Chapter 6[1]. Policy options and capacity development to operationalize the inclusion of diverse values of nature in decision-making

Supplementary material

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[1] This is the final text version of the supplementary material of Chapter 6 of the IPBES methodological assessment of the diverse values and valuation of nature (https://doi.org/10.5281/zenodo.6522359).

Annex 6.1 Definition and key aspects of transformative governance

As the IPBES Global Assessment Report points out, transformative changes across socio-economic, technological, and political realms are required if humanity is to achieve biodiversity goals envisioned in the Sustainable Development Goals 2030 and 2050 Vision for Biodiversity (IPBES, 2019b). Such transformative changes must include fundamental reorganization of paradigms, goals, and values, which requires innovative and holistic approaches to governance, or transformative governance (IPBES, 2019b; Pelling et al., 2015).

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 sectors, levels and scales (Göpel, 2016; Kelly et al., 2019). A fundamental element in transformative governance is institutional restructuring, which includes the modification in legislation, policies, technologies, and changes in behaviour, culture, and practices within the system (IPBES, 2019b; Kelly et al., 2019).

There is no single prescription for the transformation towards new biodiversity governance, and various transformation pathways are possible to facilitate the transformative change from status quo towards sustainability (*Chapter 5*) (Beck & Forsyth, 2020; Koh, 2020). Transformative governance often requires a mixed set of *policy* or *governance* aimed at navigating transformative changes in mainstreaming biodiversity concerns across all sectors, from the global to local scale (Kivimaa & Kern, 2016; Koh, 2020; Loorbach, 2014). Such policy or governance for transformative change requires an approach that enables the incorporation of various values, knowledge, and visions regarding biodiversity within its implementation boundary. Thus, transformative governance would require policy-makers to carefully assess and consider whose sustainability values and visions should be counted and represented throughout the process (Beck & Forsyth, 2020).

Values and interests of actors will differ across scales and transformative governance needs to link those multi-level perspectives of values on biodiversity and sustainability. The acknowledgement of plural values can improve the capacity to vision better futures and identify appropriate transformation pathways towards sustainability. Transformative governance systems can acknowledge diverse values by:

- Diversifying the range of values of nature, which recognise and support multiple values within the governance to enhance;
- Co-producing values of nature, such as through inclusive governance approaches that addresses diverse values-knowledge and acknowledges under-represented voices and perspectives regarding sustainability;
- Institutionalising values at different levels to illustrate alternative visions/pathways to sustainability; and
- Acknowledging various levels of societal changes, starting from the individual values towards broader collective values (*Section 5.3.1.5, Chapter 5*). In many cases, acknowledging local values through ILK can significantly contribute to a more pluralistic understanding of transformations and the requirement for the transformative change.

These transformative changes can be enabled by incorporating various approaches to governance, such as integrative, inclusive, informed and adaptive governance (IPBES, 2019a; Visseren-Hamakers et al., 2021). Integrative governance approaches are required to address the challenges of policy

incoherence in sustainability and environmental governance. This governance approach aims to ensure that transformative solutions can have sustainable and replicable impacts at various scales, locations, and sectors. The pluralist governance approach requires transformative changes based on legitimate and credible knowledge that incorporates different knowledge and value systems, particularly the sustainability values and knowledge from the minority group that is underrepresented. Adaptive governance represents a continuous learning process and reflection on the progress of changes, the challenges, and the best ways to move forward. Adaptive governance enables the actors to recognise and respond to uncertainty, social conflicts, and complexity in the socio-ecological system. Inclusive governance enables participation of different actors in decision-making processes to improve the decisions' quality, as well as to secure legitimacy and accountability of the process, by including the minority groups which have sustainability interests and values.

Although these governance approaches have been extensively discussed as the enablers of transformation, the combined contribution of those approaches to transformative governance has not yet been deeply examined (IPBES, 2019a). In this section's assessment, a literature review focused on these different governance approaches was used to develop five overarching criteria with which to assess the potential of policy instruments to support transformative governance. Below there is a brief description of the main criteria.

Address Status Quo

Transformation towards sustainability is related to the process of change within societies to overcome ecologically harmful (unsustainable) policies and practices and to formulate alternative innovations as the replacement (Förster et al., 2020; Loorbach & Rotmans, 2010; Meadowcroft, 2009). As a process of change in governing environment and biodiversity within the socio-ecological system, transformative governance focuses on: (1) the transformation of the ecosystem, which represents the changes in the state of ecosystem, and (2) the transformation of decision-contexts, which represents significant shifts in social arrangements that define decision-making processes, such as networks and social relations, knowledge-values-rules, and resource allocations (Colloff et al., 2017).

The IPBES Global Assessment highlights the required transformative change as the systematic changes from the *status quo*, which mainly consists of (1) development based on the unsustainable material consumption, and (2) continuous production of social inequalities (IPBES, 2019b). The move from the status quo requires a transformation in *'perceptions and meaning, social network, interactions among actors, including power relations and institutional arrangements'* (Folke et al., 2010). Thus, the criteria for transformative governance must consider the changes in societies from the unsustainable or unwanted condition, or the status quo, towards more sustainable material production-consumption, as well as social equalities and equal power distribution.

Address diverse values

Values are not only properties of individual cognition but can also be conceived as socio-cultural resources in particular contexts to form views about goals and process (*Chapter 5, Section 5.3.1*) (Demski et al., 2015). There is a growing literature on sustainability transformations or transitions research that shows the increasing importance of values to transformation. Values have the potential to function as effective intervention points as well as the leverage points for sustainability transformations (*Chapter 5, Section 5.3.3*) (Abson et al., 2016; Fischer et al., 2012).

Given the uncertainties associated with global environmental change, biodiversity governance and sustainable resource management must be adaptive and inclusive towards diverse values and perspectives. The transformative change towards sustainability can only be achieved by considering values of multiple stakeholders, including the interactions of values and perspectives, at different

scales and levels (*Chapter 5, Section 5.3.3*). When assessing sustainable values and visions, the representation of values and interests become the main consideration, particularly for the under-represented sustainable values, goals, and knowledge (Beck & Forsyth, 2020).

The acknowledgement of plural values can improve the capacity to vision better futures and identify appropriate transformation pathways towards sustainability. To become transformative, diverse values must be acknowledged by applying inclusive and informed approaches in policy and governance (IPBES, 2019b). An inclusive governance approach is necessary to accommodate plural values and empower marginalized groups of stakeholders with sustainability values. Informed governance approaches enable actors to reflect on diverse values, monitor and assess changes, stimulate dialogues, learning and reflection, co-produce knowledge, and address power asymmetry (IPBES, 2019a; Visseren-Hamakers et al., 2021).

Stimulate institutional changes

Transformative governance requires addressing a wide range of institutional, legislative, social, and economic challenges as the part of persistent problems that inhibit sustainability (Stevens & Kanie, 2016). Transformative governance to address these challenges can be stimulated by providing learning and experimenting conditions within social and institutional networks that differ from traditional practices. These conditions can be provided by making decision-making processes open and transparent, engaging more local initiatives, and enabling institutional change (Schreurs et al., 2019). Fundamental to this transformation process is the institutional restructuring, which includes the modification of policy, administration, legislation and institutions, as well as changes in behaviour, values, and culture (Kelly et al., 2019; Schreurs et al., 2019).

Capacity development

Transformative governance processes towards sustainability are linked to the capacity of government actors to devise, implement and adapt institutional arrangements and legal prescriptions of a set of policy-mixes, while keeping a keen eye on social realities in everyday governance practices and the abilities of the societal actors to understand and utilise the policy (Förster et al., 2020). As a deliberative process, transformative governance is seen as a process to develop the capacity of people and institutions to support the intended changes (Colloff et al., 2017).

The capacity to enable transformations in biodiversity governance is determined by the intersection of capacities available at the different levels (individual, organisational and systemic) and dimensions (analytical, operational and contextual) of policy (Förster et al., 2020; Wu et al., 2015). The intersection of policy levels and policy dimensions starts from the individual and cognitive level towards the organisation and systemic level, to build, share, and develop sufficient skills for actors as the strategic requirement for transformative change towards biodiversity sustainability.

Transformation towards sustainability requires transformative literacy, which is the capacity of actors to assess information about transformation processes, and utilise the information to get involved in the right stage of transformation processes (Göpel, 2016). Hölscher et al. (2019) elaborate four different types of capacities to address transformative governance, namely stewarding capacity, unlocking capacity, transformative capacity, and orchestrating capacity. These capacities are required in different stages of the policy cycle. The stewarding, unlocking, and orchestrating capacities are particularly necessary to anticipate the impacts and understand the issues to support transformative policy development. The transformative and orchestrating capacity are necessary in the policy implementation stage. Thus, policy to support transformative governance requires sufficient capacity of actors and organisations to induce shifts from the status quo towards sustainability, and the ability

of actors to develop and/or acquire the required capacity for transformation when such capacity is absent or lacking.

Integrative-adaptive governance

While the informed and inclusive governance approaches can be reflected under the Diverse Values criteria, the integrative and adaptive aspects must be included in the policy process to support transformation. Integrative governance aims to ensure that local solutions also have sustainable impacts at other scales and locations, on other issues, and in other sectors. This impact can be achieved by applying coordination, integration, and combination strategies and developing a set of policy-mixes for transformative change (Visseren-Hamakers et al., 2021). As stated in the IPBES Global Assessment, *'the effective decision making for transformative change uses a mix of instruments and tools, and bridges across different sectors, levels and scales'* (IPBES, 2019a). To address the biodiversity crisis, a mix of policy instruments are needed to mainstream and integrate biodiversity agenda across all sectors (Koh, 2020).

Adaptive governance acknowledges that transformative change and governance goals are complex, uncertain, and constantly moving, so governance needs to enable (Borie et al., 2020; IPBES, 2019a) continuous learning, experimentation, reflexivity, monitoring, and feedback. A reflexive transformation must happen from within the governance process, to inform the transformations process beyond policy boundaries and opening-up towards a broader range of possible futures and policy options (Borie et al., 2020). The adaptive governance approach allows for such internal reflexivity to overcome the barriers to adaptive approach, to reflect the complexity and uncertainty in policy and governance process, and to address power asymmetry (IPBES, 2019a; Visseren-Hamakers et al., 2021).

General stakeholder categories

Intergovernmental organizations (key players): while intergovernmental organizations may determine the agendas of different global processes relating to social and ecological concerns, their roles are more facilitative, with opportunities to nudge more inclusive and equitable mechanisms of decision-making across different sectors and levels of governance.

National and subnational governments (key players): even while governments are active actors in decision-making related to various socio-ecological issues from land use, cropping patterns, to efficiency and equity parameters across various sectors, they also influence various stakeholders who abide by the rule of the law on how they conduct their activities.

Non-governmental and civil society organizations (key players): they represent the collective voice of several stakeholder groups whose individual voices may be considered weak, such as nature, IPLCs, women, youth. They also elevate issues relevant for these underrepresented group, e.g., consumer rights, producer rights, equity, fair trade, sustainability. Non-governmental organizations can also act as donors, i.e., they provide aid and grants for research, experimentation and pilot implementation, and this way they provide resources to advance conservation and development work that may be considered even non-mainstream. Non-governmental organizations wield high moral authority and act as bridging organizations to negotiate terms of engagement between different stakeholder groups. In the chapter, this group is considered as a proxy for the affected actors who are depending on and impacted by the decisions of other stakeholders.

Citizen groups (key players): include collectives of citizens who operate at the same levels of social organization in roles of consumers and/or primary producers and manufacturers (e.g., farmers, fishermen and other resource users), as well as interest groups and social movements which represent

socio-cultural diversity e.g., across gender (women, intersectional groups), race, or specific age groups, and raise their voice on issues related to environmental justice, biodiversity, climate change, equitable development, etc.

Private sector (key players): business organizations are crucial to any economy and persuasive in influencing government policy related to prioritization of ecological concerns or social concerns. The private sector uses natural resources and impacts the natural environment in every stage of the process of creating market-value.

Academia/researchers (influencers): The role of academics and researchers in promoting different methodologies cannot be overstated. They influence how causal effects are understood, what drivers for socio-ecological changes are considered and which stakeholder preferences are included in any such assessment.

Media and Arts (influencers): includes conventional media such as radio, television and print media and social media and various art forms that have an impressionable influence on the opinions and preferences of different stakeholder groups (Saratsi et al., 2019). In the age of post-truth, when information is often manipulated, it is critical to ensure that robust and trustable knowledge is used to create media outlets.

Summary of the targeted literature review on the six capacity dimensions

Motivational capacity: building awareness and desire to consider multiple values

The motivational capacity of decision makers must be understood from both at the individual level and the individual's interaction with the organization. Attitudes and performance are driven by intrinsic and extrinsic motivations related to the ways in which rewards are generated (Ryan & Deci, 2000). Intrinsic motivation refers to behaviour that is internally driven by a sense of meaning and interest, and the rewards include a sense of meaning and value, or experience of competence which, in turn, generates positive emotions within an individual. Extrinsic motivation occurs when the motivation to act is driven by potential to earn a reward or avoid punishment. Intrinsic motivation has been found to be strongly linked to more productive and positive work performance where employees are motivated by the task itself and recognition of its inherent value (Gagné & Deci, 2005; Lawler & Hall, 1970; Schreurs et al., 2014).

On both individual or organizational level, Lambin (2005) proposed that motivation relates to the sources of behaviour of agents and has also multiple dimensions, including: (i) a cultural dimension related to local environmental attitudes, values and knowledge; (ii) an economic dimension that balances benefits and costs (Balmford, 2002; Cormier & Gordon, 2001) (iii) a policy dimension addressing different framework conditions (Kent & Myers, 2001); (iv) a conflict dimension related to different interest between stakeholders, affecting the willingness of decision makers to intervene; and (v) an institutional dimension, related to ecosystems and institutional systems (Young, 2002).

Analytical capacity: knowledge and tools to analyse multiple values

The approaches, methods and tools used in ecosystem services assessments and valuation as well as their contexts and goals shape their scope, results and conclusion. There is no neutral assessment. Approaches and tools in biodiversity management also influence the ways decisions are taken and how power is exercised. The socio-ethnographic approach of monitoring programmes in seven national parks in tropical Africa and Indonesia shows how power asymmetries in cognitive representations of nature could be supported through technical tools (Vimal et al., 2018). Tools carry a cognitive representation of the world, a theorization of action and give legitimacy to values and

perspectives (Cabane & Tantchou, 2016; Carolan, 2009; Desrosières, 1998; Lascoumes & Le Galès, 2005).

Domination of Western science and rationality also influences the ways in which local knowledge is treated and accounted for. Transformative governance requires reconsideration of the relation between knowledge and decision-making (IPBES, 2019a). Scientific expertise is not in all cases required for effective and legitimate action and 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). This means that existing tools will need to be adapted to generate inclusive processes for the recognition and consideration of multiple values, implying forms of scientific and non-scientific knowledge, that could be credible, legitimate and salient for all relevant stake- and knowledge-holders (Cash et al., 2003; Mauser et al., 2013; Robertson & Hull, 2001).

Bridging capacity: capacity to bridge different ways of knowing

A crucial element in the production of legitimate and credible information is the facilitation of dialogue and learning (Breslow, 2015; Lemos & Morehouse, 2005; Peterson et al., 2003; Turnhout, 2018; Voinov & Bousquet, 2010). Literature on transdisciplinary and co-production offers a variety of tools and methods that can be used by Governments (GO) and Non-governmental organizations (NGOs), also in bottom-up processes, to organize participatory knowledge production that are able to bridge practical, local, and Indigenous knowledge (Clark et al., 2016; Tengö et al., 2014, 2017). The application of inclusive and participatory approaches is limited (Brandt et al., 2013) and their ability to produce positive outcomes for problem solving and stakeholder empowerment depends on the presence of an enabling institutional context (Armitage et al., 2011) which is able to effectively address unequal power relations between stake- and knowledge holders (Dilling & Lemos, 2011; Nadasdy, 2003).

Negotiation capacity: capacity to negotiate trade-offs and mainstream into policy

Negotiation, by definition, requires interaction between two or more parties seeking to find a mutually acceptable agreement (Fairman et al., 2012). The two most common negotiation behaviours are forcing behaviour – directly contending the other party – and problem-solving behaviour – reconciling the parties' primary interests (Beersma & De Dreu, 1999). It also involves a negotiation of meaning, that is the process through which people with different perspectives arrive at a sufficiently common understanding of a challenge or problem for their current purposes (Beers et al., 2006). The success of a negotiation is dependent on the individual's skills, but also the capabilities of their counterparts and the support of their institution to implement the agreements reached.

Building negotiation capacity at the individual level requires decision makers and practitioners to be able to overcome the "negotiator's dilemma" of between promoting cooperation versus advancing own interests, understand the education to negotiation, consider negotiation as a process, reinvent of strategy and see the value of relationship with their counterparts (Soliman & Antheaume, 2017). Improving organizational negotiation capacity requires identifying the negotiation challenges most important to the organization's success, reflecting on how effectively the organization is meeting those challenges, revising policies and staffing that affect negotiation success and building skills to increase success (Fairman et al., 2012). Apart from training and other forms of knowledge and skill-building of staff to achieve institutional change, the institution should ensure trainees have an opportunity to use the concepts in context, offer easy access to negotiation support and have the operating procedures of the institution, both formal and informal, aligned to enable negotiators to be effective (Fairman et al., 2012).

Capacity to negotiate for trade-offs, including having trade-off management measures in the decision-making process, such as the "Trade-Off Decision-Making tool" assists trade-offs management operationalization also needs to be enhanced (de Magalhães et al., 2019). The issue of "boundary-crossing" must be tactfully addressed to promote interagency cooperation by bridging "divided terrains" to enable renegotiation and reorganization of collaborative relations and practices between and within the activity systems (Warmington et al., 2004). However, reconciliation of conflicts and reaching agreement on common interests may not necessarily result in biodiversity mainstreaming. Thus, it is also important to build institutional capacities to promote biodiversity mainstreaming in policies, by addressing the barriers and finding levers relating to institutional, motivational and means (Karlsson-Vinkhuyzen et al., 2018).

Social network capacity: capacity to learn together, act and adapt or transform

Network governance rests on a recognition that policy-making occurs through interactive forms of governing that involve many actors from different spheres, reliant on negotiation and coordination between various actors (Mayntz, 1993). Network governance involves a select, persistent, and structured set of autonomous firms (as well as non-profit agencies) engaged in creating products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges. Network governance overcomes problems of adapting, coordinating, and safeguarding exchanges by using social mechanisms - restricting access to exchanges, imposing collective sanctions, and making use of social memory and cultural processes - rather than authority, bureaucratic rules, standardization, or legal recourse (Jones et al., 1997). Social network analysis can be used to understand joint management and the establishment of cross- scale linkages (Carlsson & Sandström, 2008), as well as network structure supporting stability, flexibility, and innovation to increase regional resilience (Luthe et al., 2012).

Social learning is both the cooperation of partners and the outcome of this cooperation that occurs most efficiently through joint problem solving and reflection within learning networks (Berkes, 2009) can be reinforced by experiences (Bandura, 1971). Social learning model is posited for more broad-scale use in providing multi-level governance linkages and as a basis for targeting interventions to address policy gaps or failure, but will be required to manage risk, support stakeholder analysis and resolve funding issues (Leys & Vanclay, 2011). Weaving indigenous and mainstream knowledge within science arenas to promote co-learning, including "two-eyed seeing" where people familiar with both knowledge systems can uniquely combine the two in various ways to meet a challenge or task at hand (Bartlett et al., 2012). Knowledge co-production is defined as the collaborative process of bringing a plurality of knowledge sources and types together to address a defined problem and build an integrated or systems-oriented understanding of that problem (Armitage et al., 2011). Reed et al. (2014) propose five principles for effective practice of knowledge exchange, - Design; Represent; Engage; Impact; Reflect and Sustain - to assist researchers, decision-makers and other stakeholders working in contrasting environmental management settings to work together to co-produce new knowledge, and more effectively share and apply existing knowledge to manage environmental change. Co-management, which can be considered a knowledge partnership, relates to knowledge generation, bridging organizations, social learning, and the emergence of adaptive co-management (Berkes, 2009).

Adaptation, considered as responses to risks associated with the interaction of environmental hazards, is intimately associated with the concepts of vulnerability and adaptive capacity (Engle, 2011; Smit & Wandel, 2006). Adaptation, constrained by the adaptive capacity could result in uncertainties in decision- making processes. Adaptive capacity can be identified and measured at various stakeholder scales (Simha et al., 2017). Evidence suggests that adaptive capacity at multiple levels built through the process and linkage functions of co-management by fostering shared understanding and sense-making, increasing dialogue and interaction, distributing control and shared responsibility for actions,

and improving conditions for individual and group learning (Berkes, 2009; Plummer, 2009). Recognizing that adaptation is a process, it then also involves the ability to consider consequences of different adaptation options, evaluating and negotiating trade-offs, and communication among diverse groups (Armitage et al., 2011).

Reed et al. (2017) propose the wheel of participation that defines different types of stakeholder and public engagement, which it combines four modes of engagement with either top-down or bottom-up agency: top-down one-way communication and/or consultation; top-down deliberation and/or co-production; bottom-up one-way communication and/or consultation; and bottom-up deliberation and/or co-production. A theory of participation explains how the outcomes of this wheel by context, process design, the management of power dynamics and scalar fit.

Governance capacity: creating an enabling and socially just governance environment

Governance capacities are related to accountability, transparency, rule of law and participation (IFAD, 1999). Especially when working with ILK these issues must be strongly considered. Some ILK experiences showed that there is a lack of recognition of indigenous authority; inadequate focus on human resource development at the local level; lack of information to facilitate decisions; very little jurisdiction authority for communities to control important matters; categorization of indigenous people as disadvantaged rather than as people who have rights and responsibilities and lack of a land base or no control to traditional lands (Makuwira, 2007).

Still, there are many tools available to set up inclusive and participatory mechanisms for capacity development and knowledge co-creation (Brondizio & Tourneau, 2016; Fernández-Llamazares & Cabeza, 2018; IPBES, 2019a; Pert et al., 2015; Schreckenberg et al., 2016; Zafra-Calvo et al., 2017) including IPLCs-led codes of ethical conduct in conservation (e.g., Akwe: Kon Guidelines and The Tkarihwaié:ri Code of Ethical Conduct) and tools for dialogue such as the Whakatane Mechanism (Freudenthal, 2012; Sayer et al., 2017). Additionally, legal approaches that draw inspiration from indigenous and Local Knowledge (ILK) and customary institutions.

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Annex 6.2 Details of the policy instruments, brightspots and cross-scale initiatives analysis

Section 6.2 asked two broad questions:

1. To what extent are diverse-value policy options available, in which context and scales are they operationalized, and whose worldviews and values do they represent?, and
2. What policy options exist for operationalizing diverse value approaches for transformative governance?

To develop the assessment criteria for transformative governance against which we can assess the potential of policy instruments to facilitate transformative change, we conducted a literature review and also drew strongly on *Chapter 5.3.2*.

From the literature review, we identified various components of transformative governance, which we then grouped into five main components (further discussed in the main text). These were: Address Status Quo, Address Diverse Values, Stimulate Institutional Changes, Capacity Building, and Integrative-Adaptive). Within these broader categories, we defined the following criteria:

Address Status quo

- Does the policy instrument / initiative address the direct and indirect drivers of biodiversity loss (based on the IPBES Global Assessment)?
- Does the policy instrument stimulate and/or promote a positive major shift to the states of ecosystem and biodiversity?
- Does the policy instrument stimulate and/or promote a positive major shift in the social networks and power distribution?
- Does the policy instrument stimulate and/or promote a positive major shift in rules and resource allocation in biodiversity governance?
- Does the policy instrument promote positive changes in social production and consumption towards a more sustainable pattern?
- Does the policy instrument challenge the inequalities and able to promote equalities among the social group involved in biodiversity management?

Address diverse values

- Does the policy instrument stimulate and/or promote a positive major shift in recognising and revealing diverse knowledge and values of biodiversity?
- Does the policy instrument provide room to accommodate or consider diverse values of different groups in biodiversity management, including the ILK values of the local and indigenous people, in its decision-making process?
- Does the policy instrument reflect or accommodate social and cultural values of the local community?
- Does the policy instrument reflect or accommodate the ILK values of the local and indigenous people?
- Does the policy instrument acknowledge or accommodate the trade-off between values of biodiversity, including values of the marginal and under-powered group?

Stimulate Institutional changes

- Does the policy instrument stimulate positive shifts (radical or incremental) in the organisation, legislation, policies, and administration regarding biodiversity governance?
- Does the policy instrument stimulate positive changes (radical or incremental) in the behaviour, culture, and practices of actors involved in biodiversity governance?

Promote and Supported by Sufficient Capacity of actors

- Do the actors have sufficient capacity to design the policy instrument?
- Do the actors have sufficient capacity to implement the policy instrument at the targeted level(s)?
- Do the marginal, under-represented, and less-powerful groups be able to participate and influence the decision-making process throughout the policy process?
- Do the actors have sufficient capacity to recognise and reveal the values of biodiversity throughout the policy instrument design and implementation?
- Do the actors have sufficient capacity to collaborate, co-learning, and co-producing values of biodiversity throughout the policy instrument?
- Does the policy instrument improve the capacity of actors to recognise diverse values of biodiversity in the decision-making process?
- Does the policy instrument improve the capacity of actors, particularly the marginal and less-powerful groups, to express their values of biodiversity in the decision-making process?

Integrative and Adaptive

- Can the policy instrument be integrated into a policy-mix to stimulate positive transformation in biodiversity governance?
- Can the policy instruments be adapted into local socio-economic-political culture to stimulate transformations in biodiversity governance?
- Does the policy instrument reflect the complexity and uncertainty of biodiversity values from different actors at the different levels involved in the biodiversity governance?

Assessing the transformative potential of policy instruments

We assessed altogether 37 policy instruments[2]. The initial list of policy instruments was derived from the IPBES Catalogue of Policy Instruments and Policy Support Tools (IPBES, 2017). Additional policy instruments were added to this list after the screening of the IPBES Global Assessment and regional assessments. The assessment of the policy instruments is a meta-analysis: 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.

The assessment focused on evaluating the potential of policy instruments to change the current status quo either through incremental steps or via more transformational processes. Assessing how far policy instruments can support transformational or incremental is 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 (synergies or incoherencies) 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 how far a policy instrument supports transformational or incremental change depends largely on exactly it is implemented and how much it aims to challenge the institutional settings that maintain the status quo. These challenges of

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[2] Transformative Governance within Policy Instruments and Initiatives (https://doi.org/10.5281/zenodo.4331126)

evaluation lead us to choose the potential for change (either transformational or incremental) as the focus of our analysis.

The potential for incremental or transformational change was evaluated via the above detailed five criteria. Each of these five criteria was assessed on a three-point scale: (1) unlikely to meet the criteria if maximum one sub-question could be answered by yes (score=0), (2) medium potential to meet the criteria if 2-3 sub-questions could be answered by yes (score=1), (3) high potential to meet the criteria if three or more sub-questions could be answered by yes (score=2). Whether a policy instrument has potential for inducing incremental or transformational change was decided based on the scoring:

- policy instruments were justified as having more transformational potential if the average score across the five criteria was equal or higher than 1.5,
- policy instruments were justified as having more incremental potential if the average score across the five criteria was higher than 0.8 and lower than 1.5,
- policy instruments were justified as maintaining the status quo if the average score across the five criteria was equal or lower than 0.8.

Additionally, we collected and synthesised information on all instruments regarding what kind of valuation approach (a pluralistic and inclusive valuation or a narrower approach) is usually referred to in the literature for the given instrument (although information on this aspect was often scarce), who are the key stakeholders implementing or being influenced by the instrument, what is the potential scale(s) of implementation, and what is the geographical spread of implementation.

Brightspots analysis

To find additional illustrative examples of potentially transformative policies, we also analysed the valuation "brightspots"[3] assessed in *Chapter 4*. "Brightspots" were identified by *Chapter 4* through a comprehensive literature review and refer to 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.

Section 6.2 identified 255 such cases. We considered this "uptake" to signal a high potential to include policy instruments supporting transformative governance. To identify brightspots cases that did indeed include a description of how policy instruments could facilitate transformative governance, we screened all 255 papers to identify ones that mentioned diverse values, elements of transformative governance (as described in *Section 6.2.1*), and specific policy instruments. This left 62 papers.

There papers were then further coded against the following criteria:

1. What policy instruments are associated with the case?
2. Category of Policy instrument (as defined in *Section 6.2.3*)
3. Elements of transformative governance present (as defined in *Section 6.2.1*)
4. Decision making contexts (as defined in *Section 6.2.3*)
5. Stakeholders (as defined in *Section 6.2.3*)
6. Which broad values, specific values and life frames are accounted for in the application of this policy instrument (as defined in *Section 6.2.3*)
7. At what scale is this policy instrument implemented? In this case we used local, provincial/state, national, regional, international, cross-scale
8. In which way did the application of policy support tools facilitate incorporation of (a) diverse value approaches and transformative governance

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[3] Brightspot Cases text analysis (https://doi.org/10.5281/zenodo.4338411).

9. Leverage Points

For question eight, the dimensions differed from case to case, but elements that emerged included: what is the evidence for transformative governance presented (refer to sub-indicators), in which way were policy support tools used to facilitate policy implementations, how were stakeholders involved, were multiple policy approaches used?

Most of the brightspots assessed (82.3%) concerned the use of policy support tools to integrate diverse values and knowledge systems to facilitate transformative governance. Diverse support tools were used, but by far the most popular was multi-criteria decision-making, assessment and evaluation (e.g., Barquet & Cumiskey, 2018; Graziano et al., 2009; Ha et al., 2017; Hajkowicz et al., 2008; Mustajoki et al., 2020; Ridgley & Rijsberman, 1992; Vollmer et al., 2016). Other policy support tools used included participatory mapping (Ioki et al., 2019), participatory rural appraisal, agent-based modelling (Brady et al., 2012), analytic hierarchy processes (Ananda, 2007), contingent valuation strategies (Cameron et al., 1996; Nomura et al., 2018), social-benefit cost accounting (McDonald & Johns, 1999), exploratory mapping (de Oliveira Leis et al., 2019), and participatory geographic information systems supported ownership, engagement and stewardship (Ioki et al., 2019). These support tools were used to identify, assess and incorporate technical/practitioner, local/traditional and scientific knowledge (e.g., Barquet & Cumiskey, 2018; Graziano et al., 2009; Ha et al., 2017; Hajkowicz et al., 2008; Onyewotu et al., 2003) and involve diverse stakeholders (e.g., Hajkowicz et al., 2008; Kerselaers et al., 2015; Onyewotu et al., 2003). In facilitating processes that integrated (on a spectrum) diverse values, knowledge systems and stakeholders, these policy support tools facilitated a shift towards transformative governance by legitimizing decisions to a broader group of stakeholders (de Oliveira Leis et al., 2019; Ridgley & Rijsberman, 1992), highlighting trade-offs to different interest groups (Ananda, 2007; Barquet & Cumiskey, 2018; García-Llorente et al., 2011; Xu et al., 2003), helping to incorporate more criteria that align with diverse values from various interest groups (Ananda, 2007; Barquet & Cumiskey, 2018; Graziano et al., 2009; Ha et al., 2017; Xu et al., 2003), and developing policy that acknowledges every day experiences (Barquet & Cumiskey, 2018). As these support tools supported diverse valuation and approaches to governance, they aided transparency (Ananda, 2007; de Oliveira Leis et al., 2019; Rohde et al., 2006), accountability (Rohde et al., 2006), public acceptance (Ananda, 2007; Barquet & Cumiskey, 2018; de Oliveira Leis et al., 2019; Rohde et al., 2006), and resolved conflict (Boix & Zinck, 2008). They also supported ownership, engagement, and stewardship (Ioki et al., 2019).

Two stakeholder groups were most often involved: National/Sub-national Government (91.8 % of all studies) and resource users (86.9 % of studies). IPLCs (24.4%), civil societies and the private sector (both 24.6 %) and non-governmental organizations (16.4 %) were mentioned in a few studies, but youth, intergovernmental organizations, donors and the media were mentioned in fewer than 2% of studies. Dominant decisions-making contexts thus included public actors (e.g., government) and civil society actors making environmental decisions (88.6 % and 85.2%, respectively). Political decisions were also often mentioned, most strongly intersecting with public actors (77% of studies). Economic decisions were generally less frequently mentioned (55.8 % with public actors and 52.5 % with civil society actors). Very few decision-making contexts involved private actors (9.8%, 13.2% and 14.8% respectively). These cases largely focused on the local/landscape scale (68.9% of studies), with decreasing numbers of studies with increasing scale (only 1.6% of studies focused on the international scale), and a moderate number (23%) of cross-scale valuation uptake studies.

Analyzing cross-scale initiatives

To more deeply investigate consequences of narrow and plural value approaches in and for policy, we assessed 46 initiatives that are active at global or large regional scales. We define initiatives as an agency, movement or organisation that works at a large regional or global scale and manages or

influences (e.g., funds) multiple projects on the ground. For inclusion in our list of initiatives, we had to ascertain that an agency, organization or movement:

- Oversees or (aims to) influence place-based projects, programmes, policy and decisions related to conservation of biodiversity and ecosystem services;
- Is active over large regional (e.g., continental/subcontinental) or global scales;
- Concern outcomes that link to biodiversity and ecosystem services;
- advocate knowledge and awareness regarding narrow, plural, or both values within its project activities;
- Has project and institutional documents available in the project domain

To identify initiatives, we used the following search criteria using Google Search, and screened them against the inclusion criteria: "Environmental project", "Ecosystem service valuation initiative", "Ecosystem service valuation project", "Biodiversity project", "Biodiversity initiative", "Nature Project", "Environmental Project". We also used "Environmental valuation initiative", and "Environmental valuation capacity building".

We also reviewed a database of policy support tools (IPBES, 2019a) to include any support tools that qualified under our initiative definition

Upon establishment of our initiative list, we conducted a superficial assessment on the inclusion of diverse value approaches in each initiative, based on the initiatives' mission, vision, "about", and project web pages.

We assessed each initiative against the following criteria (*Table SM6.1*).

- Value(s) being addressed (based on IPBES typology: holistic value, health value, economic value, socio-cultural value, biophysical value) explicitly addressed in the description of the initiative, its mission and vision, and description of projects/work
- Values typology (intrinsic, instrumental, relational)
- Diverse values present or not. We considered an initiative to have diverse value inclusion when more than one value type (relational, instrumental, and intrinsic) was addressed in the
- Whether or not the vision, mission and "about us" pages considered indigenous and local knowledge
- The IPBES region where an initiative was active (i.e., Africa, America, Europe-Central Asia, Asia-Pacific, Global)
- Dominant Decision Making context: Use, Conservation or Development
- Does it include Targeted Policy Themes?
- Does it speak to Grand Challenges?
- Goals/Objectives of Initiative
- Work area boundary (Glob, Reg, Nat, Sub-nat, Ecosystm, Sect)
- Decision makers targeted

Table SM6.1 Coding the key characteristics of global biodiversity initiatives

Characteristic	Coding	Coding explanation
Plural Values being addressed	Hc	Holistic value
	Heal	Health value
Based on IPBES' plural values typology	Econ	Economic value
	SoC	Socio-cultural value
	Biop	Biophysical value
Types of Values evident	Int	Intrinsic
	Ins	Instrumental value
	Rel	Relational value
Plural values explicitly addressed in the mission, vision, value statement of initiatives	Yes	Implicitly or explicitly addressed In the mission, vision or value statement of an initiative
	No	Not implicitly or explicitly addressed in the mission, vision or value statement of an initiative
ILK addressed	Yes/No	Is ILK mentioned in the mission/vision/value statement or descriptions of type of projects supported
Region/Scale	Glob	Global
	AP	Asia Pacific
Based on IPBES' Regions	Af	Africa
	EuCA	Europe and Central Asia
	Amrc	America
Dominant decision-making contexts	Conservation	Incl. protection and restoration, with the aim of supporting positive effects on nature
Based on Ch4 typology on the decision-making contexts	Development	Understood in the traditional sense (mining, infrastructure, agricultural expansion, urbanization etc.) where the aim would be to avoid harm on nature
	Use	Refers to access or management of nature, might include sharing/reallocation of benefits and rights -- consultation and involvement of the local stakeholders on resources use
Pet policies	BD	TBD post-CBD (0-2 coding)
	CGA	Corporate Green Accounting (0-2 coding)
	Edu	Education (0-2 coding)
Hot Potatoes	Trans	Rapid, large-scale transformations (e.g. large infrastructure, large plantation agriculture, rapid urbanization)
	AgF	Agriculture and food (extensification vs intensification, agro-ecological vs monoculture approaches, farmers, corporation svs IPLCs)
	Fish	Fisheries (small scale vs industrial, coastal vs oceans)
	PA	Protected areas for biodiversity as policy implementation measure for conservation management (and associated win/lose conflicts)
Goals/Objectives	Mainst	Awareness raising, mainstreaming
As advised in the projects' brief/webpage	CapStg	Capacity strengthening, knowledge improvement
	PolAdvoc	Inform, influence, or advocate policy, *including trade-off*

The *superficial* assessment of initiatives allowed us to assess how initiatives were generally aspiring to diverse value approaches, but to assess how diverse value approaches in policy were used to facilitate transformative governance, we assessed specific case studies that documented evidence of policy support for transformative governance (*Table SM6.2*).

To identify case study for each initiative, we used one of two approaches:

1. We searched the SCOPUS and Web of Science databases using the following search string: "[name of initiative]" AND "values" AND "policy" AND "transformative governance" OR "status quo" OR "institutional change" OR "capacity building" OR "integration" OR "adaptation"
2. Where an above search yielded no results, or papers that did not provide sufficient information or evidence, we also used case studies reported on the initiative's web page.

We balanced case studies by region, and specifically selected case studies that involved IPLCs. Generally, we selected case studies that presented more evidence on how policies could support transformative governance.

We assessed each of the example initiatives in the same way as we assessed the brightspot cases.

Table SM6.2. A list and short description of initiatives considered in the assessment

Name of initiative	Initiative Description	Website	General Notes
UNESCO	UNESCO is the United Nations Educational, Scientific and Cultural Organization. It seeks to build peace through international cooperation in Education, the Sciences and Culture. It operates across many different focal areas, including one on biodiversity. Within this theme, many different projects have been supported across the globe.	https://en.unesco.org/about-us/introducing-unesco	
WRI	World Resources Institute (WRI) is a global research organization that spans more than 60 countries. Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Liveable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.	https://www.wri.org/about	Info derived from: https://www.wri.org/our-work/project/eutrophication-and-hypoxia/education-and-outreach, https://www.wri.org/our-work/topics/forests, https://www.wri.org/our-work/topics/business and search tool
IIED	Our mission is to build a fairer, more sustainable world, using evidence, action and influence, working in partnership with others. The International Institute for Environment and Development (IIED) is an independent research organisation that aims to deliver positive change on a global scale.	https://www.iied.org/about	Info derived from: https://www.iied.org/biodiversity, https://www.iied.org/our-work, https://www.iied.org/governance, https://www.iied.org/policy-planning and search tool
WAVES (Wealth Accounting and Valuation of Ecosystem Services)	Wealth Accounting and the Valuation of Ecosystem Services (WAVES) is a World Bank-led global partnership that aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts.	https://www.wavespartnership.org/en/about-us	Info derived from: https://www.wavespartnership.org/en/natural-capital-accounting and search tool

ValuES	ValuES is a global project that aids decision-makers in our partner countries in recognizing and integrating ecosystem services into policy making, planning and implementation of specific projects. We do this by developing instruments and training courses, providing technical advice and facilitating planning and decision-making processes. We also promote knowledge-sharing via regional workshops and participation in global discussion forums.	http://www.aboutvalues.net/about_values/	Info derived from: http://www.aboutvalues.net/six_steps/, http://www.aboutvalues.net/case_studies/ and search tool
Health and Environment Linkages Initiative (HELI)	HELI is a global effort by WHO and UNEP to support action by developing country policymakers on environmental threats to health. HELI encourages countries to address health and environment linkages as integral to economic development. HELI supports valuation of ecosystem 'services' to human health and well-being. Promoting better access to policy-relevant tools and knowledge about health and environment linkages is a third HELI activity	https://www.who.int/heli/en/	Info derived from: https://www.who.int/heli/risks/en/,
The Economics of Land Degradation	The Economics of Land Degradation (ELD) Initiative is a global collaboration to evaluate and raise awareness on the economic benefits of land and land based ecosystems. Economics of land degradation describes a holistic approach for estimates of the total economic valuation of land and land based ecosystems. The ELD approach covers economic, social and environmental factors as well as the costs and benefits of sustainable land management.	https://www.eld-initiative.org	Info derived from: https://www.eld-initiative.org/en/what-we-do/thematic-focus/, https://www.eld-initiative.org/en/what-we-do/activities/ and search tool
European Business and Biodiversity Campaign (EBBC)	The European Business and Biodiversity Campaign (EBBC) is a partner consortium which supports companies from all industries in integrating biodiversity into their corporate management. Our key project LIFE Food & Biodiversity, funded by the EU LIFE programme, aims to improve the biodiversity performance of standards and labels within the food industry.	https://www.business-biodiversity.eu/en/welcome	Info derived from: https://www.business-biodiversity.eu/en/biodiversity, https://www.business-biodiversity.eu/en/business and search tool
Natural Capital project	The Natural Capital Project pioneers science, technology, and partnerships that enable people and nature to thrive. We work to integrate the value nature provides to society into all major decisions. Our ultimate objective is to improve the well-being of all people and nature by motivating greater and more targeted natural capital investments.	https://naturalcapitalproject.stanford.edu/who-we-are/natural-capital-project	Info derived from: https://naturalcapitalproject.stanford.edu/impact/where-we-work, https://naturalcapitalproject.stanford.edu/sustainable-livable-cities and search
Cambridge conservation initiative	CCI seeks to transform the global understanding and conservation of biodiversity, and the natural capital it represents. Through this, we aim to secure a sustainable future for all life on Earth.	https://www.cambridgeconservation.org/about/	Info derived from: https://www.cambridgeconservation.org/impact/case-studies/, https://www.cambridgeconservation.org/about/vision-strategy/ and search tool
System of Environmental Economic Accounting (SEEA)	The System of Environmental-Economic Accounting (SEEA) is a framework that integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment and the stocks and changes in stocks of environmental assets, as they bring benefits to humanity.	https://seea.un.org/content/about-seea	Info derived from: https://seea.un.org/content/applications-seea, https://seea.un.org/content/homepage,
IUCN	IUCN is a membership Union composed of both government and civil society organisations. It harnesses the experience, resources and reach of its more than 1,300 Member organisations and the input of more than 15,000 experts. This diversity and vast expertise makes IUCN the global authority on the status of the natural world and the measures needed to safeguard it.	https://www.iucn.org/about	Info derived: https://www.iucn.org/theme and search

UNEP	The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. Our mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.	https://www.unenvironment.org/about-un-environment	Info derived from: https://www.unenvironment.org/explore-topics/ecosystems/why-do-ecosystems-matter, https://www.unenvironment.org/explore-topics/ecosystems/about-ecosystems, https://www.unenvironment.org/explore-topics/ecosystems/what-we-do/accounting-ecosystems and search
OECD Environmental Directive	The Environment Directorate helps countries to design environmental policies that are both economically efficient and effective at achieving their environmental objectives.	https://www.oecd.org/env/	Info derived from: https://www.oecd.org/environment/resources/biodiversity/, https://www.oecd.org/env/resources/
OECD Capacity Directive	We promote coordinated, innovative international action to accelerate progress towards the Sustainable Development Goals (SDGs) in developing countries and improve their financing. Supporting the OECD Development Assistance Committee (DAC), we help set international principles and standards for development co-operation, and monitor how donors deliver on their commitments. Drawing upon the whole OECD expertise, we support members and partners with our data, analysis and guidance.	http://www.oecd.org/dac/	Info derived from: http://www.oecd.org/dac/
World Business Council for Sustainable Development (WBSCD)	WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995. Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within the boundaries of our planet, by 2050.	https://www.wbcsd.org/Overview/About-us	Info derived from: https://www.wbcsd.org/Programs/Food-and-Nature, https://www.wbcsd.org/Overview/Our-approach, https://www.wbcsd.org/Overview/Global-Network and search tool
Knowledge-Action Network	Our Knowledge-Action Networks (KANs) bring together innovators from academia, policy, business, civil society and more to address the world's most pressing sustainability challenges. KANs are collaborative frameworks that facilitate highly integrative sustainability research on some of today's most pressing global environmental challenges. Their aim is to generate the multifaceted knowledge needed to inform solutions for complex societal issues.	https://futureearth.org/networks/knowledge-action-networks/	Info derived from: https://futureearth.org/networks/knowledge-action-networks/ and search tool

Satoyama Development Mechanism	The Satoyama Development Mechanism (SDM) is one of the collaborative activities of the International Partnership for Satoyama Initiative (IPSI), established jointly by the Institute for Global Environmental Strategies (IGES), the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) and the Ministry of the Environment of Japan (MOEJ) as a financing mechanism to facilitate the implementation of activities under the IPSI. These activities are expected to contribute to the retention and enhancement of biodiversity in socio-ecological production landscapes and seascapes (SEPLS) for achieving the Aichi Biodiversity Targets.	https://www.iges.or.jp/en/projects/sdm	Info derived from:https://www.iges.or.jp/en/publication_documents/pub/technicalreport/en/7029/SDM_A4_report_web.pdf
REDD+	The Conference of the Parties (COP) invited Parties, relevant organizations and stakeholders to share outcomes, experiences and lessons learned from their efforts to reduce emissions from deforestation and forest degradation in developing countries (REDD+). The REDD+ Web Platform, mandated by the COP in decision 2/CP.13, was established with the purpose of making available such information on the outcomes of activities relating to REDD+, including activities on capacity building, demonstration activities, addressing drivers of deforestation and mobilization of resources.	https://redd.unfccc.int	Info derived from: https://redd.unfccc.int/fact-sheets.html, https://redd.unfccc.int/submissions.html?mode=browse-by-topic
Sector Network Natural Resources and Rural Development (SNRD) Asia	the Sector Network Natural Resources and Rural Development Asia (SNRD Asia and the Pacific) is part of GIZ's knowledge management initiatives in Asia working to raise the positioning of the technical capacities and expertise of German Development Cooperation in the region. Through sharing of expertise and networking, SNRD Asia and the Pacific currently links 58 projects and programmes in over 15 countries across Asia and the Pacific. Work in 7 thematic groups including agriculture, biodiversity, climate change, hills to ocean (H2O), Forest, green education, and Sustainable Development Goals in Asia and the Pacific.	https://snrd-asia.org/about-us/	Info derived from: https://snrd-asia.org/workgroup/biodiversity/, https://snrd-asia.org/where-we-work/ and search tool
UNCCD (CB Workshop on the Economic Valuation of Land & ES)	the United Nations Convention to Combat Desertification (UNCCD) is the sole legally binding international agreement linking environment and development to sustainable land management. The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.	https://www.unccd.int/convention/about-convention	Info derived from: https://www.unccd.int/actions/actions-around-world and search tool
Natural Capital Coalition	The Natural Capital Coalition is an international collaboration that unites the global natural capital community. Together we are creating a world that conserves and enhances natural capital. Together, the Natural Capital Coalition and the Social & Human Capital Coalition form the Capitals Coalition, a global collaboration transforming the way decisions are made by including the value provided by nature, people and society.	https://naturalcapitalcoalition.org, https://naturalcapitalcoalition.org/the-coalition/	Info derived from: https://naturalcapitalcoalition.org/how-we-work/, https://naturalcapitalcoalition.org/natural-capital-2/, https://naturalcapitalcoalition.org/coalition-organizations/?mfilter=scienceandacademia

Global Environment Facility (GEF)	The Global Environment Facility (GEF) was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems. Since then, the GEF has provided close to $20 billion in grants and mobilized an additional $107 billion in co-financing for more than 4,700 projects in 170 countries. Through its Small Grants Programme, the GEF has provided support to nearly 24,000 civil society and community initiatives in 128 countries. the GEF is: -Strategically focusing its investments to catalyze transformational change in key systems that are driving major environmental loss, in particular energy, cities and food; -Prioritizing integrated projects and programs that address more than one global environmental problem at a time, building on the GEF's unique position and mandate to act on a wide range of global environmental issues; and -Implementing new strategies and policies to enhance results, including stronger engagement with the private sector, indigenous peoples, and civil society, and an increased focus on gender equality.	https://www.thegef.org/about-us	Info derived from: https://www.thegef.org/topics/biodiversity, https://www.thegef.org/our-work, https://www.thegef.org/projects
IISD	The International Institute for Sustainable Development (IISD) is an award-winning independent think tank championing solutions to our planet's greatest sustainability challenges. Our vision is a balanced world where people and the planet thrive; our mission is to accelerate solutions that drive a global transition to fair economies, clean water and a stable climate. Our big-picture view allows us to address the root causes of some of the greatest challenges facing our planet today—ecological destruction, social exclusion, unfair laws and economic rules, a changing climate. Through research, analysis and knowledge sharing, we identify and champion sustainable solutions that make a difference. We report on international negotiations, conduct rigorous research, and engage citizens, businesses and policy-makers on the shared goal of developing sustainably.	https://www.iisd.org/about/about-iisd	Info derived from: https://www.iisd.org/topics/all-topics, https://www.iisd.org/projects, https://www.iisd.org/program/economic-law-and-policy and search tool
Small Island Developing States (SIDS) - Partnership Framework	the SAMOA Pathway was the establishment of the SIDS Partnership Framework, designed to monitor progress of existing, and stimulate the launch of new, genuine and durable partnerships for the sustainable development of SIDS.	https://sustainabledevelopment.un.org/sids/partnershipframework	Info derived from: https://sustainabledevelopment.un.org/topics/sids, https://sustainabledevelopment.un.org/content/documents/24591SIDS_Partnerships_May_2019_web.pdf, https://sidspartnerships.un.org/partnerships/
SwedBio	SwedBio is a knowledge interface at Stockholm Resilience Centre contributing to poverty alleviation, equity, sustainable livelihoods and social-ecological systems rich in biodiversity that persist, adapt and transform under global change such as climate change. SwedBio enables knowledge generation, dialogue and exchange between practitioners, policy makers and scientists for development and implementation of policies and methods at multiple scales.	https://swed.bio/about/	Info derived from: https://swed.bio/focal-areas/themes/climate-change-ecosystems/, https://swed.bio/focal-areas/themes/values-governance/, https://swed.bio/focal-areas/themes/

World Bank	The World Bank Group has set two goals for the world to achieve by 2030: End extreme poverty by decreasing the percentage of people living on less than $1.90 a day to no more than 3%; Promote shared prosperity by fostering the income growth of the bottom 40% for every country. The World Bank is a vital source of financial and technical assistance to developing countries around the world. We are a unique partnership to reduce poverty and support development.	https://www.worldbank.org/en/about/what-we-do	This info was focused on the relevant program of the initiative not the whole initiative. Info derived from: https://www.worldbank.org/en/about/what-we-do, https://www.worldbank.org/en/topic/environment, https://maps.worldbank.org/#, https://projects.worldbank.org/en/projects-operations/project-theme?lang=en&page= and search tool
GIZ/GTZ	A service provider in the field of international cooperation for sustainable development and international education work, we are dedicated to shaping a future worth living around the world. GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment promotion, energy and the environment, and peace and security. The diverse expertise of our federal enterprise is in demand around the globe – from the German Government, European Union institutions, the United Nations, the private sector and governments of other countries. We work with businesses, civil society actors and research institutions, fostering successful interaction between development policy and other policy fields and areas of activity.	https://www.giz.de/en/aboutgiz/profile.html	This info was focused on the relevant program of the initiative not the whole initiative. Info derived from: https://www.giz.de/en/ourservices/environment_and_climate_change.html, https://www.giz.de/expertise/html/60099.html, https://www.giz.de/expertise/html/59889.html, https://www.giz.de/en/workingwithgiz/8343.html
USAID	USAID leads international development and humanitarian efforts to save lives, reduce poverty, strengthen democratic governance and help people progress beyond assistance. USAID transforms. It transforms families, communities, and countries – so they can thrive and prosper. Whether by preventing the next global epidemic, responding to a devastating earthquake, or helping a farmer access tools to grow her business.	https://www.usaid.gov/what-we-do; https://www.usaid.gov/who-we-are/mission-vision-values	This info was focused on the relevant program of the initiative not the whole initiative. Info derived from: https://www.usaid.gov/biodiversity/policy/conservation-is-development, https://www.usaid.gov/what-we-do/environment-and-global-climate-change, https://www.usaid.gov/what-we-do/environment-and-global-climate-change/knowledge-management-environment-and-natural, https://rmportal.net/biodiversity conservation-gateway and search function
WWF	For nearly 60 years, WWF has worked to help people and nature thrive. As the world's leading conservation organization, WWF works in more than 100 countries. At every level, we collaborate with people around the world to develop and deliver innovative solutions that protect communities, wildlife, and the places in which they live.	https://www.worldwildlife.org/about	Info derived from: https://www.worldwildlife.org/initiatives/transforming-business, https://www.worldwildlife.org/initiatives/people-and-communities and search tool

Conservation International	Conservation International works to spotlight and secure the critical benefits that nature provides to humanity. Since our inception, we've helped to protect more than 6 million square kilometers. Building upon a strong foundation of science, partnership and field demonstration, Conservation International empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity.	https://www.conservation.org/about	Infor derived from: https://www.conservation.org/places, https://www.conservation.org/about/center-for-environmental-leadership-in-business, https://www.conservation.org/priorities/working-with-governments, https://www.conservation.org/search?indexCatalogue=site-search&searchQuery=local%20knowledge&wordsMode=AllWords, https://www.conservation.org/priorities/food
The Nature Conservancy	The Nature Conservancy is a global environmental non-profit working to create a world where people and nature can thrive. Founded at its grassroots in the United States in 1951, The Nature Conservancy has grown to become one of the most effective and wide-reaching environmental organizations in the world. Thanks to more than a million members and the dedicated efforts of our diverse staff and more than 400 scientists, we impact conservation in 79 countries and territories across six continents.	https://www.nature.org/en-us/about-us/who-we-are/	Info derived from: https://www.nature.org/en-us/about-us/who-we-are/; https://www.nature.org/en-us/about-us/who-we-are/our-science/; https://www.nature.org/en-us/about-us/who-we-are/how-we-work/ and search engine, https://www.nature.org/en-us/about-us/who-we-are/how-we-work/working-with-companies/companies-investing-in-nature1/finance/
FAO	The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger. Our goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives.	http://www.fao.org/about/en/	Info derived from: http://www.fao.org/themes/en/ and search among projects
UNESCO	UNESCO is the United Nations Educational, Scientific and Cultural Organization. It seeks to build peace through international cooperation in Education, the Sciences and Culture. It operates across many different focal areas, including one on biodiversity. Within this theme, many different projects have been supported across the globe.	https://en.unesco.org/about-us/introducing-unesco	Info derived from: http://www.unesco.org/new/en/natural-sciences/ioc-oceans/, http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/about-mab/, https://en.unesco.org/themes/communication-and-information, https://whc.unesco.org/en/sustainabledevelopment/
EU Green Deal / Biodiversity strategy and Farm to fork strategy	It resets the Commission's commitment to tackling climate and environmental-related challenges that is this generation's defining task. It is a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.	https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#documents	Info derived from: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN

EU Business @ Biodiversity Platform	The EU Business @ Biodiversity Platform provides a unique forum for dialogue and policy interface to discuss the links between business and biodiversity at EU level. It was set up by the European Commission with the aim to work with and help businesses integrate natural capital and biodiversity considerations into business practices.	https://ec.europa.eu/environment/biodiversity/business/index_en.htm	Info derived from: https://ec.europa.eu/environment/biodiversity/business/workstreams/index_en.htm, https://ec.europa.eu/environment/biodiversity/business/our-members/index_en.htm, https://ec.europa.eu/environment/biodiversity/business/about-us/index_en.htm	
WHO Public health, environmental and social determinants of health	The role of the Department of Public Health, Environmental and Social Determinants of Health (PHE) within the overall work of WHO is to promote a healthier environment, intensify primary prevention and influence public policies in all sectors so as to address the root causes of environmental and social threats to health. PHE develops and promotes preventive policies and interventions based on an understanding and an in-depth scientific analysis of the evidence base for environmental and social determinants of human health.	https://www.who.int/phe/about_us/en/	Info derived from: https://www.who.int/phe/health_topics/en/,	
BirdLife International	BirdLife International is a global partnership of conservation organisations (NGOs) that strives to conserve birds, their habitats and global biodiversity, working with people towards sustainability in the use of natural resources. We are driven by our belief that local people, working for nature in their own places but connected nationally and internationally through our global Partnership, are the key to sustaining all life on this planet. This unique local-to-global approach delivers high impact and long-term conservation for the benefit of nature and people.	https://www.birdlife.org/worldwide/partnership/about-birdlife	Info derived from: about us and search tool	
Protected Planet (UNEP-WCMC & IUCN WCPA)	Protected Planet is the most up to date and complete source of information on protected areas, updated monthly with submissions from governments, non-governmental organizations, landowners and communities. Protected Planet enables a spectrum of users to use existing protected area data for information-based decision making, policy development, and business and conservation planning. The Protected Planet Initiative provides the world's policy-makers with the best possible information on protected areas and their value for conserving biodiversity and ecosystem services, and supporting human communities.	https://www.protectedplanet.net/c/about	Info derived from: thematic areas and search tool	
Global Alliance for the Rights of Nature (maybe also include the Earth Law Centre?)	The Global Alliance for the Rights of Nature (the "Alliance") is a global network of organizations and individuals committed to the universal adoption and implementation of legal systems that recognize, respect and enforce "Rights of Nature". Rather than treating nature as property under the law, the time has come to recognize that natural communities have the right to exist, maintain and regenerate their vital cycles.	https://therightsofnature.org/what-is-rights-of-nature/ https://www.earthlawcenter.org/about-earth-law-center	Info derived from: https://therightsofnature.org/get-to-know-us/	
Akwé Kon Guidelines (CBD)	Voluntary guidelines for the conduct of cultural, environmental and social impact assessment regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities.	https://www.cbd.int/traditional/guidelines.shtml	Info derived from: https://www.cbd.int/traditional/guidelines.shtml	

Non-timber Forest Products Exchange Program	The NTFP-EP is a collaborative network of over 60 non-governmental organizations (NGOs) and community-based organizations (CBOs) working with forest-based communities to strengthen their capacity in the sustainable management of natural resources in the Philippines, India, Indonesia, Malaysia, Vietnam, and Cambodia.	https://ntfp.org/who-we-are/	Info derived from: https://ntfp.org/what-we-do/
TEEB	The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on "making nature's values visible". Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels. It aims to achieve this goal by following a structured approach to valuation that helps decision-makers recognize the wide range of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, capture those values in decision-making.	http://www.teebweb.org/about/	Info derived from: search tool, http://www.teebweb.org/areas-of-work/, http://www.teebweb.org/about/related-initiatives/
OPPLA	Oppla is the EU Repository of Nature-Based Solutions. It provides a knowledge marketplace, where the latest thinking on natural capital, ecosystem services and nature-based solutions is brought together. Its purpose is to simplify how we share, obtain and create knowledge to better manage our environment.	https://oppla.eu/about	Info derived from: search tool, https://oppla.eu/case-study-finder (but note that the case study is not an example of how Oppla itself has affected transformative governance - simply one of the case studies)
EKLIPSE	Our goal is to bring scientists, policy-makers and others together to ensure that decisions that affect the environment are made with the best available knowledge.	https://www.eklipse-mechanism.eu/a_self-sustaining_mechanism	Info derived from: https://www.eklipse-mechanism.eu/eklipse_outputs_impact, https://www.eklipse-mechanism.eu/how_did_we_get_there and search tool
Natural Capital Initiative	Mission is to support decision-making that results in the sustainable management of our natural capital. We initiate and facilitate dialogue between people from academia, policy, business and civil society, and communicate independent and authoritative synthesis of scientific evidence.	https://www.naturalcapitalinitiative.org.uk/about/	Info derived from search tool, https://www.naturalcapitalinitiative.org.uk/publish/, https://www.naturalcapitalinitiative.org.uk/links/
We Value Nature	We Value Nature is an EU Horizon 2020-funded three-year campaign (November 2018 –October 2021). The campaign is supporting businesses and the natural capital community to make valuing nature the new normal for businesses across Europe.	https://wevaluenature.eu/About	Info derived from: search tool and https://wevaluenature.eu/About

Natural Capital Accounting – some key challenges

Natural capital accounting collects detailed statistical information on the environment and its interaction with the economy and integrates this information into the regular economic accounts of countries or businesses (Ruijs et al., 2019). The System of Environmental-Economic Accounting, Experimental Ecosystem Accounting (SEEA EEA) was launched in 2012 by the UN Statistical Office to provide international standards for national accounts, while the Natural Capital Coalition created standards for corporate natural capital accounting. The number of countries implementing a SEEA account became a core indicator of the SDG target 15.9 (by 2020, integrate ecosystems and biodiversity values into national and local planning, development processes and poverty reduction strategies, and accounts; (Ruijs & Vardon, 2018)). Natural capital accounting also entered strategic policy documents and frameworks (e.g., the European Union Biodiversity Strategy to 2020 (European Commission, 2011)), and SEEA Ecosystem Accounting has been declared an international statistical

standard in 2021), providing further impetus for implementation. Beside standards, targets and policy frameworks that emerged as a result of collaborative efforts of international and national agencies and experts from the academia and the Non-governmental Organizations sector, various knowledge and capacity development programmes are available to policy makers, corporations, non-governmental organisations, and statisticians therein, ranging from global initiatives like the WAVES or TEEB, to professional partnerships (e.g., We Value Nature) and place-based research and innovation projects (e.g., the MAIA EU Horizon2020 project). Not surprisingly, natural capital accounting is spreading all over the world: 69 countries implemented SEEA accounts in 2017 (UNCEEA, 2017), and the number keeps growing.

While the political will and institutional support behind natural capital accounting seem impressive and promising with high-level cross-sectoral integration through diverse policy applications (Ruijs et al., 2019), empirical examples highlight challenges for natural capital accounting being inclusive and integrative. Using natural capital accounting as a key input to public policy decisions is still rare, especially in developing countries, due to institutional constraints and the availability of relevant and high-quality data (Recuero Virto et al., 2018). Studies from South-East Asia and Africa show that the place-based implementation of natural capital accounting, as well as of other policy instruments related to the green economy, often ignores the local informal economy and culture, misses opportunities for participation, and leads to reproduced inequalities, bureaucratic repression and a maintained pressure on the environment (Fletcher et al., 2019; Milne & Mahanty, 2019; Smit & Musango, 2015).

Natural capital accounting – considering its theoretical underpinnings – follows an instrumentalizing ethic (i.e., perceiving nature as an economic asset which can be valued by, and compared to, economic indicators) and is operationalized predominantly via the implementation of other economic and financial policy instruments (e.g., payments for ecosystem services or REDD+). This ontological approach and its manifestation are restrictive to a capitalist worldview and instrumental values therein. However, due to lack of funds and robust institutional structures, such a mix of green economy policy instruments in many cases cannot make nature conservation more profitable than extraction (Fletcher et al., 2019). On the other hand, the ethical stance of natural capital accounting cannot accommodate local, traditional, indigenous and solidarity-based worldviews and realities that rely on a more pluralistic (intrinsic and relational) value approach, therefore it has a limited capability to support the transformation of the market logic (Boehnert, 2016; Sullivan, 2017).

Legal approaches to acknowledge the Rights of Nature

Since the 1970's an increase can be noted in constitutions addressing environmental protection with a growing trend to constitutionalize environmental rights and related responsibilities (which however may be hindered by the free-market ideology and law enforcement difficulties) (Gellers, 2012). According to Bosselmann (2015), ca. 130 constitutions incorporated environmental norms, and 92 recognize in particular the right to a healthy environment, however, only few may be enforceable.

Based on currently available knowledge gained from peer reviewed literature a search protocol was created and artificial intelligence was used to assess how national constitutions (available in English in a global and freely accessible database at www.worldconstitution.org) consider and apply the values of nature. Out of the 196 countries assessed, 194 contained at least one of the terms from our

bag-of-words, and the terms from our bag-of-words occurred 98.25 ± 114.26 (stdev) times per country (*Figure 6.1*). On average, there was an 29.64% ± 88.16% increase in terms potentially associated with plural values of nature. 63 countries (63.63%) showed an increase in the number of (potentially) pluralistic terms, 22 countries (22.23%) showed no change, and 13 countries (13.13%) showed a decrease in the number of (potentially) pluralistic terms.
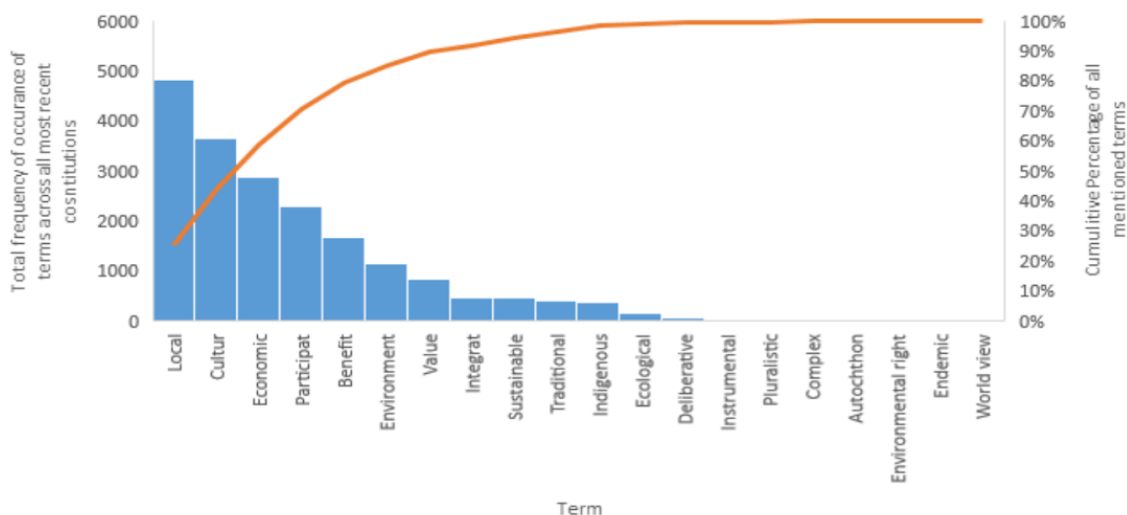
Figure 6.1. Number of key terms (potentially) associated with values of nature mentioned in national constitutions.

The number of terms associated with the values of nature in national constitutions varies hugely across regions (Figure 6.2). The theories of environmental rights' inclusion in constitutions may be region-specific, e.g., in the post-communist countries it may be due to previous environmental social rights; in Brazil it may be due to searching international community support (Gellers, 2012).

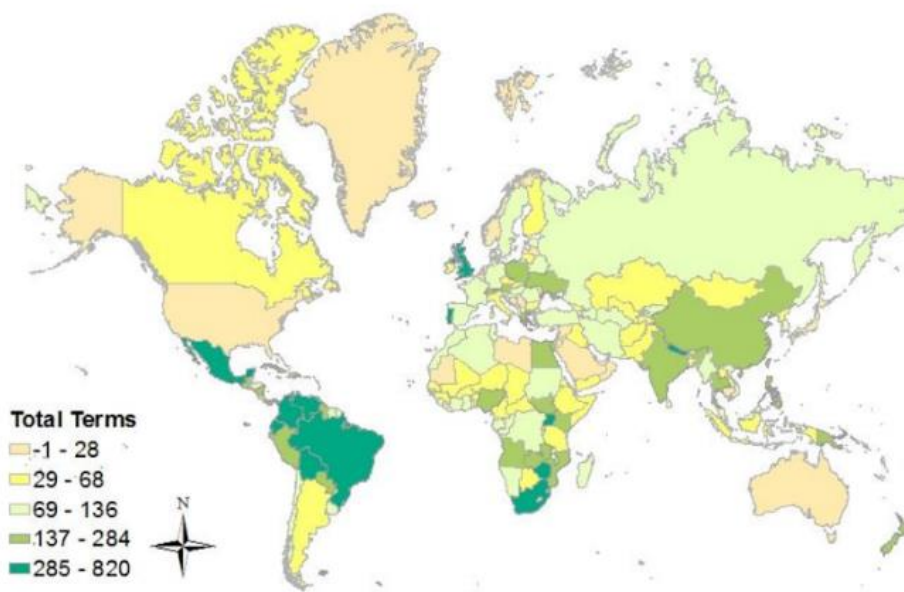*Figure 6.2. The total number of times terms (potentially) associated with values of nature was mentioned in constitutions.*

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The ecosystem services concept has gained traction amongst stakeholders involved in environmental regulation, yet little is known about the extent to which the ecosystem services concept has been translated into public policy. A global database of policy documents related to ecosystem services was created in 2016 and compiled through a crowdsourced process (GlobalDES available at https://tinyurl.com/GlobalDES) (Robinne et al., 2019). Learners participating in on-line course on ecosystem services were invited to seek in their home country or native language examples of formal legal documents (laws, ordinances) and informal documents (e.g., strategic documents) that explicitly mentioned "ecosystem services" or its translated equivalent. Learners then completed a shared spreadsheet that captured, amongst other sources of information, the type of document in which the ecosystem service concept appeared, the thematic approach, country, language, and the services that were captured. By early 2018 the database contained 136 relevant entries from 46 countries. More than 50% of entries addressed multiple ecosystem services or the link between biodiversity and ecosystem services. There was also a positive temporal trend towards inclusion of multiple ecosystem services, which suggests an accelerating adoption of the ecosystem services concept into policy.

The analysis of the database entries (2016-2018) revealed a surprising breadth of examples of mainstreaming. Indeed, the ecosystem service concept had been integrated in 46 countries, most of which (60%) were non-English speaking. A majority of examples captured cultural ecosystem services or multiple (cultural, regulatory, provision) services. Policy sectors covered within the database included biodiversity protection, finance, food, governance, human health, gray infrastructure, tourism, and water. The database is not conducive, however, to a formal analysis of how values were integrated into legal documents because it does not represent a systematic survey and because each contributor would have to be solicited to re-analyse the document or documents that they initially reported.

Locally Managed Marine Areas and other legal tools for marine protection

Nearly half of the human population resides in and depends on coastal regions for their well-being (Berkes, 2015). Yet, ocean, coastal, and fisheries management approaches have lagged behind other natural resource management arenas in incorporating human dimensions and plural values in decision-making (Cavanagh et al., 2016). Until recently, top-down, centralized, single-species, and commerce-focused approaches were the norm. The collapse of major fish stocks in the late 1900s, however, catalyzed a paradigm shift toward more holistic and participatory approaches (Berkes, 2015; Charles, 2017).

Nevertheless, the unique challenges of managing ocean, coastal and fisheries resources remain: in comparison to terrestrial resources, marine and fisheries ecosystems are often very large in scale, crossing national and even continental boundaries; they are among the richest and most complex ecological systems on the planet; and their most valued resource, namely fish, are mobile, stochastic in time and space, and difficult to observe and access. Moreover, coastal regions are characterized by dense, urbanizing, and highly pluralistic human populations that demand multiple uses for what are increasingly contested marine and coastal spaces. Finally, the fact that marine, coastal and fisheries resources are often common property, rather than assigned fixed ownership, poses special challenges for their governance (Armitage et al., 2017).

Faced with this level of complexity, the multiplicative threat of climate change, the ongoing loss of biodiversity, and persistent management failures, marine and coastal ecosystem managers have converged with their terrestrial colleagues in a world-wide movement to adopt integrated (multi-sectoral, often specifically multi-industry, including recreation and tourism), ecosystem-based (inclusive of multiple species and human well-being), social-ecological (interdependent systems-based), and participatory (stakeholder-engaged and cooperative) approaches to resource governance (Charles, 2017). Armitage et al. (2017) and Virapongse et al. (2016) have identified several principles across these approaches that are likely to foster positive outcomes and transformative change, with the caveat that local communities will know best which specific factors lead to change:

- Multi-level, collaborative, adaptive, and decentralized governance, founded on trust in stakeholders and the ability of local systems to self-organize
- Transdisciplinary, collaborative co-development of holistic understanding, requiring openness to plural knowledge systems and social-ecological systems thinking
- Long-term, bi-directional and deliberative engagement with stakeholders through the fostering of trust, social networks, social capital
- Participatory approaches, necessitating empowerment and capacity-building in stakeholders to self-organize and create transformative change
- Education and training of stakeholders for leadership and capacity-building in, e.g., community organizing, systems thinking, conflict resolution, and community-based management, trust-building, sense making, managing conflict, compiling and generating knowledge, fostering entrepreneurial activities
- Multi-disciplinary, multi-scalar, standardized, community-based monitoring

Reviews suggest that ecosystem services valuations are considered useful and have been applied to marine and coastal management, albeit more recently than in terrestrial systems (Cavanagh et al., 2016). Most such valuations are conducted via interviews and surveys and emphasize economic values more than social and ecological values (Lopes & Videira, 2018). Outcomes are variable, and, according to one analysis, their impact on policy "appears to be globally weak" (Marre et al., 2015). To more effectively support policy, Lopes & Videira (2018) propose an inclusive, deliberative, cyclic and multi-method process for assessing plural, shared and conflicting values, which aligns with nearly all of the best practices for managing social-ecological systems, summarized above. Mohamad et al. (2015) describe a transformative process of identifying shared values using an appreciate inquiry approach that *'involves the art and practice of asking questions that strengthen a system's capacity to apprehend, anticipate and heighten positive potential'*. Of particular importance are not only shared values about nature, but shared values of collaboration, volunteerism, and citizen volunteerism, such as those found in successful community-engaged conservation initiatives in Japan. A question is whether such "heartware" values would be shared in more pluralistic societies (Mohamad et al., 2015).

Simultaneously, inspired by the Millennium Ecosystem Assessment framework, there is a growing movement to assess how environmental change and management affect human well-being. In the field of ocean and coastal management, quantifiable social and ecological indicators are analyzed in integrated ecosystem assessments (Breslow et al., 2017). While not specifically valuation, such processes could effectively include the assessment of a wide range of values since, *'we value what*

we perceive to be contributing to our well-being' (Murray et al., 2016). For a similar reason—that well-being is in the eye of the beholder—participatory approaches and complementary qualitative assessments are often recommended. The most comprehensive framings cover a wide range of domains, from physical health to social relationships and spiritual values (Breslow et al., 2017). Even without assessments, such framings can serve as communication devices that expand managers' awareness of the social complexity of their work. However, reviews of the well-being outcomes of ocean, coastal, and fisheries management, including marine protected areas, suggest that indicators and data currently in use skew toward tangible and easily quantifiable indicators of economic and ecological well-being, leaving less quantifiable and cross-cutting domains of well-being such as cultural identity, mental health, sense of security, political voice, power and equity under- or unassessed (Ban et al., 2019; Breslow et al., 2017). Such findings parallel similar limitations in ecosystem services valuations.

Beyond quantitative assessments of plural values and human well-being, the understanding that stakeholder engagement increases local support and enriches knowledge underpins a flowering of participatory and decentralized approaches to ocean and coastal management, in marine spatial planning, marine protected areas, locally managed marine areas (LMMAs), learning networks, and other forums. These approaches emphasize integrating the academic, local and traditional knowledge of diverse stakeholders, as well as co-producing holistic knowledge, and promoting learning across a social network (Bell et al., 2020; Berkes, 2015). Again, while not specifically valuation, knowledge systems "are multi-dimensional and include information, values and understandings of resource and environmental management, governance structures, cultural values, social roles and responsibilities, and many other aspects of human-environment relationships, among other things" (Raymond-Yakoubian & Daniel, 2018) such that integrating multiple knowledge systems into decision-making effectively means integrating plural values to some degree. Learning networks can help participants develop shared visions and values, fill knowledge gaps and address management complexities, while building capacity, empowering leaders (especially women), mobilizing communities, supporting innovation, and nurturing transboundary collaborations, all of which help advance ecosystem sustainability (Bell et al., 2020).

Nevertheless, participatory processes do not necessarily account for power differences, inequities, and injustices among stakeholders, between stakeholders and governing bodies (Virapongse et al., 2016), as well as between different genders, of special concern in the heavily male-dominated ocean and fisheries realm (Gissi et al., 2018). In fact, participatory processes can serve to exacerbate inequities and conflicts (Biggs et al., 2015), although conflict may also represent productive democratic debate (Ban et al., 2019). Furthermore, few decision-making structures recognize their own embedded values (Breslow, 2015; van Assche et al., 2012; Virapongse et al., 2016), or that values about nature always have a history, and could be shaped by previous or ongoing governance regimes in "traumatic" ways, impacting the degree to which local stakeholders trust and willingly participate in any resource management process (van Assche et al., 2012). In addition, participatory processes that adhere to existing jurisdictional boundaries which conflict with the geographic scale of local values of nature complicate and limit the application of plural values to decision-making (Makey & Awatere, 2018). Finally, the primary value that indigenous communities place on sovereignty and responsibility to care for their traditional homelands and natural resources (often perceived as the embodiment of ancestors) governance renders settler governments' plural valuation processes irrelevant and a perpetuation of colonialism (Wilson & Inkster, 2018).

The most transformational existing initiatives account for these and other limitations by devolving decision-making authority to fully cooperative partnerships and co-management arrangements or directly to local resource-based communities. Logically, if one has direct and equal access to resource governance, one will be able to represent the full suite of one's own values in the decision-making process, including those values that are intangible and non-quantifiable. Similarly, if one has direct and equal access to the natural resources in question, one can benefit from them in multiple ineffable ways that cannot be accounted for in quantitative values or human-wellbeing assessments (Breslow, 2015). As Charles (2017) explains: *'Unlike governments that are structured in departments ('silos') with separate consideration of resource use, environmental considerations, social aspects, etc., local communities are inherently integrated, reflecting a reality that their quality of life depends jointly on multiple economic activities as well as on environmental quality and social well-being. This reality is reflected in the success of many LMMAs [Locally Managed Marine Areas]'*.

Likewise, values are most meaningful and powerful when still embedded and expressed through the history, practices, languages, rights, and relationships they come from. This is especially true for indigenous communities. Genuine and transformative integration of indigenous values into coastal and fisheries management depends on a solid legal foundation, such as indigenous rights. For example, the Boldt Decision in Washington State upheld the right of local Native American tribes to fifty percent of harvestable fish and shellfish and serve as co-managers of the resource based on treaties signed with the United Stated of America government in 1855. This co-management arrangement, which represents one of the most powerful instances of indigenous co-governance in the world, is transforming the politics, values, and practices of resource management in the region toward an emphasis on restoring biocultural ecosystems and traditional foods. In the same region, shared core values helped mobilize an unlikely coalition of local tribes, religious organizations, and environmental groups to successfully block development of a coal export terminal—but notably, the decisive factor was the tribe's constitutionally-guaranteed treaty fishing right (Allen et al., 2017).

In fact, Wilson & Inkster (2018) argue that indigenous-led governance has the potential to better accommodate plural values for all since indigenous ontologies understand *'water as a living entity'* deserving of many things. This involves thinking of water as kin with its histories enlivened in the landscapes it carves and the people it holds, past and future. They argue that, *'If it is the case that Indigenous water laws tend to centre on the inclusion of all relations and perspectives, governance arrangements built on Indigenous law and institutions might not only better reflect Indigenous epistemologies and ontologies, but perhaps also better serve the collective good through engaging pluralist perspectives rather than those rooted in scientific rationalism, private property, and individualism'* (Wilson & Inkster, 2018).

Assessed international initiatives

Altogether 46 initiatives were reviewed based on a screening exercise of their websites (*Table 6.3 for details*). According to the screening's analysis, 85% of the initiatives engaged diverse value approaches. Of all the initiatives, 32 out of 46 had holistic values, 30 health values, 43 economic values, whilst 43 and 41 had social and biophysical values respectively.

Apart from one initiative, TEEB, there was no other initiative that expressed solely one value category (it should also be noted that TEEB's case descriptions mentioned more diverse values). At least two

types of values were addressed in all other cases and on average four values were to a certain extent referred to. Among the types of values, intrinsic values were the least referred to - 27 initiatives covered explicitly intrinsic values, whereas instrumental and relational values were more often reflected (43 and 42 respectively). Despite some initiatives having articulated diverse values in their introduction, they were still classified as not considering plural values due to the nature and work focus of the initiatives (e.g., SEEA, ValuES).

Initiatives can support the positive transformation in biodiversity management by influencing various decision-making contexts at the local and landscape, regional, and global scale. In the efforts to supporting biodiversity management, one initiative can address multiple decision-making contexts. The decision-making context shows that the development, use and conserve categories were all featured with 33 initiatives having development, 33 conserve and 38 use categories

Local knowledge was addressed in the case of 28 initiatives, while 91% of the initiatives were identified to explicitly address plural values in their vision, mission, and values statement

As regards to global challenges, agriculture was ranked as the key issue initiatives dealt with (40) followed by fisheries (36), protected areas (35) and rapid and large-scale transformations (29) (although intensive agriculture may overlap with the latter category in some instances).

In term of goals and objectives, all initiatives covered at least two of the categories (categories include mainstreaming, capacity building, policy/advocacy and stakeholder engagement) simultaneously with having the main focus on mainstreaming and capacity strengthening (although here as well, categories potentially broadly overlap). In terms of work boundary, the majority of the initiatives work globally or feed into global processes and also focus on certain ecosystems and specific sectors. Concerning target groups, all organisations have more than one target group and on average work with over five stakeholder groups with the most common being national governments, donors and businesses. 41 initiatives have policy focus, which includes direct policy formulation, policy recommendations, implementation or advisory activities although it is important to note that most of the policies are non-binding and most initiatives are contributing to recommendations rather than binding policy formulations.

Certain limitations of the screening exercise may be worth mentioning. Bias could have occurred because specifically plural values were sought (confirmation bias) and thus, relevant keywords were focused on. In terms of the methodology in selecting the values of certain categories, classification may be subjective to a certain degree and could have been based on personal interpretations. Overlaps of certain categories (e.g., health and economic values may be considered social values, as well) may have also caused some ambiguity. Depth of information search may have also influenced the results. Looking at the "about us" section may not have sufficiently covered the initiatives' relevant values. Therefore, often specific keywords (e.g., health, social) were used in the search tool to assess whether certain values are present or not. In some cases, this sort of search yielded more results and values were detected, which otherwise would have been omitted based on the introductory text. Where the initiative is focused on other topics not necessarily related directly to biodiversity (e.g., UNESCO, USAID, GIZ), both the organisation and its specific biodiversity/ecosystem services program were screened mostly because the organizations have relevant fields labelled under other programs (e.g., forestry, oceans or even social programs). Interpretations of definitions within certain categories (e.g.,

hot potatoes, work boundary, goals) may have caused overlaps or "double-accounting" (e.g., initiatives may have been considered under more than one category). Additionally, due to the somewhat superficial screening, certain aspects may have been overlooked.

Table 6.3. Major characteristics of the assessed initiatives (incl. intergovernmental organizations, funding agencies, programmes, partnerships and non-governmental organizations (NGO)s in alphabetical order).

Name	Main objectives	United Nations Region coverage	Diverse values	Specific values in focus	ILK inclusive	Key challenges addressed	Related policy areas	Governance scales	Stakeholders targeted
Akwé Kon Guidelines (CBD)	Mainstreaming	Global	Yes	Intrinsic, relational	Yes	Rapid land use change, protected areas	Biodiversity	Glob	Governments, academia
BirdLife International	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity	Glob, reg, nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors
Cambridge Conservation Initiative	Mainstreaming, Capacity building, Policy Advocacy	Global	Yes	Intrinsic, instrumental, relational	No	Protected areas	Biodiversity, Education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, youth, businesses, academia, donors
Conservation International	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, youth, businesses, academia, donors
Eklipse	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Europe & Central Asia	No	Instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy	Reg, nat, sub-nat, ecosyst, sect	NGOs, governments, youth, businesses, academia
European Business and Biodiversity Campaign (EBBC)	Mainstreaming, Capacity building, Stakeholder Engagement	Europe & Central Asia	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food	Biodiversity, green economy	Glob, reg, sect	Governments, businesses, academia, donors
EU Business @ Biodiversity Platform	Mainstreaming, Capacity building, Stakeholder Engagement	Europe & Central Asia	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries	Biodiversity, green economy	Glob, sect	NGOs, businesses, academia
EU Green Deal / Biodiversity strategy and Farm to fork strategy	Mainstreaming, Policy Advocacy	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid lan duse change, agriculture and food, fisheries, protected areas	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, youth, businesses, academia, donors
FAO	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors

GIZ	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors
Global Alliance for the Rights of Nature	Policy Advocacy	Global	Yes	Intrinsic, relational	Yes	Protected areas	Biodiversity	Glob, ecosyst	Civil society, NGOs, youth, governments, businesses, academia
Global Environment Facility (GEF)	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors
International Institute for Environment and Development (IIED)	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Asia-Pacific, Africa, Americas	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy	Glob, nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors
International Institute for Sustainable Development (IISD)	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors
IUCN	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors
Knowledge-Action Network (KAN) of Future Earth	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, businesses, academia, donors
Natural Capital Coalition	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Africa	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries	Biodiversity, green economy	Glob, reg, nat, ecosyst, sect	NGOs, Governments, businesses, academia, donors
Natural Capital Initiative	Mainstreaming, Policy Advocacy, Stakeholder engagement	Asia-Pacific, Europe & Central Asia	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy	Glob, reg, ecosyst, sect	NGOs, governments, businesses, academia
Natural Capital Project	Mainstreaming, Policy advocacy, Stakeholder engagement	Gobal	Yes	Instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, youth, governments, academia, donors

Name	Activities	Region		Value type		Drivers	Themes	Scale	Stakeholders
Non-timber Forest Products Exchange Program	Capacity building, Policy advocacy, Stakeholder engagement	Asia-Pacific	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, protected areas	Biodiversity, education	Reg, nat, ecosyst, sect	Civil society, NGOs, governments, businesses, donors
OECD Capacity Directive	Mainstreaming, Capacity building, Stakeholder Engagement	Global	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries	Biodiversity	Glob, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, youth, businesses, donors
OECD Environmental Directive	Mainstreaming, Capacity building	Global	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries	Biodiversity, green economy	Glob, nat, sect	Civil society, governments, businesses, academia, donors
OPPLA	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	No	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	NGOs, governments, businesses, academia, donors
Protected Planet (UNEP-WCMC & IUCN WCPA)	Mainstreaming	Global	Yes	Intrinsic, instrumental, relational	No	Rapid land use change, fisheries, protected areas	Biodiversity, green economy	Glob, reg, nat, sub-nat, ecosyst	Civil society, NGOs, governments, businesses, academia
REDD+	Mainstreaming, Capacity building, Stakeholder Engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, protected areas	Biodiversity	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors
Satoyama Development Mechanism	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors
Sector Network Natural Resources and Rural Development (SNRD) Asia	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Asia-Pacific	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, education	Reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
Small Island Developing States (SIDS) - Partnership Framework	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Asia-Pacific, Africa, Americas	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
SwedBio	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth

System of Environmental Economic Accounting (SEEA)	Mainst, CapStrg	Global	No	Instrumental, relational	No	Agriculture and food, fisheries	Green economy	Glob, nat, ecosyst, sect	Governments
The Economics of Ecosystems and Biodiversity (TEEB)	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	No	Instrumental	No	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy	Glob, nat, ecsoyst, sect	Governments, businesses, academia, donors
The Economics of Land Degradation	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Asia-Pacific, Africa	Yes	Instrumental, relational	No	Rapid lan duse change	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst	Civil society, NGOs, governments, academia, donors
The Nature Conservancy	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
UN CCD (Workshop on Economic Valuation of Land & ES)	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, protected areas	Biodiversity, education	Glob, nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
UNESCO	Mainstreaming, Capacity building	Global	Yes	Intrinsic, instrumental, relational	Yes	Fisheries, protected areas	Biodiversity, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
UNEP	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
UN Health and Environment Linkages Initiative (HELI)	Mainstreaming, Policy advocacy	Asia-Pacific, Africa	Yes	Instrumental, relational	Yes	Rapid land use change, agriculture and food	Biodiversity	Glob, nat, sect	Governments, youth
USAID	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, education	Glob, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
ValuES	Mainstreaming, Capacity building, Stakeholder Engagement	Global	No	Instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, education	Glob, nat, sub-nat, ecosyst, sect	Governments, businesses, donors

We Value Nature	Mainstreaming, Capacity building, Stakeholder Engagement	Europe & Central Asia	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Sect	Academia
Wealth Accounting and Valuation of Ecosystem Services (WAVES)	Mainstreaming, Policy advocacy, Stakeholder engagement	Global	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy	Glob, nat, ecosyst	Governments, businesses
World Bank	Mainstreaming, Capacity building, Stakeholder Engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth
World Business Council for Sustainable Development (WBSCD)	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Instrumental, relational	No	Rapid land use change, agriculture and food, protected areas	Biodiversity, green economy, education	Glob, nat, ecosyst, sect	Governments, businesses, academia, donors
World Health Organization (public health, env.tal and social determinants of health)	Capacity building, Policy advocacy	Global	No	N.d.	No	Rapid land use change, agriculture and food, fisheries	n.d.	Glob, nat	Civil society, NGOs, governments, academia
World Resource Institute (WRI)	Capacity building, Policy advocacy, Stakeholder engagement	Asia-Pacific, Africa, Americas	Yes	Instrumental, relational	Yes	Rapid land use change, agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Sub-nat, ecosyst, sect	Governments, businesses, academia, donors
WWF	Mainstreaming, Capacity building, Policy Advocacy, Stakeholder engagement	Global	Yes	Intrinsic, instrumental, relational	Yes	Agriculture and food, fisheries, protected areas	Biodiversity, green economy, education	Glob, reg, nat, sub-nat, ecosyst, sect	Civil society, NGOs, governments, businesses, academia, donors, youth

For each of these initiatives a literature search was conducted to identify place-based case studies. 43 case studies were identified from the 46 initiatives spanning across the national and local scales. These were allocated into ten different groups based on similarities of cases in relation to transformation towards a governance more accommodative to diverse values. The description below explains each typology in more detail.

<u>Group 1.</u> Case studies that directly demonstrate or mainstream the initiatives framework and approach through pilot activities:

- The Economics of Land Degradation – Farmers Managed Natural Regeneration. The discussion on values is mainly limited to economic values (opportunity cost, cost-benefit analysis, the economics of farming, etc.; Westerberg et al., 2019).
- Wealth accounting and valuation of ecosystem services and the system of environmental-economic accounting. They promote the integration of environmental or ecosystem services values into economic accounting systems (Nishimwe et al., 2020; Onofri et al., 2017).
- World Resources Institute promotes the utilization of forest data to support evidence-based policy and decision-making. The case study illustrated the use of forest data to inform public (forest management plan, logging quota, forest patrol plan, law enforcement, etc.) and private sectors (sourcing guideline, supply-chain management plan) decision-making related to forest management (Neeff et al., 2020).
- Future Earth, a research programme on sustainability that mainstreams the co-production of knowledge as their main research approach. A form of engagement supported by Future Earth, in particular, is that through Knowledge-Action Networks, which are new initiatives intended to bring together researchers and extra-scientific actors in responding to key societal challenges, and to strengthen the link between scientific knowledge and societal change (van der Hel, 2016).
- The Natural Capital project encourages stakeholder engagement and trade-off analysis between economic-environment-social interests in developing an integrated coastal zone management plan in Belize (Arkema et al., 2015).
- FAO city region food system promotes transformation towards sustainability by transforming the food system. The city region food system requires political will and the creative use of available policy and planning instruments (infrastructure and logistics; public procurement; licences; land use planning, etc.); the involvement of different government departments and jurisdictions (local and provincial); new organizational structures at different scales (municipal, territorial, etc.); and cross-sectoral approach with food as the nexus (transport, health, waste, land-use planning, employment, climate change adaptation, etc.; Dubbeling et al., 2017).
- European Union Green Deal's presents the "mainstreaming agricultural innovation system" concept to promote agricultural innovation as the means to support food system transformation. The mission-oriented agricultural innovation system approach can be utilized to map agricultural innovation and understand the pathways for food system transformation. (Klerkx & Begemann, 2020). No direct link between the initiatives and case study in the publication.

- An Ecosystem Services assessment on the territory of the national park (Parc National de Taï, Côte d'Ivoire) was carried out based on the TEEB stepwise approach with the main aim to increase funds and get potential donors for the park (Berghöfer et al., 2018).

Group 2. Case studies that show the role of initiatives as facilitator and stimulator of biodiversity governance transformation, as reported by the initiatives below:

- Conservation International facilitated local and indigenous stakeholders to co-develop the action plan on payment for ecosystem services in Rancheria River Basin in Columbia. The local government and actors have been trying to promote the payment for ecosystem services scheme, but the presence of external actors is sometimes required. Given that Conservation International was accepted as a neutral mediator in the payment for ecosystem services planning process, they were able to integrate the multiple and diverging interests of upstream and downstream communities, including the indigenous groups, and develop a plan accepted by both communities. The presence of external intermediaries helped to transform the watershed governance through the working payment for ecosystem services scheme (ValuES, 2014).
- In Belize, the national Belizean coastal zone management authority received support from the natural capital project in co-developing the integrated coastal zone management plan. The integrated coastal zone management plan was co-developed together with the local stakeholders' in different coastal regions. The project facilitated the collaborative planning process that included trade-offs between environmental, social and economic values of the local stakeholders (Arkema et al., 2015).
- The Global Environmental Fund supported a project in the Pacific region named community-based marine monitoring toolkit. The community monitoring toolkit provides information that can be used by communities for local decision-making, and by governments to inform national initiatives. Data can also be scaled-up for regional assessments. The toolkit was developed in response to community needs using a participatory approach and implemented through a series of training workshops with local environmental leaders. The impacts of toolkit implementation, such as increased local awareness, implementation of local management actions, and improved local monitoring motivation, seem depend on the presence of local champions and transformative impacts appear to be limited (Johnson et al., 2020).
- Deutsche Gesellschaft für Internationale Zusammenarbeit implemented a project in Laos that aims to support the management authority of the national protected area of the Hin Nam No National Protected Area, as well as the local communities to conserve biodiversity. Support is given by promoting a co-management approach (Vongkhamheng, 2014). Another project of Deutsche Gesellschaft für Internationale Zusammenarbeit in Laos relates to land use planning and the use of the science–practice–policy interface to facilitate the interactions between scientists, planners and villagers, in designing future landscapes (Castella et al., 2014).
- Various decision-making support mechanisms provided by donors and regional cooperation (i.e., EU EKLIPSE and ESMERALDA mechanism, see point 6).
- The HELI assessment (World Health Organization) - consisting of chemical input, pollution risk and cost benefit analysis assessments of livestock considering health, economic and

environmental values - fed into various agricultural and environmental policies of Uganda, mostly centring around livestock.

Group 3. Case studies that demonstrate the initiatives' values framework on biodiversity governance using example at the local scale without any intervention from the initiatives. Instead, the cases used by the initiative to illustrate the implementation of their concept or approach at the local level. These types of indirect links between initiatives and case studies show the potential of initiatives to stimulate transformative change:

- Adaptive co-management through collaboration and co-learning is promoted to strengthen biosphere stewardship. Biosphere stewardship is an ongoing and continuous approach to improve collective action and the overall governance of biosphere reserves, which is supported by UNESCO to maintain and enhance the valuable global natural and cultural sites (Plummer et al., 2020).
- The world heritage concept in the case of Pimachiowin Aki world heritage site in Canada helped to increase the acknowledgement of different stakeholders, including the indigenous tribe and different provincial governments, regarding the importance of the site and requirements to improve its management. The designation as world heritage site supports the transformation of governance through a multi-stakeholder platform called Pimachiowin Aki Corporation that facilitates its co-management.
- One Health framework. Supported by the World Health Organization, it addresses disease problems that involve complex interactions between people, animals and the environment. The framework intervention targets animal vaccination to support human health and livelihood. The intervention highlights the need for building cross-sectoral governance and enhancing community trust, engagement and ownership to support technical aspects of vaccination aiming for the benefits of human health and livelihoods. Although instrumental values (health) still predominantly motivate the effort in this framework, the framework's impact can be intrinsic and relational (trust, engagement, equitability for less advantaged groups, equitability for community and other species) (Cleaveland et al., 2017).
- Specific pesticide policy cases in France and Denmark show how specific pesticide taxations were implemented due to the chemicals' high impacts on biodiversity, and how relevant policies, taxations and compensation payments to farmers contributed to mitigate pollution (OECD, 2020).
- UNCCD's Land Degradation Neutrality concept was found in numerous Kenyan laws, policies and spatial plans. UNCCD and its programmes present an option to focus more on healthy soils and land, which largely contribute to live hood and economic activities in Kenya (Gichenje et al., 2019).

Group 4. Case studies that promote collaboration and co-management with local actors to address diverse values of biodiversity to transform governance, many initiatives' case studies promote the improved engagement of grass-root actors and local stakeholders, through a participatory, deliberative, and adaptive co-management approach at the local level (Arkema et al., 2015; Castella et al., 2014; Johnson et al., 2020; Jupiter et al., 2014; ValuES, 2014; van der Hel, 2016):

- Implementation of a community-based marine monitoring toolkit in Vanuatu, Pacific addressed to the context. The monitoring toolkit was designed and implemented based on a participatory process, addressing community needs and concerns (Johnson et al., 2020).

- Based on a case study of biodiversity conservation policy in the Pacific region, brightspots of conservation implementation in the Pacific region were identified for three contexts, namely: regional initiatives, knowledge-sharing networks, and community-based management (Jupiter et al., 2014).

- A comparative analysis of 12 REDD+ projects in the Madre de Dios watershed of South-eastern Peru explored how local initiatives link with the emerging national REDD+ design in Peru by focusing on the founding and organizational strategies of the different projects. The results highlight the importance of hybrid institutional logics, the key role played by highly networked individuals in pushing project-level REDD+ forward, and the important role of understanding a fundamental innovation such as the REDD+ carbon credit value chain. In addition to these aspects, the development of standards, technologies and other norms are complementary to the primary task of defining roles and interests of actors along the chain (Hajek et al., 2011).

- As part of the participatory development of a payment for ecosystem services scheme in Columbia, Conservation International and local authorities found that economic and ecological value (i.e., opportunity costs, willingness to pay, and water utilization purpose) are not the only significant influence on actions of the local communities involved. The opportunity to improve the socio-economic situation of both communities in the downstream and upstream, including the ethnic group, could be an incentive to improve biodiversity management. As a result, payment for ecosystem services action plan also addresses the socio-economic needs through local development activities (ValuES, 2014).

- In Xinshe Village, Taiwan, two indigenous ethnic groups –Kavalan and Amis tribes – have farmlands located in the same watershed between the national forests and the Pacific Ocean. Resource conflicts over water usage, hunting and fishing rights have happened from time to time between the tribes. In the past, different governmental agencies worked separately with each settlement based on their sectoral goals. A new co-management strategy was proposed by the local actors, with support from the local tribes, to improve the watershed management through collaborative planning and actions. A new multi-stakeholder cross-sector platform was established in 2017 to promote collaborative planning and management with promising results (Lee et al., 2019). This case study was also documented as part of the Satoyama Initiative knowledge management activity (IPSI case study).

- Co-production of knowledge in the climate and weather forecast system in Ethiopia, between traditional/indigenous and modern weather and climate forecast systems. The co-production was mediated by the local and customary institutions (Balehegn et al., 2019).

- Co-management of seagrass conservation in Australia and New Zealand, which requires involvement of the local community and partnership with the traditional and indigenous groups (Tan et al., 2020).

- At the global governance level, the multi-actor dialogue seminars approach employed in the case study of Quito dialogues was built on social learning theories as a means for personal, relational and systemic transformation for enhanced environmental governance. Using Quito dialogues as the case study, the result suggests that the Quito dialogues contributed to transformative social learning in the context of the Convention on Biological Diversity. The

case study concluded that there is a need for better dialogue and learning across cultures, interests and various actor groups to support positive transformation in environmental governance (Schultz et al., 2018). In this case, the recommendation to "Address Diverse Values" is directed towards personal communication value rather than biodiversity values.

Group 5. Case studies that demonstrate the empowerment and integration of local and indigenous people, values, and knowledge in biodiversity governments:

- In the World Heritage site of Pimachiowin Aki, Canada, the local actors are committed under the Pimachiowin Aki Corporation, a multi-stakeholder platform for "establishing knowledge systems dialogue between indigenous people and western scientists in land management and planning", and "intergenerational and inclusive approaches to participation in communities' dialogue" (Pimachiowin Aki).
- Community-based marine monitoring toolkit, in which the information from the results of monitoring was used by the local community and other decision-makers to support the local management plan (Johnson et al., 2020).
- Akwé: Kon Voluntary Guidelines is a protocol developed by the Convention on Biological Diversity for cultural, environmental, and social impact assessment to be applied in regions inhabited or used by indigenous peoples. The case study reviews the utilisation of the Akwé: Kon Guidelines for land-use planning in Finnish Sámi communities. The incorporation of traditional local knowledge into land use planning faced practical challenges, such as a mismatch between the oral narrative nature of traditional local knowledge and the planning systems currently in use, and pointed to a need to make traditional local knowledge more spatially explicit (Markkula et al., 2019).
- The combination of traditional-indigenous knowledge with the modern system on climate and weather forecast for pastoralists in Ethiopia. The bridging is conducted by triangulation of information from two knowledge system by the traditional village institution, which will decide the final information and local management actions (Balehegn et al., 2019).
- Non-timber forest product certification process involving traditional indigenous knowledge to close the knowledge gap required for certifying timber products of the local community (Shanley & Stockdale, 2008).
- Involving local communities in reforestation using the IISD framework to aid building resilience, adaptation and sustainable agriculture practices in Bolivia (Robledo et al., 2004).

Group 6. Case studies that promote indigenous rights and justice in managing biodiversity:

- The recognition of rivers as legal entities in New Zealand (Whanganui River) and Colombia (Río Atrato). The case study concluded that the improved outcomes of the river governance, will depend on the surrounding institutional framework designed to engender enforceability on the legal and cultural interests in the river (Macpherson & Ospina, 2020).

Group 7. Case studies that demonstrate knowledge co-production mechanism to support decision-making in biodiversity management:

- Co-production of knowledge involving traditional and indigenous knowledge and modern climate and weather forecast system in Ethiopia (Balehegn et al., 2019).

- EKLIPSE decision-support mechanism for European Union Biodiversity and ecosystem services conservation policy. The EKLIPSE mechanism focuses on the engagement of relevant actors (scientists-policy makers-society) in decision-making, and strengthening the networks of scientists and other knowledge holders (Watt et al., 2019).
- Future Earth addresses the (western knowledge-based) researchers as well as extra-scientific actors perspectives in sustainability research (van der Hel, 2016).
- World Resources Institute Global Forest Watch data (mostly biophysical data, instrumental values) for public and corporate decision-making in supply-chain management plan (Neeff et al., 2020).
- The combination of traditional-indigenous knowledge with the modern system on climate and weather forecast for pastoralists in Ethiopia. The bridging is conducted by triangulation of information from two knowledge system by the traditional village institution, which will decide the final information and local management actions (Balehegn et al., 2019).
- Within the European Union Business @ Biodiversity Platform, the case of the ESMERALDA project aims to support European Union member states in the mapping and assessment of ecosystem services as part of implementing the European Union Biodiversity Strategy. ESMERALDA's key tasks included network creation, stakeholder engagement, enhancing ecosystem services mapping and assessment methods across various spatial scales and value domains, work in case studies and support of European Union member states in the mapping and assessment of ecosystem services implementation (Burkhard et al., 2018).
- Non-timber forest product certification process involving traditional indigenous knowledge to close the knowledge gap required for certifying timber products of a local community (Shanley & Stockdale, 2008).
- An IIED-designed project researched local fishermen through focus group discussions and interviews with 800 households participating. The main aim was to collect data for conservation recommendations about the hilsa population through sanctuaries, fishing season regulation and species management plan (Bladon et al., 2019).

Group 8. Case studies that demonstrate the collaboration with private sectors in transformative biodiversity management:

- World Resources Institute Global Forest Watch data for corporate decision-making in supply-chain management plan (Neeff et al., 2020).
- The voluntary cacao sustainability standards for farmers in West Africa promoted by UTZ. The voluntary certification has mixed and modest outcomes based on the assessment of various social, economic, and environmental indicators. However, the implementation of voluntary certification created new potentials to improve the sustainability of cacao value chains. Other policy interventions beyond farm level are required to promote transformative governance, such as strong cooperatives, training, and societal partnership between farmers, cocoa value chain players, and cocoa industries to implement sustainable cocoa initiatives (Ingram et al., 2018).
- Non-timber forest product certification process involving traditional indigenous knowledge to close the knowledge gap, required for certifying timber products of the local community (Shanley & Stockdale, 2008).

- The example of We Value Nature shows how an international cement company called for assessing social-economic and environmental values with a natural capital assessment methodology, which resulted in adaptive corporate level policies (We Value Nature, 2021).
- In the TEEB case study, the ES assessment's primary focus was to target donors and raise funds for the national park through a participatory process with a wide-ranging inclusion of stakeholders (Berghöfer et al., 2018).
- A natural capital assessment focusing on the Natura cosmetics company's value chain provided data for supporting decision-making at the corporate level on increasing efficiency of resource use (esp. water) and reducing GHG emission (*Natural Capital Protocol: Case Study for Natura*, 2021).
- Incorporating biodiversity aspects for sustainability certification of coffee producing and working with local farmers increased biodiversity actions at Costa Rican farms (Food and Biodiversity, 2021).
- The company BASF, based on the French legislation Grenelle de l'environnement, aimed to contribute to create green infrastructure in agricultural areas with local stakeholders. In 2009, on 400 km2 in the Champagne-Ardenne region, the development of a three-phase approach was launched to identify elements and tools for locals, mostly for farmers (e.g., bee fallows, hedges, using local crops), and create fiscal and biodiversity indicators to measure outcomes (WBCSD, 2012).

Group 9. Case studies that demonstrate the urgency of providing capacity building and tools for social-learning and decision-making in biodiversity governance:

- Transformative cases involving capacity building through social learning.
- Land use planning through the social learning process in Laos (Castella et al., 2014).
- Integrated coastal zone management process in Belize (Arkema et al., 2015).
- Future earth co-production of knowledge (van der Hel, 2016).
- Pimachiowin Aki case study (Pimachiowin Aki).
- Cases of tools for decision-making support (decision-support tools).
- Community-based marine monitoring toolkit, in which the information from the results of monitoring was used by the local community and decision-makers to support local management plan (Johnson et al., 2020).
- Birdlife's marine species tracking tool to inform conservation policy and management (Hays et al., 2019).
- Protected Planet provides data on protected areas, which was recommended to be used as global standardized data for e.g., global IPBES assessments (Brooks et al., 2016).

Group 10. Case studies that demonstrate Integration of diverse values for urban biodiversity management transformation:

- Utrecht nature-based solution (OPPLA)
- FAO city food region
- The Natural Capital Initiative (NCI) is a platform that promotes relevant events and facilitates exchange. The WBCSD/Arcadis case study - presented at the NCI event - about Birmingham Smithfield Development Plan - Zero emission sustainability plan incorporates ecosystem

services (incl. aesthetic and recreation), human health and well-being aspects. The plan includes a cost benefit analysis about green roofs and rain gardens vs more traditional methods and suggest using these options, while incorporating biodiversity net increase and other "green" solutions (e.g., permeable pavement, green walls, green roofs) into the development plan.

Table 6.4. Types of Values addressed in the initiatives' case studies. Acronyms refer to initiatives documented above.

Values addressed	No of case studies	Initiatives' case study
Only Instrumental value	13	WRI; WAVES; SEEA; World Bank; FAO; HELI; EBBC; OECD Environmental Directive; WBCSD; UNCCD; Natural Capital Coalition; TEEB; We Value Nature
Only Intrinsic value	0	N/A
Only Relational value	1	SwedBio
Relational & Intrinsic	2	Global Alliance for the Rights of Nature; Akwé Kon Guidelines (CBD)
Instrumental & Intrinsic	4	SIDS; Birdlife; CI; USAID
Instrumental & Relational	15	ValuES; ELD; GEF; GIZ; Natural Capital project; UNESCO TLK climate-weather; WWF Natural Capital project; TNC; EU Green Deal; NTFP Exchange; OPPLA; REDD+; IIED; IISD
Instrumental & Intrinsic & Relational	10	SNRD; UNESCO-biosphere stewardship; IUCN; KAN; SDM; EU Business@Biodiversity Platform; WHO Public Health; EKLIPSE; UNDP-UNEP PEI; Natural Capital Initiative
No relevant case studies found or no values indicated	3	Cambridge Conservation Initiative; OECD Capacity directive; Protected Planet (UNEP-WCMC and IUCN-WCPA)

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Annex 6.3 Case studies

Hunting in the Amazon: conservation trade-offs

In the Amazon region as elsewhere too, the establishment of protected areas has led to a shift in local management practices towards state mandated forms of how resources can be used or not. Indigenous groups have often been rather critical towards the establishment of various forms of protected areas (Tauli-Corpuz et al., 2020), for reasons like lack of inclusion and participation in the design and set-up, unclear tenure over territories that limits access to land and resources (Krause et al., 2020). Indigenous peoples and local communities often have important values attached to the territories they live in, and are informed by mythical and cosmological structures.

This cosmovision manifests in numerous cultural and spiritual values of nature which also leads to very different explanations for ecological changes, which are not separated from the social sphere (Fernández-Llamazares et al., 2016; Krause et al., 2020).

Hunting of wildlife in the Amazon exemplifies not only the clash in different ontologies and explanations for ecological changes, but it also reveals the frequently encountered trade-offs between local livelihoods and biodiversity conservation. However, hunting as an important local activity can also help to understand and manage these trade-offs. The meat of wild animals represents an important contribution to local nutrition for many people across the world (Nielsen et al., 2018; Sarti et al., 2015). In Colombia hunting of fauna is legally restricted to subsistence use by indigenous peoples living in indigenous reserves and any commercialization of wild animal products is prohibited by law (Krause et al., 2020; Ponta et al., 2019). Nonetheless, for many indigenous peoples commercializing wild fauna, mainly wild meat, is an important source of income, particularly in the absence of other income generating activities (van Vliet et al., 2015). The illegality of commercializing wild meat leads to clandestine markets, and makes the management of hunting inherently difficult. Yet, in light of the cultural importance of hunting and the contribution of wild meat to people's diets and incomes, sustainable hunting management together with indigenous hunters and based on traditional ecological knowledge and local cultural norms is essential. For places like the Amazon region with hundreds of different indigenous people's territories, conservation has to acknowledge and work with the tremendous bio-cultural diversity that still exists, but which is also at great risk of disappearing.

Issues and tools in sustainable consumption and production

issue	production	consumption	individual	community	firm	state	relation to economic growth	reference
Safe and ecologically sound design (products & services)	x				x		potentially moderating	Alayón et al. 2017
Reducing, eliminating wastes	x				x		uncertain	Alayón et al. 2017
Conserving energy and materials	x				x		moderating	Alayón et al. 2017
Eliminating dangerous chemical substances/physical agents	x				x		potentially moderating	Alayón et al. 2017
Maximizing material and energy efficiency	x				x		potentially moderating	Bocken et al., 2014
Delivering functionality rather than ownership	x	x	x	x	x		moderating	Bocken et al., 2014
Stewardship role	x				x		uncertain	Bocken et al., 2014
Re-purpose the business	x				x		moderating	Bocken et al., 2014
Ecological modernization / Green growth	x	x			x	x	boosting	Mol–Spaargaren, 2000 Harangozo et al., 2018
Sufficiency	x	x	x	x	x		steady-state degrowth	Princen, 2005 Bocken et al., 2014
Reconfiguration	x	x			x	x	potentially moderating	Geels et al., 2015 Urry, 2010
Absolute reduction		x	x				steady-state degrowth	Sandberg, 2021
Modal shift		x	x				potentially moderating	Sandberg, 2021
Product longevity	x	x			x	x	moderating	Sandberg, 2021
Sharing practices (outside households)		x	x				moderating	Sandberg, 2021
Nudge		x	x			x	potentially moderating	Sunstein, 2015 Reisch et al., 2021
Slow		x	x	x			moderating	Mayer–Knox, 2006
Celestial footprint		x	x	x			moderating	Kocsis, 2012
Voluntary simplicity		x	x	x			steady-state degrowth	Elgin, 1981 Alexander–Ussher, 2012
Alternative hedonism		x					potentially moderating	Soper, 2008 Caruana et al., 2020
Ecological intelligence		x	x				potentially moderating	Goleman, 2009
Tracing production and products by block-chain technology	x	x			x	x	uncertain	Feng et al., 2020
Boycott		x	x				uncertain	Hoffmann et al., 2018
Buycott		x	x				uncertain	Hoffmann et al., 2018
Critical consumption / Political consumerism		x	x	x			potentially moderating	Yates, 2011 Copeland–Boulianne, 2020
Labelling	x		x		x	x	uncertain	Torma–Thøgersen, 2021
Multidimensional labelling	x		x		x	x	uncertain	Kocsis–Kuslits, 2019
Developing scale-up solutions	x				x	x	potentially moderating	Bocken et al., 2014
Avoiding in situ urbanization		x				x	moderating	Zhou et al., 2018
Avoiding suburbanization, urban sprawl		x				x	moderating	Glaeser, 2011
Urban economies		x				x	moderating	Fremstad et al., 2018
Household economies		x	x	x			moderating	Liu et al., 2003 Fremstad et al., 2018
Avoiding expansion of one-person households		x	x	x			moderating	Liu et al., 2003 Ellsworth-Krebs, 2020

Barriers and challenges of Circular Economy

Circular Economy can be considered as a business-oriented option that help protect nature and its benefits to people and good quality of life in various ways, e.g., by saving energy (Cooper et al., 2017), decreasing landfilling (Reike et al., 2018), reducing production costs (Mativenga, Agwa-Ejon, et al., 2017; Mativenga, Sultan, et al., 2017) or lowering the demand for biomass (Haas et al., 2015). Circular economy can contribute to several SDGs, especially SDG6 on clean water and sanitation, SDG7 on affordable and clean energy, SDG8 on decent work and economic growth, SDG12 on responsible consumption and production, and also to SDG15 on life on land (Schröeder et al., 2019). A modelling study run by the Organisation for Economic Co-operation and Development (OECD) reinforced that a transition to circular economy would not have significant negative impacts on overall macroeconomic performance (incl. growth and employment) but would contribute to a re-allocation of competitive advantage across sectors and induce changes in trade and socio-economic impacts (McCarthy et al., 2018).

Despite best practice cases, consensus is still lacking on how far the global economy progresses towards a circular economy. Cooper et al. (2017) estimated that potential savings of energy used for economic activities world-wide can reach 6-11%. A material flows analysis in 2015 showed that recycling within the economy as share of processed material reached 6% globally and 13% in the European Union (Haas et al., 2015). The most recent Circularity gap report issued by PACE (2020) concluded that the current degree of circularity in the global economy is currently lower than 9%. Reasons for these relatively low numbers are thought to be the large proportion of material throughput (Haas et al., 2015), and the accelerating production due to the rebound effect (Zink & Geyer, 2017). Some authors however question the very basic assumption of circular economy (namely that economic growth and resource use can be decoupled in a closed system) saying that due to increasing entropy the process of recycling will always need input energy and will always create extra waste, so fully closing material loops is impossible (see e.g., Giampietro & Funtowicz, 2020; Millar et al., 2019).

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, 2018; Ranta et al., 2018). Among "soft" factors, circular literacy – i.e., understanding complexity, de-materializing the economy, preserving natural livelihoods, fostering social justice, diversity and uniqueness, including multiple actors and knowledge forms, and opening up for reflexivity, creativity and innovation etc. – is key to integrate the economic vision of circular economy to the broader political and socio-cultural context, and to fully employ the transformative change potential of circular economy (Zwiers et al., 2020). Also, addressing research gaps related to circular economy especially on the direct and indirect impacts circular economy might have on biodiversity (Buchmann-Duck & Beazley, 2020), and means and indicators for socially more inclusive circular economy approaches (Clube & Tennant, 2020) is important for further implementation of circular economy. *Table 6.5* table sums up the key challenges identified as well as the options to overcome those.

Table 6.5. Circular economy challenges and possible solutions.

	Challenges/Barriers	Options to overcome	Reference
Soft	The concept overlooks social equity and justice	Sharing economy, circular economy initiatives inclusive to actors of the informal waste sector in developing countries	Kirchherr et al., 2017
	Limited institutional support for circular economy principles other than recycling	Applying and extended Rs model	Ranta et al., 2018
	Difficulties of law enforcement at local level (clashing with social norms)	Knowledge (co-)creation, circular literacy, nudging behavioural change	Ranta et al., 2018; Zwiers et al., 2020
	Consumers prefer new products	Changes in the value system	Ranta et al., 2018
	Rational economic decision making at company level (prices of materials mainly reflect the cost of mining and short-term values but not the costs of depletion or environmental degradation)	Pricing externalities, extended value approach (include intrinsic values beyond economic exchange values)	Andersen, 2007
Hard	Fossil energy carriers used as energy sources with limited recycling options	Carbon capture, transition to green energy, cascadic use of fly ash and slag	Haas et al., 2015
	Biomass used for food, feed and fuel with limited recycling options	Closing the loops in agricultural production by sustainable agriculture (see land use section), changing dietary habits, reducing food waste	Haas et al., 2015
	Limitations to practical implementation (e.g., missing infrastructure to local waste separation)	Increased investment and funding of R&D activities, organizational development and new business models	de Jesus & Mendonça, 2018; Zwiers et al., 2020

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Annex 6.4 Summary tables on the interlinkages between SDGs, diverse values and options for decision makers

SDGs Cluster 1 on Nature

SDG	Contribution of pluralistic approaches and diverse values	Types of policy support tools & methodologies	Examples of policy instruments & interventions	Examples of leverage and entry points
Goal 6 Clean Water & Sanitation	• Better understanding/ identification of the actors and property rights could assure a more equitable access and use of water [6.1, 6.4, 6.5, 6.6] • Involvement of IPLCs and ILK is key to improve the water capture, filtration, and regulation in water source ecosystems and plays a main role in restoring and conserving natural infrastructure [6.3, 6.6, 6.b]	**I:** informative tools for all 17 SDG **T:** technical tools for all 17 SDG; dryland water resource assessment; IWRM rapid assessment; Hydrus; ECOPLAN - SE (Scenario Evaluator); WOCAT Database for Sustainable Land Management (SLM) technologies; System of Environmental-Economic Accounting (SEEA); Toolkit for Ecosystem Service Site-based Assessment (TESSA); Scoping ecosystem services for impact assessment (WRI); Coordination of Information on the Environment (CORINE) Land Cover; Revised Universal Soil Loss Equation (RUSLE); Ecoplan Quickscan; CENTURY Model **D:** decisive tools for all 17 SDG; IWRM toolbox (GWP); SDG 6 Policy Support System (SDG-PSS); The Nature Index, IES Integrating Ecosystem Services for Developing Planning IES/GIZ	**E&F:** PES, taxes, fees, trade permits, environmental/ecological fiscal reform **L&R:** Rights of Nature **R&C:** IPLC-led codes of ethical conduct; Free Prior and Informed Consent; Rights-based and consent-based approaches to nature **S&C:** co-management & Conservation Agreements; IWRM; Ecosystem based adaptation, Nature based Solutions	**Water sector examples:** Watershed management plans at different levels (sub-basin, local aquifer, basin or provincial scale); Water Resources Management and Technology Conferences (ICWRMT) **Cross-cutting examples:** National Adaptation Strategies (to climate change) **Situational examples:** problems/needs from different actors regarding water quality and quantity

| Goal 14. Life below water | • Integrated and ecosystem based management approaches can play key roles in restoring and conserving healthy marine ecosystems and reducing land-based pollution in watershed, upstream and coastal areas [14.1, 14.2]
• Mobilizing and engaging small-scale, artisanal fishers and other IPLCs can play a key role in conserving coastal and marine ecosystems and can improve fishing practices and management to ensure sustainable use of marine resources [14.4, 14.5, 14.6] | **I:** informative tools for all 17 SDG; circumpolar Biodiversity Monitoring Program (CBMP)

T: technical tools for all 17 SDG; Sea-Level Rise Modelling Handbook; Fisheries catch reconstruction; Management strategy evaluation; Toolkit for Ecosystem Service Site-based Assessment (TESSA); Multi-scale integrated models of ecosystem services (MIMES); System of Environmental-Economic Accounting (SEEA), Integrating Ecosystem Services into development planning for coastal and marine ecosystems (IES)

D: decisive tools for all 17 SDG; The Norwegian Nature Index; MARXAN

; Protected Planet/World Database on Protected Areas (WDPA); Integrating Ecosystem Services for Developing Planning for Coastal and Marine Ecosystems (IES Blue/GIZ) | **L&R:** Fish stock regulation, Marine protected areas, Codes of conduct for fisheries management, Voluntary guidelines for fishing practices

S&C: Integrated coastal zone management, Ecolabelling, co-management | **Sectoral processes:** United Nations Convention on the Law of the Sea (UNCLOS), Our Ocean Conference (OOC)

Cross-cutting examples: National Adaptation Strategies (to climate change), Climate finance resources for project on oceans

Situational examples: Reports and news on oil accidents, Strong attention of media, broad images divulgation on marine litter and impacts of oil accidents in ocean platforms and/or ships |

| Goal 13. Climate action | • Pluralistic approaches can holistically capture concepts such as strengthen climate resilience [13.1]
• Incorporating pluralistic values can enhance education and capacity on climate change mitigation, adaptation, impact reduction and early warning and ensure that ILK and IPLCs interests are part of climate change measures integrated into national policies, strategies and planning [13.2, 13.3] | **I:** informative tools for all 17 SDG; The Circumpolar Biodiversity Monitoring Program (CBMP); Toolkit for the indicators of resilience in socio-ecological production landscapes and seascapes; rapid forest assessment (RFA); Method for Multiparty Monitoring Across Landscapes; Community biodiversity management

T: technical tools for all 17 SDG; Resource box for resilient seed systems: handbook; Enhancing crop gene pool use: capturing wild relative and landrace diversity for crop improvement; Crop wild relatives (CWR): In situ conservation; Coordination of Information on the Environment (CORINE) Land Cover; ARIES (Artificial Intelligence for Environment & Sustainability) modelling platform; Toolkit for Ecosystem Service Site-based Assessment (TESSA) ; Mitigation cost-based valuation; ECOPLAN - SE (Scenario Evaluator); Stochastic dynamic programming; Multi-Attribute Value Theory (MAVT); Sea-Level Rise Modelling Handbook; ECO-DRR

D: decisive tools for all 17 SDG; SARVA (South African Risk and Vulnerability Atlas) Spatial Portal; Global Risk Data Platform; Consequence tables; Integrated Biodiversity Assessment Tool (IBAT) | **E&F:** Economic restructuring, socially responsible investments

L&R: UNFCCC, National adaptation plans, Multilateral Frameworks

R&C: Free Prior and Informed Consent (FPIC) Behavioural approaches for reduced consumption

S&C: community-based adaptation, IPLC-led adaptation management approaches, | **Climate-related processes:** UNFCCC CoPs; Cost of extreme climate events; NDCs; National Adaptation Plans; Carbon markets; NAMA and GCF Projects

Situational examples: extreme hazards (such as floods, droughts, heat waves, heavy rains, etc.) |

| Goal 15 Life on Land | • Can bring together different actors and sectors related to the landscape to improve conservation of terrestrial, inland and mountain ecosystems and biodiversity and enhance national and local planning, development processes, poverty reduction strategies and accounts [15.1, 15.3, 15.4, 15.9]
• Whole-of-society efforts, including the custodians and right holders of forests IPLCs, can play a key role in halting the drivers of land-use change, and the sustainable conservation of forests, and motivate and ensure conservation of genetic resources [15.2, 15.5, 15.6, 15.7, 15.8] | **I:** informative tools for all 17 SDG; biodiversity indicators partnerships; Participatory approaches to the conservation and use of plant genetic resources; Community biodiversity management; Circumpolar Biodiversity Monitoring Program; Ecosystem Services Card Game

T: technical tools for all 17 SDG; world database on protected areas (WDPA); tessa toolkit for site-based ES assessment; Conservation Evidence; MAPFORGEN; In situ conservation of wild plant species a critical global review of good practices; Crop wild relatives (CWR): a manual of In situ conservation; Core collections of plant genetic resources (book); WOCAT (World Overview of Conservation Approaches and Technologies); Revised Universal Soil Loss Equation (RUSLE); Toolkit for Ecosystem Service Site-based Assessment (TESSA); DNDC DeNitrification-DeComposition model; *World Database of Key Biodiversity Areas*TM; Scoping ecosystem services for impact assessment;ARIES (ARtificial Intelligence for Environment & Sustainability, Acting on Ecosystem Service Opportunities, Invest (Integrated Valuation of Environmental Services and Trade-offs), mulit based evidence approaches (MEB),. Conceptual Framework combining Eccosystem | **E&F:** biodiversity offsets, taxes, trade permits

L&R: UNCCD, UNCBD, NBSAP, Indigenous and Community Conserved Areas and Territories (ICCAs),National strategies (e.g., Biodiversity); Biodiversity offsets, land and resource tenure reform

R&C: FPIC

S&C: integrated landscape approaches and

Sector approaches (e.g., landscape, rights-based, other participatory environmental approaches); Mechanisms for more equitable use and benefit sharing | **Land sector examples:** CBD CoPs; Bonn Challenge; Access and Benefit sharing agreements; GEF projects

Cross-cutting examples: CRS, NAMA and GCF projects, Sustainability Reporting, National Adaptation Plans,

National Biodiversity Strategy and Plans |

		Services, social interdependencies and collective action. **D:** decisive tools for all 17 SDG; mapping biodiversity priorities; Integrating Ecosystem Services into Development Planning (IES/GIZ); Integrated Biodiversity Assessment Tool (IBAT); MARXAN; IUCN Green List; IUCN Red List of Threatened Species; IUCN Red List of Ecosystems		

SDGs Cluster 2 on Nature's Contribution to People

SDG	Contribution of pluralistic approaches and diverse values	Types of policy support tools & methodologies	Examples of policy instruments & interventions	Examples of leverage and entry points
Goal 1. No poverty	• Can help build the resilience of the poorest and most vulnerable whom often depend disproportionately on biodiversity and ecosystem services for their livelihoods and wellbeing and resilience against shocks and disasters [1.5] • Can help ensure that differential access to natural resources and land, as well as unequal opportunity costs and other	**I:** informative tools for all 17 SDG; Promoting value chains of neglected and underutilized species for pro-poor growth and biodiversity conservation; Acting on Ecosystem Service Opportunities (ESO) **T:** technical tools for all 17 SDG; Toolkit for Ecosystem Service Site-based Assessment (TESSA); Preference assessment **D:** decisive tools for all 17 SDG	**E&F:** Poverty-weighted ecological-fiscal reform, ecological fiscal transfers, socially responsible investments, Targeted environmental credit and loans, Debt for nature swaps, Integrated social-environmental accounting and reporting **S&C:** ecolabelling/certification	**Economy and livelihoods processes:** Green Recovery, Social Movements **Cross-cutting processes:** Designation of new protected areas

	forms of exclusion and inequality are eliminated, and that a more direct strategy recognizes the different ways that environmental poverty and stress is felt by different actors [1.2, 1.4, 1.a]		**L&R:** Rights-based approaches to natural resource management, PRSP with nature-based approaches Socially-safeguarded co-management agreements, Support to sustainable nature-based businesses, Rights-based approaches to NRM, Prioritization of nature-based approaches into PRSP Land and resource tenure and access reform	
Goal 2. Zero hunger	• Brings together various actors of the landscape to ensure that the different land-uses are coordinated to achieve sustainable, resilient food production systems and can help improve the access to food and nutrition security of vulnerable groups [2.1, 2.2, 2.4] • Recognizing and securing the rights of women and IPLCs to land, sea and resources as the custodians and knowledge holders of native varieties of crops can help identify valuable native seeds and species and promote more sustainable agricultural use and conservation of agrobiodiversity, while promoting access to	**I:** informative tools for all 17 SDG; Participatory approaches to the conservation and use of plant genetic resources **T:** technical tools for all 17 SDG; TEEB AgriFood valuation framework; Fisheries catch reconstruction; Target-Seeking Analysis **D:** decisive tools for all 17 SDG; Law and policy of relevance to the management of plant genetic resources	**E&F:** Growth Corridor Initiatives **L&R:** The food sovereignty movement, Environmental approaches to agriculture (swidden agriculture, sustainable intensification, landscape approaches) **R&C:** ILK-led management of genetic resources **S&C**: Eco-labelling/fair trade labels, Environmental approaches to agriculture (swidden agriculture, sustainable intensification, landscape approaches) Food Insecurity Experience Scale (FIES), Seed and plant banks, Rights-based, pro-poor and ILK-led approaches to	**Sectoral Processes:** Landscape management plans; Integrated nutrition and agriculture platforms (SUN, others); Movements for Regenerative agriculture and agroecology **Cross-cutting processes:** Urban renewal efforts that can incorporate sustainable urban agriculture; Climate smart agriculture and climate smart landscapes; Watershed management plans **International Commitments:** UN Food Systems Summit; Global Landscapes Forum; Bonn Challenge; CFS Sessions

	benefits arising from the utilization of genetic resources and sustaining their livelihoods [2.3, 2.5]		NRM and management of genetic resources	**Contextual Situations:** Food Summit Champions; changing the goal of food production from yield to nutrition value
Goal 3 Good health and well-being	• Understanding Nature as the foundation of our human health and placing Nature at the heart of policy will reduce the risk of water- borne diseases, zoonosis pandemic outbreaks and other communicable diseases, and promoting the access of women and children in these healthy environments can reduce the rate of premature infant deaths and maternal mortality [3.1, 3.2, 3.3] • Including the ILK of native varieties of plants and other biological resources for medicinal values can contribute to the R&D of medicine and vaccines [3.8]	**I:** informative tools for all 17 SDG; International Code of Conduct on Pesticide Management; International Partnership for the Satoyama Initiative (IPSI) **T:** technical tools for all 17 SDG; Guidelines for the Registration of Pesticides ; Ecosystem services reference book; Ecoplan Quickscan; Epidemiological methods; Health Impact Assessment (HIA) **D:** decisive tools for all 17 SDG; Human Development Index; OECD Better life Index, Voluntary guidelines for mainstreaming biodiversity into nutrition policies and programmes	**L&R:** Legislative control over pesticide use, WHO Global Action Plan for Healthy Lives and Well-Being, Global Action plans and health funds (WHO Action Plan for Healthy Lives, Global Fund to fight AIDS, TB, Malaria), integrating biodiversity and nature approaches (One Health approach), COVID-19 response plans, legislative control and guidelines over pesticide use **S&C:** Eco-labelling and certification, One Health approach	**Health sector examples:** Build back better from covid-19; COVAX; UNAIDS; Roll back malaria; GAVI; National plans for universal health coverage; community health worker programmes; UNFPA; The Global Action Plan for Healthy Lives and Well-being for All; Early warning systems for global and national health risks **Cross-cutting examples:** One Health; Lifestyle changes to eating less meat; National plans to reduce the risks of zoonotic diseases
Goal 11 Sustainable cities and communities	• Holistic planning of land use and participatory approaches can promote a more inclusive process for integrated and sustainable human settlement planning and management and enhance resilience against disasters and climate change impacts, while also	**I:** informative tools for all 17 SDG; **T:** technical tools for all 17 SDG; Global Risk Data Platform; Ecoplan Quickscan; System of Environmental-Economic Accounting; Hedonic	**E&F:** Urban ecosystem services, circular economy systems **L&R:** UNESCO World Heritage, national urban policy (NUP) **S&C:** EbA, Eco-DRR and Biocultural approaches, Planning	**Urban sector examples:** Global Mayors' Forum (GMF); second United Nations Global Sustainable Transport Conference **Cross-cutting examples:** ECO-DRR land-use planning;

emphasizing the multiple values of Nature such as the ecological and cultural importance of the landscape and seascape as heritages of mankind [11.3, 11.4, 11.5, 11.b] • Fostering understanding of the interdependency between cities, peri-urban and rural areas can strengthen city-rural linkages to promote development planning based on sustainable practices and promote the safeguarding of green spaces and Nature to ensure safe and inclusive access for all people [11.6, 11.7]	Property Pricing; Travel Cost Valuation **D:** decisive tools for all 17 SDG; Global Risk Data Platform; OECD Better life Index	and legal and regulatory areas (UNESCO World Heritage, national urban policy), nature-based city development and management	Promote circular economy systems between urban-rural settlements; Sendai Framework for Disaster Risk Reduction 2015–2030

SDGs Cluster 3 on Good Quality of Life

SDG	Contribution of pluralistic approaches and diverse values	Types of policy support tools & methodologies	Examples of policy instruments & interventions	Examples of leverage and entry points
Goal 4 Quality Education	• Can help promote education for sustainable development and sustainable lifestyles through empowering and giving equal opportunities to women, youth, indigenous peoples and other vulnerable groups, of all race and beliefs for	**I:** informative tools for all 17 SDG; Challenges and successes in engaging citizen scientists to observe snow cover **T:** technical tools for all 17 SDG	**R&C:** ILK incorporation or recognition in curriculum at all levels **S&C**: education for sustainable development (ESD)	**Education sector examples:** Re-opening schools after COVID-19; Education and promotion of sustainable lifestyles at all levels **Cross-cutting examples:**

	education and capacity building to conserve Nature for sustainable development [4.5, 4.7]	**D:** decisive tools for all 17 SDG; OECD Better Life Index	Environmental education approaches, transformative and social learning for sustainability, competency-based approaches; ILK revitalization through recognition or integration in curriculum at all levels or in environmental education	Harnessing ILK systems through culturally sensitive educational initiatives and agricultural extension services; public awareness on the importance of biodiversity to human well-being; encouraging people to be in touch with nature and recognize their need for nature
Goal 5 Gender equality	● Can help women and girls who are caretakers, breadwinners, knowledge holders, and custodians of their landscape and traditional knowledge and whose livelihoods are dependent on Nature to have equal rights, ownership and access to education, as well as an equal share of responsibility in the household, thus empowering them to lead sustainable livelihoods and better conserve their natural resources. [5.1, 5.4, 5.5, 5.a, 5.b]	**I:** informative tools for all 17 SDG; Stakeholder Analysis; Participatory approaches to the conservation and use of plant genetic resources **T:** technical tools for all 17 SDG; Ecosystem services reference book **D:** decisive tools for all 17 SDG	**L&R:** ILO conventions (equal remuneration, workers with family responsibilities) **S&C**: co-management	**Gender-related processes:** Beijing Platform for Action area on Women and the environment; Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) Article 14 **Cross-cutting processes:** Agenda 21, Chapter 24 'Global action for women towards sustainable and equitable development'; Programme of Action of the International Conference on Population and Development
Goal 10 Reduced inequalities	● Can help involve people of all ages, sex, dis sex, disability, race, ethnicity, origin, religion or economic or other status in processes	**I:** informative tools for all 17 SDG; Stakeholder analysis; EKLIPSE - Knowledge and Learning Mechanism on Biodiversity and Ecosystem	**E&F:** REDD+ benefit sharing mechanisms, ecological fiscal transfers	**Inequality-related processes:** Leave no one behind

	and actions to be freed from poverty, and to achieve a better quality of life and sustainable livelihoods in harmony with Nature [10.1, 10.2]	Services; Biocultural Community Protocols - A Toolkit for Community Facilitators **T:** technical tools for all 17 SDG; Ecosystem services reference book; Promoting value chains of neglected and underutilized species for pro-poor growth and biodiversity conservation **D:** decisive tools for all 17 SDG	**L&R:** Nagoya protocol **S&C**: Socially responsible investments; Corporate social responsibility	**Cross-cutting processes:** Nagoya protocol on fair and equitable sharing of benefits Chennai Guidance for the Integration of Biodiversity and Poverty Eradication
Goal 16 Peace, justice and strong institutions	• Can help ensure the rights, safety and equal access to justice of IPLCs and other actors of environment conservation activities, and ending all forms of violence against them as well as enhance institutional measures to prevent corruption and bribery in favouring unsustainable practices of development, and ensuring accountability and transparency at all levels of governance [16.1, 16.3, 16.5, 16.6] • Can help promote international cooperation and exchange, including with developing countries, for achieving global goals for nature [16.8]	**I:** informative tools for all 17 SDG; Biocultural Community Protocols: A Toolkit for Community Facilitators; multi-attribute value tree analysis (MAVT); Multi-Criteria Analysis (MCA) **T:** technical tools for all 17 SDG; Toolkit for Ecosystem Service Site-based Assessment (TESSA); Guidelines Access and Benefit Sharing in Research Projects; Law and policy of relevance to the management of plant genetic resources **D:** decisive tools for all 17 SDG; Environmental Impact Classification of Alien Taxa (EICAT); ECOLEX	**E&F:** REDD+ **L&R:** Expanding food market transparency ; Regulations on Illegal, unreported and unregulated (IUU) fishing; Forest Law Enforcement and Governance (FLEG) **R&C:** IPLC-led codes of ethical conduct; ILK revitalization **S&C**: Corporate social responsibility; participatory approaches that reduce conflict over NRM; FSC and PEFC	**Cross-cutting processes:** London Conference on Illegal Wildlife Trade; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); REDD+; Forest Law Enforcement and Governance (FLEG) processes at all levels; Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan; G8 Action Programme on Forests; Ministerial Conference on the Protection of Forests in Europe (MCPFE); National forests plans

SDGs Cluster 4 on Drivers of change in Nature and NCP

SDG	Contribution of pluralistic approaches and diverse values	Types of policy support tools & methodologies	Examples of policy instruments & interventions	Examples of leverage and entry points
Goal 7 Affordable and clean energy	• Can help coordinate different land-use priorities to ensure the sustainable use of natural resources to improve energy efficiency and access to energy, without compromising the integrity of Nature [7.1, 7.2, 7.3] • can help to identify affordability and accessibility conditions for communities both for the urban and rural production and consumption of energy • can be used to identify financial, infrastructural, institutional, socio-cultural barriers of renewable energy implementation	**I:** informative tools for all 17 SDG; deliberative approaches, mitigation hierarchy, co-production of principles for implementation **T:** technical tools for all 17 SDG **D:** decisive tools for all 17 SDG; comprehensive environmental and health impact assessment by including precautionary principle, compensation schemes, adaptive management	**E&F:** Economic restructuring, Ecosystem accounting, Law and policy of relevance to land/water use/energy use, environmental mainstreaming **S&C:** Eco-labelling and certification, ecosystem-based approaches to food production	**Energy-sector processes:** Sustainable Energy for All (SEforALL); UN General Assembly's 2021 High-level Dialogue on Energy; Energy Compacts; SDG7 Coalition; UN-Energy; Energy and Biodiversity Initiative (EBI) **Cross-cutting processes:** National infrastructure development plans; NDCs that contain specific energy sector pledges; Net Zero Coalition
Goal 12 Responsible consumption and production	• Can involve and empower multiple actors and interest holders of the landscape and seascape, and also better inform interest holders and other actors about the values of sustainable development and lifestyles in harmony with nature to ensure that the different land/sea-uses are coordinated, and that actors have the adequate skills and capacity to achieve sustainable management and efficient use of natural resources, as well as responsible production and consumption [12.1, 12.2, 12.8, 12.a]	**I:** informative tools for all 17 SDG; Toolkit for the indicators of resilience in socio-ecological production landscapes and seascapes; Target-Seeking Analysis; rapid forest assessment (RFA) **T:** technical tools for all 17 SDG; System of Environmental-Economic Accounting; TEEB AgriFood Valuation Framework; Integrated Valuation of Ecosystem Services and Trade-offs (InVEST); CENTURY Model Version	**E&F:** Integrated approaches to natural capital accounting, Sustainable state economics (SSE) Degrowth (DG) **L&R:** 10-Year Framework of Programmes on Sustainable	**Economy and beyond examples:** 10-Year Framework of Programmes on Sustainable Consumption and Production; national SCP action plans; Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs (STI Forum) **Cross-cutting examples:** Sustainable Mobility for All

	• Can encourage the design and implementation of holistic plans for management of sustainable tourism , sustainable land-use practices and resource management that promotes learning about nature, local culture and supports local produce while curbing adverse impacts on the environment brought about by tourism, and reducing waste generation including food lost, improve waste management and reducing pollution of the environment and society [12.3, 12.4, 12.5, 12.b]	4.0; MARXAN; System of Environmental-Economic Accounting (SEEA) **D:** decisive tools for all 17 SDG; Analytic Hierarchy Process (AHP)	Consumption and Production Patterns **S&C**: Eco-labelling FSC, ASC, MSC, corporate social responsibility	(SuM4All); Global Food Loss Index
Goal 8 Decent work and economic growth	• Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium- sized enterprises, including through access to financial services [8.3] • Implement sustainable land/sea-use practices and sustainable tourism to halt environmental degradation and promote nature and local culture, achieve efficient use and management of natural resources, as well as promote responsible production and consumption [8.4, 8.9] • Can support implementation of measures to engage all actors on an equal basis, building capacities and respect for labour rights, providing safe, secure and equal working environments for all women and man, including for young people and persons with disabilities, and lead to	**I:** informative tools for all 17 SDG; Ecosystem services reference book; Promoting value chains of neglected and underutilized species for pro-poor growth and biodiversity conservation; Guidelines for innovation platforms in agricultural research for development **T:** technical tools for all 17 SDG; Time use study; Acting on Ecosystem Service Opportunities; Management to mitigate and adapt to climate change; Cost-Benefit Analysis; Integrated Biodiversity Assessment Tool (IBAT) **D:** decisive tools for all 17 SDG; OECD Better life Index; *World Database of Key Biodiversity Areas*	**E&F:** economic restructuring **L&R:** ILO conventions	**Decent work and economy related processes:** 10-Year Framework of Programmes on Sustainable Consumption and Production; Global Jobs Pact of the International Labour Organization; Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries **Cross-cutting processes:** C40 Global Youth & Mayors Forum

	sustainable livelihoods in harmony with nature that reduce unemployment and precarious employment and eradicate forced labour [8.5, 8.6, 8.7, 8.8]			
Goal 9 Industry, innovation and infrastructure	● Helps ensure that infrastructure development puts nature at the heart of policy considerations when developing quality, reliable, sustainable, and resilient infrastructure and can enhance capacities, including for scientific research and technology and innovation, while respecting the rights and needs of various land-users to promote nature friendly oriented industry practices [9.1, 9.5, 9.b] ● Can promote sustainable practices for resource-use efficiency and clean energy without comprising the integrity of nature and facilitate access and integration of small-scale, local businesses into wider value chains and markets, in particular for developing countries and especially IPLCs [9.3, 9.4]	**I:** informative tools for all 17 SDG; Guidelines for innovation platforms in agricultural research for development **T:** technical tools for all 17 SDG; Hedonic Property Pricing; Manual of seed handling in gene banks **D:** decisive tools for all 17 SDG; Global Forest Watch	**L&R:** Environmental impact assessment **R&C:** Rights of nature, IPLC-led codes of ethical conduct, ILK revitalization	**Cross-cutting processes:** Research, technology and innovation for reliable and cost-effective green and natural infrastructure (coral reefs, mangrove forests, Urban green belts and vegetation)

| Goal 17 Partnerships for the goals | • Can engage and involve IPLC, women, and vulnerable groups in whole of society partnerships with public, private and civil society partners, and in particular mobilize and share ILK, expertise, and technologies in efforts to achieve the sustainable development goals [17.16, 17.17] | **I**: informative tools for all 17 SDG; Participatory economic valuation methods; Ecosystem Services Partnership Visualization tool (ESP-VT); Circumpolar Biodiversity Monitoring Program (CBMP); rapid forest assessment (RFA)

T: technical tools for all 17 SDG; Biodiversity Indicators Partnership (BIP); World Database of Key Biodiversity AreasTM; ARtificial Intelligence for Environment & Sustainability (ARIES); Resource box for resilient seed systems: handbook; The International Treaty on Plant Genetic Resources for Food and Agriculture: Implementing the Multilateral System

D: decisive tools for all 17 SDG; Global Forest Watch (GFW); Protected Planet; The Norwegian Nature Index; ECOLEX | **E&F:** transformational approaches in varying sectors energy, agriculture, infrastructure

S&C: inclusive, participatory and integrated approaches to sustainable development | HLPF

Multi-stakeholder partnerships and voluntary commitments

SDG Accelerator

2030 Agenda

2030 Agenda Partnership Accelerator

Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs (STI Forum)

ECOSOC Partnerships Forum |

Characteristics of different types of operationalization contexts

Enabling	
Institutional Framework conditions	- Inclusive governance systems by means of non-discrimination and accessibility - Existence of participatory policy support tools, methodologies and policies already formally established and working (in laws and regulations, formal and informal formats and rules) - Recognition and exercise of different and customary rights, rules and norms (power balance) - Coexistence and weaving of different worldviews - Sharing and use of Information and data in quality and time - Accountability, transparency, responsiveness and legitimation - Collaboration and coordination between and within different levels works (global, regional, national, subnational, local) - Peaceful and inclusive conflict resolution mechanism are established and worked, space of conflict transformation: provision of constructive dialogue. - Equity, procedural (who and how) and distributional (what benefits and responsibilities) justice. - Possibility to influence on outcomes/decision making.
Capacities	- Governance: able to create fair processes and institutions - Analytical: develop and use knowledge and tools - Motivational: awareness, wiliness and resources to integrate plural values - Bridging: bring different way of knowledge together, synthetize - Negotiation: navigate trade-offs and outcomes - Social Network: Learn adapt and act together
Conducive	
Institutional Framework conditions	- Inclusive Governance systems - Existence of participatory policy support tools, methodologies and policies formally established but not always working (in laws and regulations, formal and informal formats) - Recognition (but weak exercise) of different and customary rights, rules and norms - Open access to information and date, thus weak consideration for policy design - Accountability, Transparency and Legitimation, limited responsiveness - Collaboration and coordination between different levels (global, regional, national, subnational, local) - Peaceful and inclusive conflict resolution mechanism established but not always working, - Equity, procedural (who and how) and distributional (what benefits and responsibilities) justice. - Invisible power structures might hinder the last mile of full integration of multiple values.
Capacities	- Governance: mostly able to create fair processes and institutions - Analytical: Use and adapt knowledge and tools for nature, - Motivational: wiliness to integrate plural values of different actors - Bridging: need to be built - Negotiation: identification of trade-offs, thus difficulties to overcome them - Social Network: existing but need to be strengthened
Challenging	

Institutional Framework conditions	● Challenging governance systems ● Limited use of participatory tools and methodologies lack of promotion ● Policies and mechanisms to consider plural values are not established. ● Lack of accountability, no responsiveness ● Limited access to information and data ● Lack recognition of customary rights, rules and norms ● Weak of collaboration between different stakeholders and absence of coordination between levels ● High level of power imbalance, inequality and injustice ● Absence of peaceful conflict resolution mechanism ● Discrimination for different sociocultural groups exist, thus is not official spoken
Capacities	● Governance: available only to specific stakeholders, restrictive to build fair processes and institutions ● Analytical: difficult access to information, limited use of knowledge and tools ● Motivational: low motivation to integrate plural values ● Bridging: not available and do not see the necessity to do so ● Negotiation: trade-off are not spoken. Negotiation only among specific stakeholders ● Social Network: small circles, excludability and not supported
Contested/ restrictive	
Institutional Framework conditions	● Contested governance systems ● Participatory tools and methodologies are not desired and/or forbidden ● Inexistence of mechanisms and policies for plural values (laws and regulations, rules and norms) ● Dominant worldview: one way communication ● Lack of accessibility, accountability and responsiveness ● Prohibition to exercise customary rights, rules and norms ● Absence of collaboration and coordination between different stakeholders ● Extreme power imbalance, inequality and injustice ● Absence of peaceful conflict resolution mechanism, ● Existence of coercive mechanisms, discrimination and/or repression
Capacities	● Governance: inability to develop and establish fair processes and institutions ● Analytical: lack of access to knowledge and use of tools, ● Motivational: lack of wiliness/not desire to integrate plural values ● Bridging: there neither interest nor acceptance for different knowledge systems ● Negotiation: invisible and unspeakable trade-offs ● Network: weak and inexistence social capital

Context assessment grid

The context assessment grid considers factors such as level and quality of participation, accountability, responsiveness and inclusiveness of different actors and their values for an appropriate policy design and effective implementation. The grid could be used to identify what is present and what is missing in specific situations (*Table 6.6*). Of course, most real-world scenarios will possess characteristics and capacities from different types of contexts. Nevertheless, it should be possible to identify general trends, identifying salient aspects that are either strongly enabling or strongly contested, when identifying options for action. Whenever the assessment is negative, this could be interpreted as a restriction at the beginning of the process, turning to be an opportunity to start to

build on. For example in a conducive context where accountability exists but responsiveness is missed, actions should be focus on creating enabling conditions to enhance responsiveness, strengthening trust and legitimacy.

Table 6.6. *Context assessment grid. References: enabling (++), conducive (+), challenge (-), contested (--).*

	Context	Enabling	Conducive	Challenge	Restrictive
Institutional characteristics	Participatory and Power balance mechanisms (such as consultations)	++	+	-	--
	Accountability, transparency and responsiveness	++	+	-	--
	Access to information and knowledge	++	+	-	--
	Collaboration and coordination between and within levels	++	+	-	--
	Peaceful conflict resolution mechanisms	++	+	-	--
	Recognition of rights and exercise of rights	++	+	-	--
Capacities	Governance	++	+	-	--
	Analytical	++	+	-	--
	Motivational	++	+	-	**--**
	Negotiation	++	+	-	**--**
	Bridging	++	+	-	--
	Social Network	++	+	-	--

Different contexts enable different stakeholders to act

Different contexts usually offer varying opportunities for different actors to become engaged, and for their actions to have impact. Restrictive and/or contested contexts will generally allow the fewest options for action (red and orange), while more enabling contexts (green and yellow) usually offer a much broader range of possibilities (green) (*Table 6.7*). This means that any option for actions, methodology and policy that is suggested for restrictive contexts could also be used in all the other contexts. On the contrary, actions that are possible to implement in more enabling contexts might be difficult, challenging and/or even counterproductive for more restrictive ones.

Table 6.7. *Options for actions in different contexts. Colour codes: Green: possible to act, more responsibility; Yellow: possible to act, with some responsibility; Orange: difficult to act; Dark orange: action is not allowed or not desire, they also might be blocked.*

Contexts	Options for actions	International organizations	National Government	Subnational Government	Civil Society organizations	Private Sector	University & Research
Enabling	Institutional conditions: maintain	Yellow	Green	Green	Green	Yellow	Yellow
Enabling	Capacity development: Maintain	Yellow	Green	Green	Yellow	Yellow	Green
Enabling	Coordination and collaboration: recreate	Yellow	Green	Green	Green	Yellow	Yellow
Enabling	Implementation: Monitor, evaluate adapt and improve	Yellow	Green	Green	Green	Yellow	Yellow
Enabling	Generation, access and use of information: maintain	Yellow	Green	Green	Green	Yellow	Green
Enabling	Knowledge sharing, co-production and weaving: promote and recreate	Green	Green	Green	Green	Yellow	Yellow
Conducive	Institutional conditions: Improve	Yellow	Green	Green	Green	Yellow	Yellow
Conducive	Capacity development: strengthen	Green	Yellow	Yellow	Green	Yellow	Green
Conducive	Coordination and collaboration	Green	Green	Yellow	Green	Yellow	Yellow
Conducive	Implementation: Strengthen/improve	Green	Yellow	Yellow	Green	Yellow	Yellow
Conducive	Generation, access and use of information: improve existing channels	Green	Green	Yellow	Green	Green	Green
Conducive	Knowledge sharing, co-production and weaving: create and support	Green	Green	Green	Green	Green	Yellow
Challenging	Institutional conditions: Develop	Yellow	Orange	Yellow	Yellow	Yellow	Yellow
Challenging	Capacity development: Develop	Green	Orange	Yellow	Green	Yellow	Green
Challenging	Coordination and collaboration: work on to build the basics	Yellow	Orange	Orange	Green	Yellow	Yellow
Challenging	Implementation: Especially at subnational and municipal level	Yellow	Orange	Yellow	Green	Yellow	Yellow
Challenging	Generation, access and use of information: work to open new channels	Yellow	Orange	Orange	Yellow	Yellow	Green
Challenging	Knowledge sharing, co-production and weaving: enable	Green	Orange	Yellow	Yellow	Yellow	Yellow
Contested	Institutional conditions: Create	Yellow	Dark orange	Yellow	Yellow	Yellow	Yellow
Contested	Capacity development: started	Green	Dark orange	Yellow	Green	Green	Yellow

	Coordination and collaboration: Started						
	Implementation: Support under safe space						
	Generation, access and use of information: create alternatives						
	Knowledge sharing, co-production and weaving: build conditions						

A selection of policy support tools and instruments available in the different contexts

	Options available in			
	Enabling contexts	**Conducive contexts**	**Challenging contexts**	**Contested contexts**
	• Maintain, improve, consolidate and recreate institutional conditions for pluralistic approaches and policies • Support/recreate democracy, inclusiveness, trust and transparency, accountability and responsiveness • Ensure allocation of resources to maintain conditions and capacities • Influence different decisions; political (rights and obligations), economic (incentives, levies, fines and investment) and social environment (inclusion, motivation). Improve, develop and adapt. • Consolidate spaces for the joint consideration of values associate with different sectoral interests. Key cross scale value trade-offs and conflicts • Consolidate and maintain inclusive mechanisms for dialogue • Promote inclusion of sustainability aligned strategies and plan in policies related NCPs • Setting standards, advocacy among interest groups, prioritize inclusion of values in programs and projects	• Improve and established institutional conditions, e.g., access to information, transparency and responsiveness. • Improve democracy, institutionalize customary rights recognition, support implementation first in pilots then in a broader scope, create learning loops. • Strengthening influence decisions; political (rights and obligations), economic (incentives, levies, fines and investment) and social environment (inclusion, motivation) • Work with research funders and development agencies on procedural and distributional equity • Support balance values across sectors, considering different priorities and interdependencies • Cross-scale value trade-offs & conflicts • Ensure meaningful participation of marginalized actors in decision-making, • Foster adequate resource mobilization and allocation • Enable sharing of resources between sectoral initiatives to leverage on synergies • Strengthen governance frameworks to integrate plural values into cross-sectoral decisions	• Identify champions that support the creation of enabling conditions • Enable spaces where social organizations claimed and propose open spaces to discuss and where actors and decision makers could exchange different perspectives in safe. • Support the inclusion of sustainability aligned principles in policies and plans • Facilitate and build honour brokers. • Work with awards • Establish governance frameworks and institutions to integrate plural values • Leverage barriers for valuation uptake • Support participatory planning when possible • Address resources and capacity development to overcome challenges in integrative valuation and uptake of results	• Create open spaces for social actors to gather and safe spaces for decision-makers and other actors to exchange ideas • Look for entry points by customary and informal rules of social interaction to broaden alternatives • Work with champions and proud awards • Participation and exchange in international meetings, conferences of parties and similar events. • Position at different levels, exceptional commitments. • Engage in cross sectoral dialogue and cooperation to promote transparent, ethical and sustainable production and consumption standards in markets • Engage proactively in sustainable production, consumption, land use and related decision, building the safe space.

• Maintain, create and recreate, allocate resources • Promote capacities to nurture behavioural change	• Special attention to bridging capacity for knowledge weaving and validation • Strengthen all capacities • Special attention to negotiation capacity to overcome trade-offs • Foster trans- and interdisciplinary research • Promote valuation with all three method families • Develop capacities for integrated valuation • Strengthen social learning	• Strengthen and building all six capacities at all action levels, especially at subnational levels starting with the analytical, negotiation and social network. At national level concentrate on build and improve the governance and motivation ones. • Support building capacities for valuation, beginning with nature and behaviour ones	• Support curricula development for all three valuation method families. Use more nature and behaviour methods. • Strengthen all capacities. Special attention on analytical, motivational and social network capacities at subnational, and governance capacities at national level. • Promote training and capacity building among CEOs and employees on values ethics and sustainability standards • Foster trans- and interdisciplinary research methods and peer learning
• Strong work within all different levels and sector to recreate framework conditions and implementation support coordination and communication • Maintain and recreate vertical and horizontal collaboration • Strengthening communication between and within sectors	• Established alliances among research institutions/university and government and support Networks • Improve cooperation and collaboration between levels. Consider the last mile by policy formulation and implementation • Enabling sharing of resources between sectoral initiatives to leverage synergies	• Collaborate especially horizontally, and across local and subnational, and local and international scales	• Especially with civil society organizations, private sector and subnational levels, strengthening constructive forms of social interactions, show possible alternatives, build networks with international organizations and donors.
• Ensure information flows • Promote research, generate, adapt and use of data	• Generate and improve data on plural values through all three families of methods	• Identify alternative ideas, support innovation • Strengthen science-policy interfaces • Support awareness raising • Make information available and understandable for different audiences	• Support dissemination, access and use of diverse information • Search for alternative methods • Facilitate information sharing through appropriate platforms and programs • Make information available and understandable for different audiences
• Knowledge sharing, co-production, bridging and weaving • Ensure that high levels policy dialogues and platforms consider plural values. • Advocate for non-conventional approaches to valuation. Confront vested interests and power relations to allow transformative change.	• Make knowledge co-production work and build knowledge weaving • Knowledge sharing and exchange: support innovation and scaling up.	• Create "safe spaces" for knowledge sharing and co-production. • Support exchange and participation in international meetings. • Identify alternative forms of knowledge validation and credibility • Highlight relevant initiatives and brightspot stories	• Establish exchange opportunities for individuals and groups to ensure openness and willingness to learn and adapt • Create "safe spaces" for knowledge sharing and co-production. • Identify and understand different validation forms

• Generation, upgrade, adaptation of data, tools, methodologies and policies • All three family of valuation methods (nature, behaviour and statement valuation) possible, • Support integrate valuation with different sources of information • disseminate tools, methodologies, approaches, policies and indicators to assess, adapt and improve them • keep on working on implementation, monitoring, evaluation and adaptation of policies (in both formulation and implementation) to ensure inclusion, impacts and effectiveness. • Valuation purposes for information, decisions and technical • Design, improvement and implementation of public policy in existing laws, regulations and incentives, planning processes, research programs. • Promote social learning	• Develop, adapt and disseminate tools, methodologies, indicators to assess, adapt and improve policy • Use all three valuation families (nature, behaviour and statement) and booster policy uptake within the process • Improve design and implementation of strategies and tools considering disaggregate information and data • Improve design, use and institutionalization of tools for a better participation, knowledge weaving and build bridging capacities • Valuation purposes for information, decisions and technical are possible • Ensure target project funding • Promote advocacy and crowed funding • Foster valuation processes through methods that help to address and transform conflicts under conditions of high stakes and incommensurable values. • Plan, monitor and report processes aligned to principles of inclusive participation • Promote participatory planning and implementation mechanisms	• Enable access and use of information and valuation methods. Prioritize nature-based and behaviour methods • Support design and implementation of pluralistic approaches (e.g., confidential interviews, storytelling and dialogues). • Promote more integrated valuation • Make methodologies for pluralistic approaches understandable, accessible and feasible. • Contribute to sectoral processes, research programs, international agreements etc. where customary rights play a major role. • Support integration of policy support tools and methodologies into policy formulation • Conduct awareness raising campaigns in collaboration with civil society organization and actors that could be alternative champions. • Advocacy among different influential stakeholders, including policy makers, business communities and others • Support participatory planning and implementation mechanisms, considering and addressing limitations. • Seek and demand formal spaces and policies that invite to participation and consultation in decision making	• Support design and implementation of pluralistic approaches for restrictive contexts (see below), ensuring safety and well-being of participants and researchers, using more nature and behavior methods. • Make alternative policy support tools and methodologies understandable, accessible and feasible for actors of alternatives spaces • Valuation for information and technical decisions • Support community-based approaches and subnational levels for pilots • Collaborative projects CSR activities • Allocate subnational resources to enable the integration of diverse values at local planning and implementation level, when possible.

Guiding questions along the 8 iterative steps of the operationalization cycle

Step 1 – Clarify the scope and the purpose

- Why and where do we want to integrate multiple values?
- Where do we want to integrate them? In which sector?
- What are the main decisions, policies and/or management process that we want to address?
- What are the intended influences and expected outcomes?
- How will the use of pluralistic approaches contribute towards this outcome?
- Who are key stakeholders and actors to consider, and what are their roles and influences?
- How should different stakeholders participate in the valuation process?
- What methods can be used to ensure that stakeholders' needs, perceptions, worldviews and knowledge are reflected and woven into the valuation process?
- What resources are available?

Step 2 – Understand the context

- Which context pertain?
- How do the rules of engagement and participation look like?
- How do these influence rules of knowledge co production and weaving possibilities? (including validation and legitimation)
- What institutional conditions and capacities are given and could be used as a basis to start the work?
- What are the main gaps?
- What Institutional conditions and capacities should be created for a stronger contribution to transformational change?
- What stakeholders and actors should be considered and involved?

Step 3 – Represent diverse values

- Which and whose values need to be represented?
- What types of values are considered relevant by whom?
- What values are related with what outcomes?
- What effects and impacts do we want to achieve with them?
- What type of valuation is needed to inform decision makers?
- Which policy support tools and methodologies can be used?

Step 4 – Weigh up the trade-offs

- Which trade-offs and synergies arise?
- What and who do these relate to?
- Who stand to gain or to lose?
- What are the likely impacts?

- What alternative exists and what do they need to become feasible?

Step 5 – Trade the decision chain

- What are interventions are required?
- What are key decision processes and makers?
- On what basis are decisions made?
- What kinds of evidence and information are required to influence or change decision-making?
- How can this evidence and information be generated, and what gaps remain?
- What approaches and processes are required to ensure credibility, relevancy and legitimacy of the target audience?

Step 6 – Select policy options

- What are the drivers of change?
- Which instruments and interventions are needed?
- What are the implementation requirements?
- At what phase of the policy cycle should the policy option be considered?
- How can these be tailored to decision processes and audiences?

Step 7 – Find and use entry points

- What entry points are available?
- How to access these?
- How to leverage decision change?
- How to communicate effectively?
- What are actor s issues, challenges and priorities?
- What is typical for the stakeholder approach to work?
- What kind of relationships?
- Which preferences and approaches?

Step 8 – Reflect outcomes

- What outcomes were achieved?
- How effective were the tools and measures?
- What improvements are needed?.
- What processes and stakeholders should be addressed?

A list of online available guidance tools for operationalizing the multiple values of nature in decisions

- CBD (2007). Communication, Education and Public Awareness (CEPA).
- Toolkit: https://www.cbd.int/cepa/toolkit/2008/doc/CBD-Toolkit-Complete.pdf
- DEFRA (2011). Participatory and deliberative techniques to embed an ecosystem services approach into decision-making.
- An introductory guide. GTZ (2007). Multi-stakeholder management: Tools for stakeholder analysis: 10 building blocks for designing participatory systems of cooperation: http://www.fsnnetwork.org/sites/default/files/en-svmp-instrumente-akteuersanalyse.pdf
- ODI Planning Tools - Stakeholder Analysis: https://www.odi.org/publications/5257-stakeholder-analysis
- Reef, M. et al (2009). Who´s and why? A typology of stakeholder's analysis methods for natural resource management. Journal of environmental management.
- Wageningen University´s Centre for Development Innovation: Knowledge co-creation portal.
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