’ of indigenous knowledge with western scientific discourse for decision making is often rife with power imbalances (Johnson et al., 2016; Stevenson, 1996; Tengö et al., 2014, 2017; Usher, 2000) and misrepresentations (Arctic Council, 2015; Curran & M’Gonigle, 1999; Eckert et al., 2020; FPP, 2020; Hill et al., 2020; Johnson et al., 2016; Mayhew & Perritt, 2020; McGregor, 2008; Muir, 2018; Noble, 2016; Okediji, 2018; Reo et al., 2017; Reo & Ogden, 2018; Stevenson, 1996; Tengö et al., 2017; Usher, 2000; Whyte et al., 2016), the Nuclear Waste Management Organization actively works to successfully include indigenous perspectives within the project by addressing the knowledge gap that western scientists have with respecting indigenous knowledge in planning and decision-making (Díaz et al., 2015; FPP, 2020; Hill et al., 2020; Tengö et al., 2014, 2017).

Participatory decision-making in action: In line with the discourse on the need for broad public engagement and meaningful participation in developing and implementing large-scale infrastructure projects is well documented (e.g., Arnold & Hanna, 2017; Bice, 2020; Ehrlich & Ross, 2015; Gélinas et al., 2017; Gibson, 2006; Gibson et al., 2016; McGregor, 2008; Noble, 2016; Reo et al., 2017; Seaborn et al., 1998; Stevenson, 1996; Usher, 2000; Vanclay, 2020), the Nuclear Waste Management Organization has adopted a participatory process with partnership as an outcome, recognizing that working at the community level and taking the lead from local indigenous knowledge holders is the only way to incorporate the nuances of the region (Arctic Council, 2015; Arnold & Hanna, 2017; Bond et al., 2012; Booth & Skelton, 2011; Croal et al., 2012; Curran & M’Gonigle, 1999; Eckert et al., 2020; Gilchrist et al., 2005; Hill et al., 2020; Johnson et al., 2016; Landsberg et al., 2013; Mayhew & Perritt, 2020; Muir, 2018; Okediji, 2018; Reo et al., 2017; Stevenson, 1996; Tengö et al., 2017; The Nature Conservancy, 2017; Usher, 2000; Whyte et al., 2016). Including historical, cultural, and spiritual interests that are embedded in the local context ensures we draw upon the best available knowledge to understand potential environmental effects, and their significance. This has often involved “experiencing” the land together, participating in ceremony, and co-creating studies focused on features of the biophysical environment of most value to those involved in the process (Arnold & Hanna, 2017; Johnson et al., 2016; Landsberg et al., 2013; Mayhew & Perritt, 2020; Perritt & Mayhew, 2019; Reo, 2011; Rosa & Sánchez, 2016; TBC, 2018; Tengö et al., 2014, 2017). The understanding of potential effects and ways to apply the Mitigation Hierarchy (see Ekstrom et al., 2015) are being enhanced by interweaving different knowledge systems, especially when knowledge gaps exist (Arctic Council, 2015; Johnson et al., 2016; Tengö et al., 2017; Usher, 2000). This diverse values approach emphasizes the shared desire to protect biodiversity and ecosystem services essential to many facets of well-being.

6.3.1.3. Incorporating diverse values in decision-making in agriculture

In this section we highlight the various policy options that attempt to incorporate diverse values of nature in the agriculture sector. Recognizing that agriculture could lead to unacceptable socio-ecological risks when guided by a narrow consideration of interests and values; (Lathuilière et al., 2017) several policy options are being promoted including the following:

Swidden agriculture also described as “living landscapes” supporting land productivity, forest conservation, ecosystem services, and human well-being (Bruun et al., 2009; Dressler et al., 2017; Fox et al., 2014; Li et al., 2014), it is the primary source of sustenance for about 500 million of the poorest rural peoples in the humid tropical regions of Central Africa, Asia, and Latin America (Dove, 1983; Dressler et al., 2017; Li et al., 2014). Low capital input, a culture of reciprocated inter-household labour arrangements (Geschiere, 1995; Indra & Buchignani, 1997; Koczberski et al., 2018;

Vasco, 2014), and the farming of cash crops alongside food crops, have made swidden agriculture economically preferable (Dove, 1983; Li et al., 2014; Rahman et al., 2017).

These systems are managed based on culture specific indigenous knowledge about forest ecosystem functioning (Reyes-García et al., 2008; Wangpakapattanawong et al., 2010; Xu et al., 2017), with crop diversity observed to be directly linked to cultural identity (Arévalo, 2008; Hume, 2006; Perreault, 2005; WinklerPrins & Barrera-Bassols, 2004) and key ecological benefits, and role in biodiversity conservation (van Vliet et al., 2012). A global assessment points out the expansion of swidden systems in Central Africa and Latin America (van Vliet et al., 2012), partly determined by input costs and insecure land titles. Swidden farmers also undertake intensification through e.g., hedgerow intercropping that increases yield and conserves soil (Aweto, 2013; Kang & Gutteridge, 1994).

Sustainable intensification in agriculture is a diverse values based agricultural system aiming to improve agricultural productivity and environmental management (Buckwell et al., 2014; Elliot et al., 2013; Garnett et al., 2013; SDSN, 2013). For example, 75% of the land leased by National Trust in the United Kingdom to tenant farmers are part of environmental schemes that reward organic farming agriculture, nature conservation, and public access to biodiversity (especially wildlife) in the farm landscape (National Trust, 2009, 2018) and aligned with international climate, biodiversity and sustainable development obligations.

The food sovereignty movement advocates for government policies that decentralise food production among smallholder farmers around the world (Anderson, 2018; Patel, 2009). Food sovereignty advocates led by the global organization *La Via Campesina*, maintain that the right to food, not the right to profit, should be the first consideration of food policy (CAADP, 2015; National Trust, 2009, 2018; Patel, 2009; Pretty et al., 2011, 2018).

Supranational initiatives

The European Union post-2020 Common Agricultural Policy (CAP) subscribes to a diverse values ethos for the agricultural sector (EU, 2018, 2020b). The post-2020 Common Agricultural Policy discussion (EU, 2020a, 2020b) seeks to transition to sustainable agricultural intensification to support multiple objectives from viable farm income, food security, climate action, management of natural resources among others (Buckwell et al., 2014; EU, 2019; Peer et al., 2020) (see also EU, 2018; EU & Directorate-General for Agriculture and Rural Development, 2018).

A similar supranational initiative is the Africa growth corridor initiative launched at the United Nations General Assembly in 2008, and later becoming a key component of the 2014 African Union Malabo declaration on agriculture and postharvest losses (Byiers et al., 2016; Kaarhus, 2018). It is guided by the comprehensive Africa agriculture development program framework that was endorsed in 2014 (AU & NEPAD, 2015; Kimenyi et al., 2013). These are supported by national governments (e.g., Tanzania, Mozambique) and several international organizations and business interests including the African Union, the African Development Bank, the World Economic Forum, the New Alliance for Food Security and Nutrition, and Grow Africa (CAADP, 2015; Gálvez Nogales, 2014). However, their success would be limited by corruption and weak laws with deleterious effects on nature and human wellbeing (Brüntrup, 2011; Byiers et al., 2016; Cooksey, 2013; Kaarhus, 2018; Laurance et al., 2015).

Linking Environment and Farming (LEAF) certification system

Created in 1991 in the United Kingdom to promote sustainable agriculture; by 2003 and with the support of farmers and food retail chains like Waitrose, the Linking Environment and Farming Marque sustainable agriculture certification system was set up allowing certified members to label their products with the Linking Environment and Farming Marque logo (LEAF, 2018). The certification assesses multiple social and ecological dimensions e.g., soil management, crop health, pollution control, animal husbandry, energy efficiency, water management, landscape and nature conservation, community engagement, and organisation and planning (LEAF, 2020; Oberč & Arroyo Schnell, 2020; Rose et al., 2019). Presently, 43% of fruit and vegetables in the United Kingdom were produced on Linking Environment and Farming certified farms; these certified farms are now present in 27 countries across Africa, Asia, Australia, Europe, North and South America (ITC, 2011; LEAF, 2020). Complying with Linking Environment and Farming criteria is linked to financial payments farmers receive from national governments in the United Kingdom and European Union (DEFRA, 2018; EU, 2017; Hjerp et al., 2012; Reed et al., 2017).

In order to meet SDG 2 (zero hunger by 2030), with the other SDGs, there is a need for a multi-dimensional transformative agricultural approach that is responsive to ecological and social risks associated with food production (BSDC & AlphaBeta, 2016; Byiers et al., 2016; Dobermann, 2016; LEAF, 2020; SDSN, 2013). Sustainable agriculture practices are a response to this need for transformative change in food production (Oberč & Arroyo Schnell, 2020; van Vliet et al., 2012; Vía Campesina, 2017). Such initiatives share the attribute of being responsive to societal concerns that food production has to be guided not just by financial interests but by a diverse set of values including environmental and socio-cultural ethics (EU, 2019; Pretty et al., 2018).

While similar approaches including the United States Agency for International Development (USAID) Feed the Future initiative working in Africa, Asia, and South America (Feed the Future, 2020); the Inter-American Institute for Cooperation on Agriculture (IICA) (IICA, 2018, 2019)); and the Food and Agriculture Organization (FAO) global Farmer Field School (FFS) initiative (FAO, 2016) are pushing this diverse set of values agenda in policy formulation (Cairney, 2012), the challenges of legitimacy and implementation remain. This calls for partnerships involving government, civil society and business (Dobermann, 2016).

6.3.1.4. Incorporating diverse values in decision-making in protection of nature

The establishment of protected areas, effectively isolates and delimits these areas and species of fauna and flora from human impact in areas that surround it (Brockington et al., 2006; Swallow et al., 2009), often leading to displacement of local populations (Cernea & Schmidt-Soltau, 2006), with resultant negative consequences to their economic, cultural and social wellbeing (Brockington & Wilkie, 2015; Naidoo et al., 2019).

In the past, protected areas were often created on lands that were worth protecting for their ecological and intrinsic values for society, without considering for instance more instrumental or cultural and spiritual values. Yet, local and indigenous people were, and still are, important resource managers and stewards of biodiversity who are embedded in these complex and adaptive socio-ecological systems (Berkes, 2008; Iwamura et al., 2016; von Heland & Folke, 2014). Displacing indigenous peoples and local communities not only violates international law and exacerbates historical and contemporary injustices but may also have negative ecological consequences. One example of this is the loss of aboriginal fire management in Australia that led to more devastating fires that increased

in size and severity, threatening biodiversity and increasing greenhouse gas emissions from wildfires (Bowman et al., 2013; Trauernicht et al., 2015).

Current protected areas management issues and indigenous peoples

Currently, about one quarter of the world's land area is under indigenous peoples use or management rights (Garnett et al., 2018; Tauli-Corpuz et al., 2020). These indigenous and community conserved areas and territories are managed differently and in pursuit of diverse outcomes, but they are consistent with biodiversity conservation, resulting in indigenous conservation areas as being places of high cultural and conservation values (Aswani et al., 2018; Berkes, 2008; Blackman et al., 2017; Carson et al., 2018; Garnett et al., 2018; Paneque-Gálvez et al., 2018; Reichel-Dolmatoff, 1976; Tauli-Corpuz et al., 2020; van Vliet et al., 2018). Examples of indigenous and community conserved areas and territories can be found on all continents, including customary rules protecting sacred forests in Madagascar, the customary practices of the Inuit of Nunavut to respect and protect important caribou calving grounds, and community conserved seascapes in Japan where fisheries are regulated under locally agreed rules (see Borrini-Feyerabend et al., 2012).

Other effective area-based conservation measures (OECMs) are a more recent conservation designation for areas that achieve effective *in situ* conservation of biodiversity outside of protected areas with associated ecosystem functions and services, and cultural, spiritual, socio-economic, and other locally relevant values (CBD, 2018). Such areas can be managed for many different objectives where conservation can be a primary or secondary objective or may simply be the ancillary result of management activities. However, other effective area-based conservation measures must deliver effective in-situ conservation of biodiversity, regardless of their objectives (IUCN WCPA Task Force on OECMs, 2019). In the past years the number of other effective area-based conservation measures have been steadily increasing, adding to the global coverage of protected areas (ProtectedPlanet, 2020).

Moving beyond the narrow ideas of conservation and protected areas

The diverse strategies indigenous people and local communities use to manage territories represents the plurality of values people hold for nature. For instance, conservation and the managed use of resources, including wildlife, are not contradictory, but part of the same idea of land stewardship to ensure healthy lands and abundant species populations, which can also be described as '*caring for country*' using an aboriginal Australian term (Gorman & Vemuri, 2012) and respectful use and consumption of wildlife as an inherent duty (Krause et al., 2020), marked by a system of reciprocity with the ecosystem (Sirén, 2012) (*Annex 6.3*).

Working with local people is increasingly realized as central for effective and equitable conservation (Oldekop et al., 2016). This, however, requires a gender and livelihood perspective, since women and men not only hold different traditional ecological knowledges, but their use and management of natural resources varies depending on local context and cultural factors, (Aswani et al., 2018; Stiem & Krause, 2016).

6.3.2. Policy options across sectors for transformative change

Achieving SDGs and transformative governance requires a policy integration that bridges and integrates across different values across multiple sectors. A few dominant cross-sectoral themes have been assessed including health, education, economy and how diverse values are embedded in policy options within them.

6.3.2.1. Policy options to include diverse values of nature in health

Health is a multidimensional aspect that is both an input to and an outcome of good quality of life. Achieving good health entails ensuring adequate nutrition, food security, mental and physical well-being and social interactions. This multidimensional nature of health has been well recognized in policy forums such as the World Health Organization, the Convention on Biological Diversity; and further, also at the level of local communities as seen in their practices and notions of health (Payyappallimana & Subramanian, 2015). National policy objectives generally tend to take a narrower approach to implementing health goals and have tended to focus more on developing medical care facilities with less emphasis on public health issues, social and environmental determinants of health (Settele et al., 2020). At the same time, there are calls being made to foster self-reliance in health and bring in more pluralistic interventions that allow integration of multiple knowledge systems in ensuring health and well-being of individuals and societies (Mathpati et al., 2020). Some pluralistic health approaches that are gaining attention include:

Approaches promoting human-nature interactions

More recently, the environment sector has been raising the need to mainstream biodiversity and environment issues into health sector planning and implementation (WHO & CBD, 2015). With the global burden of disease shifting towards non-communicable diseases, policies related to tackling air and water pollution, improving dietary diversity and nutrition, *promoting active lifestyles* especially in urban centres (through promotion of parks and green spaces) have gained strategic importance within the health sector (WHO, 2018). Singapore is fashioning itself as a city in nature and has invested in promoting research to understand biophilic interactions of people including the well-being effects of different types of nature interactions (such as, nature parks, green spaces, therapeutic gardens for the elderly, play gardens for children) on people (National Parks Singapore, 2020). *The human urban microbiome initiative* is another initiative that aims to improve the health of populations in urban contexts. Identifying the necessity for people to interact with nature for better health, the initiative is urging cities around the world to develop green spaces and encourage people to spend time in closer contact with natural resources (Mills et al., 2019).

Building on the concept of planetary boundaries (Rockström et al., 2009), the concept of “*planetary health*” emphasizes the interconnectedness of various social and natural processes, and further that anthropogenic factors have led to large scale degradation of nature and thereby benefits from nature (clean air, water, biogeochemical processes, amongst others) (Whitmee et al., 2015). To address the challenges to these “natural life support systems” and human cross-disciplinary, multi stakeholder approaches are being promoted.

Whilst clearly acknowledging the importance of the interlinkages between the environment and health, a sense of urgency to take this nexus seriously across planning and implementation activities has arisen due to the COVID-19 outbreak (Settele et al., 2020). EcoHealth approaches are considered more transdisciplinary as it relates to addressing human health issues by tackling the various determining factors- social, environmental and other epidemiological. It emphasizes the need for cross-sectoral implementation focusing on the linkages between ecosystem health, human health and social justice. This requires a close interaction between different types of experts triangulating observations with affected populations and identifying appropriate solutions (SCBD, 2020).

One Health is being promoted jointly through the One Health Commission by the World Health Organization, Food and Agriculture Organization and the World Organization for Animal Health that seeks to attain “optimal health” of humans, animals and the environment (FAO et al., 2019). Its

mandate is therefore wider in scope and is seen to be reflected more in country policies, with rise in frequency and severity of zoonotic and emerging infectious diseases (Cunningham et al., 2017; Jones et al., 2008; Lajaunie et al., 2015). The Convention on Biological Diversity has adopted comprehensive guidance to integrate biodiversity considerations in One Health approaches to further widen the mandate of this approach beyond just infectious diseases, and to also deepen the links between biodiversity and ecosystems in achieving One Health objectives (SCBD, 2020).

For example, The Natural Livestock Foundation is coordinating an action research program to address antibiotic residue in milk in the Netherlands. Towards this, a team of modern veterinarians in the Netherlands interact actively with modern and traditional veterinarians from India, Uganda and Ethiopia to identify safer alternatives to treat cattle, that involve sustainable use of herbal medicinal resources and ensure ecosystem integrity (Groot & van't Hooft, 2016). The partnership and approach are illustrative of transformative solutions in production processes that build on deliberative and transdisciplinary approaches towards ensuring the well-being of humans, animals and the environment.

Community/indigenous health

This concept focuses on the health of local communities and marginalized populations, including indigenous people that relates not just to medical services, but involves access to food and nutritional security, cultural resources, medicinal resources, areas of cultural importance, rights to use and practice and livelihood security. It therefore translates to a sense of well-being that encompasses equity, development and ecological sustainability. Loss of or degeneration of any social, cultural or environmental resource due to various factors (from political, economic and others) has been seen to negatively impact the well-being indicators of such communities (King et al., 2009; Montenegro & Stephens, 2006; Unnikrishnan & Suneetha, 2012). Examples of initiatives that seek to revitalize indigenous health traditions and promote endogenously led health care (Bawa et al., 2020; Laycock et al., 2011; Shankar et al., 2007), also identify issues of lack of human resources to bridge between different disciplines, financial resource inadequacies and insufficient understanding and capacities of different implementing agencies.

6.3.2.2. Policy options to include diverse values of nature in education

There is a broad international consensus that education is a key enabler for change towards sustainability. Education, in its original sense of the word, is intentionally transformative, as it comes from the Latin word *ēducere*—to lead forth. However, education has also played a role in reproducing unequal and unjust social and economic relationships. It has been noted that the English word education has two different Latin roots: *educāre*, which means ‘to train or to mold’ with an emphasis on the passing down of knowledge to youth, and *ēducere*, which stresses preparing youth to create solutions to emerging problems (Bass & Good, 2004; Craft, 1984). The *ēducere* dimension has been championed as critical for educational and broader societal transformation. In particular, an overall call for ‘a shift from “transmissive” expert-based teaching and learning to transformative, community-based learning’ (Capra, 2007) resonates with literature on “social learning” for sustainability (Keen et al., 2005; Wals, 2007).

Many global and thematic indicators are narrowly focusing on schooling. Indicators for SDG 4 in general have also been criticized as prioritizing the “business as usual” in education and the education-for-economic-growth paradigm with their reliance on international large-scale assessments (especially literacy and numeracy proficiency data) as monitoring instruments (Komatsu et al., 2019; Komatsu & Rappleye, 2018).

In the two policy options discussed below, the first focuses on the *educāre* (acquisition of knowledge and skills), and the second on *ēducere* (“social learning” and “transformative learning”) dimension of education. The questions of how diverse values are included in education and how they contribute to transformative changes are also addressed in conjunction with these two broad policy options.

Formal education and competency-based approaches

As the wording and the global indicator of Sustainable Development Goal 4.7 clearly suggest, integration of ‘*knowledge and skills needed for sustainable development*’ into school curricula is considered as a viable policy option, as basic understanding of environmental issues by voters, taxpayers and consumers are hypothesized to create crucial incentives for governments and private-sector actors to adopt environmentally-responsible behaviour (PISA-OECD, 2009). In an assessment of science competencies of 15-year-olds across 57 countries by the Organisation for Economic Co-operation and Development (OECD), students expressed that they learnt about environmental issues primarily from schools and only through subjects such as geography and science (PISA-OECD, 2009).

However, such international large-scale assessments could be viewed as reducing the quality of education to mere test scores and failing to capture the transformative aspirations of the SDGs. Furthermore, it has long been acknowledged that there is a gap between people’s stated, prevalent concern for the environment and their largely unsustainable actions, lifestyles, and public policies (Glasser, 2007).

Transformative and social learning for sustainability

Exploration of learning processes which can trigger significant shifts in people’s attitudes and practice has driven many researchers with critical as well as liberal progressive orientations over recent decades. Freire’s theory and practice of “critical pedagogy” (critical awareness of social reality) formed the foundations of the “eco-pedagogy” movement which aims to foster human actions leading to social and environmental justice and planetary sustainability (Misiaszek, 2020).

The eco-pedagogy movement grew out of discussions at the 1992 Rio Summit and led to the launch of the Earth Charter in 2000. *Chapter 36* of Agenda 21 (United Nations, 1992) is commonly considered as a foundational text of education for sustainable development which highlighted the critical role of education in realizing sustainable development. (UNESCO, 2005, 2014a, 2014b, 2016, 2020; United Nations, 1992). Increasingly such calls are underpinned and reinforced by the need to achieve a paradigm shift in education—transformative shifts in educational practices, institutions, and policies required for understanding and enhancing individual and collective human well-being in profoundly different ways. Rethinking education as a global common good is even more relevant today, with new possibilities and potential threats brought about by digital technology (International Commission on the Futures of Education, 2020; UNESCO, 2015).

Apart from the Freirean, transformative education traditions and the international education for sustainable development movement culminated in the United Nations Decade of education for sustainable development (2005-2014) and is now enshrined in Sustainable Development Goal 4.7. Transformative learning as conceptualized by Mezirow (Mezirow, 1991, 1995, 2000) refers to altering already existing perspectives and implies continuity of worldviews, rather than a radical

departure from and a disruption of existing norms (Taylor, 2015). In the “t-learning” project¹⁰ under the transformations to sustainability programme of the International Science Council, the notion of “transgressive learning” was introduced to question and abandon norm foundations to explore radically different ways of being (Lotz-Sisitka, 2016; Lotz-Sisitka et al., 2015; Macintyre, Chaves, Verschoor, et al., 2017; Macintyre et al., 2018).

Another related concept which is critical in considering the *ēducere* dimension of education for sustainability is that of “social learning”. Social learning has developed as a new field of theoretical development and practical application in socio-ecological management and governance (socio-ecological systems, collective governance and management theory) and learning theory (Cundill et al., 2014). In the field of natural resource management (Cundill & Rodela, 2012), the interest in social learning emerged in the 1980s, partly due to failures of “command and control” management (Holling & Meffe, 1996). Keen et al. (2005, p. 4) have defined social learning as ‘*the collective action and reflection that takes place amongst both individuals and groups when they work to improve the management of the interrelationships between social and ecological systems*’.

Box 6.3. Case study on capturing diverse values of nature in education from Northern Japan

Tajiri Town, site of famous wild goose habitat site Kabukuri Marsh, took an innovative approach to community development. Under the leadership of the Japanese Association for Wild Geese Protection, a diverse array of local stakeholders – non-governmental organizations, farmers, local and national government authorities, researchers – came together to manage Kabukuri Marsh to maintain its ecological functions.

Overcoming the initial antagonisms between those who called for the protection of wild geese and rice farmers who viewed wild geese primarily as harmful rice-eating birds, Tajiri Town pursued preservation of biodiversity (in paddy fields) and sustainable agriculture. The figure shows how the conceptualization of rice fields not only as farmland but also as wetland and nesting grounds for wild birds gave birth to the innovation of “winter-flooded rice fields”, which in turn led to the designation of Kabukuri Marsh and the adjacent rice fields as a Ramsar site in 2005. The case study describes processes of social learning for mutually respectful cooperation between “environmentalists from outside” (initially seen as fanatic bird lovers) and “local people” (who depended on rice farming) and presents a model case of promoting both environmental and economic agendas at the local level (Mochizuki, 2007; UNESCO, 2012).

¹⁰ The t-learning project produced nine national case studies, including Sweden, Malawi, Zimbabwe, Netherlands, India, Vietnam, Ethiopia, Colombia, and South Africa. See <https://transgressivelearning.org/>

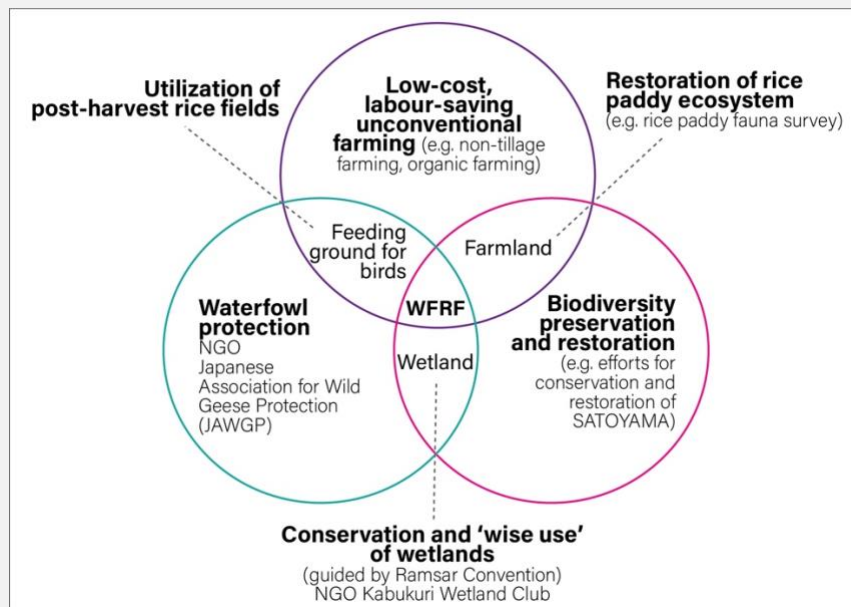


Figure 6.11. Winter-Flooded Rice Fields (WFRF) as an innovation based on social learning in Kabukuri-numa and adjacent rice fields, designated as a Ramsar site at Ramsar COP 9 (the Ninth Conference of the Contracting Parties to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat) in 2005. Source: Adopted from Mochizuki, 2007, p. 395.

6.3.2.3. Policy options to include diverse values of nature to economic paradigms

In this section, we identify key economic paradigms that seek to move economic systems towards sustainable pathways by incorporating values of nature along with other instrumental values.

Sustainable consumption and production

Moving away from promoting a high economic growth paradigm, Sustainable consumption and production is *'a holistic approach to minimising the negative environmental impacts from consumption and production systems while promoting quality of life for all'* (United Nations Environment Programme, 2015). It relies on the idea of decoupling economic growth from environmental degradation by reducing material/energy intensity of and lowering emissions and waste from economic activities, by promoting a shift of consumption patterns towards groups of goods and services with lower energy and material intensity without compromising quality of life. It also promotes a life-cycle thinking throughout all stages of the production-consumption process.

Sustainable business model archetypes target sustainable consumption and production in four ways (Bocken et al., 2014): (1) maximizing material and energy efficiency (do more with fewer resources, generating less waste, emissions and pollution); (2) creating value from *waste* (turning waste streams into useful and valuable input to other production and making better use of under-utilised capacity); (3) substituting non-renewable resources and current production systems with renewables and natural processes; (4) deliver functionality rather than ownership (provide services that satisfy users' needs without having to own physical products) (*Annex 6.3* highlights specific tools and actions to support sustainable consumption and production).

Circular economy

The major aim of the circular economy concept is to decouple economic growth and the deterioration of the environment (Ghisellini et al., 2016), suggesting that economic prosperity and improved environmental quality can be achieved together (Kirchherr et al., 2017) through technological, economic and social innovations (de Jesus & Mendonça, 2017; Ellen MacArthur Foundation, 2013). Definitions of circular economy regularly refer to the 3R or 4R or other extended Rs models (Kirchherr et al., 2017), listing most frequently reduce, reuse, recycle and recover as the key functionalities within circular economy (Potting et al., 2017; Reike et al., 2018). Circular economy initiatives can be implemented by governmental bodies as well as by business actors and non-governmental organizations (Kalmykova et al., 2018; Potting et al., 2017) (*Table 6.6*). While it is often encouraged and regulated at the national level, it is directly linked to global value chains and transnational waste dumping and trade, both characterized by power inequalities (Schröder et al., 2019), implying also that a better integration of well-being and human rights in circular economy is important (Murray et al., 2017).

Table 6.6 Examples of circular economy implementation

Country	Law / Policy	Approach	Reference
China	<ul style="list-style-type: none"> • Circular Economy Promotion Law (2009) 	Aims for green and sustainable growth of the economy	Su et al., 2013 Yuan et al., 2006
Japan	<ul style="list-style-type: none"> • Eco-town program • Forum of Global Multi-Value Circulation including companies, universities and research institutes 	Eco-industrial (urban and industrial symbiosis) parks at meso level Promote bottom-up approaches	Ohnishi et al., 2012 Van Berkel et al., 2009 Halada, 2020
EU	<ul style="list-style-type: none"> • Waste Framework Directive, 2008 • Circular Economy Package • New Circular Economy Action Plan (2020) 	Regulating both production and waste management	- Hughes, 2017 -
USA	<ul style="list-style-type: none"> • State level and sector specific regulations exist but no federal regulation 	Promote bottom-up approaches	Ranta et al., 2017
Australia	<ul style="list-style-type: none"> • Cross-sectoral initiatives 	The Circular Economy Australia and the Sustainable Business Network has been working on a circular economy agenda	Ghisellini et al., 2016
Brazil	<ul style="list-style-type: none"> • Bottom-up initiatives 	Women co-operatives, e.g., Rede Asta, created an online platform to support women artisans recovering material from urban and industrial waste	Geng et al., 2019
Mexico	<ul style="list-style-type: none"> • General Circular Economy Law 	Under development	-

The most recent circularity gap report concluded that the current degree of circularity in the global economy is currently lower than 9% (Cooper et al., 2017; Haas et al., 2015; PACE, 2020), possibly due to the large proportion of material throughput (Haas et al., 2015), and accelerating production due to the rebound effect (Zink & Geyer, 2017). Barriers and challenges of circular economy are extensively discussed in the literature, pinpointing both “soft” (social, regulatory and institutional) and “hard” (technological solutions and financial factors) limiting factors as well as opportunities to overcome the barriers (de Jesus & Mendonça, 2017; Ranta et al., 2018) (*Annex 6.3*).

In current practice circular economy is mostly contextualized within a utilitarian approach and embedded in the green growth paradigm where circular creation of economic value is considered as

a business opportunity (Buchmann-Duck & Beazley, 2020; Hopkinson et al., 2020). Its potential to transform the economic system could be enabled by including intrinsic values of nature (Schröder et al., 2019). Towards this, some policy instruments are already available which try to incorporate the intrinsic values of nature (e.g., tax and trading schemes for carbon or biodiversity). However, researchers opine that technological and socio-economic lock-ins and rebound effects can only be managed if institutional reforms consider planetary boundaries as well as social impacts in a wider sense (Schröder et al., 2019). Embracing human-centric solutions to circular economy is possible if decoupling is accompanied with a transition away from mass-consumption combined with the inclusion of diverse actors and grassroots schemes (Clube & Tennant, 2020).

Degrowth

According to Kallis et al. (2012), a degrowth society is one that is focused on social justice and ecological sustainability focusing on social and environmental wellbeing parameters (*see Chapter 5*). Building on existing practices that are in line with the values of degrowth such as eco-communities, cooperatives, community currencies or urban gardening (e.g., Cattaneo & Gavaldà, 2010; Dittmer, 2013), alternative ways of understanding societal well-being and work are suggested, with concrete proposals such as alternatives to gross domestic product, work sharing and basic income (e.g., O'Neill, 2012). Degrowth avoids the epistemological split between the natural and the social worlds but examines them as parts of one whole. It seeks alliances with communities of different worldviews, from which it also obtains inspiration, via concepts such as *Buen vivir* (Gudynas, 2011) and Ubuntu (Ramose, 1999). In this sense, it could be understood within the IPBES' integrated approach to nature that aims at bridging different value dimensions associated with value pluralism (Pascual et al., 2017).

The sustainable state economics and degrowth literatures converge, with minor differences, to a similar set of policies and institutions: from resource and CO₂ caps; extraction limits; new social security guarantees and work-sharing to green investments; cooperative property and cooperative firms (Kallis et al., 2012).

Degrowth can be implemented by all means of instruments: e.g., laws that support sustainable consumption; economic instruments such as interest rates; non-governmental organizations, government, business, campaigns too, as well as supporting a steady state. Different approaches to economic restructuring include green tax reform, which is calculated on the use of energy and resources instead of income (IPBES, 2019a).

Ecofeminist perspectives and caring economy

The concept of the caring economy, closely related to that of a care economy, takes the externalization of care work from the market economy as a starting point, and calls for a redefinition, redistribution and revaluation of caring activities (Power, 2004; Wichterich, 2015). It is an economy which prioritises care for one another and the environment over economic growth (Dengler & Strunk, 2018). Hence, it calls for a new way of valuing ecological processes and the non-human environment (Biesecker & Hofmeister, 2010; Jochimsen & Knobloch, 1997).

Proposals for transitioning to a caring economy have multiplied especially in the face of the COVID-19 pandemic, as the importance of essential workers and care activities became visible (Stevano et al., 2020). Simultaneously, the importance of care work has been highlighted in the context of Green New Deals (Bauhardt, 2014), and re-valuing care work is increasingly considered as playing a key role in climate policies and for climate justice (Barca, 2020; Di Chiro, 2015).

6.3.3. Competing interests need to be reconciled for transformative change

Reconciling between multiple interests at the international, regional and national level are being actively pursued to achieve sustainability goals. For instance, changes in climatic conditions have an overall negative impact on biological diversity. Whilst the regulatory regime needs to integrate mitigation and adaptation challenges into biodiversity conservation laws, it is not yet clear how biodiversity standards and safeguards can be effectively integrated in the climate regime, as evident from the Reducing Emissions from Deforestation and forest Degradation (REDD+) discussions (Panfil & Harvey, 2015). Further, while there is a growing recognition of the rights of indigenous peoples and local communities, the challenge now is to balance the competing social and environmental interests being mindful of power imbalances (Johnson et al., 2016; Stevenson, 1996; Usher, 2000), epistemologies (Gilchrist et al., 2005; Usher, 2000), contextual realities (Curran & M’Gonigle, 1999; McGregor, 2008; Muir, 2018; Whyte et al., 2016), equity and cultural concerns (Arctic Council 2015; Stevenson, 1996; Usher, 2000). Good practices to integrate various worldviews and practices for better socio-ecological solutions (Curran & M’Gonigle, 1999; Johnson et al., 2016; McGregor, 2008; Noble, 2016; Reo et al., 2017; Reo & Ogden, 2018; Tengö et al., 2017; Usher, 2000) need to be further mainstreamed. The evolution of policy options to adapt to growing socio-ecological tensions in and across sectors, if strengthened and promoted, could enable transformative changes towards sustainability.

6.4. Identified gaps and the role of capacity development for operationalizing the diverse values of nature

This section is focused on identifying knowledge and operationalization gaps throughout the assessment. Gaps are believed to hinder the incorporation of the values of nature into decisions. Therefore, the identification of gaps allows to highlight research needs within the topics covered in the assessment, and to identify the opportunities for fostering the integration of the diverse values of nature into decision-making processes aiming at transformative change. Assuming that capacity development is critical to shift power asymmetries, improve the outputs of negotiations, and realize more just and sustainable outcomes, gaps are presented as opportunities for capacity development. For that, a heuristic concept of capacity development is used. One in which the objective is to go beyond the transfer of information or training to the development of processes that generate context specific social learning. Processes that are respectful of different worldviews, values, and knowledge systems, and in which diverse actors can learn to act collectively to bring about transformative change towards just and sustainable futures. As such, capacity development is considered an inherently complex and evolving learning process.

6.4.1. Conceptualizing knowledge and operationalization gaps

Gaps throughout the assessment were identified as knowledge and operationalization gaps. Knowledge gaps refer to shortages of information found throughout the assessment that limit the evidence needed to answer the questions posed across the assessment. Operationalization gaps refer to all aspects throughout the assessment that were identified as undermining the incorporation of diverse values in decision-making for transformative change towards just and sustainable futures. Other limitations that frame the assessment in general were pinpointed by *Chapter 1*. They refer to the overall shortcomings regarding the literature that was accessed and used (see *1.4.3*) (*Annex 1.6*). The latter implies biases associated with the type of literature reviewed, the language it is written in, region of origin, topic of sources, and cross-regional work. These same biases are implied in the gap's analysis presented in this section.

Withing gap categorization, knowledge gaps were regarded to be pieces of knowledge or data that were absent or insufficient to fulfil the mandate of the assessment. They were categorized into (i) research gaps, referring to conceptual, relationship knowledge, and methodology gaps; and (ii) data gaps, referring to lack of information at specific spatial, temporal, taxonomic, functional, habitat, social sciences, economics, among other levels or scales. Operationalization gaps refer to all aspects throughout the assessment that were identified as undermining the incorporation of diverse values in decision-making for transformative change towards just and sustainable futures. The category includes: (i) Information gaps, which consider cases in which there is a lack of knowledge availability for mobilizing diverse values within valuations or for decision-making, (ii) resource gaps that refer to a lack of means for achieving stakeholder representation and conciliation, or for generating knowledge, or for pushing forward specific policies, and, (iii) capacity gaps, which relate to lack of skills, will, or guidance, at the institutional or individual levels, and that compromise operationalizing processes aiming at incorporating diverse values for supporting patterns for transformative governance.

6.4.2. Assessing knowledge and operationalization gaps: materials and methods

Knowledge and operationalisation gaps were compiled through a meta-analysis of gaps identified from all chapters of the values assessment¹¹. First, a quantitative analysis was made in which all gaps were categorized and organized into clusters (clusters being groups of gaps addressing the same issue within knowledge and operationalization categories). Furthermore, all identified clusters were linked to one of the eight steps of the operationalization cycle: (i) clarify the purpose, (ii) recognize diverse values, (iii) understand the context, (iv) weigh up the trade-offs, (v) trace the decision chain, (vi) select policy options, (vii) find entry points, and (viii) reflect outcomes (see 6.5.3.3, *Figure 6.13, 6.16*). The alignment of the clusters to the operationalization cycle revealed key steps in which gaps are more evident and where they are less frequently identified in available literature (see 6.4.3).

Also, a qualitative analysis was performed to all clusters of gaps identified within the assessment. The latter revealed emergent topics that are discussed as: (i) conceptualization of values, (ii) gaps linked to valuation, (iii) IPLC and ILK knowledge, (iv) policy uptake, (v) policy instruments, (vi) leverage points for transformation, (vii) values and futures, (viii) justice and power, and (ix) capacities needed to mainstream diverse values (see 6.4.4). Furthermore, capacity dimensions that have been described in detail in section 6.1.2.4, were considered entry points to address the assessment gaps and other challenges for the operationalization of values (see 6.4.5). With that consideration, findings derived from the clustering of knowledge and operationalisation gaps led to an understanding of specific capacity development needs, which were linked to capacity dimensions (*Table 6.9*).

6.4.3. Gaps in knowledge and operationalization: results

Understanding gaps within the assessment highlights a general picture about the types of gaps identified in the revised literature regarding values and valuation. The analysis across the assessment identified more knowledge than operationalization gaps (21 knowledge gap clusters as opposed to 18 operationalization ones; *Figure 6.12*), possibly due to inadequate reporting of operationalization gaps in academic literature.

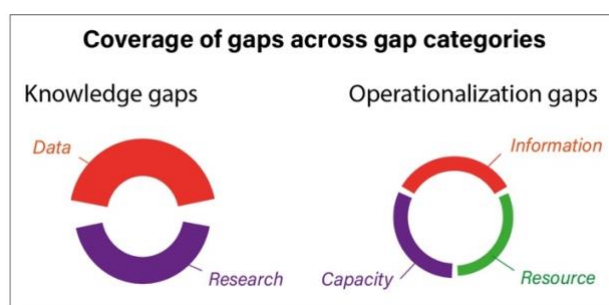


Figure 6.12. Coverage of gaps across categories to the categorization of gaps identified by each chapter of the values assessment.

Concerning the operationalization cycle, knowledge gaps addressed more than one step of the cycle. Up to 86% of knowledge gaps were associated with the recognition of values, 52% to understanding the context in which values become visible, less than 28% to knowledge associated with tracing the

¹¹ Review of gaps within the chapters of the IPBES Values Assessment (<https://doi.org/10.5281/zenodo.5899737>).

decisions chain and 33% to outcomes of decision-making. Operationalization gaps also covered more than one stage of the cycle- up to 89% related to the recognition of diverse values in decision-making; 61% to aspects linked to understanding the context and to tracing the decision-making chain; 33% to understanding outcomes of decision-making; almost 28% to our ability to weigh up the trade-offs, and up to 17% related to gaps concerning selecting policy options. Only one of the categories was aligned both with clarifying the purpose of valuation and finding entry points (5.5% for each stage).

The analysis (*Figure 6.13*) reflects an understanding about important gaps in knowledge regarding ways to make diverse values visible and the role they play in multiple decision contexts, and along the decision chain across time and scales. However, there is less knowledge about operationalization gaps that tackle the rest of the operationalization cycle. The latter implies less understanding of the possibilities of how to establish clear purposes for decision-making and valuation; weigh up trade-offs in valuation and decision-making; select between multiple policy options; find entry points for values and valuation in a decision-making process; and reflect values on outcomes of a given decision. All of these are equally important aspects to bridge the gap between knowledge generation and operationalization of values in decision-making. A greater understanding of these gaps could allow us to address them and transform the way we make decisions regarding nature and its contributions to people.

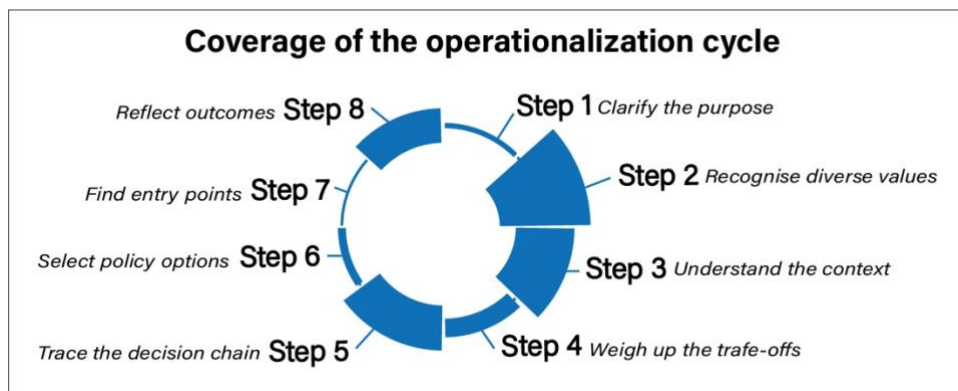


Figure 6.13. Coverage of gaps (both knowledge and operationalization) according to the eight stages of the operationalization cycle, thicker lines indicate more gaps identified for that stage of the cycle (see also *Figure 6.16*).

6.4.4. Emergent topics identified through a qualitative analysis of gaps

This subsection presents a discussion of emergent topics that resulted from a qualitative analysis of the identified clusters of knowledge and operationalization gaps. Most of these issues relate to a lack or shortage of information or capacity for operationalizing diverse values into decision-making. The following lines provide a broad picture of these emergent topics in light of the present assessment.

6.4.4.1. Gaps regarding the conceptualization of values and their roles in decision-making

The grouping of most gaps identified throughout the assessment, both concerning knowledge and operationalization, indicate that they greatly stem from a lack of a broad conceptualization of values of nature. In general terms, experts within the assessment indicated that research regarding values of nature is generally limited and has not been expanded across contexts or scales or concerning the

understanding and integration of IPLCs values and ILK systems. Even though there is an increasing trend for addressing the conceptualization of values of nature across diverse traditions (i.e., biophysical, economic, or other social sciences), interdisciplinary efforts are not common. Experts within the assessment from academic fields that address values of nature, also highlighted the need to conduct more research. For example, they point to the lack of biophysical valuation of some values of nature and their contributions to people, which result in their undermining within decision and policy making. Particularly, it is considered that in general, there is a deficiency of primary (e.g., field) data (spatial, temporal, scale related, taxonomic, functional, habitat) to be used for biophysical valuation of nature, especially over large areas. That is, there is a general lack of relevant knowledge in spatial terms (data unavailable across regions), in temporal terms (data unavailable for the required time span), in scale related terms (data is unavailable at the required scale or at a fine enough spatial resolution), in taxonomic terms (data unavailable for some taxonomic groups), in functional group terms (data unavailable for some functional groups), and in habitat terms (data unavailable for all required habitats). Particularly the Global South is considered to face a domestic deficit of research and funding sources for ecosystem assessment that affects conceptualising plural valuation. At the same time, much of the existent research is either not relevant or not accessible (i.e., not publicly available in open databases).

As the focus of research regarding the conceptualization of values and their contribution to people has mostly focused on material values, there is a lack of understanding of other values and how they can contribute to prosperous economies without requiring economic growth. Also, there is little knowledge about the implications of applying only instrumental indicators such as gross domestic product across regions (see Policy instruments section). This focus on instrumental values is also seen in the assessment of future archetypes, showing important gaps in the recognition of non-material, intrinsic and relational values (see 5.2.2.3.1). Moreover, there is scarce information to conceptualise about how values form and change over time and a lack of understanding of negative values of nature and the role they may have on individual and collective decisions.

Other issues that stand out regarding conceptualization of values of nature and their contributions to people refer to the lack of conceptual proficiency in practical applications that consider the risks of under- or over-emphasizing specific values. The current focus on values underpinning human actions (explicit or implicit) has created gaps in the understanding of relations between humans and nature which are at the centre of environmental decisions. This has often resulted in a lack of policy coherence with negative consequences for biodiversity and human well-being. Initiatives that seek to revitalize local values, in particular IPLCs values, are often not upscaled and face challenges such as lack of resources, insufficient understanding, or lack of capacities of implementing agencies (further explained below), which represent missed social opportunities for environmental policy implementation.

6.4.4.2. Gaps linked to valuation tools and methodologies

The recognition and use of methods for the valuation of the nature's diverse values is currently extensive and continues to be updated (see 3.1, 3.2). Most methods have been developed for measuring biophysical elements, that is, the structure, flow and supply of different values of nature/nature's contributions to people. Methods have also advanced in providing economic/monetary valuations regarding both market and non-market values, and further, draw out instrumental and relational values, but only to the extent that they can be quantified.

However, literature on the inclusion of non-monetary valuation methods is scarce. Values of nature such as those related to non-use and cultural values of nature were often found to limit the application

of plural and diverse valuation methods and approaches across regions and contexts. The valuation methods were grouped in four methods families for this assessment (see 3.2.2) and across all of them, limited evidence was found regarding challenges, issues, and gaps associated with nature-based valuation. Gaps also relate to the application of valuation approaches that address behaviour based values.

Significant gaps were also identified regarding valuation methods and approaches applied within and by IPLCs and eliciting their values. There is a noticeable absence of literature that explores the history of valuation methods and approaches in IPLCs contexts as well as a lack of documented understanding and use of ILK. The latter excludes other valuation methodologies that are not mainstream but that are key in terms of expressing or representing diverse values (see 6.4.3.3). The focus on biophysical valuation of ecosystem services as well as monetary valuation approaches, leaves important gaps in the participation of local people in assessing and monitoring biophysical valuation which in turn may affect the quality of the available information and the legitimacy of local decision-making.

Deliberative methods falling in the behaviour-based family and which have often been suggested to improve participation of stakeholders in valuation and decision-making also show gaps in the inclusion of deeper psychological values that people attach to nature in different temporal, spatial, and social contexts. Integration methods also highlight difficulties linking models built with different objectives, computer languages, data requirements, or incompatible parameters. For example, scenarios and models, that have the potential to address distributional justice, have usually underrepresented IPLCs values and views for transformation. Few scenarios account for winners and losers yet, those recorded show powerful actors are associated with higher impacts on nature/ nature's contributions to people and quality of life, that are associated with materialism and individualism.

Valuation methods also show operationalization gaps. For example, there is a lack of information about the knowledge and values held by local stakeholders in decision-making and about the extent to which explicit valuation methods representing them determine the effectiveness, efficiency and social equity of project and policy outcomes. There is limited knowledge and application of approaches that allow reflecting values of futures that consider the participation of IPLCs or the impacts on ILK, more on gaps on IPLC is presented below in *Section 6.4.3.3*.

There is a divergence between the procedures recommended in academic literature and those applied by practitioners. Many valuation methods lack detailed empirical evidence on implementation and uptake of environmental policies. The fact that few integrated models have been applied widely in different settings may imply a lack of comparability of their performance. In general, there is a lack of tools mainstreamed to end-users needs, and although applications of integrated models and policy instruments in the United States and Europe are increasingly being considered (e.g., meta-analysis, integrated modelling tools, Bayesian belief networks, etc.), developing-country applications often rely on unit-value and other simpler approaches that tend to be less accurate when supporting decisions regarding nature.

6.4.4.3. Gaps linked to values of and valuation with IPLCs and ILK

There is a lack of comprehension of the similarities and differences between cultures regarding their interpretation of nature, human nature-relationships and the values that emerge within them. Furthermore, there is a limited recognition of diverse knowledge systems in many countries that contributes to neglecting the use of diverse languages, history, knowledge and lived experiences of IPLCs. Although there is the recognition and understanding of the need to go beyond inter- and trans-

disciplinary frameworks and adopt cross-cultural frameworks, academic disciplines still lack a better understanding on how to recognize and integrate ILK systems in values and valuation research. These gaps seem more prominent in regions such as Eastern Europe or Africa. There is also a lack of a better understanding of how policymakers can open the space for IPLCs direct participation in shaping value assessments for decision-making processes.

The gaps identified by the assessment in the understanding of valuation methods and approaches applied by and within IPLCs can relate to multiple factors. For example, limited knowledge and understanding of the concept of “nature valuation” among indigenous and local scholars and academics. It implies a lack of documentation on these aspects. Also, the guarded nature of ILK, particularly when it relates to ancient ways, limits its accessibility. Differences in documenting processes and ILK is not always based on written tradition, and therefore it is difficult to access and might not always be available for non-indigenous scholars to study, unpackage and characterize. There are also language barriers, an absence of ILK databases and difficulties associated with the validation of the evidence (both from an academic perspective and from the perspective of ILK holders). Most available information covers territories where academic systems include indigenous scholarship (i.e., New Zealand, United States of America, Canada). Therefore, even if there is a growing number of cases documented, the rich diversity of biocultural resources remains scarce. Methods and practices often require specific skills and knowledge that are known and shared only among those entrusted to hold and guard it. Thus, indigenous and local scholars are among those best positioned to advance the study of valuation conducted in and by IPLCs.

There is also evidence that sometimes there is a misconception amongst scholars that the inclusion of ILK in assessments of nature/ nature’s contributions to people means informing or educating indigenous people about western scientific aspects. However, successful inclusion of indigenous perspectives entails acknowledging and addressing knowledge and operationalization gaps between western scientists and indigenous knowledge holders to understand, accept, respect diverse worldviews, ways of understanding and implications for decisions regarding nature. Large gaps exist regarding the understanding of valuation methods and approaches used by IPLCs. There are also gaps in the ability to validate knowledge developed by IPLCs scholars, as well as scant skills and resources to implement multiple value assessment processes that consider different knowledge systems and to properly articulate values based on ILK in decision-making and policymaking and within local and indigenous territories. The structural capacities to acknowledge self-governance and autonomy of indigenous peoples and local communities to decide on their territories is another major gap that needs to be addressed to empower stake- and right-holders and allow them to articulate their values in their own terms. Overall, there is much to be learned from IPLCs, urging for the need to increase the visibility and work with knowledge holders, indigenous scholars, etc. They hold the key to vital knowledge, and more importantly, sovereignty over their knowledge (see 3.2.4) (Chilisa, 2017).

6.4.4.4. Gaps regarding the policy uptake of valuation

Even though valuation has often been identified as a key element to support decisions across scales, there is a lack of research on the practice of non-research and non-governmental organizations commissioning valuation consultancies on nature/nature’s contributions to people and their degree of uptake to inform decisions, as well as a lack of systematic knowledge on uptake of explicit valuation in national and local policy, particularly in non-English languages. Also, there is scant research on the barriers to uptake of explicit valuation outputs in policy cycles, related to the role of power brokerage for valuation knowledge. As a result, there has been a limited role of values in policy which has resulted in negative consequences for the environment and human well-being. Gaps on valuation

uptake in decision-making, however, do not necessarily reflect limited uptake, as some valuations occurring in decision-making are not reported in academic literature.

There is little documented knowledge about how choices of decisionmakers are made and the values that are prioritized over others while making those decisions. The understanding of how decisions are made also shows gaps related to the length of decision-making processes, the resources available for decisions (e.g., size of budgets, personnel), and about monitoring results to assess the effectiveness of the implementation of decisions.

To access this type of knowledge, reviews of case studies were conducted across the assessment showing how decision-makers in developed countries have made deliberate choices to adopt multilateral environmental agreements because the governance context enabled actors such as non-governmental organizations to use valuations to contest and/or influence decision-makers. Nonetheless, these reviews also show that it depends on institutional capacity and influencers to be able to implement or use multiple valuation methods in decision-making. The case studies also show that in developing countries, monetary valuations have been necessary but not adequate to influence decisions of the private sector and policymakers. Non-monetary valuation that focused on cultural and existential threats was deemed important and missing.

Furthermore, there is a lack of understanding of the processes and methods that allow comprehending and considering the diverse values underpinning the global economic agenda, which is embedded in policies and policy instruments. Many policies at the global level are focused on one type of intrinsic biophysical value or instrumental values. For example, in the agricultural sector, we have limited understanding and awareness of environmental policy integration dynamics, processes and methods which has led to a limited incorporation of the values that underpin swidden agricultural systems in agenda setting. It would be helpful to also promote policies and instruments integrating other intrinsic biophysical values such as water cycle, water regulation as well as relational sociocultural values and instrumental economic and non-economic values.

Potential constraints for the uptake of valuation methods portraying a plurality of values can be related to methods' reliability, transparency, and valuation costs, that limit the adoption of multiple valuation systems in decision-making. Also, there are data gaps on how values from formal valuation methods align with the implicit values embedded in decision-making processes to explain why increasing valuation is not matching the adoption for informative, decisive or technical supportive purposes. Furthermore, effective coordination between stakeholders involved in decision-making processes is lacking, as well as multi-jurisdictional collaboration between stakeholders across scales. As a result of the latter, lack of coherence can be detected, both within and between final policy design/implementation and the respective values held by decision-makers and stakeholders. Addressing capacities, and in particular social network capacities, could help address these issues (see 6.4.4).

The assessment also identified limited available information regarding the uptake of valuation in the private sector, especially regarding corporate biodiversity impacts (e.g., the nature risk index parallel to climate risk). Addressing these gaps could allow data providers and investors to systematically track biodiversity disclosure, and accordingly build biodiversity information to improve decision-making impacting nature/nature's contributions to people.

6.4.4.5. Gaps in the availability of policy tools and instruments that account for the diverse values of nature

Even though the assessment has highlighted the important role of accounting for diverse values of nature in policy tools and instruments, a large gap exists between progressive policies at the international level and limited success of the application of policy tools and instruments at the national level. Simultaneously, diverse autonomous initiatives that take place at the local level, mostly led by IPLCs that allow the integration of diverse values in decision-making, are still lacking recognition from provincial and central governments across the globe. Examples of these relate to experiential learning, Mother Earth teachings, land pedagogy, and land-based education. These play important roles in the revitalization of cultures, knowledge, language and identities.

Furthermore, at the implementation level, there is a lack of repositories or databases of best practice in plural valuation, particularly relevant to local decision-making. This makes it difficult to conduct appropriate systematic reviews of the representation of diverse values in public decision-making. Furthermore, this makes it difficult for decision-makers to access potential policy options to improve policymaking.

Despite the increased diversity of values incorporated into policies that support nature's contributions to people and biodiversity conservation, the effectiveness, efficiency, impact and equity outcomes of those instruments have not been fully assessed (e.g., environmental education, protected areas, indigenous territories, land acquisitions for conservation, payments for ecosystem services, reducing emissions from deforestation and forest degradation, certification schemes for environmentally friendly production, etc.). There is also a gap in knowledge on the effectiveness, efficiency and equity outcomes of policy uptake of singular and/or diverse values aimed at balancing nature conservation and agriculture as well as policy uptake regarding ILK, such as legislation recognizing rights of nature, ecosystems, rivers, etc.

Looking at case studies and specific applications of policy instruments, the analysis highlights important gaps in the availability of funding to conduct plural valuation and adequate public consultation in Environmental Impact Assessments (EIA) or implement adequate Ecosystem Accounts. Gaps in this regard also include failures of how resources are allocated. Also, the assessment identified gaps in the understanding of off-site and long-term social and environmental impacts of protected areas and payments for ecosystem services (e.g., not only leakage, but also de-ruralisation, transformation of agriculture). Furthermore, policy documents and instruments such as national constitutions still show a limited incorporation of nature and its values as central elements of their configurations. These gaps limit the understanding of the long-term and large-scale impacts of policy instruments and their potential to promote or undermine broader transformation.

6.4.4.6. Gaps in the understanding of how values operate as leverage points for transformation

There is limited knowledge about how values of nature operate as leverage points for change. Main gaps for integrating values as leverage points lie in the ability to link interventions and provide feedback. Gaps also refer to the absence of studies assessing the decision outcomes and the impacts of the application of specific valuation methods. Studies focusing on impact evaluation rarely track the information, feeding into the evaluation of decisions causing the impacts (positive or negative).

Lacking research on how plural valuation and the consideration of diverse values may unlock transformative change has also limited understanding about the kind of sustainability aligned values that can lead to just and sustainable futures. In most methods that consider the role of human agency and intrinsic values in transformative adaptations there are gaps on the inner aspects that shape behavioural change, such as emotional, belief(s), mental at individual and social levels. Key gaps in knowledge about how social factors (i.e., institutions, norms) influence individuals' and groups' values and behaviours have also been key to mapping leverage points for the enhanced application of diverse values.

Furthermore, there is a lack of understanding of the potential transformative role that policy instruments can have within different contexts. The contextual aspects that underlie the success and failure of the application of specific policy instruments that consider more or less diverse values are rarely discussed in literature.

6.4.4.7. Gaps in linked to values accounted for in futures research

Setting common goals amidst different actors is key for achieving just and sustainable futures (see *Chapter 5*). However, the assessment has shown that research focusing on futures has important gaps in the explicit integration of values of nature and in particular in qualitative studies that allow accounting for societal and cultural values in those futures. Future archetypes tend to focus on material and individual values leaving gaps in the representation of diverse values (intrinsic, instrumental and relational) particularly in those that are non-material.

There is a limited set of approaches to allow the reflection of values for futures that take into consideration the participation of local knowledge or the impacts of these futures on health or ILK. The role of studies that focus on the future is key to support transformations across scales. Nevertheless, the analysis reveals a lack of understanding about the role they can have to enhance diverse values of biodiversity in transformations across contexts (especially in urban transformations). There is a need for envisioned future systems to be more transparent, open, and collaborative, while dealing with both normative values and systemic issues.

6.4.4.8. Gaps in the values and valuation methods on the ability to address justice and power inequalities

There is a lack of knowledge about the relationship between social roles and power structures and their implications on the values that are expressed in decision-making. This gap goes beyond conceptual aspects and it extends into valuation methods and approaches and their role in their application to shape power structures and the multiple dimensions of justice. This gap is also related to the lack of knowledge, resources and capacities presented in previous sections which constrain the valuations, that shape equity in distribution and recognition of nature, limiting the development of scenarios towards just and sustainable futures.

In particular, there are gaps in scenarios of distributional justice and in transformative frameworks that reflect representational and power asymmetries, which are often limited by the underrepresentation of stakeholders' views on transformation, such as IPLCs. The lack of representation and participation of stakeholders in valuation and decision-making regarding nature has led to an unequal distribution of benefits from political, economic and technological developments, which often prioritize certain values (instrumental) over others.

There are also gaps in legal knowledge linked to the understanding of values and valuation and their uptake in policy, especially since justice is a central topic. Economies are embedded in legal settings, and laws and regulation are one of the most common and powerful ways to translate broad values and principles of large populations and restrict or direct the use, preservation and distribution of nature and its contributions. Despite this obvious importance, the knowledge held by legal academics and research groups within rights faculties working on the global commons and natural heritage and its legal implications is underrepresented in the values assessment and in the IPBES expert pools in general. This knowledge is of a conceptual nature, but a (different) type of legal expertise is indispensable to provide policy options or determine legal bottlenecks or opportunities in better representation of nature's values in decision-making.

6.4.4.9. Gaps linked to capacities

Currently, the role of values is very limited in policy and decision-making across scales much of these can be attributed to lack of capacities that different stakeholders and implementing agencies have to demand and provide adequate valuation exercises, revitalize diverse forms of knowledge and their associated values and upscale them into decision-making. In general terms, capacities are needed to ensure the availability of adequate institutional contexts that allow integrating values in decision-making.

Also, there are capacity gaps to bridge knowledge, in particular to integrate cultural and biological diversity strategies. Within academic arenas, there are communication and participation gaps between scientists from different disciplines and between science and practice. The representation of values and the conduction of valuation processes are often led by ad-hoc availability of expertise and limited by the challenges posed by the use of valuation outcomes in policy processes, leading to a limited use of combined disciplinary insights. Consequently, decision-making informed decisions considering values and valuation is often limited to disciplinary perspectives and limited views on values and have led to a lack of incorporation of diverse values in decision-making. Reduced social network capacities leading to lack of funding, limited motivational capacity (i.e., political will), weak analytical capacities (i.e., skills, knowledge, tools) and deficient governance capacity (i.e., with entrenched power structures) have limited the evidence-based decision-making and in turn, inclusive decision-making process. Across governance levels, there is a need to mainstream diverse values into new forms of corporate and civil governance that could be improved by addressing the gaps in capacities across diverse stakeholders (see 6.4.4).

6.4.5. Capacity development for addressing gaps that hinder the operationalization of multiple values












































Capacity development is one of the main levers that can lead to transformative change by tackling the underlying indirect drivers of nature deterioration (IPBES, 2019b). It can also become a means of addressing some of the above identified gaps. Capacity development goes beyond the traditional view of one-way, top-down knowledge transfer to that of knowledge generated as context-specific social learning processes. It involves different interested parties (stakeholders) who are situated at specific levels of decision-making (i.e., individual, organization, sector/network) and engage in processes for social learning, knowledge exchange, co-creation of knowledge and others alike (Barth, 2002; Brown, 2004; Lang et al., 2012; Lotz-Sisitka et al., 2015; Roux et al., 2017; Wiek et al., 2011). Emphasis is placed on reflection and learning for change, rather than on providing information (Freire, 2000). The latter entails turning information into knowledge through social relations and social contexts (Reyers et al., 2018; Selomane et al., 2019; Tengö et al., 2014). Such a capacity development approach can address gaps regarding the use of values and valuation perspectives for

decision-making, and can also address power asymmetries, trade-offs and conflicts that may arise due to different framings, perspectives, representations, interests and needs on human-nature relations and associated values (Reed et al., 2014, 2018).

Capacity development can be described across six broad dimensions that have been described in detail in *Section 6.1.2.4*: motivational, analytical, bridging, negotiation, social networking and governance capacities (Gupta et al., 2010; Kuhlicke et al., 2011; Kuhlicke & Steinführer, 2015). Each of these dimensions can provide windows of opportunity for addressing gaps identified previously. A summary of the detailed analysis can be found in *Table 6.7*¹².

¹² Review of gaps within the chapters of the IPBES Values Assessment (<https://doi.org/10.5281/zenodo.5899737>).

Table 6.7 Topical gap categories and potential of capacity dimensions to address them. Darker blue circles indicate larger opportunities of capacities to address the gaps.

Topics covering central gaps identified across the assessment	Capacity dimensions to address identified gaps					
	Motivational capacity	Analytical capacity	Bridging capacity	Negotiation capacity	Social network capacity	Governance capacity
Gaps about conceptualizing values of nature and its implications Value conceptualizations and data on diverse values in different social-ecological contexts, spatial and temporal scales, and knowledge systems. Representation of diverse values in decision making.						
Gaps about the choice of valuation methods to support decision making Use of valuation to support specific decisions, including policy design. Documentation on how valuation methods influence policy outcomes.						
Gaps about understanding the notion of 'value' and 'valuation within indigenous peoples and local communities Understanding diverse knowledge systems and lived experiences in values and valuation research. Articulating values in their own terms.						
Gaps about uptake of values and valuation results in policy and decision Documentation of non-research organizations commissioning valuation and their uptake into decisions. Identification of barriers and enablers of valuation uptake into policy cycles. Identification of values prioritized by decision makers while making decisions about nature.						
Gaps about facilitating policy tools and instruments to consider diverse values Repositories or databases of best-practice. Documentation of their effectiveness, efficiency, impact and equity outcomes. Long-term and large-scale impacts to block or promote transformation.			-	-		
Gaps about understanding how values and valuation operate as leverage points for transformative change Role of valuation-informed decisions to unlock potential of institutions geared to transformative change across social-ecological contexts.	-					
Gaps about the role of values in futures research Representation of diverse values in futures research. Role of futures research in promoting sustainability aligned values.				-		-
Gaps about the ability to address justice perspectives in valuation Role of power structures in value expression. Capacities and resources to address the three dimensions of justice (distribution, participation and recognition) through a values and valuation lens.						

6.4.5.1. Stakeholders' capacity development needs

Based on expert knowledge, specific examples were collected where the lack of certain capacities negatively impacted the consideration of nature's diverse values in decisions. A questionnaire and a workshop were carried out with the author team of the values assessment, identifying 26 different cases where one or more capacity dimensions were considered insufficient. Within the 26 cases altogether 85 different capacity development needs were identified along the six capacity dimensions. Then each capacity development need was assessed in terms of how significant the need for the different stakeholders (on a scale of 1-5, where one referred to insignificant and five referred to highly significant capacity development need). *Figure 6.14* shows that the most frequently mentioned capacity development need relates to bridging capacities. Less cases revealed the need to develop social networking and motivational capacities, however, these two dimensions were scored the highest among all the others, highlighting how crucial their deficiency might be in certain situations.

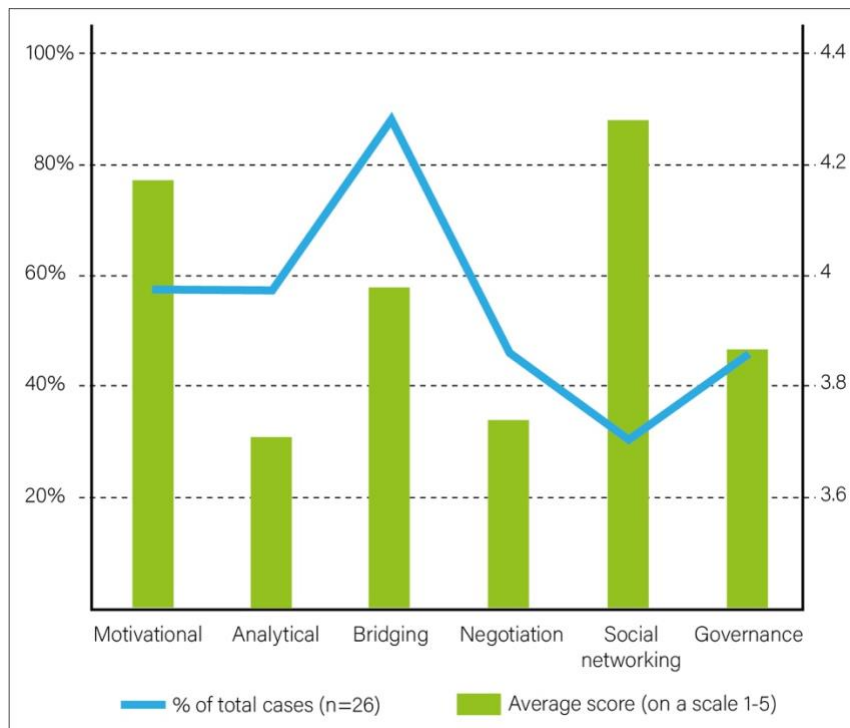






































Figure 6.14. The frequency and the significance of capacity development needs assessed through 26 expert-knowledge based cases. The left hand-side vertical axis shows the percentage of total cases where the specific type of capacity gaps was mentioned (blue line). The right hand-side vertical axis shows the average rating of capacity gaps across all the cases where the given capacity gap was mentioned (green bars). Mean values could vary from one (not relevant gap) to five (highly relevant gap).

Table 6.8 sums up the above results in a synthesised format, highlighting low, medium and high-level of capacity development needs for the different stakeholder groups along the different capacity dimensions. Please note that *Table 6.8* provides only a general overview. Even within the same stakeholder group there might be actors who have sufficient capacities and others who highly need capacity development for a given capacity dimension.

Table 6.8. Capacity development needs of the different key stakeholder groups. 85 capacity needs grouped into the six categories were identified and ranked through a consultation process involving experts across the chapters of the values assessment. The larger the bubbles, the more capacity development needed.

	Intergovernmental organizations	(Sub)National governments	Private sector	Media	NGOs	Civil society groups
Motivational						
Analytical						
Bridging						
Negotiation						
Social networking						
Governance						

To close this section, *Box 6.4* presents how the Philosophies of good living and their contributions to each capacity dimension, for example, can provide different perspectives for incorporating other values into decision-making for transformative change towards just and sustainable futures.

Box 6.4. Philosophies of good living and capacity dimensions for incorporating other values into decision-making

Following the analysis of 204 academic publications¹³ (*Annex 1.6*), we conducted a targeted review to exemplify how the “Philosophies of good living” and the nuances that emerge from them, contribute to the different capacity dimensions for making visible diverse values.

Philosophies of good living literature highlights how there may be other intrinsic motivations (as motivational capacity) to include values within decision-making processes that challenge dominant understandings of the concepts of welfare, common good, and development (Acosta, 2015; Herrera Acuña, 2016; Lalander, 2014; Munck & Wise, 2018). Values driving decision-making within such philosophies tend to have a more intrinsic and relational character than instrumental. Values for well-

¹³ Literature review for the philosophies of good living ILK cross-assessment case study (cross-chapter/ILK) (<https://doi.org/10.5281/zenodo.4399544>).

being include reciprocity between humans and with nature and communality placing at the centre the communal life rather than the individual (Acosta, 2015; Argumedo & Pimbert, 2010; Syse & Mueller, 2014). The way nature is conceptualized and valued at the core of these philosophies is rooted in biocentric attitudes. They support a more subjective quality of life and positive attitudes towards ecological protection, redistribution of wealth, the welfare state, food sovereignty and ecological diversity (Argumedo & Pimbert, 2010; Syse & Mueller, 2014). Examples of the values that drive motivations for decision-making are linked to an economic life where solidarity, love or sufficiency are at the core of social change and decisions (Argumedo & Pimbert, 2010; Bulloch, 2014; Godden, 2021; Herrera Acuña, 2016; Lee, 2014). Economic life may respond to market values, but subject to the service of society and not the individual (Acosta, 2015), focusing on a ‘harmonious coexistence’ between humans and nature recognizing principles of reciprocity, complementarity, interconnection and concordance among the various elements of life (Argumedo & Pimbert, 2010; Costanzo, 2017; Herrera Acuña, 2016; Hutchison & Sibanda, 2017; Munck & Wise, 2018; Noguera & Barreto, 2018). It also focuses on maintenance of good relations with others (Barranquero Carretero & Sáez Baeza, 2017; Herrera Acuña, 2016; Nielsen & Kimaro, 2019).

The facilitation of dialogue and learning processes (*bridging capacity*) and the abilities to develop collaborative relations and practices (*negotiating capacity*) are key to enable institutional contexts that allow such values to be represented in decision-making. In this respect, philosophies of good living show the important role of decolonizing perspectives to recognize other ways of seeing, knowing and doing (Gonzales & Husain, 2016), providing autonomy for innovation and integration of (often undermined) values immersed in those ways of thinking (Nielsen & Kimaro, 2019; Spencer, 2018), thereby enabling intercultural dialogues (Macintyre et al., 2017) and intergenerational connectedness (Ullrich, 2019) that, reframes paths with a broader and all-encompassing human coexistence with the natural and material environment (Barranquero Carretero & Sáez Baeza, 2017).

The philosophies of good living can provide important knowledge and tools to analyse and reflect diverse values (*analytical capacity*). They target research outcomes framed in revalued concepts of progress and well-being (Gonzales & Husain, 2016; LaBoucane-Benson et al., 2012) and seek to ensure the meaningful participation of indigenous and local communities in research “collaborators” (Yap & Yu, 2016). Indigenous research in Australia illustrates alternative ways of doing research to traditional research paradigms (White, 2010; Yap & Yu, 2016). These works point to their value not only in methodological terms (i.e., invoking indigenous knowledge and spirituality frameworks to dialogue with researchers through “deep listening”) but also, to the ends themselves (i.e., empowering women; restoring indigenous communities, and enabling indigenous and local groups to be agents of their own development; White, 2010).

Furthermore, in terms of the capacity to learn, act, adapt and transform (*social network capacity*), the Philosophies of good living link human-nature interconnections (Yap & Yu, 2016) to cultural identity (Prell et al., 2009). The concept of “*Satoumi*” (from Japan), for example, which means improving seascape productivity through management, has been adopted in applied research for improving fisheries (Mizuta & Vlachopoulou, 2017). Networking capacity is also exemplified in support to forest management, increasing livelihood conditions, and integrating local values into decision-making (Justo & Hersh, 2009; Johnson et al., 2018; LaBoucane-Benson et al., 2012). Philosophies of good living can also provide insights on how to enable more equitable relations, for example, with reference to gender disparities (Herrera Acuña, 2016) and avoid exclusion of voices based on the notions of respect and coexistence (Barranquero Carretero & Sáez Baeza, 2017).

The creation of enabling and socially just governance environments (*governance capacity*) is key for the recognition of values emerging from philosophies of good living (see *also Chapter 4*). The importance of self-determination to strengthen governance and well-being (He & Xue, 2014), inform new political projects across different spheres, opposing hegemonic systems and neoliberalism (Syse & Mueller, 2014) is highlighted through respect for local production practices and management; tier

knowledge systems as well as their expression within intercultural education systems; recognition of social, cultural and political rights of indigenous peoples and non-human components of nature; and providing access to information (Argueta, 2015; Giovannini, 2012).

6.5. Operationalization of multiple values for transformative change

The closing section of *Chapter 6* focuses on the operationalization of pluralistic approaches, recognizing that integrating diverse values into decision-making and policies related to nature, nature's contributions to people and good quality of life constitutes a fundamental aspect of fostering transformative change for just and sustainable futures. It offers options for taking action to close gaps related to information, governance, capacities for the recognition and integration of diverse values into decision-making processes and associated policies and programs.

The section builds on the findings of the previous chapters of this assessment and subsections of this chapter, and draws on wider literature which focuses on practical implementation. The analysis aims to provide support on how to progress towards the Sustainable Development Goals (SDGs) across different contexts and stakeholders by the help of operationalizing the diverse values of nature in decisions. The first two subsections within 6.5 provide a framework to better understand and adapt to the context of valuation. Then an eight-step procedure is explained which, if followed, can help operationalize the values of nature in decisions. *Section 6.5.4* highlights how the diverse values of nature can be operationalized through different policy support tools and policy instruments to achieve the Sustainable Development Goals. The section is closed with a list of potential values-centred action points, which provides option examples for different stakeholders.

Different epistemological frameworks and methodologies are considered that can contribute to overcoming monistic approaches, and thus have the potential to support transformation towards sustainability (Berghöfer et al., 2016; Chan et al., 2012; GIZ, 2011, 2018; Gupta et al., 2010; Jacobs et al., 2016; Laurans et al., 2020; Max-Neef et al., 1993; Reed et al., 2014, 2017; Tengö et al., 2014, 2017; UNDP, 2020; Wiek, Withycombe, Redman, et al., 2011).

The IPBES Global Assessment clearly stated that *business as usual* approaches would only drive societies to more socio-ecological risks hampering progress towards the SDGs (IPBES, 2019a), thereby calling for a wider set of alternatives (Linnér & Wibeck, 2019). Alternative pathways for more just and sustainable futures exist at many different levels, across widely varying socio-cultural contexts, which includes different worldviews, knowledge and values systems, that many times are aligned with sustainability. It is vital to fully operationalize actions that enhance the integration of diverse values in decision-making, policies and practices (Laurans et al., 2013; Reed et al., 2017; Wyborn & Leith, 2018).

This inherently complex process requires many different types of capacities at individual, organizational and institutional levels to enable active systems of information exchange between and within networks (Reed et al., 2014), which incorporate and integrate diverse knowledge systems (Tengö et al., 2017), allowing synergies and fostering knowledge co-production (Wyborn & Leith, 2018). Such efforts should be understood as dynamic social processes of “knowledge brokerage”: as a way of bridging boundaries by transforming concepts, principles, perspectives and knowledge into information that can be used and acted upon to influence decision-making in the real world (Reinecke, 2015; Rodela et al., 2015).

In the context of diverse values, the process of knowledge brokerage, transformation and handover is multidimensional, and must take on several perspectives and stakeholders. When values are not shared widely or are not sufficiently inclusive, value framing tends to become a major arena of debate and contestation, hampering transformative change. To broaden value framing, decision-makers,

policymakers, researchers, and other stakeholders need to be conscious about their values, worldviews, and the nature of their knowledge, acknowledging their strengths and weaknesses, and understanding the conceptual and policy implications (Ribot, 2017; Subramanian et al., 2019).

6.5.1. Addressing gaps and challenges in different contexts

Considering diverse values in decision-making and policies requires the creation of, and support for, enabling contexts to improve participation, deliberation and negotiation between and within different stakeholders. This is possible, if differing interests, needs and values are considered, and conflicts and trade-offs are managed in a peaceful and constructive environment, where power differences can be addressed and balanced (Kothari, 2001; Leeuwis, 2000). As these framework conditions are usually not present, it is important to understand how different contexts can frame and shape valuation assessments and how they can encourage (or restrict) the recognition of diverse values in decision-making to support the design and implementation of appropriate policy measures that will have the desired impacts. Improving information as well as strengthening and developing different capacities at all levels of interventions is key to balancing power imbalances, improving the outputs of negotiations, and reaching more just and sustainable results (Chan et al., 2012; Laurans et al., 2020; Reed et al., 2014; Zafra-Calvo et al., 2017).

This subsection summarizes contextual characteristics and conditions that shape valuation and decision-making. Understanding the historically rooted social and political characteristics of specific contexts, which determine the availability of the basic conditions for governability and capacities, can provide improved guidance for interventions at different stages to apply appropriate methods and approaches for the recognition of rights, diverse values and knowledge systems (Chan et al., 2012; Natenzon et al., 1986). If just and sustainable futures are to be pursued, but appropriate contextual characteristics are missing, more favourable conditions for pluralistic approaches need to be created and/or recreated. This can be considered as a process in itself, which implicates appropriate policy support tools as well as policy interventions (Chan et al., 2012; Laurans et al., 2020; Reed et al., 2014).

To synthesise contextual characteristics, several different United Nations guides were consulted. The analytical framework of the United Nations Development Program Oslo Governance Center and United Nations Department of Economic and Social Affairs (UNDESA) (UNDP, 2020) recommends three key principles of stakeholder engagement when it assesses the quality of participation regarding the process agenda 2030: (i) *Inclusion*: covering non-discrimination and accessibility, (ii) *participation*, considering access to information and influence decision-making, and (iii) *accountability*: covering transparency on the engagement process and responsiveness. Each principle includes two dimensions that are highlighted across the 2030 Agenda for Sustainable Development and specifically reflected in SDG 16 - peace, justice and strong institutions. Based on this recommendation, as well as a broader literature review and the findings of previous subsections, we characterize the critical aspects of different contexts along two main analytical axes: institutional framework conditions and types of capacities.

Institutional framework conditions, related to types and forms of social interactions within different actors and stakeholders, include balance and/or imbalance of power through different formal and customary/traditional rules, norms and mechanisms that regulate the way people interact with each other (Crawford & Ostrom, 1995). The main elements include (i) the existence of participatory and power balance mechanisms (such as consultations); (ii) the existence of procedures and rules for accountability, transparency and responsiveness, (iii) the access to information and knowledge, (iv)

the levels of collaboration and coordination between and within levels, (v) peaceful conflict resolution mechanisms, and (vi) the recognition and exercise of rights.

The different types of capacities include motivational, analytical, bridging, negotiation, social network and governance capacities (see more details in 6.1.3, 6.4.4).

Based on these institutional framework conditions and capacities, we differentiate four types of contexts: (i) Enabling; (ii) conducive; (iii) challenging; and (iv) contested/restrictive (Figure 6.15, Annex 6.4).

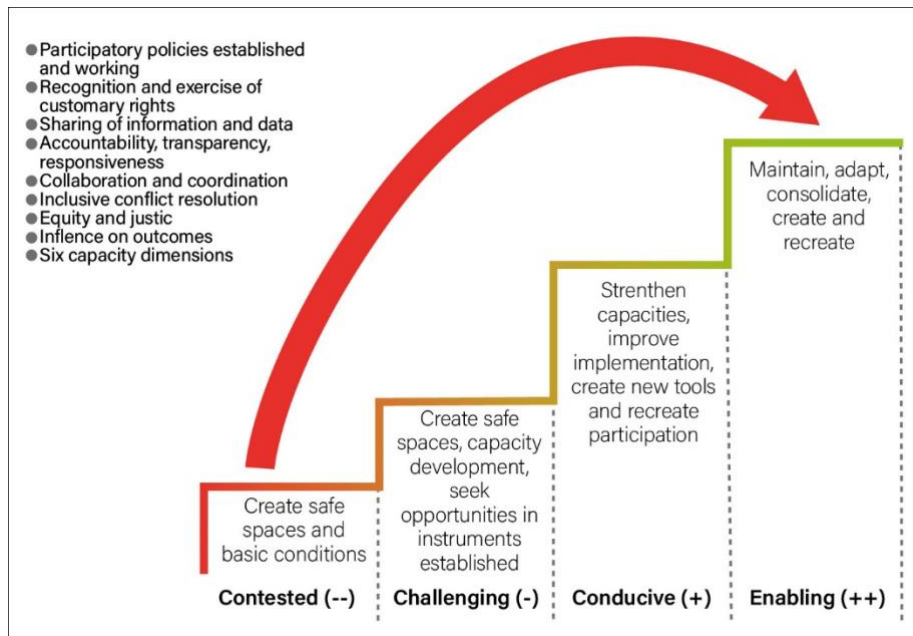


Figure 6.15. Operationalization contexts. The bullet points in the upper left corner indicate the institutional framework conditions and the capacities, while the text in the stairs highlight actions which are of key importance to move from a more restricted to a more enabling context.

Enabling contexts arise from governance frameworks that offer the possibility for deliberation, co-creation and knowledge weaving during the entire operationalization process. There is an explicit coexistence of different worldviews that are intertwined (Gupta et al., 2010; Tengö et al., 2014). These contexts promote effective participation, providing the necessary resources and conditions to do so, enabling a good quality of engagement of different stakeholders and actors, through the allocation of the necessary resources, promoting inclusion and enabling access to information to recreate accountability. During the design and implementation of assessments, a joint definition of the purpose of the valuation process, a joint analysis of the problem as well as the identification and integration of diverse values is promoted, recognizing different types of legitimation and validation in diverse sociocultural systems. Existing capacities permit tracing decisions, choosing, adapting, developing and implementing appropriate policy options. Actors and stakeholders are strengthened in many of their capacities, they are motivated, aware of and understand the relevance of diverse values. Actors have access to and are capable of using information, knowledge and tools. They are capable of bridging knowledge systems, knowing how to mobilize, translate, negotiate, synthesize and apply multiple forms of evidence (Gibert et al., 2017; Reed et al., 2017; Tengö et al., 2017). Mechanisms for peaceful conflict resolution, building consensus and balancing power, exist. Representativeness, inclusiveness and engagement of different actors and stakeholders are both

desired and promoted (Kievelitz, 1996; Kothari, 2001; Leeuwis, 2000; Max-Neef et al., 1993; Paniagua et al., 2000; Reed et al., 2009, 2017; Tengö et al., 2014). Interventions are designed based on disaggregated data and information, allowing the mobilization of resources for effective participation that leaves no one behind, permitting a comprehensive engagement. Systematically information on accessibility requirements is used to improve engagement. Resources are addressed to diminish participation barriers, understand and balance trade-offs (Fish et al., 2011; GIZ, 2011, 2018; Rodríguez et al., 2006). More challenging types of contexts can be derived from the same literature sources.

Conducive contexts permit deliberation and participation but some of their conditions limit co-creation and knowledge weaving. Mechanisms, methodologies and tools to identify and promote participation are usually used. The design and implementation of these methodologies and tools are however not systematically based on disaggregated data and information, and therefore often lack effectiveness. Some power-sharing spaces (such as free, prior and informed consent – FPIC - and consultations) exist, and there is limited resource allocation to enable participation. Thus, there is a need to improve available data, accountability, responsiveness and implementation to reach the last (or first) mile. Participatory and peaceful resolution mechanisms exist, but because of their general design, way of implementation and/or lack of resources, are less effective. Engagement is possible, desired and promoted but there remains a need to improve the quality of engagement through capacity development. Actors are motivated, understand the relevance of, and are willing to apply pluralistic values, have access to information, and share knowledge and tools. Capacities and tools need to be strengthened for knowledge weaving. Trade-offs are understood but mostly not balanced. Mechanisms for conflict resolution, consensus-building and power balance exist, but need to be improved. Invisible power structures or specific powerful stakeholders might limit the possibility for uptake of diverse values into policy design.

Challenging contexts have limited institutional conditions and capacities to promote and use pluralistic approaches, participation and knowledge sharing. One worldview is dominant. Administration and powerful stakeholders are not aware of the relevance of diverse values and/or have little interest in recognizing them. At the practical level, only some groups share or have access to information. Groups that bear the negative impacts of policies and measures are not included. There is a lack of resources allocated to participation of marginalized actors, and limited access to processes and information. Official channels do not present information in a way that most groups can understand and make use of. Transparency, accountability and responsiveness are lacking. If consultations occur at all, this is on request and not planned. There are limited avenues to influence any policy, program and/or measure; influence is usually only achieved through specific individuals and/or channels.

In **contested or restrictive contexts** there is an absence of institutional conditions to promote and exercise pluralistic approaches. In most cases, one worldview becomes very dominant, and alternative perspectives are not encouraged or accepted. Restrictive governance frameworks crosscut all levels of administration, mostly occurring in strongly fragmented societies with severe socioeconomic, political and cultural disparities and imbalance of power between and within different groups. A small number of stakeholders dominate decision-making, particularly regarding access, management and distribution of resources. Conditions restrict, prohibit or ignore customary rights in laws, norms and regulations (e.g., traditional property rights). Institutions promote inequality, creating and recreating imbalance of power. Participatory spaces are prohibited, and there is closed and/or exclusive decision-making. Administration has no interest in and/or is not allowed to recognize values other than officially prescribed ones. These processes are neither appropriate nor legitimate for the majority of the society are not given. Access to information and knowledge is limited to particular

stakeholders, who dominate communication, restricting and/or displacing divergent opinions, values and needs. There is not a peaceful conflict resolution mechanism, consultations are few, and there is only one direction of communication.

In a complex world, the distinction between different types of contexts and their worldviews is often not clear-cut. Boundaries are usually diffuse, and particular institutional conditions and characteristics of different types of contexts might coexist. Depending on particular situations, structural characteristics might stay, persist, disappear or need to be built. Thus, operationalization contexts may shift from being more challenging to more enabling and the other way around, depending on how specific governments and organizations work to improve or hinder the framework conditions. *Box 6.5* shares an example of how certain instruments and institutions could be improved to create a more enabling context.

Box 6.5. Creating more enabling context in Kabukuri Marsh, Northern Honshu, Japan

The example of Kabukuri Marsh in Northern Honshu, Japan, demonstrates how a move from the *status quo* often requires a radical transformation in the way in which natural, social and cultural spaces are conceptualised and managed. Here, transformative change involved a shift away from the formerly single-goal (and often antagonistic) focus of local farmers and conservationists as regards the *best* way of managing the wetlands, towards an integrated approach which balances rice production with the protection of wild geese. The resulting model of Fuyumizu-tambo or “winter-flooded rice fields”, a practice to flood the rice paddies that had usually been left dry in winter, integrates the management of the wetland area for its ecological functions (including wild goose habitat) with local community development goals (founded on rice production).

This shift was enabled by a process of social learning, brokered by an external organisation (the Japanese Association for Wild Geese), which helped to build mutual understanding and respectful cooperation between stakeholders. It brought together the formerly divergent aims (and interest groups) under a common, cooperative strategy that recognises – and, importantly, attempts to safeguard – diverse values. Not only do the winter-flooded rice fields offer good habitat for ducks and geese to roost, feed, and rest, but the bird droppings provide a good fertilizer for rice, and the maintenance of water in the paddies helps to control weeds and insects. As a result, farmers are able to produce high quality rice without chemicals, which can be sold at a premium price in the market.

An essential feature of the transformation that took place in Kabukuri was the shift in perceptions and interactions on the part of different stakeholders. This embodied a move towards collaborative planning and management that both recognized and operationalized the concept of diverse values, promoting both environmental and economic agendas at the local level. In addition, this locally-brokered solution effectively contributes towards national and even international conservation perspectives. Under the rhetoric of wise use, Kabukuri-numa and the surrounding rice paddies” is now designated as a Ramsar Wetland Site of International Importance.

6.5.2. Context assessment

To allow that actions are fit for purpose, it is important to tailor them to the specific context. It is only after the specificities of the context and stakeholders involved have been framed and understood that any meaningful efforts can be made to operationalize the concept of diverse values. To this end, a context assessment grid can be used (*Annex 6.4* for details).

Table 6.9 summarizes options for values-centred actions. Different contexts usually offer varying opportunities for different actors to become engaged and for their actions to have impact, e.g., in enabling contexts national and subnational governments have a significant responsibility to act, while

in challenging and contested contexts civil society, the academia and international organizations might reach a better impact than centralized actions which can even be undesirable or counterproductive (*Annex 6.4*). Contested contexts will generally allow the fewest options for action, while more enabling contexts usually offer a much broader range of possibilities. This means that any option suggested for contested contexts could also be used in all the other contexts. On the contrary, actions that are possible in more enabling contexts might be difficult, challenging and/or even counterproductive in more restrictive ones. A selection of policy support tools and instruments available in the different contexts is listed in *Annex 6.4*.

Table 6.9 Options available in different contexts (*Annex 6.4*).

	Options available in...			
	Enabling contexts	Conducive contexts	Challenging contexts	Contested contexts
Institutional framework conditions	<ul style="list-style-type: none"> Maintain, improve, consolidate and recreate institutional conditions for pluralistic approaches and policies Support democratic processes, sectoral coherence and foster sustainability aligned values 	<ul style="list-style-type: none"> Improve and establish institutional conditions to foster pluralistic approaches, e.g., access to information, inclusiveness, equity, transparency and responsiveness 	<ul style="list-style-type: none"> Enable spaces for frank exchange of perspectives between different actors Support inclusion of sustainability aligned principles in policies and plans Address resources and capacity needs to ensure plural approaches to valuation 	<ul style="list-style-type: none"> Engage proactively in sustainable production, consumption, land use and related decisions, building a safe space for exchange of perspectives
Capacities	<ul style="list-style-type: none"> Promote capacities to nurture behavioural change 	<ul style="list-style-type: none"> Special attention to bridging and negotiation capacities, capacity for knowledge weaving, validation and addressing trade-offs Foster inter- and trans-disciplinary research 	<ul style="list-style-type: none"> Strengthen all six capacities at all levels, especially at subnational levels 	<ul style="list-style-type: none"> Support curricula development that foster trans- and inter-disciplinary methods and peer learning
Collaboration	<ul style="list-style-type: none"> Support vertical and horizontal coordination and communication 	<ul style="list-style-type: none"> Establish alliances among research institutions/ universities and government and support networks 	<ul style="list-style-type: none"> Encourage horizontal collaborations, and across (local and subnational & local and international) institutions 	<ul style="list-style-type: none"> Strengthen social interactions especially between civil society, private sector and subnational institutions, donors and international organizations.
Information	<ul style="list-style-type: none"> Ensure credible information flows 	<ul style="list-style-type: none"> Generate and improve data on plural values 	<ul style="list-style-type: none"> Strengthen science-policy interfaces Make information available and understandable for different audiences 	<ul style="list-style-type: none"> Support dissemination access and use of diverse information
Knowledge	<ul style="list-style-type: none"> Advocate for non-conventional approaches to valuation involving knowledge sharing, co-production, bridging and weaving 	<ul style="list-style-type: none"> Support knowledge co-production and knowledge weaving 	<ul style="list-style-type: none"> Create 'safe spaces' for knowledge sharing and co-production Highlight brightspot stories 	<ul style="list-style-type: none"> Establish opportunities for knowledge exchange for different actors and under different validation mechanisms
Implementation	<ul style="list-style-type: none"> Sustain methods and approaches that support plural approaches to capture diverse values and promote shared values of sustainability 	<ul style="list-style-type: none"> Design and improve methods and approaches to support plural valuation approaches 	<ul style="list-style-type: none"> Support design and implementation of pluralistic approaches (e.g., confidential interviews, storytelling and dialogues) Enhance advocacy and awareness among different influential stakeholders to promote inclusive and participatory decision making mechanisms 	<ul style="list-style-type: none"> Make alternative policy support tools and methodologies understandable, accessible and feasible for actors of alternative spaces.

6.5.3. Operationalizing nature's diverse values in decision-making

This subsection presents a series of iterative steps to guide the integration of diverse values into decision-making. The steps are based on the IPBES Preliminary Guide regarding Diverse Conceptualization of Multiple Values of Nature and its Benefits (IPBES, 2015) and associated documents (Pascual et al., 2017). Key insights are incorporated from other IPBES manuals and

documents (e.g., IPBES Guide on Production of Assessments), as well as guidance developed by the United Nations Development Program (e.g., Capacity Development Methodology Users Guide, Institutional and Context Analysis Guidance note) (UNDP, 2008, 2012), the World Bank (Managing Knowledge Results) (Roberts, 2013), GIZ (Supporting Capacity Development, Integrating ES into Development Planning, Guiding Principles for Ecosystem Services Assessment and Valuation, Capacity Works) (GIZ, 2011, 2018; GIZ GmbH, 2013, 2015), the World Conservation Monitoring Centre (WCMC), as well as from expert knowledge of the authors of the chapter.

6.5.3.1. Weaving diverse values: An iterative stepwise approach to link guidelines, valuation steps, and the policy cycle

Capturing the different values of nature and making them explicit in norms and institutions is constrained by several challenges, such as socio-political exclusion, power imbalances, resource constraints, or knowledge asymmetries, among others (*see 6.4*). To overcome these challenges associated with knowledge and operationalization gaps, a collaborative approach is needed which addresses power imbalances, trade-offs and conflicts (GIZ, 2011, 2018; GIZ GmbH, 2013, 2015). For this reason, the valuation steps outlined by the IPBES preliminary guide on values and valuation (IPBES, 2015) are combined with the five tasks proposed by Tengö et al. (2017) and the theoretical inputs from Gupta et al. (2010) as being necessary for successful collaboration, weaving and cross-fertilization of diverse knowledge systems.

If different values that are aligned with sustainability and justice are recognized, accepted and respected, then these can become a co-created part of “the society’s” values and support “value-weaving” systems that shape decisions, policies and actions to foster more sustainable and just futures. *Figure 6.16* provides orientation for practitioners and decision-makers who carry out valuation and intend to use and uptake the results of valuation on how to operationalize diverse values in decision-making. The overall goal of the process is to identify, understand, recognize and consider different values in decision-making and policies: to “weave values for just and sustainable futures” as a dynamic, reflective and interactive process. Supporting this process, the figure links the concept of decision-cycle from *Chapter 4* and the valuation steps outlined in *Chapter 3*. The steps proposed are not intended to be prescriptive, instead, they can and should be tailored to the context and purpose of valuation, adapted to the right stage of the decision-making cycle, and also should reflect stakeholder needs. The graphic depicts the main stages of the decision cycle and shows the corresponding process of operationalizing diverse values.

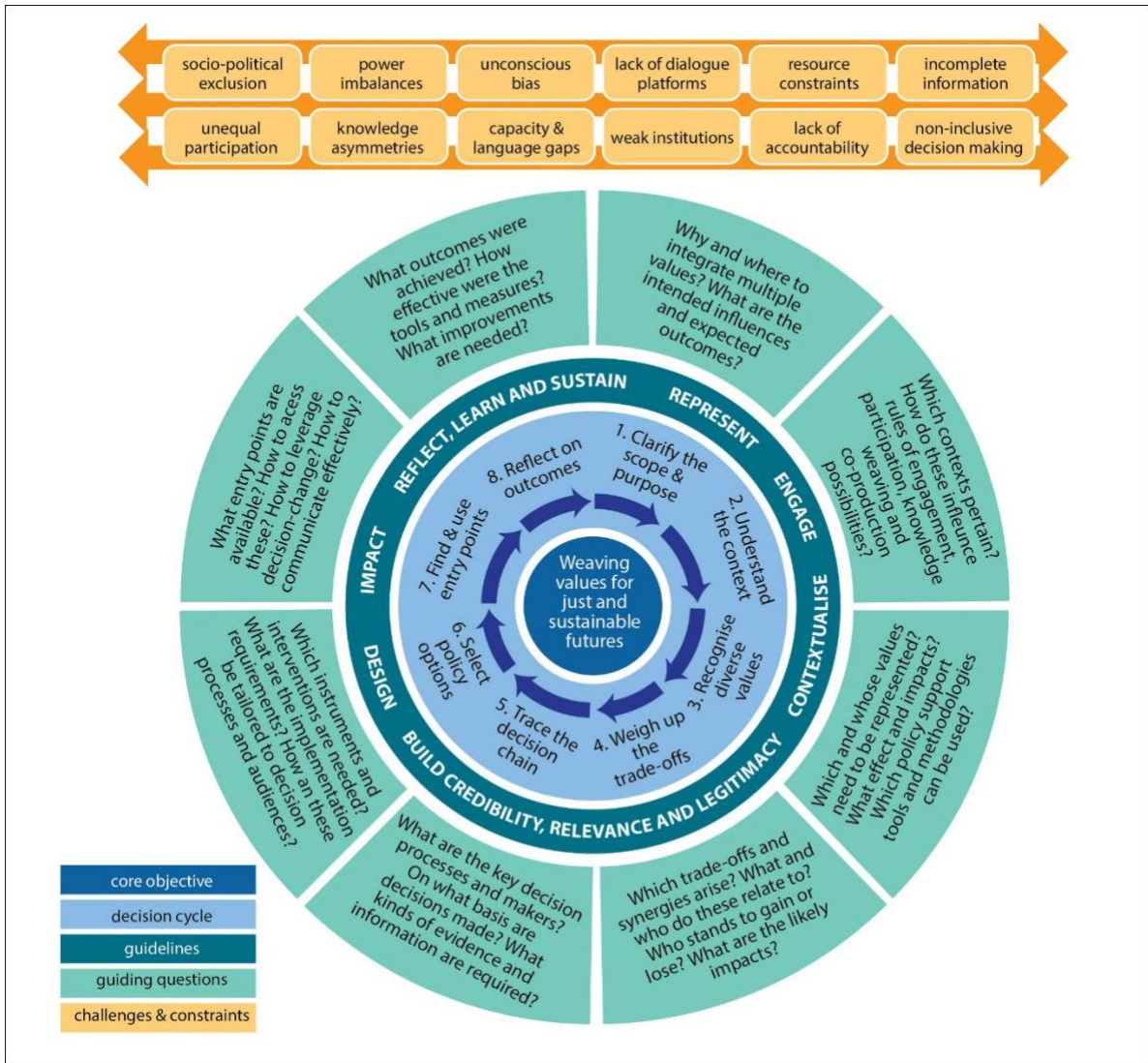


Figure 6.16. The operationalization of diverse values in the decision-making cycle.

The figure represents the logic and flow of different stages of a process for integrating diverse values into decision-making and implementation. It moves from the core objective to the outer layers of the cycle, while cross-cutting guidelines are considered at all the stages. The guiding questions cover the key issues to be addressed, while challenges and constraints can arise throughout the whole process (see more details in *Annex 6.4*). The conceptual framework is unpacked below in the consecutive subsections (see 6.5.2.2. and 6.5.2.3.) to describe how the process can be applied to operationalize diverse values at different scales, for different sectors and stakeholder groups, and towards different issues, goals and decision outcomes. The guidelines and the iterative steps for operationalizing the nature's diverse values in decisions brought together and synthesized the key aspects of already available guidance documents in one general framework - a selection of the most useful and online available tools and guidelines can be found in *Annex 6.4*.

6.5.3.2. Guidelines

Six key guidelines were identified which, if applied throughout the above suggested stepwise process or any other approach or policy intervention for the operationalization of diverse values, help

overcome the challenges that hinder the uptake of valuation results in decision-making. The six guidelines include the following (see also *Figure 6.16*):

- Contextualize the entire decision-making process in synchrony with the values that underpin the biophysical, social, economic, cultural and political context in the target intervention area.
- Design decision-making processes that take into account capacities, knowledge and perspectives of stakeholders through equal, participatory, communicative, and conflict management approaches.
- Ensure a fair representation of diverse worldviews and values held by relevant actors (including stakeholders, right holders and knowledge holders e.g., indigenous peoples and local communities, gender diversity and youth, civil society organizations involved in conservation or development activity among others).
- Engage interactively with the relevant actors to promote dialogue, long-term collaboration and co-creation of solutions.
- Strive for impact and legitimacy by instilling a sense of co-ownership over valuation results by all actors who take part in the valuation process.
- Reflect and learn to ensure that decisions that impact nature and its contributions to people are aligned with the values and actions that can foster transformative change.

The identification of these guidelines was built on literature review (Berghöfer et al., 2016; Gibert et al., 2017; GIZ, 2018; Reed et al., 2017). The emphasis is on ensuring that the guidelines presented respond to current knowledge and best practice, which is rephrased and reinterpreted specifically to deal with the concept and application of diverse values. *Table 6.10* gives exemplary actions on how each of the guidelines can be materialized in real life.

Table 6.10 Guidelines and related actions. KMs refer to relevant messages in executive summaries of all chapters of the assessment.

Guidelines	Related Actions
<p>Engage</p>	<ul style="list-style-type: none"> • Be aware of differentials and imbalances in power and decision-making influence between (and within) different actors, communities and societies; • Plan strategic/effective communication from the very beginning; • Be aware of capacity/skills needs for participation, collaboration and negotiation; • Allocate resources (human and financial) and develop a plan that allows for adaptive management; • Identify desirable and undesirable, intended and possible unintended impacts of the process; • Consider and respect different worldviews, perspectives, beliefs and knowledge; • Actively foster an enabling environment, promote agency and empowerment, encourage self-help, build in good governance (fairness, equity, transparency, social justice); • Develop a code of ethics and outline a process that requires mutual respect. <p><i>KM2.1; KM2.2; KM2.3; KM2.4; KM2.6; KM2.14; KM2.15; KM4.2; KM4.4; KM4.8; KM4.12; KM5.11; KM5.16; KM5.17; KM6.4; KM6.11; KM6.13</i></p>
<p>Contextualize</p>	<ul style="list-style-type: none"> • Understand the context; • Tailor the process to the real-world context and the identified practical/policy purpose; • Define the stakeholders, participants and audience, their needs, perceptions, roles and standpoints; • Identify the purpose of the knowledge weaving and co-production from the beginning. <p><i>KM2.5; KM2.6; KM2.9; KM2.13; KM2.6; KM4.7; KM6.7; KM6.16</i></p>
<p>Design</p>	<ul style="list-style-type: none"> • Ensure stakeholder representativeness, leave no one behind; • Systematically identify and represent diverse knowledge holders, intermediaries, research users, knowledge needs and priorities in environmental management to identify and engage with change agents; • Consider the ethical implications of engaging with different stakeholders; • Understand and account for power dynamics; • Identify knowledge brokers, bridging and boundary organizations, and their relationships. <p>• <i>KM2.9; KM2.11; KM2.13; KM3.7; KM4.2; KM4.4; KM4.7; KM4.12; KM5.1; KM5.10; KM5.11; KM6.1; KM6.13</i></p>
<p>Represent</p>	<ul style="list-style-type: none"> • Embed interactive engagement and knowledge co-production in the process; • Create a safe and collaborative space in which those involved can effectively listen to each other, share knowledge and skills, explore new ideas, learn, adapt and apply the knowledge they gain; • Promote mutual learning about each other's histories, values and existing knowledge; • Actively seek to create trust, transparency, respect and openness; • Make use of appropriate techniques, instruments and methods taking account of the cultural, governance, institutional and socio-economic context; • Foster dialogue within and between different groups, build long-term relationships, support and strengthen networks; • Work with good facilitators; • Understand different actors' needs and interests; • Create opportunities for informal interaction and learning spaces; • Work with stakeholders to interpret the implications of your work for policy and practice, and co-design communication products. <p><i>KM2.8; KM2.10; KM2.11; KM2.12; KM2.14; KM3.3; KM3.6; KM3.11; KM4.4; KM4.7; KM5.2; KM5.10; KM5.13; KM6.1; KM6.13</i></p>
<p>Impact</p>	<ul style="list-style-type: none"> • Focus on delivering tangible results as soon as possible that will be valued by as many stakeholders as possible; • Plan for measures to foster validation within and between knowledge systems; • Identify quick wins where tangible impacts can be delivered as early as possible in the research process, to reward and keep likely users of research engaged; • Get timing right; • Develop processes and products that are coherent as regards policy frameworks (especially those of intended end uses); • Embed the process and product within participating institutions; • Focus on identifying opportunities for scaling up (changing institutions, policies, rules, laws) and scaling out (replication across region and stakeholders); • Consider boundary objects and collective action; • Be performance oriented. <p><i>KM2.4; KM2.9; KM2.10; KM2.12; KM3.5; KM3.10; KM3.14; KM4.5; KM4.10; KM5.14; KM5.20; KM6.2; KM6.5; KM6.6; KM6.10; KM6.15</i></p>
<p>Learn, reflect and sustain</p>	<ul style="list-style-type: none"> • Create a learning loop with actors: jointly monitor and reflect on process; • Share good practice, perceived successes and shortcomings; • Consider how to sustain processes in the longer-term, and how to adapt to changing need and circumstances; • Scaling deep (Changing relationships, cultural values, beliefs); • Create continuous and periodic opportunities for reflection and evaluation; • Allow for the validation of knowledge representations; • Engage in iterative knowledge co-production; • Direct processes and products towards aspirational common futures and change pathways; • Learn from peers. <p><i>KM2.4; KM2.14; KM2.15; KM3.15; KM4.6; KM4.9; KM4.13; KM5.18; KM5.19, KM5.21, KM5.22; KM5.23; KM5.24; KM6.2; KM6.9</i></p>

6.5.3.3. The iterative steps of operationalizing the nature's diverse values

To operationalize the diverse values of nature in decision-making in a context-specific manner, which consider stakeholders' specific needs and available leverage points, an eight-step procedure can be followed (see the light blue circle in *Figure 6.16*). These eight steps are synthesised here based on the preceding chapters of the *values assessment* and are described below in more detail.

Step 1: Clarify the scope and purpose

The first step clarifies the scope and purpose of the valuation with relevant actors, aligns it with the relevant stage of the policy cycle, and supports policy uptake from the beginning. Being clear about the purpose and the envisaged outcome of the valuation before the study has been designed and methods selected helps align it with the intended use (and users) of the results and ensure that it fits to purpose (see *Chapter 3* and *4*). This step includes answering the questions of which decision-making process it links to, what are the associated policy and management challenges, what is the objective of valuation, who and what does it seek to influence, and which outcome or change it intends to set in motion (Berghöfer et al., 2016; GIZ, 2018; Laurans et al., 2020). This enables one to choose the right combination of methods and to design a feasible process considering the context (see *6.5.4*) and resources available, which highly influences the end results of valuation. Understanding the purpose also creates space for reflection to use appropriate policy support tools and methodologies to identify and capture different values in a specific place.

Once the purpose is set, the geographical, institutional, and sectoral scope, as well as the key stakeholders can be identified (Ash et al., 2010; GIZ, 2011; IPBES, 2015). Mapping the stakeholders at the beginning of the process helps better characterize the context and support a joint definition of the purpose. Additionally, it contributes to building legitimacy. Relevant stakeholders include individuals and groups that will be affected by the decision-making process, and those that are responsible for making the decision, setting the policy, or leading the management actions that the valuation exercise seeks to influence (see *Chapter 3* and *4*) (Berghöfer et al., 2016; GIZ, 2018; Reed et al., 2009).

Understanding and respecting different validation mechanisms within and between groups is a major topic to ensure credibility. This includes developing a shared understanding of the issue at hand, how it will be addressed, and which questions are asked to ensure that diverse values are incorporated. Legitimacy and effective implementation at later stages highly depend on whether a clear and resource-efficient workplan has been set up and discussed and agreed with key stakeholders from the onset.

Tools that assist this first step include brainstorming sessions, problem tree analysis and mind-mapping, among others. Relevant background literature and data should be collated and reviewed to inform the framing and diagnosis of the issues to be addressed. Motivational and analytical capacities are of key importance to successfully accomplish this step (see *Chapter 3*).

Step 2: Understand the context

The second step aims to understand the specific factors and conditions that shape how, and to what ends, the concept of diverse values should be operationalized (*Section 6.5.4* provides a detailed explanation of different contexts and related conditions, capacities and action points). This helps discover both opportunities and challenges to identify, understand, integrate, reflect and support pluralistic approaches. A rapid context assessment (*Annex 6.4*) can be a start to map existing

conditions and capacities and to highlight the ones to be improved. Understanding whether the context is more enabling or more contested provides orientation for the design and implementation of different actions to increase opportunities and reduce risks for sustainability (see *Chapter 3* and *4*). Design and implementation should consider power dynamics, knowledge and operationalization gaps, forms of knowledge generation and validation, to achieve the desired impacts through place-specific interventions.

Offering safe spaces for interaction expresses care for stakeholders, supports fair social interaction, and contributes to ‘*leaving no one behind*’. A needs and capacity assessment provides a comprehensive analysis and specific recommendations for valuation uptake in policy design and implementation. Stakeholder consultations help refine and focus the objectives and scope to reflect the realities of the on-the-ground situation and enable new perspectives and knowledge to be built into the design. It is also a critical step in leveraging buy-in and acceptance from those involved (strengthening credibility and legitimacy), including the groups who may ultimately be responsible for acting on the valuation results (Ash et al., 2010; Berghöfer et al., 2016; GIZ, 2011, 2018; Laurans et al., 2020; Reed et al., 2009, 2017). Involving different actors with strong dependencies and impacts on the ecosystem helps consider cultural patterns of social interaction.

The shared understanding of the management problem and the first overview of the different types of values create alliances and a solution-oriented approach. It helps to ensure that key participants support the valuation process and will also be committed to the uptake of the results (see *Chapter 3* and *4*). Having agreed the broad boundaries and scope of work, stakeholder mapping, face-to-face meetings and/or bilateral interviews can be used to identify additional groups to be engaged. Starting with a small workshop to discuss the values approach, inviting representatives of different civil society and indigenous groups, communities as well as government organizations, universities and research institutions, can help better understand the context (*ibid*). Either an existing or a newly established task force or working group can be mandated at this stage to coordinate the process and create a stakeholder engagement and communication plan covering the rest of the process. Analytical, governance and social networking capacities are the most crucial at this stage.

Step 3: Represent diverse values

The third step of the value-weaving process is focusing on how to identify and capture instrumental, intrinsic and relational values of nature in the given scope and for the chosen purpose (see *Chapter 3*). Key questions to answer include whose values are in place, how they will be addressed, whether all relevant actors and values are considered, and if someone is missing how the missed ones can be brought on board. During the design it is critical to choose the right combination of nature-, behaviour- and statement-based valuation methods that should be appropriate for the study questions and/or policy issues to be addressed in the specific context. Study and policy questions are in turn shaped by the study’s purpose and scope.

When identifying the diversity of values across different value foci, it will sometimes be the case that value trade-offs and incommensurability among values will be encountered and thus need to be acknowledged. This requires that the unequal power relations among those holding conflicting and incommensurable values are addressed. This is the stage where relevant nature’s contributions to people and ecosystem services are identified and classified in relation to the management challenge, the purpose and the scope. This also implies analysing conditions, trends and underlying causes of degradation and unsustainable use of different ecosystem services and nature’s contributions to people, which at the same time are related to the values and worldviews held by different

stakeholders. Appropriate policy support tools and methodologies to capture those values should be selected regarding the context, purpose and types of values to be addressed (see *Chapter 3*). Lastly, the third step also gives space for reflection on who is selecting the valuation methods, which are the possible strengths and weaknesses of the selected approach, and whether and how an inter- and transdisciplinary valuation team can be organized to foster integrated valuation. To accomplish this step, analytical and bridging capacities are crucial.

Step 4: Weigh up the trade-offs

The aim of the fourth step is to identify the factors that shape people's behaviour and actions, understand their motivations, and identify synergies and trade-offs considering differences in time, location, and cost-benefit distribution. Values are inherently related to stakeholders and actors. Analysing social interactions, representation, interests, rights and needs helps understand how these determine the way in which stakeholders depend on, interact with, use and impact nature (see *Chapter 2 and 3*). Trade-offs emerge when values and needs differ, and therefore often imply conflicts among different stakeholders who can benefit and/or carry on the costs of decisions made. The ways that trade-offs are solved influence the development pathway and the well-being of stakeholders (*ibid*). Weighing up trade-offs can contribute to alleviating environmental and social conflicts, improving outcomes of negotiations and supporting inclusiveness in decisions and policies. It also provides information on which incentives need to be changed to decrease negative impacts on ecosystems and people. The management of trade-offs implies balancing power asymmetries, creating the space to clarify, discuss and recognize different perceptions and values, supporting knowledge weaving and setting the basis for constructive negotiation (*ibid*).

Different tools and formats such as bilateral and group consultations can be used to collect, elaborate and complete information as well as co-produce and weave knowledge systems of diverse actors and stakeholders. Validation of the results and consideration of possible future actions might consider the particularities of the context (see *Chapter 3*). Key questions to address include who wins and who loses, what is needed to manage trade-offs, what are the main opportunities, challenges and risks related, and whether more beneficial alternative scenarios exist, considering their feasibility. Analytical, bridging and negotiation capacities are highly relevant at this step.

Step 5: Trace the decision chain

The fifth step brings together all the information collected during steps one to four and links them to possible policy interventions to effectively operationalize diverse values in concrete decisions and management actions. It involves defining the means of influencing decision-making and achieving a more just and sustainable future.

The fifth step fosters a joint reflection on what and how should be changed, and who should be involved and how (GIZ, 2011; Reed et al., 2009; Wiek, Withycombe, Redman, et al., 2011). Identifying key decision processes as well as related stakeholders and actors to address trade-offs will contribute to leverage change. An upgrade of the communication strategy could support outreach for change, knowing better what kind of decisions and decision-makers as well as other relevant audience should be addressed,

Decision chains are not unitary, but typically incorporate many different dimensions, and are variously understood and experienced by different stakeholders. Therefore, a collaborative – engaging diverse stakeholders and knowledge systems – review of possible interventions according to the policy cycle can provide orientation and discover potential actions and limitations (see *Chapter*

4). An in-depth understanding of the policy process and the associated organizational dimensions, as well as the knowledge of how decisions are made, will strengthen the policy uptake. The analysis of decision-making involves different aspects of how individuals make choices, and how they value alternatives inside the specific context in which they act.

By making the links between nature and society visible and tangible, valuation can support more equitable, sustainable and inclusive planning and decision-making across different sectors and contexts (Ash et al., 2010; GIZ, 2011, 2018). To make transformative change possible, the assessment should be embedded into the policy process from its start and be considered as a means to change the perceptions of and relations with nature (see *Chapter 4*). As a social process, it seeks to establish a connection between ecosystems, societal needs and decision-making – and, as such, creates the space for knowledge weaving and co-production, shaping the values and perspectives of stakeholders and actors involved. As with earlier steps of the assessment process, efforts must continue to ensure that the information being produced meets the target audience’s needs and is also generated and presented in a way that is credible, relevant and legitimate in the light of these needs and interests. At this step, analytical, bridging, negotiation and governance capacities are equally important.

Step 6: Select policy options

The sixth step is a key in the valuation uptake where a move from information gathering to a more action-oriented identification of concrete responses and measures happens. Key intervention areas are identified that could act as leverage points and address the drivers of degradation and unequal distribution.

Possible interventions could range from shallow leverage points, i.e., easy actions to implement with small impacts on changes (e.g., working at municipal levels, introducing participatory planning, design and/or implementation of standards and safeguards, target investments) to deep leverage points that have a strong impact on transformative change (e.g., policy reforms that address underlying causes of degradation and unequal distribution, establishment of new institutions for a more inclusive government, ecological fiscal reforms etc.) (see *Chapter 4 & 5*). Interventions can address three main areas: (i) institutional dynamics (restructure); (ii) human-environment interactions (reconnect); and (iii) sustainability-related knowledge creation (rethink) (Abson et al., 2016; Göpel, 2016; Meadows, 1999). The type of interventions planned should consider the institutional characteristics and different capacities of the specific context, also including the mobilization of financial and human resources as well as timespan and political support.

Different policy options and alternatives to operationalize diverse values can be considered, supporting policy coherence and subsidiarity across different levels of interventions (see 6.2, 6.3). Policy options can be mutually reinforcing constituting a policy mix – i.e., mechanisms and approaches which strive to create a ‘*whole that is greater than the sum of the parts*’. The combination of different policy options and instruments is particularly relevant to integrate diverse, sustainability-aligned values, since it allows the consideration of multiple needs, perspectives, different knowledge systems and stakeholder groups to become effective, inclusive and legitimate. To ensure that the policy options selected address the context-specific needs of stakeholders, both customary norms and formal rules and regulations can be considered as appropriate ways of design and implementation. The selection of the policy options also depends on the institutional capacities and the potential adverse impacts of different measures and instruments.

Valuation can play a role in selecting options at all steps in the policy cycle (see *Chapter 4*). For example, during awareness-raising, valuation can help to mainstream an issue by showing data or explaining the potential consequences of a particular course of action. In relation to problem definition, it can be used to explore an issue and attempt to explain and clarify what challenges arise, what causes these, and what the consequences are for different groups. During agenda setting, assessments can be used to generate information and lend credibility and legitimacy to a policy issue. Valuation can support policy development, by helping to explore different options and scenarios, and highlighting the advantages and disadvantages of different responses (see *Chapter 4*). At the implementation stage, valuation provides guidance on how and where to implement pluralistic approaches and measures, and where adjustments could be made. Additionally, valuation could contribute to monitoring the impacts that the selected policy option had on the problem situation (*ibid*). To successfully accomplish the sixth steps, motivational, governance and negotiation capacities are crucial.

Step 7: Find and use entry points

The seventh step of the value operationalizing process seeks to find and use entry points to integrate diverse values into decision-making. Entry points should be related with the drivers of change and policy options that were identified in previous steps to support change. Entry points are windows of opportunity that allow us to place an issue on the political agenda and should be connected to policy issues in order to receive the attention of decision-makers (Abson et al., 2016; GIZ, 2018; Göpel, 2016). There are multiple ways to achieve this, and there is no clear structure or process involved in identifying and using entry points. They simply relate to any process, be it circumstantial or programmatic, which creates an opportunity to influence decision-makers. The valuation process can either be used as an entry point to obtain political relevancy or can also act as one, since they generate knowledge and provide recommendations to improve policy (see *Chapter 4*). If it is tailored to specific policy issues and are well communicated from the beginning, valuation can deliver a new issue that decision-makers were not previously aware of, or it can highlight or explain certain aspects of an existing issue. Valuation exercises can mobilize citizens, inform and examine different options or scenarios to deal with a socio-ecological problem (see *Chapter 3 and 4*).

To ensure the uptake of valuation, an effective communication strategy is needed from the beginning, involving different stakeholders, influencers and champions who can also support the consideration of diverse values and plural approaches aligned with sustainability. Communication may not be as simple as it first appears and can be layered with traps and pitfalls. Some barriers include selective perception, information overload, emotions, language-barriers, differences in culture, gender, preferences, values and belief systems. Improving the effectiveness of communication is possible by using standard and precise terminology, providing space for clarification and feedback, supporting regular interaction, and working also with nonverbal communication such as body language, intonation or attire. Public environmental decision-making is mostly driven by several aspects such as public risk perception, available solutions, legal obligations, etc. (GIZ, 2018). Therefore, to successfully influence a policy process, valuation needs to relate to these aspects (Berghöfer et al., 2016; Laurans et al., 2013, 2020). To effectively identify and use the entry points, motivational, governance and social networking capacities are of key importance.

Step 8: Reflect on outcomes

The last step of the values-weaving process attempts to support the reflection on the process regarding impacts of the different actions implemented. This step consists of an evaluation of the policy decision

after it has been implemented. Thus, effects and changes are monitored over a given time to determine the effectiveness of the intervention, seeking for adaptation. This step is related to monitoring and evaluation, supporting adaptive management to improve actions towards the desired outcomes, and observing how the situation and relationship of different actors changed and how decisions were taken and enforced. At the same time, it assesses conditions and trends of ecosystems and analyses where and how to improve. Once a decision has been made on how to approach the issue, alternative or adapted policy instruments could be implemented, which requires assistance from many different actors and therefore links iteratively back to the first steps of the operationalization process. Successfully accomplishing the last step of the process requires analytical, motivational and governance capacities.

6.5.3 Operationalizing the diverse values of values in decisions to achieve the Sustainable Development Goals

The SDGs are a key part of today's dominant development rhetoric, guiding both global and national policy agendas, as well as funding flows. This forces us to deliberate about what needs to be done to achieve the SDGs, including reconsidering which structures and practices need to be changed (Linnér & Wibeck, 2020). By advocating a just and sustainable society, the 2030 Agenda implies that there is a need to adopt a much wider set of alternatives to realize this desired future, that goes well beyond past and present efforts (Linnér & Wibeck, 2019). Many authors have noted the interdependent, and at times, conflicting nature of targets across goals (ICSU & ISSC, 2015; Nilsson et al., 2016). Such synergies and trade-offs need to be considered, including the potential for both positive or negative impacts on different stakeholders and actors (Fish et al., 2011; GIZ, 2011, 2018; Rodríguez et al., 2006).

Diverse values and approaches currently play only a minor role in the global discourse that surrounds the SDGs. Often local priorities or values may differ from globally chosen indicators of sustainable development (IPBES, 2019a). Consequently, for instance, although indigenous peoples and local communities (IPLCs) make a significant contribution to many SDG targets, their knowledge, experiences, and needs are reflected weakly in the development of options to implement Agenda 2030. Yet the recognition and consideration of diverse values is key to achieving the transformative change that is required to make Agenda 2030 possible (IPBES, 2019a).

It follows that there is a considerable need to increase efforts to integrate diverse values at both strategic and implementation levels, to reach the SDGs and effect transformative change. The comprehensive and cross-cutting nature of the SDGs' provides opportunities for better integration and balancing of poverty-environment concerns. For this, SDG-related measures need to challenge the institutional *status quo*; transform how we measure, understand, value and implement sustainable development; design interventions that reflect local visions of development; make trade-offs and potential synergies between SDGs explicit; and address the ultimate drivers of environmental degradation and poverty (ICSU & ISSC, 2015; Johnson et al., 2019; Obersteiner et al., 2016; Schleicher et al., 2018).

Table 6.11 is a summary of how pluralistic approaches and diverse values can contribute to achieve all the SDGs, and a more detailed version is available in Annex 6.4. It was built by scrutinizing how each of the SDGs and their specific targets can be better achieved if diverse values and plural valuation approaches are used to enhance equity, resolve conflict, and find a better and more sustainable balance among trade-offs. The results are based on the findings of this assessment (especially *Chapters 3, 4, 5, and 6.2, 6.3*), other IPBES assessments, literature reviews and the review

of related virtual platforms (the IPBES Catalogue, other digital platforms such as OPPLA and ValuES) (European Commission, 2022; GIZ, s. f.; IPBES, 2017). *Table 6.10* is accompanied by similarly structured but more specific tables which separately address each SDG (*Annex 6.3*).

The first row of *Table 6.11* indicates the types of policy support tools and methodologies that can support any or all of the 17 SDGs in categories, based on purpose of valuation, as follows: *informative* tools and methodologies (used to inform and reflect with stakeholders and for inclusive planning) (see “*informative*” in *Table 6.11*); *technical* tools and methodologies (used for research and to guide technical aspects of management or policy design) (see “*technical*” in *Table 6.11*) and *decisive* tools and methodologies (used to aid decision processes and for decision-making, to solve problems and for policy intervention) (see “*decisive*” in *Table 6.10*).

Next, *Table 6.11* identifies policy instruments across the four common instrument categories of *Section 6.2* (economic and financial – E&F, legal and regulatory, L&R, rights-based and customary – R&C, and social and cultural – S&C) The policy instruments provide a means of considering and implementing plural approaches, recognizing different values, needs and interests. It should be noted that many of the instruments mentioned have the potential to integrate diverse values. However, their effectiveness depends on how they are designed, developed and implemented.

Table 6.11 then identifies leverage and entry points for the 17 SDGs. Entry points are understood as windows of opportunity to place an issue (in this case, diverse values) on the political agenda and support change (GIZ, 2018; Göpel, 2016; UNEP, 2011). They could either be very generic and/or similar in every SDG, or specific to particular contexts, usually addressing interests and needs of specific stakeholder groups. Importantly, a comprehensive strategy addressing different entry/leverage points, should be considered to boost transformative processes (Abson et al., 2016; GIZ, 2018). Entry points can occur at all levels, and may take different forms, depending on the specific topic and context. Entry points can be processes and/or situations. Processes are pre-existing and ongoing structures and frameworks that can be used to make an appeal, persuade and put an issue into the political context (Abson et al., 2016; GIZ, 2018). The design, review and/or implementation of policy instruments could also be considered as entry points such as development plans, spatial planning, multi-stakeholder platforms as well as policy and/or economic reforms. Four main categories of entry points relating to processes, can be identified: (i) policies (subnational, national, international), (ii) economic and fiscal incentives, (iii) sector policies, and (iv) governance, most of them could be found, fostering the consideration of diverse values through all SDGs (Ash et al., 2010; GIZ, 2011, 2018; WRI et al., 2008). In addition, specific situations provide a clear yet time-limited opportunity to get an issue into the political agenda. They could be among others, a change in government, elections, media attention, natural and/or made hazard and scientific findings that addresses issues of political or public concern. Ecosystem service assessments and valuations can be used either as an entry point to obtain political relevancy or can also act as one, since they provide knowledge, which can be used to base decisions on. In general, assessments can discover a new issue that decision-makers were not previously aware of, or they can highlight or explain certain aspects of an existing issue (GIZ, 2018). The table highlights some general and specific entry points that can be used to better achieve the SDGs.

Table 6.11 Integrating diverse values and plural valuation approaches into policy, using the SDGs as an example.

How can diverse values and plural approaches contribute to all the 17 SDGs?				
Pluralistic approaches can capture the concepts within the goals more holistically, better inform actors about the values of sustainable development and ensure that they have the adequate skills and capacity to achieve sustainable management, and enhance understanding, education and capacities of all actors on pluralistic values in education, awareness-raising and human and institutional capacity building and to lead sustainable livelihoods in harmony with nature	Identifying, engaging, supporting and strengthening actors and communities (including ILK), and using integrated and holistic management approaches that bring together different actors and sectors is key to better meeting and achieving the targets and goals and improving management, resource-efficiency, coordination, accountability, transparency and resilience, motivating and mobilizing support and conservation among actors, and ensuring sustainable use	Ensuring ILK, IPLCs, and small business interests are integrated into national policies, strategies, value chains and national and local planning enhances development processes and poverty reduction, prevents favoring of unsustainable practices, and fosters understanding on the interdependency and linkages to reduce environmental impacts	Better understanding of the knowledge of, needs, and rights of different actors can allocate appropriate roles to custodians and rights-holders, recognize fair and equitable sharing of the benefits, define more effective implementation strategies, promote learning about culture and nature, create more equitable access and use, ensure safety and equal access to justice and end violence, and ensure a better quality of life	Well formulated needs and aspirations of different groups and capacity development can alleviate disproportionate dependence, stress, and environmental poverty, and reduce unemployment and precarious employment, differential access, greater opportunity costs and social and economic inequities of the poorest, marginalized and most vulnerable leading to better quality of life and sustainable livelihoods in harmony with nature
Which value-focused policy support tools & methodologies can be used?				
Informative Participatory rural appraisal, cross culture approaches, visual and multimedia based participatory methods, holistic valuation systems of life of Mother Earth, holistic or integrated planning approaches, landscape approach, guidelines or toolkits for mainstreaming cross-cutting areas in development planning, indicators partnerships	Technical Mapping, surveys, interviews, observation and field notes, rapid and full sector assessments and prioritization, action research, group models or network analysis, impact assessments, world databases, disciplinary and comparative research methods, vulnerability assessments, ethnographic methods for cultural and social assessments and valuations, preference methods	Decisive Toolboxes designed for multiple stakeholders or integrated approaches, deliberative methods, multi-criteria decision analysis (MCDA), sector-based valuation frameworks, toolkits for site-based assessments		
Examples of policy instruments & interventions				
Economic and financial Economic restructuring, alternative measures of economic welfare, Payment for Ecosystem Services, ecological fiscal transfers, ecosystem accounting, biodiversity financing (incl. ODA), REDD+, taxes on consumption, environmental subsidies, biodiversity relevant taxes, charges and fees, biodiversity offsets.	Legal and regulatory Legally protected areas, multilateral agreements, national legislation; environmental impact assessment, legislative control over pesticide use, commodity chain regulation, voluntary codes of conduct and guidelines, IPLC managed areas, environmental and social standards, NBS.	Rights-based and customary OECMs, ILK revitalization, IPLC-led codes of ethical conduct, Free Prior and Informed Consent (FPIC)	Socio-cultural Co-management, environmental education, certification and labelling, behaviour nudges for reduced consumption, socially responsible investments, corporate social responsibility	
Examples of leverage and entry points				
<p>Sector-based examples: Sector management plans at different levels; revision of laws and regulations; sector and international conferences</p> <p>Cross-cutting examples: National Adaptation Strategies; National development Plans; NDCs; Access to Climate and Biodiversity Finance</p> <p>Situational examples: Respond to natural hazards; elections; participation in and/or hosting international meetings and conferences (such as CoPs)</p>				








The difference between entry and leverage points depends on the type and impact of the intervention made. Thus, leverage points could be understood as places where interventions can influence the behaviour of a system. (Meadows, 1999) identified 12 leverage points that range from easy interventions (*shallow*) to implement with small impacts (parameters and feedback) to *deep* leverage points that might be more difficult to implement but have a stronger impact on transformative change

(design and intent), supporting to realign complex socio-ecological systems to the normative goals of sustainability. These deep leverage points could be addressed in three main areas: (i) institutional dynamics (restructure); (ii) human-environment interactions (reconnect); and (ii) sustainability-related knowledge creation (rethink) (Abson et al., 2016; Göpel, 2016; Meadows, 1999).

Summary

This assessment of various policy options incorporating diverse values of nature available across sectors, implemented and advocated by governments, multilateral organizations and further across a broad set of stakeholders indicates a mixed picture. On the one hand we can see progressive evolution of policies, taking cognizance of interests of multiple stakeholders, multiple priorities and impacts on (and from) other sectors. Jurisdictional boundaries of policy options is narrowing, there is greater legitimacy for participatory approaches and socio-ecological planning. On the other hand, operationalizing the inclusion of diverse values of nature into decision making is highly contextual and subject to different constraints- political, different capacities, resources, among several others. That said, there is sufficient evidence to show how every member of society could contribute to ensuring inclusion of diverse values of nature in different decisions. Based on the evidence from across the different chapters, a summary of types of concrete actions across stakeholders to support the integration of diverse values in decision-making has been done (*Table 6.12 that also provides examples of values centered actions across various stakeholder groups*). The assessment clearly points out that synergistic and concerted actions are needed from all actors in society upon a wide range of values-centred action points for achieving more just and sustainable futures.

Table 6.12 Action points related to inclusion of diverse values in decision-making on nature and Responsibility of different actor groups.

		Actors						
		 Inter-governmental organizations	 National and subnational governments	 Non-governmental organizations	 Academia	 Citizen groups/IPLCs	 Private sector	 Media
Values-centred action points	Embed diverse values into decisions	Promote the incorporation of diverse values into national biodiversity strategies	Implement policies that articulate diverse values	Develop values-centred safeguards	Address knowledge gaps	Mobilise sustainability-aligned values	Implement standards for values-based corporate responsibility	Communicate on the diversity of values of nature
	Foster policy coherence across sectors based on sustainability-aligned values	Align policy with value diversity	Establish coordination mechanisms among sectors around shared values	Foster initiatives to make visible diverse values	Advance inter and trans-disciplinary research on values	Advocate for recognition and respect for diverse values	Engage in cross sectoral dialogue to build shared values	Highlight stories of successful values alignment
	Ensure representation of stakeholders' values	Develop standards for inclusive participation in decisions	Encourage participatory policy design	Support valuation uptake in policy decisions	Assess representation in valuation and its outcomes	Promote respect for marginalised worldviews and values	Adopt practices of inclusive participation	Promote public debates on the diverse values of nature
	Enable capacities to embed diverse values into decisions	Address barriers (e.g., knowledge of trade-offs) to develop capacities of stakeholders	Enable mechanisms for policy uptake of plural valuation	Support capacity development activities based on nature's values	Build research programmes to strengthen the transformative potential of values-centred leverage points	Network to foster peer to peer learning	Support capacity development on values-based corporate sustainability standards	Train communication experts (including local communicators) on the role of nature's values
	Strengthen co-learning among stakeholders to develop shared values	Promote projects that entail cross sectoral planning by highlighting best practices	Encourage collaborative learning across scales and sectors	Document good co-learning practices across actor groups	Promote research incorporating different knowledge systems	Support awareness raising among peers	Promote co-learning with affected stakeholders	Communicate on how shared values are built
	Enhance resource mobilisation for plural valuation and policy uptake	Foster international commitments to undertake plural valuation and uptake	Allocate resources for capacity building to support uptake of valuation	Ensure project funding is targeted to addressing key gaps	Channel resources for plural valuation research	Support crowdfunding to enable wider participation in decision making	Allow for plural valuation and its uptake	Highlight gaps in resource availability

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