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Annex

Chapters of the assessment of the diverse values and valuation of nature.

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Chapter 4. Value expression in decision-making

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Executive summary

This chapter links diverse values of nature as communicated through different value articulation (“valuing” and valuation) processes to decision-making and its outcomes. It reviews the underlying causes of treating impacts on nature as external to, and ignored in, decisions by current political, economic and socio-cultural actors and institutions (i.e., conventions, norms and rules), and describes how on-the-ground drivers of nature’s decline can be transformed towards recovery, focusing on land and sea use. The modalities and practice of explicit valuation of nature (preceding chapter) in support of decisions, and the decision-making processes themselves, may need to further evolve to achieve global sustainability goals, the CBD 2050 vision of living in harmony with nature and the recent Kunming Declaration of the CBD.

1. Decisions supporting the current drivers of unsustainable human appropriation of nature derive from values embedded in existing laws and other institutions; these values conflict with the full set of Sustainable Development Goals to address development deficits within planetary boundaries (*well established*) {4.2, 4.3}. Values associated with a wide range of societal and policy goals, including the values of nature, are embedded in legislation, policies, economic value chains and markets, but value conflicts and trade-offs are commonly encountered. Negative effects on nature and people are handled as externalities in the decision-making process {4.2.4}. Internalization of environmental externalities can be based on modified instrumental values and/or increased awareness and recognition of relational values as principles guiding people’s motivations to act in certain ways {4.2.2}. Despite public commitment to environmental and social causes, market values commonly prevail where economic trade-offs among competing goals cannot be avoided {4.3.2}.

2. The interaction of knowledge and power shapes the values held by social actors as well as how these values are articulated in specific decision-making processes (*well established*) {4.2, 4.3, 4.4, 4.5}. Power relations are relevant to all aspects of decision-making, beyond simply enabling some actors to influence which outcomes will be favoured. Power-knowledge interactions shape the decision-making context, rules and other aspects of institutions, and determine what types of knowledge are given credence in the decision-making process, influencing whether and how certain values are expressed and made legible to decision-makers {4.2, 4.4, 4.5}. Power relations among social actors not only influence which values are privileged over others or what information is available to decision-makers, they also determine what rules guide decision-making {4.3.2}.

3. While value-based intentions embedded in national biodiversity strategies and action plans have been internalized by many countries and a range of policy instruments included in the context of the CBD 2020 Aichi Targets have been implemented, limited progress has been made on the Aichi Goals A and B that deal with underlying causes of biodiversity loss and cross-sectoral power relations (*well established*) {4.3}. The reported achievement in aligning development pathways with the values of nature through the global 2020 biodiversity agenda has been higher for the targets that are typically within the mandate and resources of a ministry of environment (or its equivalent; Aichi C, D and E), than for targets that require cross-sectoral cooperation and co-investment (Aichi A and B; focused on such issues as reducing perverse subsidies for unsustainable production, pollution control and reorienting development projects) {4.3.1}. Progress on Aichi Target 2 on accounting systems through the recent adoption of United Nations System of Environmental Economic Accounting-Ecosystem Accounting (UN SEEA) standards will facilitate globally consistent ecosystem accounting and reporting on the contribution of ecosystem services to the economy {4.3.6}. Compliance mechanisms beyond good intentions are still lacking, however, and despite Aichi target 3 to abolish perverse economic incentives, these incentives still provide mixed messages to natural resource users in many countries {4.3.2}. Similarly, programs aimed at responsible production and consumption (aligned with SDG12) require managing competing

values in decision-making processes, and a strategic approach to dealing with existing power asymmetries among stakeholders {4.3.3}.

4. Strengthening collective and customary territorial rights of IPLCs, beyond recognition and inclusion of their knowledge and valuation of nature, can yield substantial advantages for the protection of nature through local empowerment, transparency and accountability (*well established*) {4.4, 4.5}. Political empowerment of indigenous peoples and local communities, allowing them to regain control of their land management and resources, can align the values of external programs with values and priorities expressed locally {4.4.2}. Given the exclusion of many communities dependent on ecosystems for their livelihood, being recognized in valuation and impact assessments of development projects or policies is not enough; empowerment requires that the rights and values of such stakeholders over existing natural resources and ecosystems are recognized in the law {4.5.5}. Negative outcomes and conflicts can arise and escalate from misalignment between the values embedded in the design of ‘conservation’ or ‘sustainable development’ programs and ‘local values’ the values of local people and communities that are affected by the decision, including those involved in customary land use {4.5.2, 4.5.3}. In contrast, when decision-making authority rests with local communities, protected areas management can lead to the creation of new institutions like tribal parks or indigenous and community conserved areas that further promote empowerment and social benefits as the link between values of nature and people {4.5.2}. The absence of such rights typically leads to unjust outcomes across conservation and development decisions {4.5.2, 4.5.3, 4.5.5}.

5. Consumer dissatisfaction with the social and environmental values embodied in current trade, where it was expressed and led to pressure and self-regulation of global value chains, has made some, but limited, progress toward halting biodiversity loss and achieving fairer trade (*established, but incomplete*) {4.3.3, 4.5.4}. Consumer concerns for sustainability and justice have triggered corporate responses to change production practices (such as ‘deforestation-free’ claims), which can transform production systems more rapidly than public sector engagement within world trade institutions {4.3.3}. Farmer-level incentives for environmentally sustainable and socially responsible production systems are often insufficient, given the high costs for certification and transparency mechanisms, especially for small-scale farmers {4.3.3}. Positive environmental and social outcomes for sustainability certification across more of the production system may require public sector-led involvement enabling transparency of monitoring and reporting systems by civil society {4.5.4}. Effective implementation of sustainability certification programs implies aligning international standards to local values and conditions and establishing mechanisms for verified sourcing integrated into public-sector development planning {4.5.4}.

6. In designing economic incentive policies for nature and nature’s contributions to people, incorporating stakeholder values can reinforce rather than undermine motivations for environmental stewardship (*established but incomplete*) {4.3.4}. Economic incentives such as payment for ecosystem services programs can unintentionally affect people's existing motivations for nature conservation and environmental stewardship, in positive or negative ways, known as “crowding in” or “crowding out”, respectively. Anticipating and avoiding such effects can improve policy design and its communication but requires understanding of the conditions under which these effects emerge, in a social-cultural context. Current literature provides some guidance, but still has limited predictive ability on the crowding effects {4.3.4}. Similarly, market-based initiatives, such as sustainability certification, designed at international scales and not adapted to the local context can exclude local management practices and increase inequalities among stakeholders {4.5.4}.

7. Enhancing meaningful involvement of local actors in decision processes regarding the management of natural resources and the design and implementation of policy instruments increases the recognition and prioritization of the diversity of local values. Participatory processes in decision-making are more likely to lead to more sustainable and just outcomes

concerning the use, conversion or conservation of nature (*established but incomplete*) {4.5}. In protected areas, deep community involvement and institutional capacity for collaborative governance that allows for prioritization of local values (including instrumental and relational values) aligned with sustainable use promotes positive social and environmental outcomes, including reduced poverty, increased forest cover, enhanced fish stocks, and greater biodiversity {4.5.2}. Likewise, recognizing and respecting values of affected people in voluntary programs like payment for ecosystem services and sustainability certification can improve outcomes of the program, principally by affecting participation levels and program sustainability {4.5.3} and increasing financial and technical capacity of program participants {4.5.4}. Improvements in procedural justice are often associated with improved distributional justice and recognition, which often lead to greater public support for conservation programs, and in turn better prospects for their sustainability {4.5.2, 4.5.3, 4.5.4}, though formal evaluations of interactions between outcomes are scarce and more diverse metrics to represent different social and environmental outcomes (beyond poverty and habitat extent) are needed {4.7}. For large infrastructure projects, procedural justice can be (but very rarely is) manifested in terms of statutory representation for indigenous peoples and local communities in final decision-making, while distributive justice can be addressed through flexibility regarding size and siting of projects, mitigation measures, and improved benefit-sharing, including profit-sharing, which all contribute to better balancing between instrumental values for local livelihoods or larger scale developmental benefits and intrinsic or relational values for nature {4.5.5}. In all cases, increasing what appears to be “participation” through cursory or coercive involvement of local actors is not sufficient and may even be detrimental to both social and environmental outcomes; contextually-appropriate safeguards for the legitimate participation in the decision process by people living closer to and being more dependent on ecosystems are critical for balancing the diverse values held by stakeholders and ensuring positive outcomes for nature and people {4.5.2, 4.5.3, 4.5.5}.

8. Socio-environmental conflicts, resulting from lack of recognition of the diverse values held by different stakeholders, procedural injustices in the decision process, and perceived or anticipated distributional injustices in decision outcomes, can undermine the effectiveness of policy interventions (*established but incomplete*) {4.5}. Socio-environmental conflicts arise from clashes of values and power asymmetries among different groups: within local communities, between local communities and external actors (outside the local community), and among different scales of governance (e.g., local and national). Such conflicts often result from decisions that impact the local environment, and which do not consider the unequal distribution of burdens due to degradation of ecosystems and exclude the values of local people who are in direct connection with local nature {4.5.2, 4.5.3, 4.5.5}. Prolonged conflicts over large infrastructure development projects, for example, often result in repressive measures from the state, furthering perceptions of environmental injustice from locally affected communities {4.5.5}. Similarly, exclusion of local values in the establishment of protected areas can leave a legacy of mistrust or resentment that is difficult to repair, even with transitions to more community-based co-management approaches {4.5.2}. Misalignment between the values built into voluntary programmes like payment for ecosystem services and certification programmes and the values of local communities can provoke local protest and even sabotage, jeopardizing programme’s outcomes over time {4.5.3, 4.5.4}. However, conflict can also provide leverage for needed change, and knowledge gaps exist about the role of conflict in transformation of values {4.7}.

9. Valuation of nature has the potential to inform, to support decision-making and policy design at different stages of the policy cycle, at different levels of environmental governance (*established but incomplete*) {4.6.3, 4.6.6}. Valuation of nature can be used to inform agendas and support commitment to agreed policy goals {4.6.3, 4.6.6}. Indigenous and local knowledge can support determination of rights by the judiciary e.g., nature as a subject of rights *such as* the law of Mother Earth {4.4.2, 4.6.5, 4.6.6}. Valuation can provide technical support for policy formulation and design, for example helping to achieve agreement on the types of policy alternatives under

consideration, to determine voluntary incentives (e.g., levels of payment for ecosystem services), and to co-design and co-manage protected areas with different social groups {4.6.3, 4.6.6}. Valuation can be used for decisive purposes by supporting decisions for policy adoption and helping reach agreements about the means of policy implementation {4.6.3, 4.6.6}. Valuation can support in-course adjustments to implementation measures, or justification for continued budget allocations {4.6.3, 4.6.6}. In addition, the use of valuation methods can also provide agreed means of retrospective policy evaluation - when applied in the context of impact evaluation or natural capital accounting, valuation can also provide key ex-post information on the effectiveness of implementation and achievement of policy goals {4.6.3, 4.6.6}. Such ex-post applications of evaluation methods also serve the purpose of method development for researchers since they provide the opportunity to compare ex-ante and ex-post evaluation processes, and as such, the ability to test the effectiveness of methods used. Completing the policy cycle, valuation can contribute to renewed agenda setting and the development of new policies or projects to address emerging sustainability issues {4.6.3, 4.6.6}.

10. A large body of knowledge has been developed on methods for valuation of nature and nature's contributions to people, but there has been limited documented uptake of valuation methods to support public policy decisions at different scales (*well established*) {4.6.3, 4.6.4}. Guidance documents, valuation databases and standards provide ample resources and expectations for valuation results to support decision-making across a number of sectors and governance levels. Valuation research has produced a large body of knowledge developing explicit valuation methods and valuation results {4.6.2}. Yet, scientific literature for the period 1990-2020 reports uptake of this valuation knowledge in decision-making in less than 5% of published studies {4.6.3}. While the proportion of valuation studies making cursory reference to uptake has increased since the 1990s, documented uptake has not increased. Studies with a decisive or technical policy design purpose are somewhat more likely to document uptake than studies for informative purposes {4.6.3}. Economic valuation methods are only slightly more likely to document uptake than non-economic valuation methods {4.6.3}. The lack of documented uptake does not match expectations created by the exponential growth of the peer reviewed valuation literature {4.6.3}. Documentation of valuation of biodiversity in national biodiversity strategies and action plans is incomplete in most countries, While a number of countries report on uptake of valuation {4.3.5, 4.6.4}, many countries' national reporting on Aichi target 2 does not reflect actual valuation and accounting taking place {4.6.4}.

11. Standardization of valuation can increase the level of reliability and uptake of natural capital accounting into national-level policies (*established but incomplete*) {4.3.5, 4.6.4, 4.7}. Natural capital accounting aims to assess nature's contributions to national economies in standardized ways that allow for comparisons across countries and through time. The United Nations System of Environmental and Economic Accounts - Experimental Ecosystem Accounts (UN SEEA-EEA), provides an international statistical standard to guide the integration of largely unaccounted biophysical values of ecosystem services in national accounts. Many countries are pilot testing or starting to undertake ecosystem accounts {4.6.4}. The spatial and biophysical foundation of this more recent ecosystem accounting approach has the potential to inform (sub)national and local stakeholders and their decision-making needs, such as in land-use planning {4.6.4}. National accounts aggregate values at national level, which facilitate comparisons across time, countries, and sectors of the economy, but standardization at national level can come at the expense of not identifying some ecosystem service values at local level {4.3.5, 4.6.4}. Further research is needed on the valuation methods to account for values of ecosystem services for the purposes of national accounts {4.6.4, 4.7}.

12. Analyses of the barriers to uptake of valuation in public decision-making have focused on method quality issues, but understanding is limited concerning the role of power (*well established*). Power dynamics and actors' capacity to broker knowledge associated with valuation represents both a potential for, or barrier to, valuation uptake in the policy cycle

(*established, but incomplete*) {4.5, 4.6.2, 4.7}. Barriers to uptake of valuation in public decision-making have been attributed to the quality of valuation studies (recognition, procedural justice, reliability and validity) and to a lack of policy alignment between political jurisdictions, administrative levels and sectors. Barriers to uptake can also derive from a lack of timeliness of results, or lacking salience, credibility, legitimacy, and process documentation in the valuation process; it can also be due to the excessive cost and capacity requirements of plural valuation studies {4.6.2}. A number of best-practice valuation uptake cases demonstrate that overcoming these barriers to valuation uptake is possible, but rare {4.6.6}. The selective commissioning of valuation and emphasis on certain values by powerful stakeholders in policies, plans and their implementation is often to the detriment of marginalised stakeholders, their local knowledge systems and their worldviews {4.5.2, 4.5.3, 4.5.5}. The role of power in selective uptake of valuation in policy continues to be a blindspot in the valuation literature {4.6.2, 4.7}.

13. Valuation is more likely to overcome barriers to uptake throughout the policy cycle, if it is used to represent specific actors' interests and responds to their knowledge needs (*established but incomplete*) {4.6.6, 4.7}. To improve uptake of valuation in decisions, valuation practitioners can move away from assumptions that the results from valuation studies will influence general public policy discourse and undertake more –specific valuation studies that clearly define their policy purpose. Valuation commissioners can improve specification of the purposes of valuation in the terms of reference for valuation studies, lower valuation costs by standardization of or best-practice guidance on methods, and increase relevance and robustness by funding valuation exercises regularly throughout the policy cycle. Publicly funded valuation research can improve targeting of knowledge gaps in the use of explicit valuation for policy support over time {4.7}.

4.1. Introduction

4.1.1. Aims of the chapter

Chapter 4 of the *values assessment* addresses:

i. *The diverse conceptualization of values of nature and its benefits.* Specifically, this chapter examines the role of diverse values and valuation approaches in public decisions on ‘*institutions and governance*’ that are at the centre of the IPBES conceptual framework. Values are embedded in the institutional and economic drivers of the global production system, which are the main indirect drivers of biodiversity loss. Assessing these values not directly related to nature is outside the scope of this assessment, but the chapter provides examples of how the current poor representation of values of nature, embedded in legislation and trade regulations, cause ecosystem degradation.

Figure 4.1 shows the relationship between the diverse values of nature and the way values are articulated (arrow 1) and how this is linked to decisions (arrow 2), but modified by power (arrow 3A) and knowledge (arrow 4A; including diverse knowledge systems such as scientific, local and indigenous knowledge) and their interactions with values held and values articulated (arrows 3B-3D and 4B-4D). Decision-making occurs through the creation and reform of institutions (conventions, norms and rules), and within the mandates of existing institutions, in a multi-phased process (a “policy issue cycle”, shown as the spiral on the right side of Figure 4.1), with different entry points for value articulation (expression). Such decisions lead to outcomes (arrow 5) for well-being, equity and sustainability, that themselves interact with nature (arrow 6A), knowledge (learning; arrow 6B), power (determining winner and losers; arrow 6D) and the ways values are expressed publicly (arrow 6C). The complexity of these multiple feedback loops challenges the conceptual simplicity of expectations that better ways of articulating nature’s values (arrow 1; through informal ‘valuing’ or more formal ‘valuation’ methods, as described in Chapter 3) alone will lead to better decisions and outcomes for people and nature, or at least have direct leverage on policy and societal change.

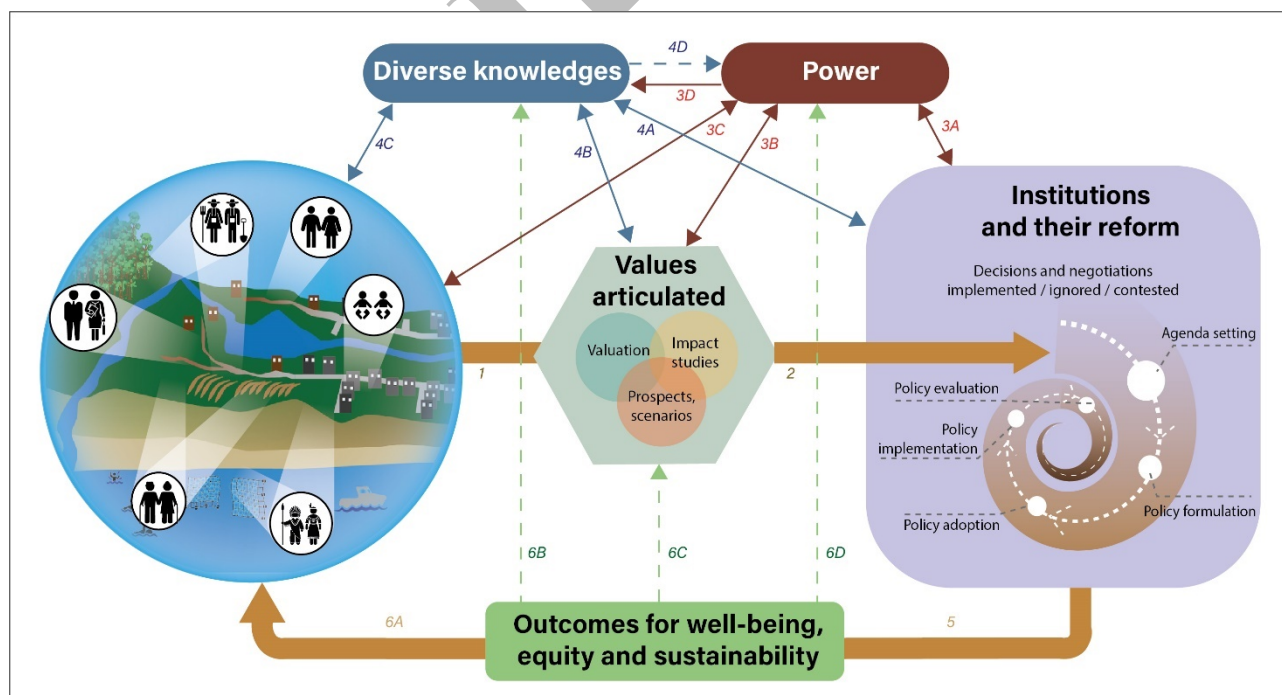


Figure 4.1. Value articulation (through informal ‘valuing’ or formal ‘valuation’) as the link between values held across diverse people, and institutions and decisions, that lead to outcomes for well-being, equity and sustainability, is strongly influenced by

power and knowledge. This chapter explores the complexity of these relationships (arrows) between values, institutions, power, knowledge, and outcomes in decision-making.

ii. The diverse valuation methodologies and approaches. This chapter evaluates the extent to which valuation methods and approaches have been designed and carried out for policy and decision-support purposes (arrows 1 and 2 in *Figure 4.1*). It builds on the methods typology of *Chapter 3* and its overview of the most commonly used valuation methods, as well as their characteristics, including how they address different social and societal values.

iii. The different approaches that acknowledge, bridge and integrate the diverse values and valuation methodologies for policy and decision-making support. This chapter evaluates the evidence of implicit valuing of nature and its contributions to people, manifested through the decisions made tacitly or explicitly within different institutions and governance regimes, across policy cycles. It also examines how values are integrated into decision-making processes resulting in different outcomes of decisions regarding, e.g., protected areas, payments for ecosystem services, sustainability certification and infrastructure development. This culminates in an assessment of the evidence for actual uptake (and barrier to uptake) of formal valuation in policy and decision-support.

iv. Knowledge and data gaps and uncertainties. The chapter assesses the role of power in determining uptake of valuation, and the outcomes of value conflicts between interests in decision processes. In section 4.7, knowledge gaps that limit the bridging and bringing together of diverse voices in decision-making and policy, are identified. The role of power relations in determining knowledge gaps and the uncertainty due to dynamics of decision-making runs through the evaluation of the evidence in all sections.

4.1.2. Chapter outline

Section 4.2 posits that the more values taken into account, the more complex decision-making becomes. Aspects that matter to the decision-maker are typically prioritized over externalities. Negative impacts on environmental quality, ignored as externalities by decisionmakers may lead to conflicts between stakeholders. Values expressed by other stakeholders could matter to a decision-maker because (i) the people expressing those values matter to the decision-maker, (ii) the arguments as such may be convincing, or (iii) both (see 4.2.1). Even if valuation makes externalities an explicit consideration of decision-makers (see 4.2.2), trade-offs are to be made – often in a stepwise progression from ignorance, denial, conspiracy theories towards shared understanding, common goals and fairly distributed responsibility for means of implementation. These steps are understood as “issue cycles” (see 4.2.3), traced through the example of balancing different goals formulated for the 2030 Agenda for Sustainable Development (see 4.2.4)

Section 4.3 considers how, across scales, existing institutions (conventions, norms and rules) and decisions reflect the values (arrows 1-2 in *Figure 4.1*), power (arrows 3) and knowledge (arrows 4) that shaped them. At global scale, decisions concerning both incremental (small-scale, short-term) and potentially transformative change were embraced in the Aichi 2020 biodiversity targets (see 4.3.1). However, within national jurisdictions court cases challenge the interpretation of existing legislation where drivers of business-as-usual decisions about mining, large infrastructure and global trade intersect with values of nature and impacts on local people (see 4.3.2). At the individual scale, an increasing share of consumers internalize and take responsibility for their environmental footprints, and put pressure on the private sector. This has, in a growing number of commodities, led to voluntary certification responses but perspectives on their effectiveness are diverse (see 4.3.3). Policies such as payments for ecosystem services are designed to financially internalize externalities of environmental stewardship not appreciated by current market prices; however, they can have

unexpected effects on existing motivations to act in different ways by people (see 4.3.4). National reports on meeting the Aichi commitments to reduce perverse subsidies for land use that damages nature, and to ensure that national accounting systems include the externalities of national development policies show that progress on those targets has been limited (see 4.3.5).

Section 4.4 analyses how values of nature are expressed and taken into account in decision-making processes in multicultural and intercultural rural territories. Three cases are used to highlight how the diversity of values of nature are included in the decision-making process in different geographies and how knowledge and power relations influence the decisions to consider the diverse values of Indigenous Peoples and Local Communities (IPLCs). The case of governance institutions in the Amazon (see 4.4.2) illustrates how values of nature taken into account in the decision-making process change through time, subject to contradictions and conflicts between the national economic goals, the conservation of the rainforest, and the well-being of IPLCs. In contrast, the examination of research of protected spaces, including indigenous community conserved areas and cultural landscapes (see 4.4.3), shows the continuity of values when the IPLCs have security and autonomy over their territories. Finally, the conservation and sustainable use of agrobiodiversity (see 4.4.4) implies diverse and even contrasting values of agrobiodiversity that come into tension in the decision-making processes between various actors implied in the agricultural sector.

Section 4.5 examines how values (*Figure 4.1*, arrow 2), along with knowledge (arrows 4) and power (arrow 3), influence decisions that lead to social and environmental outcomes (arrows 5 and 6), feeding back to knowledge and power (arrows 6B and 6D). This process is examined in four different decision contexts spanning the range of human interactions with nature: protected areas (see 4.5.2), payments for ecosystem services (see 4.5.3), commodity sustainability certification programs (see 4.5.4), and large development projects such as mining and dams (see 4.5.5). Literature reviews of systematic reviews as well as in-depth case studies provide robust evidence to evaluate under which conditions diverse values lead to more sustainable and just outcomes of decisions.

Section 4.6 reviews evidence that valuation methods (as described in *Chapter 3*) are being used by stakeholders for different purposes in the policy cycle (*Figure 4.1*, arrow 2). An analytical framework describes barriers to and criteria for uptake of valuation in the policy cycle, due amongst others to power brokerage (arrow 3A), robustness of valuation knowledge (arrow 4A) and the way valuation is articulated publicly by methods (arrow 4B; see 4.6.2). A systematic review of published research focused on the valuation of nature's contributions to people, including ecosystem services, finds continuing research blindspots regarding documentation of stakeholder uptake (see 4.6.3). Only part of documented uptake of valuation scientific publications coincides with national reporting on valuation practice and ecosystem accounting (see 4.6.4). The potential for uptake of local and indigenous valuation knowledge in policy plans is reviewed and exemplified (see 4.6.5). Finally, the section showcases seven case studies demonstrating how barriers to valuation uptake can be overcome for a range of methods addressing stakeholder needs at different governance scales and policy cycle stages (see 4.6.6).

Section 4.7 summarizes critical knowledge gaps identified in the preceding sections and discusses ways forward to support decision-making through value articulation.

4.2. Valuation of nature: relevant but insufficient for public policy decisions

4.2.1. Relevant but insufficient

The often-implicit expectation that valuation will appeal to all involved in decision-making and improve decision making through a common understanding of implications of alternative choices (arrows 1 and 2 in *Figure 4.1*), refers to a rationally economic, instrumental worldview. This ignores the reality of power differences (Juerges et al., 2021) and plurality of knowledge. A large empirical body of literature focuses on the *bounded* rationality of actual human decision-making (Kahneman, 2011; Thaler, 2015; Welch, 2020). The alternative, political, interpretation that participation in decision-making is a social process and open to influencers, status and power relations is generally accepted. Current concepts of “relational values” and “sociality” (Fiske, 1992; Hofstede, 2019) articulate what the bounds to rationality are: human decisions relate to reference groups, rituals, affiliation, status and power; they include “eudaimonic” as well as hedonic concepts of human well-being in a context of cultural diversity (see *Chapter 2*), and are open to articulations of relational values of nature. These articulations commonly use metaphors and language also used to describe human-to-human relations. Human openness to “influencers” is exploited by active misinformation campaigns and conspiracy theories protecting interests of those resisting change (van Noordwijk, 2019). Beyond value articulation throughout the public decision-making cycles, at least four other elements (voice, vote, violated rights and laws, and invoices paid) contribute to public decisions and their effectiveness (Cashmore et al., 2010; Elling, 2012; Glucker et al., 2013). While most of these aspects are outside of the scope of this *values assessment*, they are considered to be the *context* in which efforts to value nature are more, or less, effective. They may also contribute to the limited incidence of explicit valuation in various political and social contexts discussed in *section 4.6*. Hence, valuation of nature (in the plural sense of *Chapter 3*) is relevant but insufficient to enable public decisions within social and environmental policy mandates.

The relative influence of the rationality (benefit-based) and sociality (relationship-based) sides of decision-making on public policy is poorly understood (Hofstede, 2019), but likely has consequences for the way valuation studies can be designed, executed and communicated (van Noordwijk, 2019, 2021). Beyond the content and conclusions of valuation studies, the way results are communicated, the legitimacy and status of the people communicating is, an often undocumented, part of the relevance of valuation. In the sociality perspective on decision-making, decisions still need a *post-hoc* rationalization in terms of values for external communication. Deliberate use of attractively sounding values as a coverup (greenwashing) for resisting change, can remain part of the public negotiation process until it is exposed as such.

In trying to understand the role of institutions (‘rules in use’) in constraining and modifying individual decisions, the rise and fall of specific institutions can be related to the way they function. Two broad categories of public decisions are “constitutional” and “allocational” (Ostrom, 1990). The first, politically, shape institutions (or policy instruments), including those for commons and for defining boundary conditions to, and interacting with private (and corporate) decisions. The second type, economically, uses institutions to modify benefit distribution within existing mandates. Jointly these processes and their outcomes define *governability*, ‘as a balance between the ambitions of all stakeholders and what can be operationalized’ (Kooiman et al., 2008).

Public policy decisions interact with and modify the boundaries (rules and rights, incentives, motivation) that enable decision makers to internalize at least part of the externalities they produce in their current decisions, but they are themselves challenged, modified and shaped by societal (including political) processes (*Figure 4.2*). They typically combine rules, incentives, and motivation

in “policy instruments” (Persson, 2006) that interact with private and civil society decision-makers and aim to induce desired behaviour. As influences on public decisions, current values of nature complement the understanding of past and current human impacts on nature (IPBES, 2018a, 2018b, 2018c, 2018d, 2019a) and the expected consequences (prospects) of future scenarios (IPBES, 2016a). Jointly the past, present and future inform the rationality and knowledge base of human decisions (*Figure 4.2*), but if conveyed by respected voices, also their sociality.

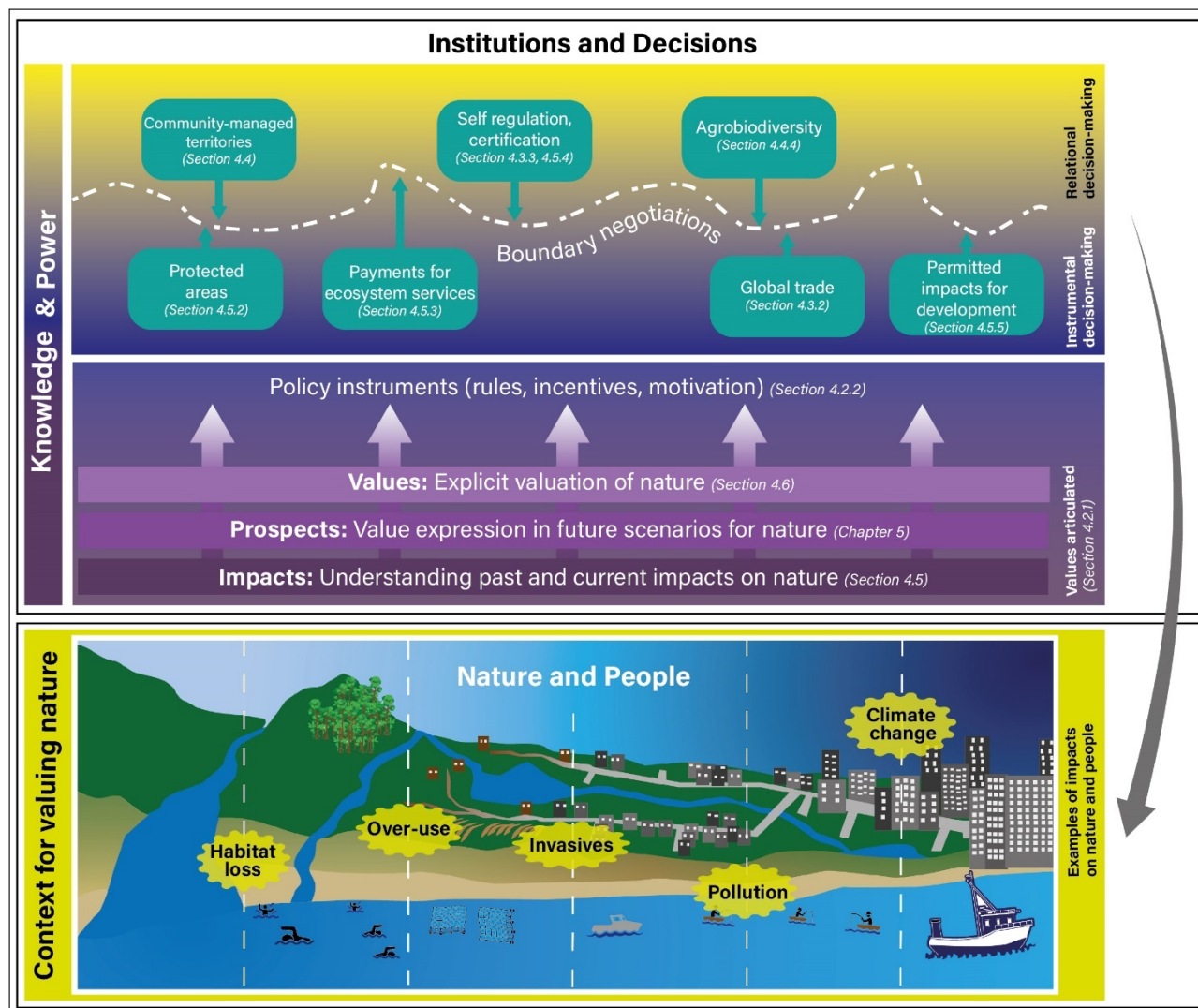


Figure 4.2. Gradients of land and sea use intensities (lower panel), respond to and impact issues of concern, including the five main drivers of biodiversity loss; Knowledge of the impacts, values at risk and prospects in future scenarios inform political, economic and societal decision and negotiation processes (upper panel); some of the specific policy instruments discussed in this chapter are positioned in the gradient and evaluated for social and environmental outcomes.

Issues of concern arise across the gradients of land use (from wilderness to urban) and sea use intensity (from coastal zones to open oceans) and their teleconnections that shape life on land and life in water. These gradients determine where the top five direct drivers of biodiversity loss (as ranked by IPBES (2019): habitat loss, over-use, invasives, pollution, and the causation of climate change) are located. They also suggest that development deficits (SDG 1-11) are linked to geographic areas where existing conservation efforts are concentrated. In this section current understanding of the processes involved in public decision-making is reviewed in response to issues of concern that relate

humans to nature. The formulation of goals (such as SDGs) is a major steppingstone in the processes of change that connect global impacts to local actions, by clarifying externalities of past decisions.

4.2.2. Internalizing externalities

Some values and expected impacts of decisions are considered important, others not. These latter, known as ‘externalities’, are of two types: unforeseen social or environmental impacts, and foreseen impacts beyond the group decisionmakers care about. Decision-makers care about expected impacts on their social group (known as ‘in-group’ in social and social psychology literature; Aronson et al., 1994), often with family at its core, but extending to friends, clan, tribe, ethnicity, class, generation or other social stratifiers depending on cultural context (Hofstede, 2019). For the first category of externalities efforts to better inform decision-makers of likely impacts and values potentially affected can help; for the second, the underlying values of decision-makers on who and what they themselves care about will have to change before decision-making will change.

Instrumental values of nature that express how nature-based solutions support human goals are challenging the ‘rationality’ of ignoring human impacts on nature, while relational values address the way in-groups are perceived. Internalization means bringing values into the inner spheres of decision-making, at the interface of rationality and sociality. The most common interpretation of internalization only refers to one of the three basic policy instruments: incentives, rules, and motivation (Bemelmans-Videc et al., 2011). It can, however, take different forms (van Noordwijk et al., 2012):

- Rules that regulate human activity, making environmental impacts subject to permits and prior assessments, often made politically palatable by compensating for previous, implicit or explicit, rights to pollute or over-use of resources,
- Incentive structures modified as in payments for ecosystem services programs and pollution charges, but also changing co-investment regimes, expressing shared public-private responsibility and risk management,
- Accountability for side-effects (linked to “duty of care”, “due diligence” concepts), with social and financial consequences, and threats of legal prosecution; and related to that, creating moral accountability for footprints, e.g., through (threats of) consumer boycotts, political demonstrations or other forms of protest, and standards for free, prior and informed consent by local stakeholders,
- Changing the boundaries of what is perceived as in-group to include (parts of) nature; for example, early-age environmental education influences emotional aspects of motivation; most languages differentiated between ‘friends’ and ‘enemies’ among plant and animal species and the associated terms may need to be challenged early on.

These different pathways to internalization of externalities can rely on implicit and explicit values and valuation, in the context of local knowledge and power dynamics (van Noordwijk, 2021). As analysed by Chapman et al. (2020), the apparent success of a policy instrument such as payment for ecosystem services in Costa Rica can be due to “optimal ambiguity”, that allows interpretation and rationalization to differ between high-level policy discourse (market-based instruments) and its interpretation on the ground (public co-investment in local stewardship), crossing over between payment for ecosystem services paradigms (Leimona et al., 2018; Shapiro-Garza et al., 2020; van Noordwijk et al., 2012) implemented as a policy mix (Barton et al., 2017). *Annex 4.1* provides an example of how in Indonesia a phase of violent conflicts was transformed by a combination of rule-, incentive- and motivation-based approaches to internalization in a single landscape.

4.2.3. Multi-scale, sequential political decision-making processes

Public governance decisions can allocate resources (land use rights or budgets, for example), change the rules governing specific activities (such as permitted uses of biocides), or set generic incentives (including subsidies or performance-based payment for ecosystem services). Most decisions impacting nature involve local-to-global scales, with the higher levels defining the boundary conditions within which lower levels can fine-tune decisions, within the trade-offs relevant at each scale. In line with the subsidiarity principle (Carozza, 2003; Vischer, 2001; Wanzenböck & Frenken, 2020), constitutional and allocational decisions start with a choice to make a decision, delegate to higher or lower levels of authority, or delay for further analysis and consultations. For example, the Aichi targets (or the next set of CBD targets), negotiated in international fora, may represent a country's level of ambition for the amount of their land placed under environmental protection; the (allocational) designation of specific areas as a national park (or other protected area category) may then be identified and allowed resource uses within its boundaries determined at the national scale; yet day-to-day management decisions, consultation with local communities (or not), and implementation strategies are conducted at a local scale. It is these continual and evolving local decisions that ultimately determine the success of the protected area in achieving its desired aims.

Political decision-making is understood as a process where political and public actors interact with the private sector, civil society/local actors, or (often) both. Decision-makers respond to continuously emerging "issues of concern" in an issue attention or policy cycle (Downs, 1972; Jann & Wegrich, 2007; Peters & Hogwood, 1985; Tomich et al., 2004). *Figure 4.3 shows that the issue cycle involves many types of decisions. Some issues get accepted as part of the agenda (decision I), and after analysis get sufficient traction (decision II) to lead to revisiting and reframing of goals (decision III), to the acceptance of these goals (decision IV) and formation of new institutions (constitutional rules of the game, policy instruments) with delegated authority and budget (decision V) to implement these rules (decisions VI), inducing further responses by other actors (decisions VI).*

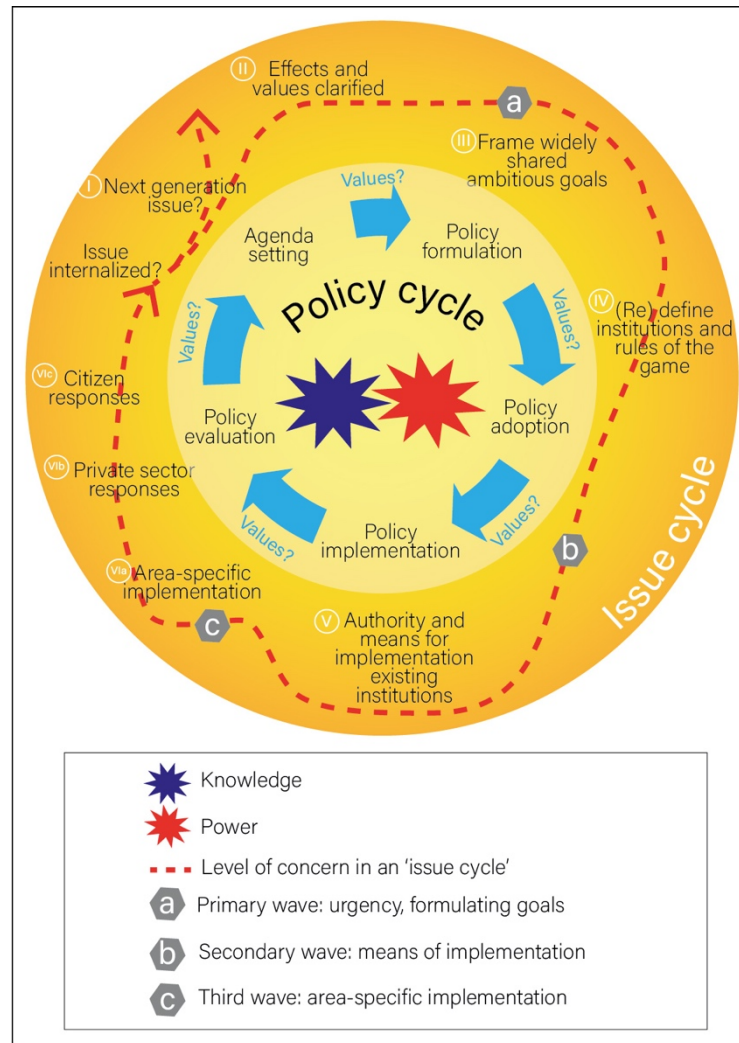


Figure 4.3. Schematic representation in the inner circle of stages in a policy cycle and the public (political), private (economic) and civil society (socio-cultural) decisions (I - VI) that drive the outer circle of issue cycles. With various entry points for value articulation; three waves of increased public concern and political pressure are indicated.

4.2.4. Incremental and transformative change

Decisions can be classified in many ways, including but not restricted to the typology presented in *Chapters 1* and *2*. Ostrom (2005) identified seven types of constitutional decisions that define the boundary, payoff, position, choice, scope, information, and aggregation of allocational (economic) “rules in use” by any institution. Payoff rules determine if, and if so what, valuation methods are deemed valid knowledge about the costs and benefits of actions. Other rules in use determine the context of action situations, and implicitly value outcomes of those actions. Valuation as “boundary work” at the science-policy interface (Cash et al., 2003; Clark et al., 2016), tries to match the supply of and demand for knowledge of values of nature in both types of decisions. In the relationship between constitutional plus allocational decisions and specific values of nature (i.e., instrumental, relational and intrinsic values), four interconnected levels need to be mentioned (Meadows, 1999):

- *Parameters* (or *data*), where metrics, parameters, expected (discounted) costs and benefits associated with quantified instrumental values interact with explicit, often binary, decisions to accept or not accept proposed projects;

- *Feedbacks*, where values of reduced riskiness of investment, potential social pay-offs, reciprocity and status indicators, interact with efficiency-oriented decisions on roles, cost and benefit allocation among multiple actors, with attention to implementation and transaction costs,
- *Institutions*, where aspects such as recognition, stewardship, eudaimonia, group (club) membership, and avoiding conflict, interact with constitutional (effectiveness) decisions about rules of the game, boundaries to rights, in-group membership/exclusion and security (risk sharing) in determining how and which values are included in decisions
- *Goals*, where invaluable, non-negotiable held values of respect, identity-related self-expression, ethics, and sovereignty/autonomy concepts such as free and prior informed consent, interact with equity decisions on universal goals, ways to internalize externalities, intergenerational responsibility and ensure continuity.

Mismatches may arise if valuation does not align with what is at stake in specific decisions. The issue cycle in *Figure 4.3* suggests that public debate on issues may need to proceed to the fourth level (goals) before identifying “on the ground” solutions in decision making processes (*Figure 4.4*). Yet, once goals have been agreed on, the steps towards means on implementation, empowerment of implementers and accountability have to be followed, to avoid so-called implementation gaps. Processes that only influence the first two layers may be described as “incremental change”, processes that reformulate goals and institutions have the potential to induce “transformative change” -- at least if the implementation gap is addressed.

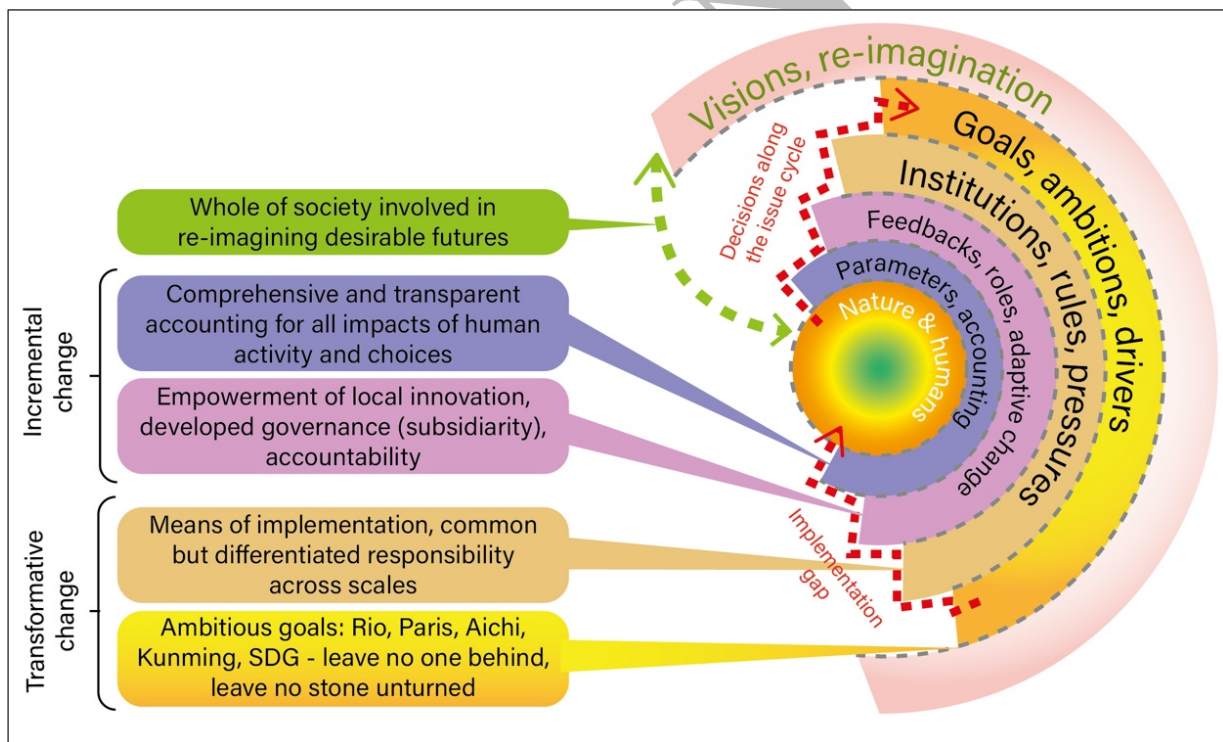


Figure 4.4. Overview of decisions that are part of issue cycles (upwards from data towards goals) and can help resolve issues of concern in the public policy sphere, progressing towards stronger leverage (*sensu* Meadows, 1999) and reduce the implementation gaps for broadly accepted goals that need to have means of implementation, accountability and accounting attached to them

When an issue cycle has led to the formulation and acceptance of goals, the initial proponents may still primarily express the relational and/or intrinsic values behind these goals, but the goals and the costs of achieving them turn to be articulated as instrumental values. Where the goals have achieved

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legal status, the threat of litigation can add strength to efforts to achieve them. *Annex 4.2* reviews the multi-layered decision-making in a European country around restricting atmospheric nitrogen emissions from agriculture, traffic, and industry responded to and transformed values and required decisions by the country's highest court to force the political sphere to deliver more than words and promises.

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4.3. Policy instruments, values, decisions and power

4.3.1. Public policy instruments in the Convention on Biological Diversity

Existing institutions reveal the history and path-dependency of the forces that shaped them, as well as the modifications and adaptations that they accumulated over time (Bateman & Mace, 2020; Baumol et al., 1988; Freeman III et al., 2014). For example, the Aichi targets represent institutional history. Global participation in the Convention on Biological Diversity (CBD) demonstrates that environmental issues have gained recognition as sectors of society, with budgets, space, and government institutions dedicated to ambitious goals formulated. Reaching these goals, however, requires change beyond the mandate of specific Ministries and involves trade-offs with other, valued, sectors of society, including those providing health, food, water, and energy, overcoming the implementation and compliance gaps (Buchanan et al., 2020; Butchart et al., 2016; Tittensor et al., 2014). The five objectives that guide the 20 Aichi targets for 2020 of the CBD are constructed along a driver-pressures-system state-impacts-responses framing in five strategic goals (*Table 4.1*).

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Table 4.1. Aichi goals and targets, examples of policy instruments used to achieve them and interacting SDGs. E = Economic, P = Public policy (political), S = Social-cultural

Aichi CBD goals and targets for 2020	Decision-making typology* (see Chapter 1)			Policy instruments discussed in Chapter 4	SDGs (beyond 14 & 15) intersected
	P	E	S		
Strategic Goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.					
1: Awareness increased	●		●		
2: Biodiversity values integrated	●	●	●	National accounting & valuation	1, 16
3: Incentives reformed	●	●	●	Payments for ecosystem services Green growth policies	1, 2, 6, 7
4: Sustainable production and consumption	●	●	●	Trade regulation Certification (commodities, jurisdictions)	12
Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use					
5: Habitat loss halved or reduced	●		●	Payments for ecosystem services	1, 2, 7, 10, 12, 13
6: Sustainable management of marine living resources	●	●	●		2
7: Sustainable agriculture, aquaculture and forestry	●	●	●	Agrobiodiversity	2, 12
8: Pollution reduced	●	●		Environmental impact assessments	2, 3
9: Invasive alien species prevented and controlled	●	●	●		15
10: Pressures on vulnerable ecosystems reduced	●	●	●	Environmental impact assessments	
Strategic Goal C. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity					
11: Protected areas increased and improved	●		●	Protected areas	
12: Extinction prevented	●		●		
13: Genetic diversity maintained	●	●	●		
Strategic Goal D. Enhance the benefits to all from biodiversity and ecosystem services					
14: Ecosystems and essential services safeguarded	●	●	●	Payments for ecosystem services	13
15: Ecosystems restored and resilience enhanced	●	●	●	IPLC territorial management	13
16: Nagoya Protocol in force and operational	●	●			2, 3, 16
Strategic Goal E. Enhance implementation through participatory planning, knowledge management and capacity building					
17: NBSAPs adopted as policy instrument	●				16
18: Traditional knowledge respected and integrated	●		●	IP territorial management	16
19: Knowledge improved, shared and applied	●	●	●		16
20: Financial resources from all sources increased	●	●			16, 17

The reported achievement of Aichi targets by 2020 (SCBD, 2020) has been higher for targets 11-20 (Goals C-E), typically within the mandate and resources of a Ministry of Environment than for targets in objectives A and B, such as pollution control and reorienting development projects that directly interact with mainstream business-as-usual economic development and its fiscal policies, requiring

cross-sectoral cooperation and co-investment. Target 11, increasing the space for protected areas had the highest reported success, controlling pollution (target 8), the lowest (*Figure 4.5*).

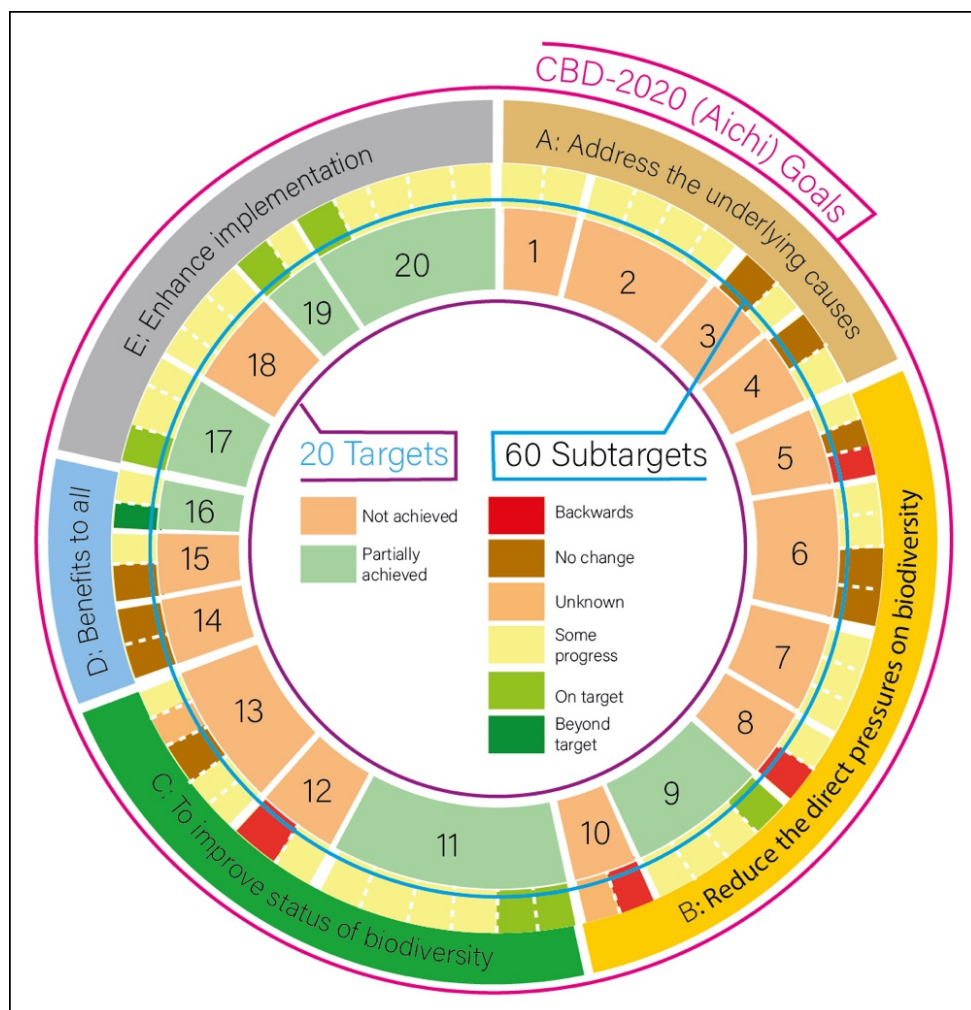


Figure 4.5. Reported progress in National Biodiversity Strategies and Action Plans of the Aichi targets (*Table 4.1*) for the CBD (SCBD, 2020).

The targets differ in institutional translation. Some targets are claiming a considerable part of planetary space (so-called “conservation grabs”; Holmes, 2014; Lunstrum, 2016), implying conflicts over rights, values and livelihoods of local communities (Büscher et al., 2017; Kopnina et al., 2018). Beyond values of nature, these deal with trade-offs with other quality of life aspects. Targets more directly in the mandate of ministries of environment (or their equivalents in national contexts) may be constrained by budgets (and thus bargaining power in political realms) rather than conflicts with other national priorities, as reflected in the full set of 17 SDGs. The language of nature-based solutions aims to broaden coalitions.

Where institutions fail to effectively address the issues for which they were created it may be a path of lower resistance to create new ones, rather than replace or change the power of existing ones (Andrews, 2013). This contributes to the institutional jungle through which only skilled guides can find their way, creating niches for new specialized combinations of knowledge and power. Against this background it should not be a surprise that “to-whom-it-may-concern” type knowledge products, including results of valuation studies, have a relatively poor track record of uptake in decision making processes (Cash et al., 2003; Clark et al., 2016). Many public policy decisions deal with the interface of public and private sector values and institutions.

4.3.2. The interface of public and private sector values in global trade

Existing economic drivers of natural resource extraction and appropriation (via institutions such as financial and industry legislation, subsidies, trade agreements and other formal economic institutions) make trade-offs between economic growth and the protection of nature's contributions to people (NCP). These institutions reflect and reinforce the knowledge-power nexus. They reveal how much less effective valuation of nature as abstract entity may be compared to the values currently expressed in the SDGs in the (international) public domains or by indigenous peoples and local communities. In particular, the formal institutions governing the global supply chains, and the natural resource extraction these institutions enable, reveal very different values of nature compared to the values expressed by indigenous peoples and local communities, generating conflicts around extractive projects (Ghazoul & Kleinschroth, 2018; Zeng et al., 2022).

International trade is a major economic driver causing ecosystem degradation and the IPBES Global Assessment (IPBES, 2019b) emphasizes the importance of reforming trade agreements to internalize externalities. In the scientific debate on trade and environment, investor-state dispute settlement has been identified as one of the most controversial individual trade institutions (Pelc, 2017). Investor-state dispute settlement is a mechanism that provides private foreign investors legal recourse, in ad hoc international arbitral tribunals, against new government regulations which harm their investments (Bronckers, 2015).

Investor-state dispute settlement mechanisms in the North American free trade agreement (NAFTA) have increased the power of corporations to get compensation from governments for "indirect expropriation," even if governments did not intend or gain from the regulation (Pelc, 2017). For example, the California-based waste disposal company, Metalclad, obtained a \$16.7 million award against Mexico after the arbitration panel in 2000 found that the Mexican decision to make a nature reserve was an indirect expropriation of Metalclad's investment in a pre-existing landfill (italaw, 2015).

Investor-state dispute settlement mechanisms are also included in the trans-Pacific partnership (TPP), and the comprehensive economic trade agreement (CETA); in the latter referred to as an investment court system which is a transition to the creation of a multilateral investment court (Mbengue & Schacherer, 2019). Some kind of mechanism is probably needed to protect investors from indirect expropriation (Quick, 2015). However, Bernasconi-Osterwalder and Mann (2019) argue that CETA represents a missed opportunity to include recent advances in corporate social responsibility and sustainable investments and therefore has reinforced the protection of the investor's right to profits. Besides, the values expressed by the investor-state dispute settlement institution have also resulted in regulatory chill (Tienhaara & Ranald, 2011), i.e., "*strategic litigation by investors whose aim is not only to obtain compensation but also to deter governments' regulatory ambitions*" (Pelc, 2017).

Values of various aspects of nature can be revealed from national legislation as well as other institutions and policies for natural resource extraction (e.g., mining policies). By comparing the gross and net revenues of the extraction projects enabled by such policies with the social costs of these projects, it can be estimated how society values nature when designing and implementing these policies and institutions. It was difficult to make a systematic literature review because mixed methods are used to estimate the social costs in these case studies. The first two cases, coal mining in Colombia (*Box 4.1*) and the Mountain Valley pipeline in the United States of America (see *Box 4.2*), illustrate the difficulties of policy integration and mainstreaming the values of nature in sector policies and implementation.

Box 4.1. Coal mining in Colombia.

Mining in Colombia is promoted by the mining code (El Congreso de Colombia, 2001) to advance industrialization, generate jobs and development, increase exports and produce royalties for the state (Cardoso, 2015). Policies to protect ecosystems and biodiversity as well as rights granted to Afro-descendant and indigenous communities have been violated by permits for exploration and mining (ABColumbia, 2012; Vargas, 2013). In a recent assessment, mining activities account for 42% of reported environmental conflicts in Colombia (Pérez-Rincón, 2014).

The open-pit coal mining in Cesar takes place in tropical dry forests. Local communities protested in 2007 against high levels of air pollution and the presence of respiratory disease (Cardoso, 2015). Using mixed methods, Cardoso (2015) estimated the external costs for extraction and transportation of coal within Colombia to 110-160 USD/ton, or 0.014 – 0.02 USD/kWh (1 ton = 8141 kWh). The largest components of this cost are public health loss (extra mortality and morbidity), mining waste effect on soil, and transportation (noise and air pollution). The global external cost for coal combustion has been estimated to 370 – 1900 USD/ton (Epstein et al., 2011) and to 1,140 – 2,770 USD/ton coal (Shindell, 2015). This includes the effect on climate change and other pollution. Hence, the external cost of coal, for extraction, transportation and combustion, can be estimated to 480 – 2,930 USD/ton (0.06 – 0.36 USD/kWh).

The market price (gross revenue) of coal at the time of this analysis (June 2019) was 70 USD/ton coal and has over the last ten years varied between 50 and 140 USD per ton. The net revenue for coal producers is the gross revenue minus the internal costs for extraction, transportation and other operational costs. The external cost of carbon by far exceeds the 10-year highest market price by a factor of between 3.5 and 20. For the coal producing country, the external costs for extraction and transportation are of the same magnitude as the highest market price and when the internal cost for extraction and transportation are subtracted the net revenue becomes negative. These estimates suggest that coal mining and coal combustion are uneconomic activities when external costs are considered (Cardoso, 2015).

These external costs affect at least eight nature's contributions to people: (i) habitat creation and maintenance, (ii) regulation of air quality, (iii) regulation of climate, (iv) regulation of freshwater quantity, location and timing, (v) formation, protection and decontamination of soils and sediments, (vi) physical and experiential interactions with nature, (vii) symbolic meaning, involving spiritual, religious, identity connections, social cohesion and cultural continuity and viii) preservation, by organisms and ecosystems, of options for the future (González-Martínez et al., 2019). Hence, the value of these nature's contributions to people is inadequately recognised by policies and institutions promoting coal mining and coal combustion for energy (Cardoso, 2016).

There are several competing hypotheses of why fossil fuel extraction continues despite being uneconomic. First, the external costs are easily overlooked by actors who focus on the tangible monetary revenues more than the often intangible external effects on health and ecosystems. Nevertheless, this short-termism reveals a very low value of nature and human lives. Second, and related to the first, the people who benefit may be clearly differentiated from the people who bear the costs, which reveals power imbalance at the national level (Strambo et al., 2020). Third, the government may understand the problems but be forced to pay debt service and therefore approve uneconomic mineral extraction which reveals international power imbalance (Strambo et al., 2020).

Box 4.2. The Mountain Valley pipeline

The Mountain Valley pipeline is a proposed \$4.6 billion USD project to transport fracked natural gas nearly 500 kilometres from the state of West Virginia (in the United States of America) to an existing transport terminal in Virginia. According to the project's environmental impact statement, construction of the Mountain Valley pipeline will require converting approximately 8,810 hectares of forest into new edge habitat, crossing over 1,100 streams and wetlands, and traversing roughly 950 individual steep slopes across

the Appalachian Mountains. In August 2017 the United States Court of Appeals for the District of Columbia Circuit concluded that estimates of carbon dioxide emissions for the Mountain Valley pipeline were inadequate (United States Court of Appeals, 2017).

While construction of the Mountain Valley pipeline began in February 2018, the project is facing a growing list of physical and legal setbacks, and consequently increasing costs and a delayed completion date. Lawsuits led by the Sierra Club and other civil society organizations have resulted in multiple permits being vacated. In July 2018, the United States fourth circuit court of appeals concluded the United States forest service and bureau of land management had erred in their issuance of permits to the Mountain Valley pipeline to cross national forest and other federal lands. Specifically, the court found the agencies had failed to comply with their obligations under the national environmental policy act, the national forest management act, and the mineral leasing act (United States Court of Appeals, 2018b). In November 2018, the United States fourth circuit court of appeals similarly concluded the United States army corps of engineers had erred in its issuance of nationwide permit 12, which applies to stream and wetland crossings. Specifically, the court found the corps had failed to comply with the clean water act (United States Court of Appeals, 2018a).

Despite the vacation of these permits, and presupposing the reissuance of the permits, construction of the Mountain Valley pipeline is proceeding in a piecemeal fashion in all areas of the pipeline route not affected by the individual permits. Environmental liabilities can be operationalized under three types of responsibilities: moral, legal, and economic (Cardoso, 2015). In the Mountain Valley pipeline case there is yet no estimation of the external costs. The case however highlights how values of nature, recognised by the clean water act, the national environmental policy act, the national forest management act, and the mineral leasing act have been compromised.

To what extent are administrative decisions based on formal valuation in e.g., environmental impact assessments, and to what extent are they based on administrative instruction (e.g., administrative circulars; administrative guidance documents) by the government to line ministries? Within the adjudicating ministry, who makes the decisions? Who carries out trade-off analysis between interests? Who has valuation power? A case study in Norway (*Box 4.3*) illustrates how value conflicts and priorities between biodiversity conservation, sector interests and municipal land-use interests are articulated in sector and planning legislation interpreted in administrative decisions. The evidence used is a review of legal analysis, interviews, and objection cases adjudicated by county governors and the ministry of planning.

Box 4.3. Implicit valuation of biodiversity and ecosystem services in administrative procedures.

Based on analysis of the text of the Norwegian planning and building acts and sector acts, (Winge, 2017). observed a systematic difference in the relative supremacy of laws in the case of conflicts of interests between sectors (*Figure 4.6*).

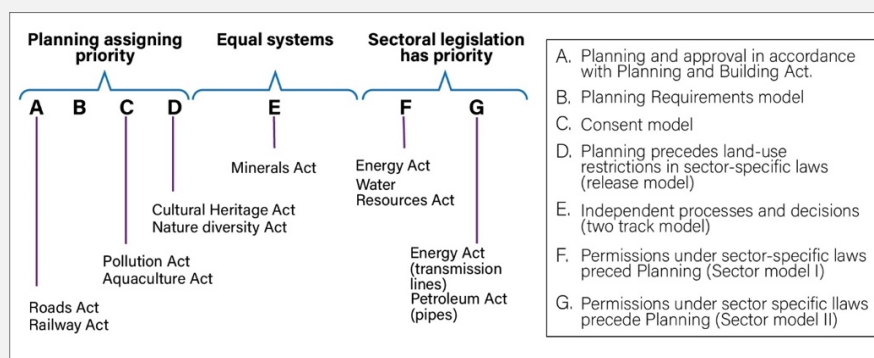


Figure 4.6. Articulation of nature values relative to sector interests based on a legal analysis of the relative supremacy laws in conflicts of interests between sectors (adapted from Winge, 2017).

Figure 4.6 shows that the planning and building act is given legal precedence over the nature act, but the energy, water resources, and petroleum acts take precedence over the planning and building act, and *ipso facto* over the nature diversity act.

Differences in the relative power of legislation to articulate sector values also comes about through political instruction to line ministries of how to interpret legislation that is in conflict. In a situation where the nature diversity act is categorized in the weakest category of acts (“planning given priority”), the decision-making in planning is sensitive to political signals through government administrative circulars. Government administrative circulars and administrative decisions on sector-contested planning decisions constitute a further source of evidence not assessed by Winge (2017). Recent studies shed light on how a specific government administrative circular (to avoid objections to municipal plans) has influenced the weighing of contested concerns by county governors (Hanssen, 2018; Myklebust, 2017). As a result, the well-developed hierarchical valuation system of the nature diversity act was undermined.

In conclusion, where there was a conflict of interest in Norway between national legislation and local development interest, politically dictated administrative practice and precedence implicitly valued nature interest lower than local development interests, which in turn was subordinate to energy sector interests. Researchers recommend strengthening the role of the planning and building act which mandates a more explicit balancing of sector interests through public hearing procedure.

4.3.3. The values shaping sustainability certification schemes

Sustainability certification of agricultural and other raw products has been promoted as a way of making markets work for sustainability. It involves standard setting by representatives of social, environmental, and economic interests, with third parties accredited to certify where the standards have been met (Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, 2012). The state of sustainable markets 2020 reported that the certified commodities reached a global share of the total area of at least 15%-27% and grew by at least half (+52%) in the five-year period (2014–2018). The state of sustainability initiatives review: standards and the blue economy (Potts et al., 2016) covered 20.8 million metric tons, accounting for approximately 95 per cent of the world’s certified seafood in 2013 and grew from 500,000 metric tons (0.5 per cent of global production) to 23 million metric tons (14 percent of global production) in 2003 - 2015.

Profitability in global trade depends on matching standards of consumers, especially where the latter have real choices to make. Where consumers start to feel and express personal responsibility for their footprints that reflect the social and environmental consequences of production (e.g., including effects on tropical deforestation) and adjust their consumption choices, voluntary certification schemes have emerged for many commodities in global trade (Glasbergen, 2018; Mithöfer et al., 2017). Threats of consumer boycotts have motivated private sector actors, often in dialogue with environmental and social non-governmental organizations, to commit to voluntary standards that exceed legal requirements (Henders et al., 2018; Leimona et al., 2017; Sauer, 2018). They also support independent certifying or verification institutions that publicly confirm compliance, while maintaining publicity campaigns to earn the trust of consumers (Figure 4.7).

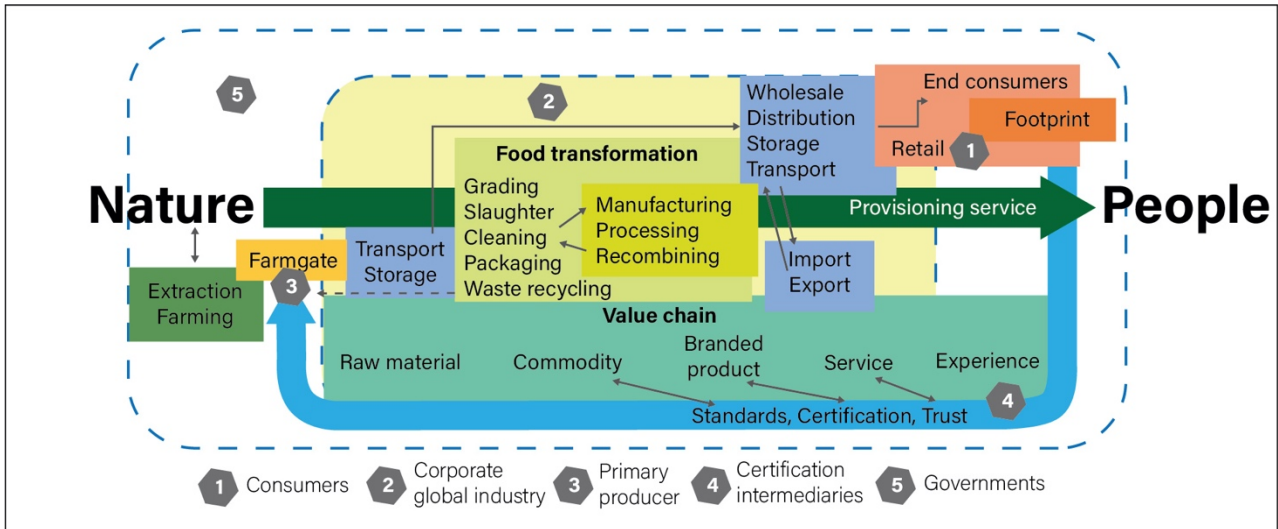


Figure 4.7. Actors along the commodity supply and value chains

Certification programs may (but not always do) offer a price premium to producers who invest in more sustainable practices. Sustainability certification schemes constitute a way for civil society actors to hold the business sector accountable, and for companies to demonstrate that they are operating responsibly. The adoption of sustainability certification and purchase of premium products with sustainability labels are self-regulatory and voluntary decisions made by assorted actors along the value chains. These include private actors such as raw-material producers (i.e., farmers, fisheries), corporate firms, industrial associations, semi-private actors, and civil societies (i.e., mostly standard-development, certifying and verification agencies, non-governmental organizations), and public actors (i.e., government at various levels). If enough demand for standard-compliant products can be generated, certification can become a *de facto* condition or mandatory for safety (in the case of food production) (Almanza & Nesmith, 2004; Crespi & Marette, 2001; Ortega et al., 2011) and market access (e.g., tropical timber) (Giessen et al., 2016; Savilaakso et al., 2017; Wibowo & Giessen, 2018). Here, the role of governments becomes more significant as they represent the developer of standards and the certifying body as institutions. Whether or not global consumers trust such government standards depends on contextual factors.

Decision-making in the context of sustainability certification provides opportunities for producers, corporates, and consumers to express their values for nature, including biodiversity and agrobiodiversity, as well as for quality of life for people in agricultural systems. Sustainable and green consumerism drives the consumers to express their relational values towards global social and environmental concerns that are often prominently published by media or non-governmental organizations. Pressures from the markets induce corporations to take more responsibility for their social and ecological footprints by joining sustainability certification schemes. Overall, values expressed by both corporates and producers in their decisions mostly serve economic enhancement goals, and thus prioritise instrumental values.

In many cases, public attention and opinion on environmental and social concerns can influence collective and individual decisions. Green-niche innovation, such as sustainability certification, starts from the emergence of new issues and concerns on biodiversity and ecosystem service degradation (i.e., loss of orangutan, forest fire, water and air pollution, increased greenhouse gas), marginalisation (i.e., child labour, eviction of indigenous people), and injustice (i.e., unfair trade, loss of forest rights). Public perceptions on such issues evolve over time through media pressures, political prominence and social interactions (Mithöfer et al., 2017). The policy issue-attention life cycle (Figure 4.3) illustrates how public attention on sustainability and green agenda can develop predictably (Tomich

et al., 2004) moving “*from the pre-development (i.e., issue emerged) to the take-off phase*” (i.e., sustainability certification implemented; Geels, 2013).

Being an ethically oriented consumer holds an attached, yet narrow relational value on social and environmental benefits of their purchased products and services. Although socially and environmentally responsible consumption is still a nascent skill, it can reform international trade relations (Low & Davenport, 2007) (e.g., politics of palm oil) and invoke an issue-attention cycle towards more responsible markets through sustainability standards and certification. The dynamic of process along the issue-attention cycle reflects shifting from relational values of consumers to instrumental values practiced by corporates and producers through the agreed objective and standards under the certification instruments.

4.3.4. The values prioritized by consumers and producers in the context of certification schemes

The increased willingness of consumers to buy certified products is caused by the emergence and growth of contemporary ethical consumption that is associated with sustainable and green consumerism. Ethical consumption is influenced by political mobilization and representation, and new modes of civic involvement and citizen participation. Ethical consumption campaigning is a form of political action that seeks to articulate the responsibilities of family life, local attachment, and national citizenship with a range of global concerns – where these global concerns include issues of trade justice, climate change, human rights, and labour solidarity (Barnett et al., 2010). Consumer campaigns often invoke the theme of collective responsibility in the effort to motivate individual behaviour change. However, individual consumers mostly lost their direct connection to the unique values of their food and did not recognize growers’ situations (Haynes et al., 2012).

An experimental survey with consumers in eight countries revealed that they mostly knew about the issues, and agreed that acceptable practices involving labour, the environment, and intellectual property are essential to society (Devinney et al., 2013). However, the majority did not consider such issues to be relevant to them personally. They perceived the sustainability was beyond consumers’ responsibility and put the product functionality, taste, and price upfront compared to its ethical product features (Devinney et al., 2013; Poelmans & Rousseau, 2016). At the general level, consumers express concern with environmental issues, while at the product-related level, this concern diminishes (Grunert et al., 2014).

From the corporate and global industry perspective, companies are required to promptly and efficiently deal with and respond to public concerns through their sustainability efforts and practices. The most visible or successful companies often are the target of activist organizations, which have grown much more aggressive and effective in bringing public pressure to bear on corporations. This condition happens even if the corporations actually have had little impact on the problem at hand (Porter & Kramer, 2006). Further, business–non-governmental organizations partnerships in global value chains are often developed by Northern businesses and non-governmental organizations but seek to address the conditions of production in the Global South. But the potential partnerships of businesses and non-governmental organizations to bring about sustainable change remains uncertain (Bitzer & Glasbergen, 2015).

The self-declared sustainability initiatives and the measures to tackle social problems within the context of establishing sustainable sourcing of commodities still rely on third-party certification with lack of adoption of the supplier code of conduct (Lalwani et al., 2018). The partnerships and collaboration programmes with different associations are presented as efficient for companies as well as farmers. Improvements in the conditions of farmers are advocated as a key result. This is relevant to the tea, coffee and cocoa value chain from the perspective of a buyer-driven model. Although there

is a dynamic interaction and cross-learning between companies (including competitors), certain elements of the chain have more power than do others, arising from their position as brokers to the more lucrative global market (Humphrey & Schmitz, 2001). Another factor affecting the degree to which companies take responsibility for the social and environmental performance of their supply chains is the extent to which importance is attached to product provenance or sourcing traceability. It can be argued, for instance, that the industries where ethical sourcing is most advanced are those where the supply chain appears to be relatively straightforward and where there is already some motivation for knowing the product origin.

Global demand for sustainable seafood in 2016 was driven almost entirely by Japan, North America, and Europe. Manufacturers and retailers serving these markets have driven demand through corporate commitments to sustainable sourcing. Near-term growth in demand for sustainable seafood is likely to be driven by continuing efforts to fulfil corporate commitments and market access requirements, rather than by consumers seeking sustainable products or individual companies seeking brand differentiation (Potts et al., 2016).

From the producers perspective, in the agricultural sector farmers are producers, to whom consumers usually expect that the additional price will trickle down and ensure a more environmentally and socially responsible production process. In most cases, targeted smallholders consider certification schemes as external imputes to change that interferes with their locally embedded practices, rules, and institutions (Glasbergen, 2018; Schouten et al., 2016). For example in the case of coffee and oil palm production by smallholders the main motivation for farmers in joining certification schemes is economic profit (Glasbergen, 2018). To them, certification is a tool that needs to bring a price premium. Another critical attribute, particularly in coffee, is a flexible system of contracts that opens opportunities to switch to market openings that offer the best price. Certification schemes, as a sustainability tool, which consumers are assumed to prefer because of the environmental and social conditions of production, tends to be reframed by the smallholders as a marketing tool to increase their income. This does not necessarily mean that farmers do not value environmental concerns or the social aspects of their practices, but their preferences regarding certifications are primarily economically driven (Hidayat et al., 2018; Ibnu et al., 2018).

4.3.5. Avoiding new value externalities in policy design

4.3.5.1. Introduction

Policies promote values and this can have unintended feedback effects on other values. Value externalities involve effects on peoples' priorities and value-related constructs (motivations, attitudes, etc.; *Figure 2.12* and *Figure 2.18*). Specifically, this section addresses the hypotheses that a discourse based on instrumental values such as ecosystem services and the introduction of economic incentives (e.g., payments for ecosystem services or fines) can lead to a reduction in pro-environmental values and, ultimately, behaviours, undermining the effectiveness of policy instruments.

Building on previous literature reviews (Akers & Yasué, 2019; Festré & Garrouste, 2015; Rode et al., 2015) and incorporating a significant number of recent publications on the theme, this subsection examines the empirical evidence on such value externalities, with a focus on how careful policy design and communication processes can reduce the risk of unintended negative effects or even promote positive effects. Details on the analysis and studies underlying this summary are provided in *Annex 4.4* and data management report².

² Systematic review on motivational crowding by economic incentives in conservation policies (<https://doi.org/10.5281/zenodo.4390995>)

4.3.5.2. Value externalities from policy discourse

Few studies have addressed the potential for value externalities from using a broad policy discourse based on instrumental or non-instrumental values of nature, respectively. They analyse the impact of specific framings of the *reasons* to, e.g., support environmental policy or engage in pro-environmental behaviour. The evidence is inconclusive. Three studies suggest detrimental effects resulting from instrumental value framings (Andrews et al., 2013; Bolderdijk et al., 2013; Rode et al., 2021), while two other studies do not find such an effect (Bernauer & McGrath, 2016; Evans et al., 2013) and another two (Rode et al., 2017; Steinhorst et al., 2015) find that instrumental value frames positively affect environmental behaviour. Regarding non-instrumental value framing, three studies present suggestive evidence that it may reduce people's pro-environmental behaviour (Evans et al., 2013; Rode et al., 2017; Steinhorst et al., 2015), while one (Bolderdijk et al., 2013) found no effect. With respect to a combination of instrumental and non-instrumental value frames, Evans et al. (2013) found no effect, while Rode et al. (2017) found the combination of arguments to perform best.

4.3.5.3. Value externalities from economic incentive policies

A larger body of literature has examined value externalities from introducing economic incentive policies, particularly whether such policies can affect intrinsic motivations for nature conservation (so-called motivation crowding) (Ezzine-de-Blas et al., 2019; Rode et al., 2015).³ Some argue that introducing economic incentives can cause crowding out of intrinsic motivations, which would decrease the effectiveness of the policy while in place, and could lead to counterproductive effects when the policy is eventually discontinued (Ezzine-de-Blas et al., 2019; Rode et al., 2015). For example, when economic incentives are stopped (e.g., a payment for ecosystem services scheme terminates) conservation could fall below the pre-policy level. Others have questioned the presence or importance of crowding out effects and/or pointed out that well-designed policies could even enhance intrinsic motivations (so-called crowding in) (Ezzine-de-Blas et al., 2019; Rode et al., 2015). 53 studies were identified that empirically assessed motivation crowding effects of introducing economic-incentive policies in the context of ecosystem services or biodiversity (*Annex 4.4*). These studies vary considerably in location, conservation context, policy design, methods and analytical rigour, which makes drawing conclusions challenging. What emerges clearly, nevertheless, is that there is by now strong empirical evidence that all three potential outcomes are possible: economic-incentive policies can cause crowding out or crowding in or have no motivation crowding effect.

Economic-incentive policies vary considerably in their design, process of formation and implementation (Bowles, 2016; Engel, 2016), e.g., they can be based on positive or negative incentives (e.g., payments for ecosystem services vs. fines), differ in other “hard” policy design features (e.g., incentive level or targeting) or how they are communicated (‘framing’), and vary in how participatory they are and the policy mix they are part of. Such policy features can influence motivation crowding via mediating factors, such as perceptions on (i) how fair the policy is, (ii) the degree of resource users’ self-determination, and (iii) other resource users’ preferences and behaviour (Akers & Yasué, 2019; Bowles & Polanía-Reyes, 2012; Ezzine-de-Blas et al., 2019; Frey et al., 2004; Rode et al., 2015). Studies also differ in socio-cultural context (e.g., trust and social cohesion), which may influence motivation crowding outcomes. Here the text focuses on extracting policy guidelines for avoiding crowding out or even inducing crowding in. For this purpose, studies are needed that

³ The literature reviewed for this section uses the terms “intrinsic and extrinsic motivations or preferences.” Extrinsic motivations mean that an activity is done for its instrumental value, i.e., in order to attain a separable outcome (Ryan & Deci, 2000). Here this mainly means motivation based on economic incentives (e.g., an action motivated by receiving material gains). Intrinsic motivations, by contrast, are those based on pro-social and pro-environmental preferences (or values, IPBES terminology), i.e., people acting for the public good or the well-being of others or for the environment. Note that intrinsic motivation is not the same as intrinsic value (see also definitions of concepts in *section 2.2.3 of Chapter 2*).

compare different variants of individual policy features in a systematic way. 32 studies were identified to have done so (*Annex 4.4*). Here the focus is on policy features that have been examined by at least two methodologically solid studies (others are described in *Annex 4.4*)

Motivational crowding effects of economic incentive policies arguably depend on how the specific incentive level is calibrated in a given context. Extrinsic efforts to nudge motivation tend to become more salient as the incentive level increases. Various studies (Cardenas, 2004; Lopez et al., 2012; Rodriguez-Sickert et al., 2008) suggest that a weakly enforced low penalty may induce crowding in by prescribing the desired behaviour without attaching harsh punishments. Higher yet still weakly enforced penalties do not induce additional cooperation in their experiments, likely due to increasing the salience of extrinsic motivations at the expense of other motivations (Bowles & Polanía-Reyes, 2012). Likewise, Reichhuber et al. (2009) find suggestive evidence that a high collective tax crowds out intrinsic motivation. However, Velez et al. (2010) and Travers et al. (2011) suggest that the specific level of mild, indicative penalties may not be altogether irrelevant in inducing conservation. Velez et al. (2010) find that lower penalties may support or hinder collective action for resource conservation whereas mild penalties support or do not affect collective action, pointing at the importance of analysing these effects within the specific socio-ecological and governance context in which incentives are deployed. With respect to payment for ecosystem services, Handberg and Angelsen (2019) find that its effect on conservation behaviour decreases with payment level, which they suggest could be due to crowding out of other motivations for forest conservation and/or an increase in other motivations for forest use. Chervier et al. (2019) find that as the payment level increases, so does the probability to perceive monetary values from forest conservation. Whether policy conditions *targeting* particular areas induce motivation crowding effects appears to depend on whether the policy is perceived as fair by the target population, which in turn is likely to be context-dependent (Bernal-Escobar et al., 2021a; Moros et al., 2020).

The relative performance of payments based on individual vs. collective performance depends on pre-existing social ties, the degree of communication, and local fairness perceptions. Narloch et al. (2012) find suggestive evidence that collective payments (i.e., based on group performance) induce crowding out compared to individual payments (based on individual performance). They argue that individual rewards trigger reciprocity, while collective rewards induce free-riding. No communication was allowed in their study, which likely hampered coordination within the group. Midler et al. (2015) suggest that individual and collective payments both induce crowding out, but that the effect is stronger for collective rewards, which seems related to participants perceiving the collective payment as unfair. Collective payments performed better when implemented in groups with strong social ties and when communication was possible. Under such conditions, Salk et al. (2017) found that collective payments outperformed individual payments, and explained this by collective payments increasing communication and that local respondents perceived the collective incentive as fairer. Moros et al. (2019) found that individual payments had no motivation crowding effect, while collective payments crowded-in social motivations, which they explain by collective payments activating social belongingness. Regarding post-policy motivation crowding effects, Salk et al. (2017) and Kaczan et al. (2019) found no motivation crowding effect of either of the two payments, while Moros et al. (2020) suggest that both crowd in other motivations for conservation.

4.3.5.4. Avoiding motivational crowding

Communicating (framing) payments for ecosystem services in line with local values can help avoid crowding out or even induce crowding in. Payments for ecosystem services is an increasingly-popular mechanism for financing conservation, with hundreds of programs worldwide (Milne et al., 2019; Salzman et al., 2018). Payments for ecosystem services is here broadly defined as monetary or in-kind transfers to individual or collective landholders that incentivize, compensate, or reward land uses beneficial for the production of pre-defined ecosystem services. Some have argued that it matters

whether payments for ecosystem services are referred to as payments, compensation, reward, or co-investment (Ezzine-de-Blas et al., 2019; Leimona et al., 2018; van Noordwijk et al., 2012). Bernal-Escobar (2021b) indeed found that framing payments for ecosystem services as a reward that acknowledges conservation as an achievement induced crowding in compared to calling it payment, while framing payments for ecosystem services as compensation had no effect. Three studies indicate that emphasizing those values that are in line with pre-existing values and/or human-nature relational models could reduce the risk of crowding out and even induce crowding in. Maca-Millán et al. (2021) found that priming and emphasizing context-specific intrinsic and relational values led to crowding in. Lliso et al. (2021) found that emphasizing relational values in an indigenous community in Colombia induced crowding in, whereas emphasizing instrumental values performed better in a Campesino community. Bernal-Escobar et al. (2021b) show suggestive evidence that an emphasis on cultural ecosystem services obtained from forest conservation induced crowding in compared to emphasizing only regulatory water services targeted by the payments for ecosystem services program, and that this effect is stronger for farmers who reported moral reasons for taking pro-environmental actions.

Participation in the design and enforcement of incentives has the potential to crowd in intrinsic motivations. Participation in the selection of the appropriate incentive scheme may in itself not be enough. Several studies suggest that allowing the relevant actors to participate in the selection of a specific incentive scheme may induce crowding in (Gatiso et al., 2015; Kaczan et al., 2017; Travers et al., 2011; Vollar, 2008). However, the few studies identified that compare similar groups and same incentive structures, thus disentangling the sole effect of participatory rule-making on resource management, found no specific effects of allowing participants to vote for their desired policies (Abatayo & Lynham, 2016; DeCaro et al., 2015; Rodriguez-Sickert et al., 2008). Rather, results in DeCaro et al. (2015) indicate that it is only the combination of voting and participating in enforcement that significantly increases voluntary cooperation. Giving participants the chance to vote for and participate in the enforcement of their governing rules arguably crowds in a series of intrinsic and extrinsic motivations that sustains cooperation even after the rules and possibility for punishment are removed. Abatayo and Lynham (2016) observe that cooperation is higher when participants get the chance to vote for their rules and communicate among themselves than when the rules are imposed on them and no communication is allowed.

In summary, adjustments in the design and process of economic incentive policies can help to avoid undesirable value externalities or even promote positive ones. Motivation crowding results from the combination of policy design, policy process, and context. Therefore, which specific policy adjustments can prevent crowding out or induce crowding in also is context dependent.

Options to reduce the risk of economic-incentive policies crowding out other motivations for conservation include paying attention to

- deliberate key policy design and implementation features to address and adapt incentives to what is considered appropriate and fair in the specific setting,
- involving those addressed in key activities concerning the design and enforcement of the agreed-upon economic incentive policies,
- emphasizing in policy communication those values that are in line with pre-existing human-nature relational models, and
- making payments conditional on individual (rather than group) performance in settings where communication among resource users is difficult and social ties are weak.

4.3.6. Environmental valuation as a public goal

4.3.6.1. Different ways of reporting progress on environmental valuation

Aichi Target 2 to the CBD called for mainstreaming biodiversity values in government and society's decision-making. Progress was reported at national scale on this target in national biodiversity strategies and action plans (NBSAPs) (Box 4.4). One reason for limited progress may be the lack of compliance mechanisms, including capacity-building and *sunshine* approaches such as transparency, monitoring, and participation. In this respect, insights from human rights review mechanisms can be useful for improving the emerging peer review mechanism of the CBD (Koh et al., 2021). Furthermore, indicators of national biodiversity strategies and action plans should reflect the mainstreaming of valuation at local scales (as promoted by initiatives such as the economics of ecosystems and biodiversity (TEEB), and wealth accounting and the valuation of ecosystem services (WAVES) partnership), as well as at national scales reflected by ecosystem accounting in national accounts. The number of countries implementing natural resource accounts, excluding energy, within the system of environmental economic accounting was included as an operational indicator for the attainment of Aichi Target 2 (Vardon et al., 2017). Because they are compiled by parties to the convention, national biodiversity strategies and action plans are expected to provide better coverage of biodiversity value mainstreaming in national policy documents (grey literature) than the published scientific literature assessed in section 4.6. Buchanan et al. (2020) reviewed Aichi target fulfilment. They did not include Aichi target 2, which was considered too difficult to monitor.

Box 4.4. Aichi Target 2: mainstreaming biodiversity values in government and society's decision-making.

'By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems' (CBD Secretariat, 2012). This target contributes to addressing the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society (Convention on Biological Diversity Strategic Goal A). Parties to the CBD have reported that the absence of economic valuations of biodiversity is an obstacle to its conservation and sustainable use. The objective of this target is to ensure that the diverse values of biodiversity and opportunities derived from its conservation and sustainable use are recognized and reflected in all relevant public and private decision-making (CBD Secretariat, 2012). The CBD proposes a theory of change whereby

'placing biodiversity into the same decision framework as other goods and services [...] would help give it greater visibility amongst policy-makers and contribute to the "mainstreaming" of biodiversity issues in decision-making processes' (CBD Secretariat, 2012).

The technical rationale for target 2 identifies specific decision-making processes that may be used as indicators, including (i) biodiversity in poverty reduction strategies, (ii) biophysical inventories of biodiversity and ecosystem services, (iii) companies with policies for biodiversity-friendly practices, and (iv) national accounts reflecting state of biodiversity and ecosystem services. The target required

'parties to appropriately value biodiversity and increase coordination among government ministries and levels of government' (CBD Secretariat, 2012).

This subsection looks at the country-level coincidence between Aichi target 2 fulfilment as reported under the CBD rules, and other reporting on the implementation of the system of environmental economic accounting. It looks specifically at country reports. In section 4.6.4 Aichi target 2 reporting and system of environmental economic accounting implementation is compared to country level frequency of the valuation studies reviewed in section 4.6.3.

4.3.6.2. Blindspots and brightspots

In some cases, national biodiversity strategies and action plans report on meeting or exceeding Aichi target 2, but there is no evidence of the system of environmental-economic accounting implementation (see *Figure 4.15*). The existence of “blindspots” in the national biodiversity strategies and action plans reporting, where the system of environmental-economic accounting accounts are being compiled yet not reflected in progress reporting on Aichi target #2 is notable. The system of environmental-economic accounting accounts are carried out but not reflected in Aichi target #2 reporting (unknown progress, no progress, progress but at a insufficient rate, and with no mention of the system of environmental-economic accounting accounts in the national biodiversity strategies and action plans progress reports) by at least, Angola, Australia, Chile, Czech Republic, Colombia, Ireland, Italy, Japan, Madagascar, Mexico, The Netherlands, The Nordic countries, Peru, Romania, Uganda and the United States of America.

Discrepancies between implementation and reporting may reflect poor inter-agency map coordination in reporting processes. They may also be an indication of limited uptake of the produced accounts in national decision-making. Alternative explanations are mapped out conceptually in *Table 4.2*, but evidence on reasons for this blindspot in some country reports is lacking. The national biodiversity strategies and action plans reporting is typically a function of ministries of environment and national environmental agencies, which as noted across this chapter, have limited decision-making power. However, gaps in the national biodiversity strategies and action plans reporting point to a disconnect between valuation research and the authorities responsible for reporting to the CBD. Improved coordination with biodiversity management / national biodiversity strategies and action plans implementing authorities is an essential part of the success of these approaches as evidenced by “brightspot” cases explained below.

Table 4.2. Simple classification on the basis of national biodiversity strategies and action plans reporting progress on Aichi target 2 and evidence of use of valuation another documents

		National biodiversity strategies and action plans report progress on Aichi Target 2	
		YES	NO
Progressing using accounting and valuation in policy	YES	Brightspot	Reporting blindspot
	NO	Reporting blindspot	Real valuation gap

As far as brightspots are concerned, a number of national biodiversity strategy and action plan reports reflect uptake of natural capital accounts approaches, ecosystem valuation or the system of environmental-economic accounting consistent with available data on the system of environmental-economic accounting compilation. These include Canada, Egypt, Indonesia, Nigeria, Malaysia, South

Africa, The United Kingdom (in particular its overseas territories). Other notable brightspots reflected in the national biodiversity strategies and action plans reporting include Rwanda, South Africa, Indonesia and in the United Kingdom. Strong progress is seen in the system of environmental-economic accounting implementation in Rwanda which is reported and reflected in their progress reports to the CBD. Rwanda reports development of natural capital accounts for land, water, minerals and ecosystems. It also reports positive uptake in the use of the findings of these accounts, particularly in the implementation and tracking of progress of the Rwanda land use development master plan. Success here is seen to be due to a high-level ministerial support (ministry of finance chairs natural capital accounts committees), strong interagency coordination, centralisation of data collection within national statistical offices and working directly with end users to compile accounts (CBD, 2021; Republic of Rwanda, 2016; Rutebuka, 2019).

South Africa has compiled both land and ecosystem accounts, and both are reflected in the national biodiversity strategies and action plans progress reports. The implementation of natural capital accounts in South Africa is co-lead by Statistics South Africa and the South African National Biodiversity Institute. South Africa has seen uptake of natural capital accounts in policy in decision-making processes for new mining and forestry projects, the development of its national water and sanitation master plan, and the use of species accounts for the management of charismatic species. South Africa has seen over 20 years of efforts to compile various natural capital accounts, starting with environmental accounts for water in 2000. Its success in mainstreaming can be partially attributed to this longevity of practice as significant time is needed to develop local capacity and systems (CBD, 2021; Republic of South Africa, 2015; Statistics South Africa, 2021).

In Indonesia the compilation of land management accounts has assisted with assessing the impact of different land use decisions on emission pathways. Natural capital accounts assisted in identifying major drivers of greenhouse gases emissions through deforestation and helped to highlight the importance of peat swamps as carbon stores and the importance of protecting them in future development pathways. These accounts contributed directly to the development of the low carbon development initiative for Indonesia (LCDI) to explicitly incorporate greenhouse gases (GHG) emissions reduction targets into the country's MidTerm Development Plan (RPJMN 2020-2025) by Bappenas (Indonesia's national development and planning agency) (Republic of Indonesia, 2015).

In the United Kingdom, natural capital asset and ecosystem service accounts are published by the office of national statistics and has seen the publication of natural capital accounts for a number of its United Kingdom's Caribbean and South Atlantic Overseas Territories. In the United Kingdom natural capital considerations are mainstreamed in a number of ways (Bright et al., 2019; JNCC, 2014). See 4.6.4 for a detailed description of the United Kingdom uptake at different scales.

These brightspots reflect a high level of mainstreaming of biodiversity concerns across various arms of the government, including the national bodies responsible for account compilation, end users and national agencies responsible for CDB reporting.

National biodiversity strategies and action plans also report uptake of thematic satellite accounts, which can play an important role for addressing sector issues of national importance in national biodiversity strategies and action plans target #2 reporting. Botswana has compiled water, energy and mineral accounts, with water accounts influencing the national spatial development plan for

Botswana 2036, the Botswana national water conservation and water demand management strategy 2016-2021 and other regional plans, encouraging the increased use of effluent wastewater, and reconsideration of industrial water abstraction fee structures. Notably, the compilation of water accounts is led by the primary end user of the accounts, the Department of Water affairs (Ministry of Finance and Economic Development, 2021; Republic of Botswana, 2016). In other cases, the system of environmental-economic accounting accounts are not explicitly mentioned in Aichi target 2 reporting, yet evidence of the uptake of monetary valuation into government decision-making is clear and reflected in progress reports. For example, Canada, which publishes the human and activity report, accounts for landscape change, freshwater (supply, use, condition), agriculture and forests (Canada Statistics, 2017). See 4.6.4 for an in-depth analysis of system of environmental-economic accounting ecosystem accounting implementation.

4.3.6.3. Barriers to uptake

Even when accounts are successfully compiled, many barriers to institutional uptake persist. Virto et al. (2018) provided evidence that there is very little use of natural capital accounts for public policy decisions, and more so in developing countries. Most relevant obstacles they observed were the lack of political support by key people and institutional leadership unable to promote policy use by other ministries.

Satellite accounts have strong uptake where key end-user institutions are involved directly (co-leading) account compilation. A few examples exist of this for land use accounts (Rwanda, Guatemala, Indonesia), water accounts (South Africa) and mining (Philippines, Rwanda, Botswana). In cases where land accounts were successful in influencing planning decisions such as Rwanda and Indonesia, planning and land use authorities as end users were directly involved in account compilation, which meant efforts to compile accounts were directly related to the implementation and monitoring of national plans / policies already in existence. Further, success in Rwanda was partially due to the adaptation of available data compiled by land management authorities to the system of environmental-economic accounting (Republic of Botswana, 2016; Republic of Indonesia, 2015; Republic of Rwanda, 2016; Republic of South Africa, 2015; Republic of the Philippines, 2016; República de Guatemala, 2013).

Success is typically seen where the process is co-lead by two or three institutions. Examples from the national biodiversity strategies and action plans reporting include:

- A high ministerial body with large power leads the process politically and gives it political validity (Ministry of Finance and Economic Planning (MINECOFIN) (Rwanda) / Ministry of Planning (Indonesia) or the Prime Minister's office (United Kingdom)
- A recognised national statistical institute national body leads data collection and management with a clear mandate of publishing official statistics (Statistics South Africa, The Indonesian Institute of Sciences, National Institute of Statistics of Rwanda, The Office for National Statistics in the United Kingdom)
- There are national institutions most likely to use accounts such as the ministry of planning (Ministry of National Development Planning Indonesia, Rwanda Land Management and Use Authority)

National biodiversity strategies and action plans reviewed in this subsection show that natural capital accounting approaches support policy development, as well as functioning as a mechanism to increase the accountability of existing policy and regulations. While evidence points to these approaches having a positive influence on national *big picture* issues, and approaches of large public and private sector institutions, they should also be recognised as potentially powerful tools for civil society actors who want to promote public sector accountability and enhanced implementation and adherence to existing environmental policy. Deepening collaboration with civil society actors and local peoples in account compilation would enhance their ability to influence decision-making and advancement of plural valuation approaches.

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4.4. Multi-intercultural territories: values articulated by institutions across scales

4.4.1. General introduction

Multi-intercultural territories around the world have been the result of historical and cultural relationships between indigenous, local communities, and national and global peoples and institutions (Dietz & Mateos, 2013; Lazos, 2013; Olaya Díaz, 2017). Many territories have been transformed since colonial regimes into commercial plantations (e.g., sugarcane, rice, coffee) and extensive cattle-raising. Their settlement and expansion have led to the control of indigenous territories with impacts on land-use conflicts. Thus, territories are a plethora of biocultural landscapes where negotiations, collaborations, confrontations and tensions of values of nature exist (de la Cadena, 2010; Escobar, 2008).

Context-specific variations in multi-intercultural territories illustrate numerous ways in which values of nature can be included in decision-making processes: from more plural and inclusive valuations to less plural dominated by hegemonic values valuations through time and geographical scales. At the more plural end of the spectrum, values at local and regional levels have been expressed in restoration programs of forests (Leone, 2019), lakes (Holtgren et al., 2014), marine areas (Di Franco et al., 2020) and co-management of overlapped areas between indigenous territories and national parks (MAVDT, 2009; PANI & PNCC, 2010). Such decisions are negotiated by several actors: public actors (e.g., department of natural resources; indigenous authorities; natural park officials); private actors (transnational and national enterprises); civil society (e.g., village associations, non-governmental organizations), all who have played a part in socio-environmental, political and economic decisions, depending on their power relations (*Figure 4.1* arrows 3A, 3B, 3C) and their knowledge (*Figure 4.1*, arrows 4A, 4B, 4C, 4D). Integration of diverse values in decision-making contexts can improve decisions in terms of achieving broad inclusion, legitimacy and potential reduction of environmental conflicts (de la Cadena, 2010; Escobar, 2008). However, examining the role of local institutions (e.g., beliefs, attitudes, social networks, customary norms, cooperatives, associations) in several decisions reveals a lack of coordination between the various institutions responsible for regulating social interactions by political jurisdiction (national, sub-national and local laws, agreements and regulations).

Valuations that elicit only one value, by contrast, display hegemonic tendencies with specific values (e.g., expressed mostly through economic valuation) benefiting certain stakeholders. These have the power to influence plans, law-making agendas and actions, by mobilizing knowledge that favours their decision-making (*Figure 4.1*, arrows 3A, 3B, 3C). In particular, the allocation of land (Bourret, 2020) and water in basins (Deutsch Lynch, 2012; England, 2019) show how the geographic location of actors using and living along the rivers determine biased management decisions; values have been privileged by central authorities in inequitable governance arrangements in favour generally of downstream users (i.e., hydropower generation and large agribusiness enterprises), while excluding other values held by upstream and midstream users. Findings demonstrate that achieving equitable governance at the watershed levels require institutional arrangements that represent diverse values as well as durable and effective alliances between users, sectoral and multi-jurisdictional actors.

Recent policies have demonstrated more plural approaches by involving cultural relational values of actors (e.g., indigenous and non-indigenous worldviews/cosmovision; emotional attachments to nature; symbolic value of species) (Chung et al., 2019), co-design and management of protected areas or voluntary community protected areas (Calle, 2018). However, analyses suggest that the capacity for a plan to meet its objectives may depend on including the values of those actors involved. If the aim is the equal access to and distribution of nature's contributions to people between all actors, their

values would need to be included (e.g., Millner et al., 2020; PANI & PNCC, 2010; Whyte et al., 2019b). When the purpose is the effectiveness of a project, those values which are most likely to affect the functioning of the project can be highlighted, given the interests, influence and resources of key actors (e.g., Kochnower et al., 2015; Semitiel-García & Noguera-Méndez, 2019; Stryamets et al., 2020).

The goal of this section is to evaluate the extent to which peer-reviewed literature assesses decision-making processes that consider diverse values as well as the specificities of decision-making contexts in multi-intercultural territories, involving indigenous peoples and local communities (IPLC). This section is divided into the following three subsections.

Section 4.4.2 analyses how values of nature are expressed in the decision-making process at multi-intercultural territories such as the Amazon (see 4.4.2.1) and different indigenous conservation areas (see 4.4.2.2). Specifically, it examines how knowledge and power differences influence the management decisions and the type of values prioritized with impact on IPLC rights to territories. The Amazon governance institutions illustrate that values of nature in decisions are not constant, but rather historical and dialectical, being subject to contradictions and continuities between the pursuit of economic progress, the well-being of IPLC, protection, sustainable use and conservation of rainforest (see 4.4.2.1). Indigenous conservation areas show, by contrast, a continuum between values of IPLCs, security and autonomy over their territories (see 4.4.2.2). The values of nature are therefore revealed by multiple decisions to sustain socio-ecological processes.

Section 4.4.3 presents philosophies of good living, their inclusion in policies and efforts towards sustainability by values aligned with political agendas (Audubert, 2017; Carranza & Rivera, 2016; Castillo-Gutiérrez, 2018; de Marchi et al., 2017; de Zaldívar, 2017; Esborraz, 2016; García-Quero & Guardiola, 2018; Gudynas, 2009; Hayward & Roy, 2019; Merino, 2016; Peña, 2016; Perra, 2019; van Norren, 2020; Velásquez, 2018). The Yasuni case displays the influence of powerful private actors in alliance with public actors by prioritising instrumental values associated with oil extractivism and depletion of nature (see 4.4.3.1). In contrast, in *Section 4.4.3.2* the different local histories, tied to sovereignty and territorial rights reveal the foundation of cultural philosophy of *Buen vivir*.

Section 4.4.4 describes diverse and contrasting values of agrobiodiversity in decision-making processes with immersed actors in the agri-food systems. In particular, instrumental values become dominant in decisions impeding the expression of intrinsic and relational values of maize in Mesoamerica and other crops among IPLC (genetic biodiversity; vital axis of rituals and spiritual life).

4.4.2. Values revealed by indigenous and local institutions

4.4.2.1. Values expressed by forestry governance institutions: the Amazon basin - a historic perspective

The Amazon, the largest tropical forest in the world, provides a wider historical context (Cronon, 1985; Hecht & Rajão, 2020; Kengen, 2019) to illustrate how values of nature are embedded in sociocultural layers of underrepresented groups (Pennino et al., 2021). Management of the basin has evolved (*Figure 4.8*) with many individual-collective decisions and actions over time (Parsons et al. 2019). Based on the analysis of literature (Adams, 2008; Carvalho et al., 2019; Evans et al., 2014; Gallemore & Jespersen, 2016; Garí, 2001; Gollnow et al., 2018; GTS, 2021; Hanazaki et al., 2018; Nolte et al., 2017; Osborne, 2015; Reydon et al., 2020; Silva & Lima, 2018; Verburg et al., 2014;

Weinhold et al., 2013), the following trends emerge, underscoring different values expressed in governance institutions and decisions with impact on the Amazon (*Annex 4.5*)⁴.

Since the 16th century, the predominance of instrumental values (e.g., transformation of forests, cattle ranching as dominant farming system) have been essential expressions of governance institutions (Kengen, 2019). Deforestation rates imply the prevailing value of rainforest as supplier of land, wood, raw materials, and latex for rubber even until the 20th century (Hecht & Rajão, 2020). Likewise, a transition of single values took place from extractive values to agrarian values based on sugar and coffee plantations between the 16th and 17th centuries (Kengen, 2019).

In late 20th century, policy instruments began to integrate intrinsic values associated with protection and conservation of the environment (e.g., Forest constitutional rights in Ecuador (Constitution of Ecuador, Chapter 7, Articles 71 – 74, 2008). Through international institutions (e.g., United Nations conferences (UN 1972 - Stockholm Conference) in the last third of the 20th century, relational values were brought to the core of decisions by underlining intellectual, moral, social and spiritual growth of the human experience of interacting with nature. It is noteworthy that a direct antecedent has been conceptualised by indigenous valuations and their cosmovisions / worldviews since ancient times (Kehoe et al., 2019; Lima et al., 2019).

Values of local and regional institutions have been articulated alongside values of global institutions (e.g., multilateral conventions, agreements) (Hecht & Rajão, 2020)). That interaction illustrates forms of globalisation of instrumental, relational and intrinsic values associated with nature and nature's contributions to people (The Nature Conservancy, 2020).

The advancement of a world capitalist system based on instrumental values of nature as commodities has brought more people into trade well beyond the boundaries of their local ecosystems (Cronon, 1985). This route had profound implications not only in terms of increased deforestation but also in the valuation of Amazon as an economic space, motivated by agricultural development goals (Kengen, 2019). For instance, *Figure 4.8* shows the direct connection between global/national institutions (legislations, conventions, agreements, policy instruments (above the red arrow)) and the valuation of rainforest and land as “merchantable commodities”, by the rise and expansion of monocultures, livestock production, and carbon sinks (below the red arrow).

The early 21st century has witnessed the soy boom in the Amazon and the concomitant role of monetary values in decisions, rendering Brazil the second-leading country for soybean production worldwide (GTS, 2021). Thus, flows of national and international private capital, governmental investments (mainly credit and infrastructure projects), prospects of increased commodity prices on the international market, and the availability of relatively cheap land encouraged forest conversion and agricultural expansion in order to meet global demands for grain crops (Pereira et al., 2019). However, the consolidation of soybean in eastern Amazon exacerbated social conflicts, ethnic differences between large soy farmers and local populations, disputes for land and territory, dispossession of traditional communities and agglomeration of local peoples into more urbanised spaces (Stabile et al., 2020). In this context, international pressure of public opinion led Brazilian agribusiness sector to adopt the soy moratorium, a voluntary agreement between representatives of civil society, environmental non-governmental organizations, local representatives, soy producers and the Brazilian government that calls for large companies to refrain from buying soy originating from areas in the Amazon deforested after 2008 (Lima et al., 2019; Myers et al., 2018; Nolte et al., 2017). The moratorium discourages the conversion of new forest areas to soy and encourages the intensification of land use through the expansion of soy in areas cleared before the moratorium (Adams, 2008). Currently 98% of the soy grown in the Amazon biome is located in these areas (GTS,

⁴ Literature review for the Amazonia case-study (<https://doi.org/10.5281/zenodo.4396203>).

2021). However, two facts circumvent the agreement. First, soy growers can avoid the deforestation restrictions of the soy moratorium by establishing their plantations in other areas of native vegetation, the “Cerrado”, instead of the Amazon biome. Second, indirect deforestation for soybean expansion can occur on pastures that were deforested 2-4 years prior (Sauer, 2018; Silva & Lima, 2018).

Overall, a better integration of sociocultural, agrarian, environmental and forestry values into global and national policies cannot be achieved without a clear understanding of the influence of these values and interests conveyed by global-local institutions in decisions, the social distribution of nature's contributions to people and their inter-relatedness with multiple actors. In this way, it is through local action that nature and nature's contributions to people start to be sustainably used, conserved, or lost.

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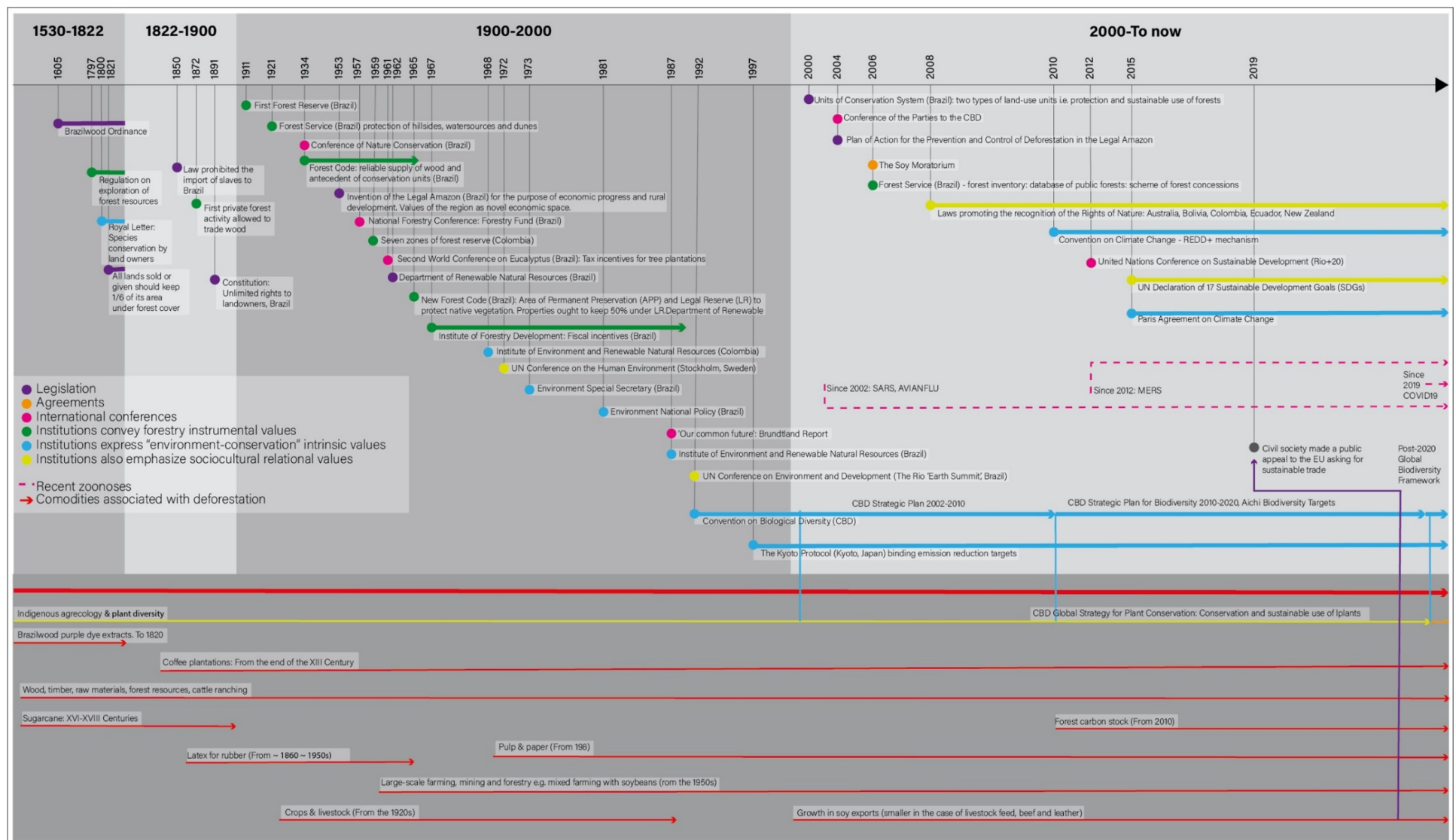


Figure 4.8. Timeline of key governance institutions from 1500 to 2021 with impact on the Amazon.

4.4.2.2. Values articulated in indigenous community conserved areas

In contrast with the tensions between values in the Amazon, research of protected spaces as the indigenous community conserved areas and cultural landscapes show that a range of values are revealed by the decision to sustain intact ecological processes. By allowing them to be involved in decisions about a territory, cultures are given the space to thrive or be revitalized (Kothari, 2008). In many protected areas case studies, such as Hā'ena (United States), once protection of a territory is secured, the focus turns to a renaissance of cultural traditions and governance systems (Gon & Winter, 2019). In this case study, 'Ōiwi values—such as *aloha 'āina*, or loving the land as a familial elder; *mālama 'āina*, or caring for the land as a familial elder (Kealiikanakaoleohaililani & Giardina, 2016), and *kia 'i 'āina* or protecting the land as a familial elder -- are at the foundation of this community-based subsistence resource management area (Kurashima et al., 2018). Along with a revival of the values inherent in customary governance, the values associated with living cultures, traditions, practices, and expressions have also shaped IPLC choice for community-based conservation. Although unique to each community and culture, some values that play a role in the governance of a territory include collective responsibility for and accessibility to the resources, sustainable subsistence harvesting, ontologies, origin stories, and heritage processes embedded within the landscape, with all these passed down from generation to generation, and which often influence all spheres of the local lifestyle (Pawlowska-Mainville, 2021). When these values are acted upon, they represent forms of indigenous and local peoples' agency in conservation efforts, which, in turn, have been pivotal to the regeneration of mainstream conservation initiatives such as achieving ecological biodiversity that is founded on cultural diversity, as articulated in the Sustainable Development Goals (Pathak et al., 2004).

Diverging values also exist within communities and within the collective decision to conserve (or not) a territory or resource. Contradicting values about community economic initiatives pose challenges to inter-generational transmission of local values and to the role that individual needs and values play in the success of community-led conservation areas. Likewise, economic values and historical circumstances pose immense challenges to IPLC, and the literature illustrates that obtaining recognition for a protected space by a local community is very difficult. For example, the Górale (Poland) are a group that underwent forced displacement, dispossession and outlawing of sheep herding because the pastoral hills and herding pastures were viewed by the state as destructive to local mountain vegetation and to the communist vision of property (Wróbel, 2013). The contested form of land title led to a massive expropriation of Górale for the purpose of “environmental protection” in the early days Poland's national park (Borucki, 2004). Sheep herding by the local people is now permitted once again, largely due to a change in public discourse around local governance and cultural heritage on these landscapes, but there is not a formal recognition of the Górale cultural landscape. Similarly, local values of the Tla-a-o-qui-aht (Canada) are ingrained in the Nuu-chah-nulth initiative to create a tribal park. Based on indigenous and local values, the watershed is run according to Nuu-chah-nulth customary governance and, while not recognized by the state (Canada), the park is an embodiment of governance and authority of the indigenous group to the area (Murray & Burrows, 2017; Pawlowska-Mainville, 2021). For this indigenous group, recognition is not important because Nuu-chah-nulth governance guides the management of the area.

Therefore, indigenous peoples and local communities are sustaining and strengthening their territories and resources with collective and culturally-rooted governance and management systems. By protecting a specific space that serves as the foundation to their very being, identity, culture, and way of life, IPLC-led resource areas provide us with a glimpse into their values and reasons as to why an in-tact territory is critical to them and to the world at large. While public support for such community-led initiatives may be present, in many cases, IPLC territoriality requires recognition,

legitimation, and support, especially when faced with industry, which often disregards IPLC values and approaches to resource governance (Worboys et al., 2015).

4.4.3. Values and power relations expressed in Philosophies of good living

Out of 204 coded papers as part of the Philosophies of good living review⁵, a total of 140 papers (69%) address power relations. These papers evidence the different spheres in which power operates, discursively and structurally (see *Annex 2.1*), usually creating contentious spaces between IPLC and other actors (e.g., political actors, elites, private actors; Canedo Vásquez, 2018; de Zaldívar, 2017; Espinosa, 2017; Hartmann, 2019; Humphreys, 2017; Hutchison & Sibanda, 2017; Lalander & Lembke, 2018; Naude, 2019; Shebell & Moser, 2019; Wolkmer & Venâncio, 2017). These tensions reflect the clashes between different values of nature.

Even though some aspects of the good living philosophies have been incorporated into policy and efforts to pursue sustainability-aligned values in policy frameworks have been made (Audubert, 2017; Carranza & Rivera, 2016; Castillo-Gutiérrez, 2018; de Zaldívar, 2017; Esborraz, 2016; García-Quero & Guardiola, 2018; Gudynas, 2009; Hayward & Roy, 2019; Merino, 2016; Peña, 2016; Perra, 2019; van Norren, 2020; Velásquez, 2018), prevalence of extractivism and exploitation of nature remains. These contradictions to the philosophies of good living at national and international levels (Carranza & Rivera, 2016; Lima Cortez, 2010; Shebell & Moser, 2019) points to the structural power and the complexity of incorporating other values of nature into laws embedded in the broader capitalist system.

As for many philosophies of good living around the world whose inclusion or institutionalization of their values and principles are in early stages or currently being negotiated, the case of the *Buen vivir* philosophy, and its inclusion in the constitutions of Ecuador and Bolivia, offers an interesting case (Collado-Ruano et al., 2019). Although great progress has been recognized by scholars and practitioners regarding how the *Buen vivir* has permeated the political arena, new challenges have emerged as this discourse has been pointed out to be taken as a utopia (Bravo & Moreano, 2015; Calvo et al., 2019). In this sense, the underlying broad values of these philosophies have not always been translated into rules, institutions or legislative measures to break the extractive development model (de Zaldívar, 2017). The issues of how the same constitution promotes economic development favouring extractive activities like mining or oil extraction, and on the other side recognizes nature as a legal subject with different rights, exposes the inherent structural / legal contradictions or dilemmas (de Marchi et al., 2017; de Zaldívar, 2017; Esborraz, 2016; Lalander, 2014).

4.4.3.1. Failed value encounters: The Yasuni case in Ecuador

The Yasuni-ITT Initiative in the Ecuadorian Amazon shows the complexities of land management in territories with high biological and cultural diversity (Bravo & Moreano, 2015; Calvo et al., 2019; de Marchi et al., 2017; Lalander, 2014, 2016; Valdez-López et al., 2019). Recognized as a biosphere reserve by UNESCO in 1989, Yasuni is home of Waorani, Kichwa, Achuar, Shuar, Tagaeri, and Taromenane indigenous people (de Marchi et al., 2017). The Yasuni-ITT initiative refers to Ishpingo-Tambococha-Tiputini, three untapped oil blocks. This initiative was part of the agenda of the long-term cooperative action under the United Nations Framework Convention on Climate Change. Through a trust fund co-managed by the Ecuadorian government and the UNDP, the idea was that the international community will contribute 50% of the income that would have been generated from oil exploitation, in order to protect biodiversity and keep social programs (Lalander, 2014). Years later, only 0.37 % of the estimated income was achieved. In 2013 the government of Ecuador finalized the Yasuni-ITT initiative and commissioned economic, legal, and technical studies for drilling in the

⁵ Literature review for the Philosophies of good living (<https://doi.org/10.5281/zenodo.4399544>)

region. This generated opposition from indigenous communities and environmental non-governmental organizations (Calvo et al., 2019). This conflict evidences the contradictions between national and international policies regarding the conservation of nature and the *Buen vivir* philosophy, and on the other hand, pursuing economic development driven by extractive activities (Bravo & Moreano, 2015; Calvo et al., 2019; de Marchi et al., 2017; Lalander, 2014, 2016; Valdez-López et al., 2019).

Even though *Buen vivir* as a vision of harmonic life with nature and nature's contributions to people by indigenous nations is considered as a constitutional principle of the Plurinational State of Ecuador, political actors differ in the interpretation and operationalization of the *Buen vivir*. The Yasuní-ITT initiative failed and oil extraction was granted to private actors (Acosta, 2010; Fleuri & Fleuri, 2018; Gudynas, 2011; Lalander, 2014), arguing national justice or the right to put “nature to the service of Nation” (de Marchi et al., 2017). This example shows which actors and whose values were finally translated into decision-making revealing structural and discursive power dimensions.

This example illustrates how instrumental values dominated the rationale of decisions over the relational and intrinsic values. The civil society movement struggled against the extraction of fossil fuels, but the protection of human rights and environmental justice failed (Calvo et al., 2019). Political, discursive, and structural power, on the one hand, and knowledge under the national government supervision, on the other, gave priority to instrumental values on the basis of national development.

4.4.3.2. Values articulated in Philosophies of good living and territorial rights

A total of 55 papers were examined to discuss the link between the philosophy of good living and territorial rights concerning people who identify as indigenous and who enunciate their views and interests to emphasize local ways of knowing and different local histories, especially when tied to sovereignty (13 papers). This review demonstrates the importance of territory as foundation for living out cultural philosophy; a total of 19 articles discussed land as a fundamental space for living out the culture and the epistemologies within the cultural philosophies, including coexistence between nature and humans. Furthermore, rights are based and acted upon on land; 91% of the articles emphasized that rights of IPLC are grounded in lands and resources and the promotion and protection of those rights, including legal recognition, are a continual struggle for IPLC. Finally, philosophies of good living can be used to empower communities; the review showed that communities relying on their own cultural philosophies found self-determination over their food systems (21 articles), resilience (4 articles), cultural revitalization (48 articles), and stronger governance of their natural resources (4 articles)⁶.

Social and environmental governance that promotes resurgence of culture and territoriality is gaining popularity as a governance principle. In Bolivia, Ecuador, and Peru, the concept of *Buen vivir* has been institutionalized and indigenous values such as harmony and complementarity with Mother Earth and the community have been embedded in diverse socio-environmental policies (Chambi Mayta, 2017; Giovannini, 2012; Merino, 2016). As a response to values associated with capitalism, and growth of resource-development industries, the cultural philosophies represent highly contrasted values to take into account when making land and resource-based decisions to support IPLC territoriality. Literature shows that the Philosophies of good living can serve as legal and ethical mechanisms, enabling states and policymakers to inform decision-making and pursue claims to sovereignty.

⁶ Literature review for the Philosophies of Good Living (<https://doi.org/10.5281/zenodo.4399544>)

The Philosophy of good living was used not only to provide a more equitable approach to the resources and a great decision-making power to marginalized groups, but in many cases, they were used as counter-hegemonic strategies for decolonization and a mechanism for protection of cultural landscapes (Kayira, 2015). While these cosmovisions are often poorly understood and not always respected by dominant elites and legal functionaries of the state, they serve to ensure people's well-being sustained on the lands they call home (Hoekema, 2017), e.g., in China, villagers' collective identity and a reinvented clan system was restored when villages united to resist land deprivation and rural identity (He & Xue, 2014).

The philosophies of *Buen vivir* across literature point to the view that humans are a part of nature and directly affected by it, inherently creating a level of responsibility towards each other and future generations. However, the practical application of these cultural philosophies faces challenges. Some neoliberal countries, totalitarian governments, corporate businesses, and enterprises abroad have led to the destruction and depletion of IPLC lands, territories, sacred places and the values associated to them. A large component is due to free-trade regimes as well as the non-binding nature of the International Labour Organization's convention 169 (ILO 69) and the United Nations declaration on the rights of indigenous people (UNDRIP). In Tamil Nadu, India, small-scale fishers have to compete for resources and space with expansionary large-scale fishing fleets. In the Amazon region, although the recognition that indigenous peoples' land rights are inalienable, the land was nevertheless used as collateral by the Peruvian government. Another problem is the reliance on values that tend to be interpreted as traditional. This colonial viewpoint that consists of the other or of the "noble savage" where a timeless rural peasant or indigenous "superhero" lives "in nature" and is resistant to the temptations of capitalism or novel technologies, are brought to light (Bold, 2017). Rather than interpreting the philosophies of good living as a remedy to the crisis of capitalism, it is important to draw on them as lenses testifying to humanity's cultural wealth and creative genius that can assist in addressing problems in social development and biodiversity degradation, inclusive of all voices and perspectives (Cochrane, 2014; Espinosa, 2017).

Relying on the philosophies for acknowledgement of local and traditional governance, for pushing the limits of government discourse, and strengthening global to local advocacy and activism that recognizes territoriality has been fundamental for a number of indigenous and local communities. Justice and territorial rights mean having the ability to choose, create, resist, reject, and change laws and policies that affect one's life and community, and inherent within the diverse philosophies of a good life, exists the notion that to pursue a good life, one must be free to live according to one's aspirations (Cadieux-Shaw, 2017). Finally, territories and rights are needed for the survival of IPLC, they need their cultural space to live out their lives.

4.4.4. Values revealed in decisions related to livelihood strategies linked to agrobiodiversity

The struggle of IPLC to defend their agri-food systems has emphasized the importance of agrobiodiversity conservation as one of the pillars of food sovereignty. Numerous studies point out that agrobiodiversity conservation reveals values of nature that address complementarity of agricultural cycles and can be key to meeting food challenges (Labeyrie et al., 2021; Lazos, 2013; Thompson & Stinnett, 2018; Zimmerer et al., 2019). The reasons why farmers use and maintain a diversity of seeds and crops and how they manage this biodiversity in their fields are strongly linked to their values. These values can contribute to adapt biodiversity conservation actions to local contexts, and support sustainable practices that benefit farmers, society and the environment. Diverse values are at stake in farmers' decisions related to crop biodiversity. A classification system of values based on farmers' local knowledge, visions, value systems and its interactions with global drivers was built.

Farmers' valuations of agrobiodiversity across the world (e.g., orchards in France, potato park in Peru, paddy fields in Iran and Myanmar, etc.) reveal four domains. (i) The socio-cultural domain includes the social significance and cultural role of agrobiodiversity. This domain encompasses the intangible dimension—spiritual and emotional aspects—of the relationship between communities and plants, highly linked to broad and relational values (*see Chapter 2*). For example, the concept of respect is central in the relationship between the Peruvian farmers of the potato park and the potatoes (Angé et al., 2018). (ii) The crop characteristics domain relates to the morphological, physiological or phenological characteristics sought by farmers in their crops, linked to what *Chapter 2* mentions as intrinsic, instrumental and life support values. Thant et al. (2020) showed that not only yield but resistance to harsh environmental conditions, along with cooking time, taste, aroma, and stickiness of the cooked grain, are all important values conveyed by farmers. (iii) The economic domain refers to the financial and non-financial valuations related to the means of subsistence, as the needs of rural households, including income, workload and uses of crops, linked to instrumental values as mentioned by *Chapter 2*. Nordhagen et al. (2017) show that self-sufficiency is a major value for a group of farmers in Papua New Guinea, and Mary et al. (1999) demonstrate that workload and multifunctionality are determinant in the choice of growing dual-purpose (fruits and wood) walnuts in the Dauphiné region in France. (iv) The ecological domain includes all the interactions with the surrounding environment, including other crops, pollinators, soil erosion, prevention of natural hazards, habitat provision for wildlife or contribution to a healthy environment, linked to life support values as mentioned by *Chapter 2* (Bardsley et al., 2019; Marzban et al., 2016; Mellon-Bedi et al., 2020; Nordhagen et al., 2017).

The articles reviewed⁷ show the importance of the multiple socio-cultural, ecological, economic and agronomic valuations at stake in the decisions made by farmers regarding various levels of agrobiodiversity. Even in industrialized, low-diversity systems, farmers recognize a diversity of values (Cutforth et al., 2001). All articles reviewed point out the various links between the domains of valuations of agrobiodiversity. In Myanmar (Thant et al., 2020), local varieties of rice are preferred not only because they have appreciated culinary qualities, but also because they are adapted to local environmental constraints such as salinity and are resistant to climatic stresses such as heavy rain. They are appreciated because of their competitiveness (high tillering), and they are less likely to shatter or lodge; they also give high straws that are used as animal fodder. These findings highlight the need to consider values as intricate elements of a system and not as juxtapositions of individual motivations. While policies may consider farmers through the prism of economic agents, the results show that multiple levers of actions may be needed to support agrobiodiversity.

Besides farmers' values, various drivers acting at different scales can influence trends in agrobiodiversity. The evolution of political and socio-economic contexts can indeed favour or hinder the expression of these values. Global processes such as market integration are one of the factors driving a decline in the number of farmers and a homogenization of the crops grown globally (Khoury et al., 2014) but do not have the same effect at all scales (*Boxes 4.5 and 4.6*). In some systems, the promotion of cash crops, producing high yields under intensive and mechanized practices, have led to sharp declines in local crop and wildlife diversity. The agrobiodiversity in Central Himalaya -- where 40 species and various landraces were grown in traditional systems -- was eroded by cash crops such as rice or wheat (Maikhuri et al., 1997). In the Andes (Hellin & Hgman, 2005) or Nepal (Upreti & Upreti, 2002), historical trends of agrobiodiversity loss are linked to market transformation. The clashes between instrumental and relational values are driven by different actors. Agrifood industries have the power to decide which varieties enter the market and this process forces farmers to change their crops and to reduce their agrobiodiversity. National and regional policies can lead to agrobiodiversity loss, through encouraging cultivation of cash crops, as did many colonial policies (e.g., peanut promotion in Senegal; Lericollais, 1987) and the "green revolution" (e.g., agrochemical

⁷ Literature review on values articulated in agrobiodiversity management (10.5281/zenodo.4394547)

intensification of monocultures in Asia, Snapp et al., 2010) (see *Box 4.6*). Labeyrie et al. (2021) reported abandonment of subsistence cereals in response to climate change and market demand; and adoption of mainly irrigated horticultural cash-crops, notably in Africa. Changes in nutritional inputs and mismatch between climate change and crop demands may undermine future food security and farmers' capacity to adapt to climate change.

However, interactions between global and local forces can lead to different outcomes in farmers' fields. The mobilization of indigenous and non-indigenous knowledge, the multiple uses of crops, and organizational knowledge can guarantee the maintenance of agrobiodiversity (Zimmerer, 2013). Brown (2013) showed that in the loss of maize genetic diversity in Mexico, local initiatives of Chiapas communities of resistance against genetically modified organisms, allowed *in situ* conservation of local landraces, thanks to indigenous and scientific expertise. The existence of local movements and institutions in the defence of agrobiodiversity is essential to ensure community empowerment (Zimmerer et al., 2019) (see *Box 4.5*).

At the community scale, the articles reviewed show that decision-making is influenced by individual characteristics such as gender, education or age and thus knowledge and power relations (Mary et al., 1999; Mellon-Bedi et al., 2020). Thus, while women are at the heart of the production of certain crops, such as groundnut in Burkina Faso, they have more complex and limited access to land, tools and knowledge (Kerr, 2014; Sinare et al., 2021). Household characteristics such as socio-economic status is another important local driver. Nordhagen et al. (2017) show a diversity of profiles existing among the farmers of Papua New Guinea with the power control linked to the possession of a great diversity of plants.

Box 4.5. Beneficial synergies between cultural values, local organizations and national policies (Moore, 2013).

Japan has experienced a considerable decrease in soybean production due to the liberalization of the market and the importation of cheaper American soybean. However, relational values linked to the diversity of food preparations requiring various qualities of soybeans has effectively contributed to maintain the cultivation of 59 local landraces. The production of local, diverse soybean was then supported by the confluence of two movements: (i) a growing concern of consumers for the traceability of products, which promoted the organization of direct local supply chains and labels, and (ii) a support from the government for the environmental benefits linked to the national production of soybeans.

Box 4.6. Domesticated forest as ecological intensification of non-timber forest products

Contested claims between local communities and forest authorities in Indonesia over the agroforest into which swidden-fallow systems had evolved, the forest-like appearance of the Repong systems with a non-domesticated tree (*Shorea javanica*, *damar*) that started as shaded coffee gardens became an eye-opener that forest policy change was needed. Emerging recognition as “domesticated forest”, -high diversity of native and planted trees, farmer- managed natural regeneration and based on human-nature relations- has challenged existing terminology that maintains an agriculture-forestry values dichotomy (Michon et al., 2000).

4.4.5. Conclusions

There is evidence that suggests that while market values distort social and cultural values, reemphasizing socio-cultural values can serve as an appropriate framework for human well-being, for effective environmental initiatives, and for improving the quality of life. Social and environmental governance that promotes the balanced life is gaining popularity as a culture, language and heritage safeguarding principle. Research shows that numerous policies and colonial processes have caused indigenous peoples and local communities to disproportionately experience ill-health, poverty, dispossession, and diminishment of cultural elements. In many cases, cultural expressions have been outlawed and rendered illegal, creating a break in the transmission of cultural philosophies such as that of what constitutes a good life. As attempts at decolonization and revival of IPLC cultures are increasingly growing, communities and families are seeking a return to a good life geared towards linguistic and cultural transmission that is based on justice. Research shows that clearly defined programs and policies based on the epistemological principles of a good life are assisting IPLC communities in revitalizing their self-determination.

It is important to point out that while indigenous peoples potentially have much to gain from resource development within their territories, they also face the highest risks to their health, economy, and cultural identity from any associated environmental degradation. The Philosophies of good living reveal a number of values including the attempts at protecting their survivability as a cultural group living in coexistence with nature (Calbucura & Almonacid, 2019) and empowering their communities (Fabri & Floriani, 2020) for mobilization to protect their culture, territory and interests (Quick & Spartz, 2018). A total of 85% articles in this literature review identified that the cultural philosophies of good living have served as a vehicle for culture and decision-making. The philosophies of good life were used as tools to ensure heritage and cultural places sustained by bringing the periphery-center closer, by supporting legal pluralism (Pawlowska-Mainville, 2021). Empowering local ways of knowing (including “indigenous science”) and bringing to the center local histories, repositions the relationship between nature, the cosmos and humans. The philosophies reveal that protection of sacred and cultural territories is increasing in importance for intergenerational connectedness, addressing heritage and sacredness.

While all cultures have an interpretation of what constitutes a good life, when it comes to heritage, specific geographical places, especially those with a sacred element ascribed to them, are often tied to identity and cultural well-being. Such places and spaces serve as mnemonic devices for a way of life that IPLC aspire to protect, promote, and strengthen. It is also found that when heritage elements are supported and valued rather than replaced with market values as the cornerstone of societies and decision-making, the philosophies of good life serve as an element of heritage that can redirect values sourced from heritage to more effectively support territories with exceptional emotional wealth. Sourced from heritage then, these intellectual processes and worldviews illustrate that contemporary values associated with individualism, development, capitalism, and cultural imperialism are increasingly rejected. In that sense, when such cultural philosophies as *dolce vita* (Italian), *sumaq kawsay* (Quechua), *dobrobyt* (Polish), *mauri ora* (Maori), *ubuntu* (diverse African nations), or *satoyama* (Japan), are evoked they form *significant* learning promoting endogenous alternatives for liberation (Kaya & Chinsamy, 2016; López Valentín et al., 2020).

4.5. The roles of values, knowledge, and power in shaping decision outcomes

4.5.1. Introduction

Current institutions reveal the values that have historically shaped and continue to shape decisions. Decision-makers would benefit from understanding how, given their current political realities and a variety of constraints, they can ensure more sustainable and just outcomes of their decisions. Based on the diverse values of nature and its contributions to people, one might expect that a more diverse expression and inclusion of these values in decisions could lead to better outcomes for nature and people. However, merely including diverse values may or may not translate into improved decisions: much depends on the structure and functioning of the decision-making process, including the voice given to under-represented groups and values, the types of knowledge included, and attention to procedural justice.

The impact analysis literature conventionally distinguishes between “outcomes” resulting directly from the decision (in terms of actions taken), and the consequent “impacts” on society and the environment (Belcher & Palenberg, 2018; Harding, 2014). This distinction is often important, but in this section, as throughout the chapter and the assessment, the term outcome is used to describe both. Outcomes are reviewed in four emblematic decision contexts that span a range of human interactions with nature: protected areas, payments or compensation for ecosystem services programs (PES/CES), commodity sustainability certification programs, and big (environmentally disruptive) development projects such as mining and dams. These decision contexts are among the best researched in the outcomes literature, are well represented across the world, and provide a contrasting set of examples from which to draw conclusions about how values, knowledge, and power shape decision outcomes.

Outcomes were grouped into categories according to the IPBES conceptual framework, including the following elements: nature, nature’s contributions to people, and good quality of life (encompassing socio-cultural, economic, and other material dimensions) (*Figure 4.9*). In addition to these categories, “social conflicts” (related to power struggles between groups of people, not human-wildlife conflict which is here considered under the category ‘nature’s contributions to people’) have overarching implications for justice and sustainability. ‘Values transformation’ (the extent to which preferences, principles or worldviews change or evolve as a result of the decision) is addressed for payments for ecosystem services alone in a separate section, due to the complexity of the topic and limited evidence across decision contexts. Consistent with the rest of the assessment, the definition of sustainability does not merely describe any positive environmental outcomes as “sustainable” but considers whether social, cultural, and environmental gains have been or are likely to be maintained over the long-term. The three dimensions of justice defined in *Chapter 1* (distributive, procedural, recognition) feedback to influence other outcomes, and also constitute significant outcomes in themselves (He & Sikor, 2015; Martin et al., 2014; Pascual et al., 2014; Sikor et al., 2014).

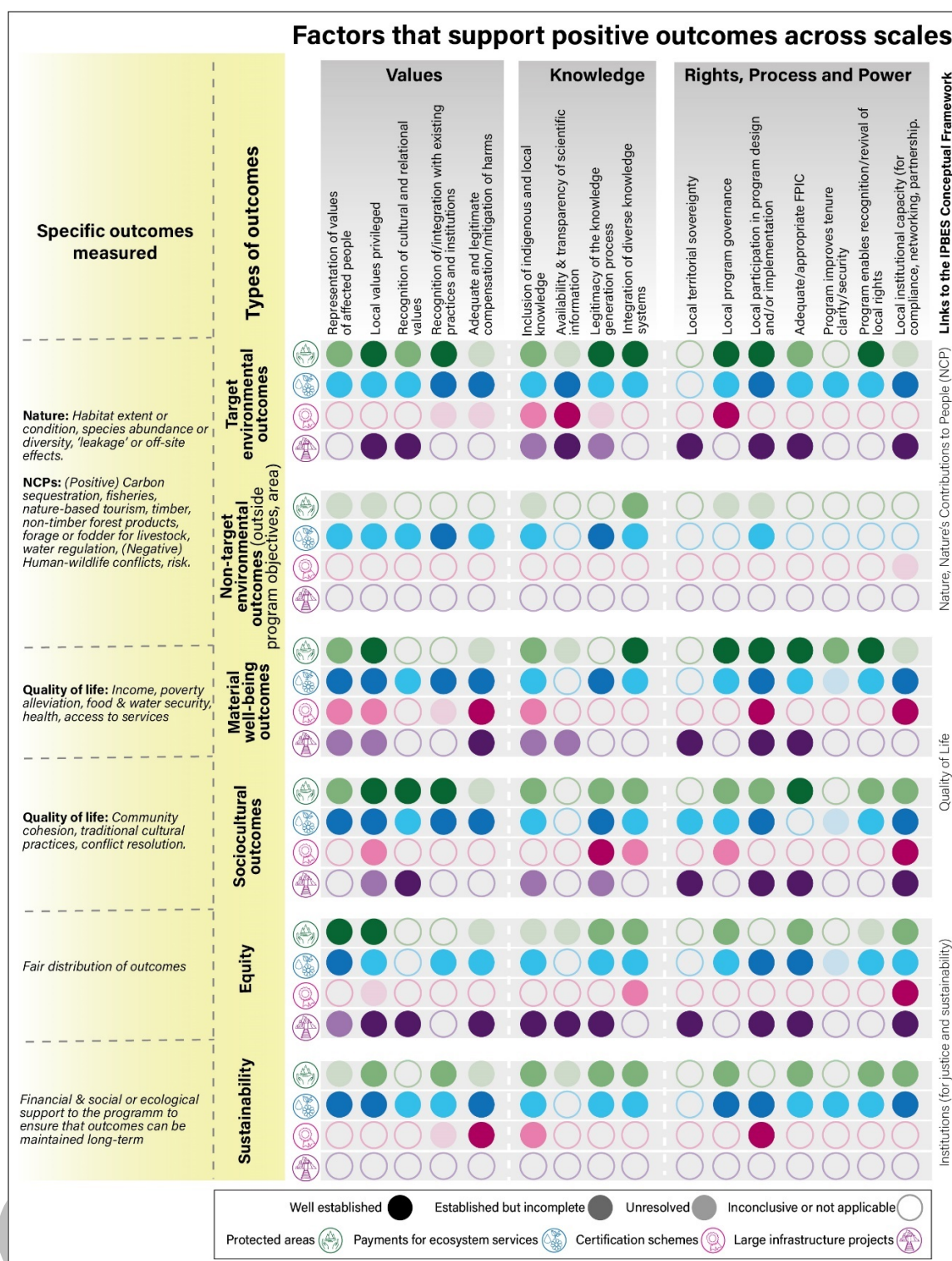


Figure 4.9. Outcomes influenced by values, knowledge and process in decisions. Filled circles indicate evidence for a positive influence of the variable (related to values, knowledge, and process, listed in the columns) on the outcome (related to elements of the IPBES Conceptual Framework: nature, NCP, good quality of life, and institutions for justice and sustainability; listed in the rows). Evidence comes from literature review and case studies for protected areas (green), payments for ecosystem services (blue), certification schemes (pink), and large infrastructure projects (purple). The darkness of the shade of the respective colours indicates the level of evidence supporting (from well established in the darkest shade to inconclusive in the lightest shade)

Two main methods were used to assess outcomes for all four decision contexts: (i) review of ‘literature reviews’ to establish the evidence base for outcomes in the decision contexts; and (ii) in-depth, site-specific case studies (i.e., a protected area⁸, a payment for ecosystem services program⁹, a mining or dam project¹⁰) involving review of literature on that site, providing additional context on decision processes as well as impacts (*Figure 4.10*). Through these deep cases it is possible to trace back to the conditions under which different outcomes occur as well as the feedback among outcomes, while the broader review of reviews makes it possible to examine general trends and gaps in the literature. Due to the larger evidence base, both protected areas and payments for ecosystem services were able to apply both methods, while sustainability certification employed mainly the literature review approach¹¹, and big infrastructure project developments were examined via case studies with the best-documented evidence.

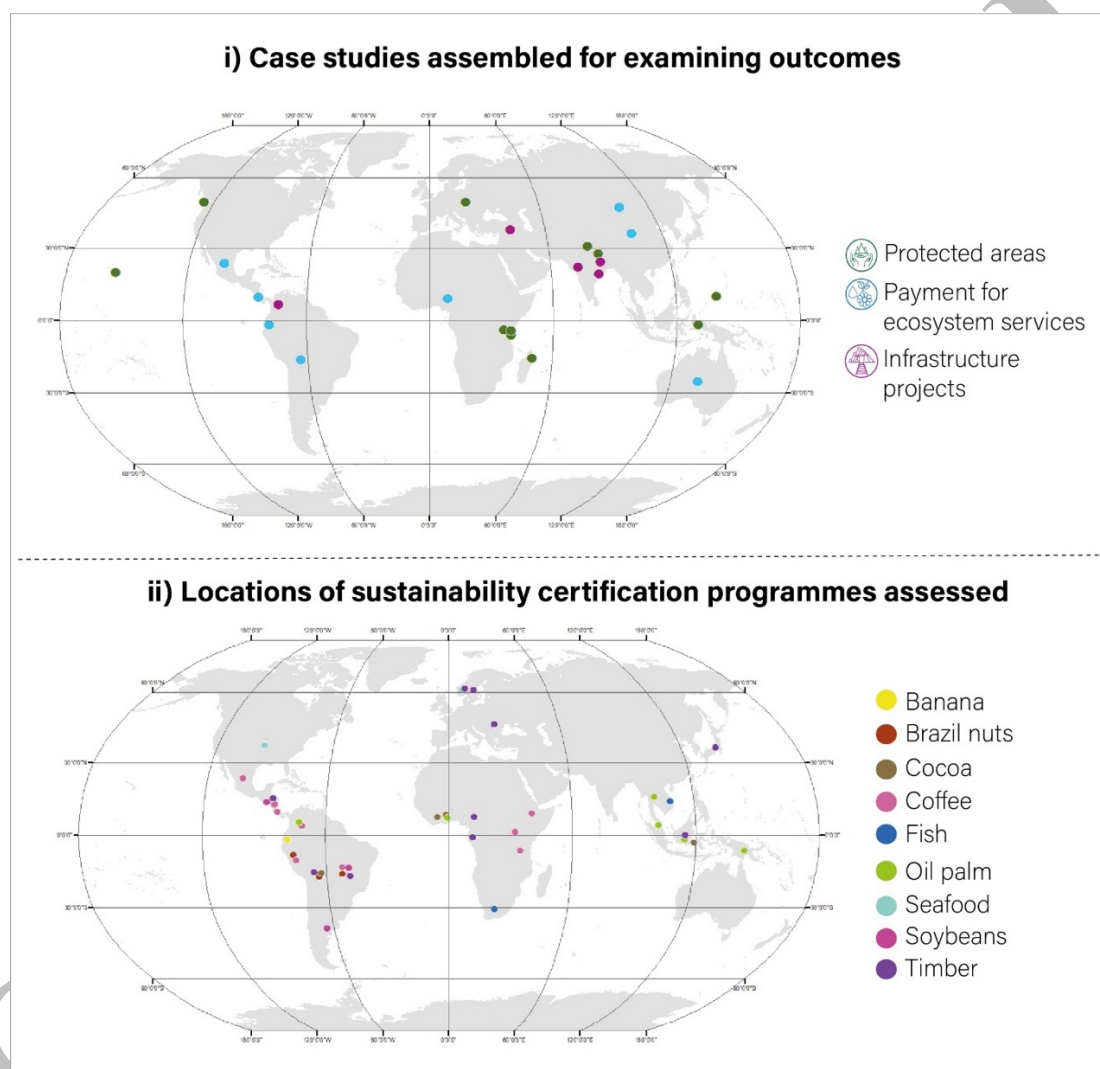


Figure 4.10. Case studies assembled for examining outcomes in protected areas, payments for ecosystem services and infrastructure projects (i), and locations of sustainability certification programs for different commodities (ii).

⁸ Literature & case study review on outcomes in protected areas and indigenous and community conserved areas (ICCAs). (<https://doi.org/10.5281/zenodo.4394267>).

⁹ Literature & case study review on outcomes in payments for ecosystem services / compensation for ecosystem services (PES/CES) programmes (<https://doi.org/10.5281/zenodo.4394520>).

¹⁰ Review on outcomes in big development projects (mining and dams) (<https://doi.org/10.5281/zenodo.4395985>).

¹¹ Literature review on outcomes in environmental certification (<https://doi.org/10.5281/zenodo.4394498>).

The guiding aim across the sub-sections is to understand the conditions under which the inclusion of diverse values in decisions results in improvements in sustainability, justice, and overall well-being, with the understanding that values are embedded in and articulated through knowledge systems and institutions. For each topic, the types of outcomes (on people and nature) commonly documented in the literature are assessed, and the outcomes of decisions in these different contexts are analysed to answer the following questions (summarized in *Figure 4.9*):

1. Whose and which values are included in decisions?
2. What types of knowledge inform the decision, and how are diverse forms of knowledge integrated?
3. How are diverse actors represented in the decision process, and how are they empowered (or not)?

Particular attention is paid to local values, those values held by local people impacted by the decision, especially the values of historically under-represented local people, and the extent to which they are included or excluded from the decision process. Under-represented values are also given special consideration, the types of values that do not typically drive decision-making in existing institutions (see 4.3) -- principally non-market values for nature, including intrinsic and relational values. This varies depending on the decision context and the institution; for instance, protected areas are traditionally concerned with intrinsic values for nature, at times marginalizing relational or instrumental values for local people. Values of historically under-represented people refer to all specific values (instrumental, relational, and intrinsic) that may be held or expressed by groups that are less often included or consulted in dominant decision processes, including IPLC, and who may also bear inequities in the broader social context. Therefore, a context-specific approach is taken to define under-represented values and values of under-represented people for each case.

Where documented, the degree to which plural valuation was employed is considered in the case studies. In keeping with the rest of the assessment (see *Chapter 1* and *Chapter 3*), plural valuation is defined as practices designed to elicit a range of values (broad or specific) and knowledge appropriate to the diversity of a given decision context, with the aim of increasing legitimacy, justice and robustness of valuations (Jacobs et al., 2020; Zafra-Calvo et al., 2020). Valuation may also be considered more plural if it mobilizes a diversity of methods and integrates diverse knowledge systems. Key here is the adequacy of a given approach to the diversity of the context; therefore, it cannot be said in advance that more plural valuation is necessarily desirable. Specifically, this section looks for plural valuation insofar as it facilitates the inclusion of under-represented values and values of under-represented people. Plural valuation has the potential to enhance outcomes across the three dimensions of justice by establishing participatory processes that empower local stakeholders to represent and integrate their values into decisions, utilizing methods rooted in diverse knowledge approaches, and better harmonizing program design and implementation with existing formal and informal institutions (see *Chapter 3*).

4.5.2. Protected areas

4.5.2.1. Outcomes

The two most frequently-studied outcomes, across a large body of literature on protected areas (482 study-site units) are associated with nature and quality of life (see *Figure 4.9*).¹² Outcomes for nature are most frequently related to ecosystem extent or condition, and species abundance and richness; much more rarely are the spill over effects of the protected area reported (e.g., displacement of habitat

¹² Literature & case study review on outcomes in protected areas and indigenous and community conserved areas (ICCAs). (<https://doi.org/10.5281/zenodo.4394267>).

conversion to surrounding areas). Impacts on quality of life, on the other hand, are much more diverse, ranging from livelihoods, poverty and other economic conditions to displacement and change of social conditions resulting from displacement, reproductive health and disease control, recognition of indigenous peoples' rights, perceptions of benefits and burdens borne by local stakeholders, satisfaction, and other subjective well-being measures. Impacts on institutions include the creation of new programs or structures enabling broader participation in protected area management, or institutions beyond the protected areas themselves that facilitate social cohesion, conflict resolution, knowledge sharing and formal education opportunities.

A subset of studies that included only rigorous impact evaluations (53 studies) demonstrate mostly positive environmental outcomes and mixed social outcomes for protected areas¹³. This review of outcomes is restricted to such rigorous studies (except for case studies or where otherwise noted, to offer additional insight), because it has been well documented that without using counterfactual methods to establish impact, the effect size may be overstated (Ribas et al., 2020). More than 70% of studies documenting win-wins (net positive outcomes) were typically between nature and nature's contributions to people or nature and quality of life. The 27% of studies that demonstrated trade-offs (net negative or net neutral) were mainly between nature and quality of life, and also mostly focused on forest cover and economic impacts (poverty, *per capita* income and expenditure, income growth, revenue, perceived change in remittance, and perceived change in income). None of the reviewed studies found trade-offs between nature and nature's contributions to people, despite the potential for negative contributions from nature (such as livestock predation, disease risk, etc).

4.5.2.2. Values

The evidence for how values influence outcomes in protected areas comes from the in-depth case studies tracking the decision process and evolving conditions in protected areas over time¹⁴ (Figure 4.9). Lessons can be learned from negative outcomes seen in the older protected areas, which were all established through colonialist or top-down approaches (Royal Chitwan National Park in Nepal, Tarangire National Park in Tanzania, Masoala National Park in Madagascar, Nanda Devi Biosphere Reserve in India). Establishment of these older protected areas often involved colonial powers or international actors who removed indigenous peoples from their territories, which has left a legacy of mistrust that has been difficult to overcome even with recent transitions to more community-based management (Dongol, 2018; Goldman, 2003; Igoe, 2002; Keller, 2015; Llopis et al., 2019; Singh & Singh, 2004). In all four of these cases, outside values for biodiversity were prioritized over local community values, and these cases demonstrate mixed or negative impacts, even for nature. The most negative were in Nanda Devi (Maikhuri et al., 2000), which maintained forest cover within the protected area but displaced land degradation outside, leading to a doubling of livestock densities and cultivation of cash crops and consequently caused much higher rates of soil erosion, with a range of negative social outcomes (material well-being, health, cultural heritage, spirituality). Other case studies demonstrated a loss of different aspects of security (water security and land tenure in Tarangire (Baird et al., 2009; Miller, 2015); concerns about food security in Masoala (Borgerson et al., 2019; Llopis et al., 2020) or a loss of identity (for example, due to forced relocations and an influx of tourism in Chitwan (Lipton & Bhattarai, 2014) and to limitations on expansion or shifting cultivation of rice farming in Masoala (Keller, 2008; Llopis et al., 2021). Problems from human-wildlife conflicts were poorly compensated (Baird, 2014; Maikhuri et al., 2000; Newmark et al., 1994) or even exacerbated (Bolton, 1975). In several of these case studies, these negative impacts have led to social conflicts between protected area authorities and local communities (Chitwan,

¹³ Literature & case study review on outcomes in protected areas and indigenous and community conserved areas (ICCAs). (<https://doi.org/10.5281/zenodo.4394267>).

¹⁴ Literature & case study review on outcomes in protected areas and indigenous and community conserved areas (ICCAs). (<https://doi.org/10.5281/zenodo.4394267>).

Nanda Devi, Tarangire), and growing resentment or even hostility (in Nanda Devi) has undermined conservation goals (Baird & Leslie, 2013; Lamichhane et al., 2019; Nepal & Weber, 1995; Newmark et al., 1993; Rao et al., 2003; Singh & Singh, 2004).

In contrast, cases for indigenous community conserved areas and territories (ICCAs) and marine protected areas (which resemble ICCAs in their local management) can be seen as conservation success stories, demonstrating how conservation practices that protect or restore local values and livelihoods are much more likely to be legitimized locally and actively supported over the long term. Some ICCAs in Hawai'i are based on local stewardship values such as *'lawai'a pono* (caring for fisheries and only taking what you need); while often at odds with (and stricter than) regulation set by the United States government, these values are manifested in the striking recovery of culturally important species like reef fish and waterbirds (Delevaux et al., 2018; Vaughan et al., 2017). Similarly, the Digo-speaking Majikendi people practiced sustainable resource use for millennia and their Kaya Kindondo sacred community forest in what is now Kenya is more than 600 years old (Kihima & Kimaru, 2013). The Gorale goat-herding communities in the Polish Tatra Mountains, as well as the Tla-o-qui-aht Nuu-chah-Nuulth in Canada exemplify similar stewardship values by local peoples (Borucki, 2004; Mroczkowski, 2006; Murray & Burrows, 2017; Worboys et al., 2015). Ulithi Atoll Marine Managed Areas (in Federated States of Micronesia) and Raja Ampat Marine Reserve (in West Papua, Indonesia), were both local-led endeavours, putting local values and voices at the center of protected area design and management, and both have documented increases in fish biomass and reef health, as well as on quality of life measures related to economic well-being, health, and education (Andradi-Brown et al., 2017; Crane et al., 2017a; Crane et al., 2017b; Mangubhai et al., 2012; Purwanto et al., 2021).

Values included in (or excluded from) decision processes are in sharp contrast between case studies of protected areas with positive and negative outcomes. Values included in protected areas with positive impacts are almost uniformly more local, often recognizing otherwise under-represented voices, even if they are not necessarily more pluralistic. Instrumental values for indigenous peoples and local communities (focused on "sustainable use") tend to dominate in marine protected areas, but relational values expressed by those communities are also important, especially in the ICCAs. Instrumental and relational values are expressed in the case studies that had negative outcomes as well, but often ignored or deprioritized; intrinsic values of biodiversity were often the primary focus (or in the case of Nanda Devi, the sole focus; Singh Rana et al., 2003). Supporting this case-study evidence, Naidoo et al., 2019 showed (across >600 protected areas within 34 developing countries) that communities living near protected areas with greater allowance for sustainable use led to significantly better social outcomes (on stunting, height-for-age, poverty, and household wealth) than living near "strict" protected areas (IUCN classes I-IV) that restrict local access. While this synthesis was obviously not able to examine values entering into the decision process itself, it can be inferred that if multiple uses are allowed within protected areas a greater representation of the diverse values of nature within those areas exists than if no uses are allowed. In particular, the analysis of the literature identified that protected areas that allowed tourism and local access to harvest plants and animals had the most positive social outcomes, which is consistent with case study findings underscoring the importance of recognizing local instrumental values alongside intrinsic values of biodiversity.

4.5.2.3. Knowledge

Positive outcomes are seen in protected areas where local communities and local experts collaborated with outside experts to blend scientific and local knowledge. Adaptive management is more successful when local actors are involved in the development and evaluation of the effectiveness of their management plans in an iterative process (e.g., in Ulithi Atoll; Agostini et al., 2012; Purwanto et al., 2021). Integrating local knowledge into economic valuation can improve environmental and

social outcomes even for reserves established by outside actors (e.g., as observed in the benefits-sharing arrangement in Jozani-Chawaka Bay Conservation Area in Tanzania; Saunders, 2011). Local knowledge can also be seen as a requirement of sustainable use (as seen in Hawai'i, by banning gear that would allow people to fish with little skill or experience; Vaughan et al., 2017). In contrast, in the four cases documenting negative outcomes described above, scientific knowledge was used to the exclusion of indigenous and local knowledge (even if research was very scarce, as in the case of Nanda Devi; Tiwari & Joshi, 2009).

4.5.2.4. Decision-making processes, power relations, and institutions

In the impact evaluation reviews, win-win outcomes for people and nature in protected areas were primarily attributed to a greater degree of community involvement in decision-making. Leverington et al. (2010) showed, across more than 3,000 terrestrial and marine protected areas worldwide, the importance of institutional enablers such as community and stakeholder involvement, the communication program, and appropriateness of programs for community benefit. Likewise in 40 marine reserves across the Philippines, community participation in determining the precise size and location of the protected area as well as financial or material inputs from municipalities were key (Gjertsen, 2005). This is also exemplified in the case studies presented: positive outcomes are seen in marine protected areas with deeper community engagement throughout both the design and management processes, especially where local villages still maintain some authority (either entirely, for Ulithi and Raja Ampat (Brown et al., 2020; Crane et al., 2017a; Mangubhai et al., 2012; Pakiding et al., 2020; Purwanto et al., 2021), or over the buffer zones for Jozani (Saunders, 2011), while negative or mixed outcomes are associated with more cursory involvement of local people, who, to the extent that they were involved in the process at all, were treated as beneficiaries or stakeholders rather than as managers or stewards (in Chitwan (Nepal & Spiteri, 2011), Tarangire (Nelson et al., 2010; Sachedina, 2016), Masoala (Keller, 2015; Kremen et al., 1999), and Nanda Devi (Seaba, 2007)). Cursory or even coercive participation should not be mistaken for co-management, and indeed has been cited as one of the principal challenges faced by Madagascar in their transition to shared governance of their protected areas (Gardner et al., 2018). Indeed, older research that has questioned the effectiveness of co-management merely confirms the importance of attention to enabling conditions such as institution building and approaches for managing inequities (Kellert et al., 2000).

The importance of co-management or community-based management to outcomes appears to exceed that of the institutional aspects traditionally assumed to determine effectiveness. For example, adequacy and security of budget, management plans, boundary demarcation, control of inappropriate land use and activities, or capacities and resources of staff to enforce regulations and legislation were not strong predictors of protected area performance in the Amazon (Nolte & Agrawal, 2013). Further, in a comparison of the relative effectiveness of multiple forest conservation mechanisms (Börner et al., 2020), greater effect sizes were seen for decentralized management than for top-down protected areas. One reason for the primacy of local communities in determining management success is local people may be better stewards if they feel their own interests are secure. While not screening for rigorous impact evaluations, Oldekop et al. (2016) reviewed 165 protected areas and found that win-wins between social and environmental outcomes were more likely to occur when protected areas *“adopted co-management regimes, empowered local people, reduced economic inequalities, and maintained cultural and livelihood benefits.”* In fact, positive socioeconomic outcomes were more predictive of positive conservation outcomes than any physical or management characteristics of those protected areas. It is not surprising that social and environmental outcomes impact and interact with each other, and these dynamics deserve further research.

Given the importance of local involvement (if not autonomy) illustrated in these reviews as well as in the case studies, further investigation into community protected / conserved areas, including

ICCAs, is critical. Börner et al. (2020) found indigenous management to be the most effective of all conservation instruments examined (including protected areas, payments for ecosystem services, and certification), but noted the low sample size required a cautious interpretation of this finding. While such local landscapes have been managed by local cultural knowledge and laws for millennia, it is only recently that these spaces have received *official* protection by conservationists or national authorities (Pawlowska-Mainville, 2021). There is little written documentation of many of these areas, as the spaces may be led by customary governance where management practices are passed down orally, or they may not have their management practices recognized. The defence of their territories is based on self-determination, biocultural conservation, reciprocity principles and the recognition of rights of nature (Acosta, 2016; Albó, 2018).

4.5.2.5. Conclusions

Across the case studies and the vast body of evidence from impact evaluation, it is clear that when local people are marginalized in decision processes, protected areas can cause social harm and the ability of these programs to achieve even their biodiversity goals is compromised. The key consideration seems to be not necessarily which values are included in decisions but whose; local and indigenous values and knowledge entered into the process too little and too late in protected areas with negative outcomes. Decision processes fostering co-learning and co-management, recognizing and respecting local stewardship values and knowledge, and sustaining the capacity for such stewardship by prioritizing positive social outcomes for local people, produce more sustainable (over the long term) and just (for different groups of people, and for non-human organisms) outcomes.

4.5.3. Payments for ecosystem services/compensation for ecosystem services programs

4.5.3.1. Outcomes

This analysis on Payments for Ecosystem Services (PES) or Compensation for Ecosystem Services (CES) programs included collective action funds (like water funds), reciprocal water agreements (e.g., in Bolivia), compensation for ecosystem services, and ‘reducing emissions from deforestation and forest degradation’ (REDD+) programs that may not self-describe as payments for ecosystem services, encompassing the diversity of payments for ecosystem services in practice.

The literature overwhelmingly emphasizes the importance of fit-to-context in shaping payments for ecosystem services outcomes. For this reason, this review and case study analysis focused on the mechanisms by which influencing factors affect outcomes, particularly focusing on alignments and misalignments between program design and local values, knowledge, and institutions¹⁵. Of the 39 papers reviewed, 27 (69%) identified causal mechanisms linking factors to outcomes for target ecosystem services, and an equal number did so for livelihoods 25 papers (64%) discussed causal mechanisms linked to program sustainability (including enrolment); 21 papers (54%) to sociocultural outcomes; 17 (44%) to equity; and 10 (26%) to other, non-target environmental outcomes. The evidence was roughly equal for positive and negative influencing factors. The review did not track broader discussions of outcomes in the literature where causal factors were not identified and did not track speculative claims about impacts on outcomes. Below, findings from the case studies augment the literature review, referenced by country (*Figure 4.10*).

¹⁵ Literature & case study review on outcomes in payments for ecosystem services / compensation for ecosystem services (PES/CES) programmes (<https://doi.org/10.5281/zenodo.4394520>).

4.5.3.2. Values

There is strong evidence that greater integration of local values positively impacts outcomes, chiefly by enhancing enrolment (quantitative levels of program participation, and overall participant buy-in and perceptions of program legitimacy), reducing conflict, and more effectively addressing drivers of land conversion. Recognition of cultural values, equity goals, and prioritization of locally-relevant ecosystem services enhance enrolment, benefit sharing, monitoring, equity, and environmental outcomes (Bayrak & Marafa, 2016; Boerner et al., 2017; Brownson et al., 2019). Misalignments among local and program values weaken enrolment and may foment conflict, especially around land use restrictions, targeting, and benefit sharing (Nigeria, Mexico, Ecuador) (Blundo-Canto et al., 2018; Corbera et al., 2020; Isyaku et al., 2017; Joslin, 2019; Odok, 2019; Osarogiagbon, 2011; Shapiro-Garza, 2013). Monistic valuation focused on single ecosystem service values can result in trade-offs affecting non-target environmental outcomes and traditional lifeways, including those that support biodiversity and food sovereignty (Bayrak & Marafa, 2016; Milne et al., 2019; Costa Rica and Nigeria cases).

Non-monetary motivations, including social and political recognition and cultural values, are well-documented as important motivators for enrolment (Australia, Mongolia, Ecuador, Mexico, Bolivia; Bétrisey & Mager, 2014; Bremer, n.d.; Bremer et al., 2018) in these case studies, co-designed payments for ecosystem services successfully incorporated these motivations into program design (Australia, Mongolia, Bolivia), while other programs made some improvements over time (Mexico, Ecuador). Even in co-designed payments for ecosystem services, difficulties remain in balancing cultural values and recognition with ecosystem services-driven policy and monitoring (Australia), and in controlling leakage without imposing culturally-inappropriate rules (Mongolia).

Insufficient or inappropriate compensation was the most-discussed benefit-sharing problem, rooted in non-recognition of local values, underestimation of participation costs, unreliable funding, and low-value ecosystem services (especially carbon). Strong evidence shows that insufficient or inequitable compensation results in negative social outcomes and threatens program effectiveness and longevity (Nigeria case; Bayrak & Marafa, 2016; Blundo-Canto et al., 2018; Brownson et al., 2019; Milne et al., 2019; Pasgaard et al., 2016; Pelletier et al., 2016; Robinson et al., 2019). Lack of participant engagement in payments for ecosystem services design may result in inequitable benefit sharing (Nigeria case; Loft et al. 2017), while participatory mechanisms enhance equity (Mongolia case; Brownson et al., 2019). In contrast, payments that meet or exceed opportunity costs predictably enhance enrolment and program effectiveness (Blundo-Canto et al., 2018; Calvet-Mir et al., 2015; Ola et al., 2019). Long-term contracts are also key to enabling enrolment and behaviour change (Boerner et al., 2017; Calvet-Mir et al., 2015; Grima et al., 2016).

A variety of formal valuation methods and informal processes of valuing (as defined by *Chapter 3*) were used across cases, but there is little documentation of specific methods employed in payments for ecosystem services design. Economic valuation of ecosystem services did not play a strong role in any case, although a valuation study in Costa Rica was used to galvanize support for market approaches early on (see Lansing et al., 2015). Estimated opportunity costs (Mexico, Costa Rica, China) and market values for carbon (Mongolia, Australia) were the primary means of determining compensation, in addition to government fiat (Nigeria) (Alix-Garcia et al., 2008; Asiyambi, 2016; Castro et al., 2000; De Camino et al., 2000; Jackson et al., 2017; Upton, 2020). Community workshops and focus groups were used for value articulation in some cases (Australia, Mongolia, Nigeria), but their impact on design and implementation varied widely based on governance structure and power relations (Jackson et al., 2017; Nuesiri, 2018; Upton, 2020). In Nigeria, despite nominal compliance with reducing emissions from deforestation and forest degradation (REDD+) safeguards, there was evidence that workshops deliberately excluded relevant stakeholders believed to hold views conflicting with reducing emissions from deforestation and forest degradation (REDD+) proponents.

There, misalignment among carbon values prioritized in reducing emissions from deforestation and forest degradation (REDD+) and instrumental, relational, cultural, and intrinsic values of forests held by communities resulted in resistance, conflict, and significant adverse social impacts. In some cases, where local values were not sufficiently represented, unofficial value articulation strategies like protest, sabotage, refusal, and resistance were used (Nigeria, Mexico, Ecuador; Diehn, 2005; Osarogiagbon, 2011; Shapiro-Garza, 2013). Cases with substantive community engagement in defining the land management problem (Australia, Mongolia) were best able to align values.

4.5.3.3. Knowledge

There is limited direct evidence in review literature on the role of diverse knowledge types in influencing outcomes. However, some studies show that integrating local traditional knowledge enhances benefit sharing and equity, and supports monitoring and environmental effectiveness (Bayrak & Marafa, 2016; Turreira-Garcia et al., 2018). Effectiveness refers to the ability of a program to deliver its intended results, e.g., additional ecosystem service/nature's contributions to people values, while controlling displacement of degrading activities (leakage). Efficiency refers to a program's cost-effectiveness relative to alternative options (Pasgaard et al., 2016). In contrast, restrictive interventions counterposed to local knowledge and management practices may lead to loss of the latter, including those supporting biodiversity (Bayrak & Marafa, 2016; Bremer et al., 2018); and may foment conflict and erode social cohesion (Blundo-Canto et al., 2018). Community-driven programs in Mongolia and Australia successfully integrated indigenous and local knowledge and mainstream science, using tools like carbon modelling to align local and non-local values. These processes were substantially community-driven, supported by well-organized local institutions, and time-consuming (Jackson et al., 2017; Upton, 2020). In national and user-driven programs, there was greater dominance of geospatial science in defining interventions, at times at the expense of local values, knowledge, and rights (Nigeria, Mexico; Asiyanbi et al., 2017; Muñoz-Piña et al., 2008; Shapiro-Garza, 2020). Certification requirements also played a role: in Mongolia, the plan vivo carbon standard set ambitious requirements for community-driven design and equitable benefit sharing, while reducing emissions from deforestation and forest degradation (REDD+) free, prior, and informed consent (FPIC) standards in Nigeria failed to ensure procedural justice (Asiyanbi et al., 2017; Isyaku et al., 2017; Upton, 2020).

There is greater evidence in review literature on the importance of participants' knowledge and understanding of program goals and benefits in supporting enrolment, compliance, and program effectiveness (Adhikari & Agrawal, 2013); of adequate contextual and technical knowledge by intermediary institutions (Ola & Benjamin, 2019; Tacconi et al., 2013); and of knowledge enhancement and training via participatory monitoring for building capacity and program longevity (Pelletier et al., 2016; Turreira-Garcia et al., 2018). Inadequate or inappropriate consultation processes, even where these satisfied certification requirements for free, prior, and informed consent, resulted in confusion about the program and goals, diminishing enrolment and at times leading to loss of land rights (Bayrak & Marafa, 2016; Duchelle et al., 2018; Lawlor et al., 2013; Milne et al., 2019; Nigeria case).

4.5.3.4. Decision-making processes, power relations, and institutions

Institutional alignment refers to how well-integrated payments for ecosystem services programs are with the broader policy context and existing institutions. Review literature provides strong evidence that integration with existing local organizations and trusted intermediaries is a key factor in program success across outcome dimensions, particularly for program effectiveness and sustainability (Bremer et al., 2018; Brownson & Fowler, 2020; Hayes et al., 2019). In contrast, weak institutional capacity and inequitable local institutions inhibit monitoring, enforcement, and behaviour change (Brownson et al., 2019; Samii et al., 2014; Wegner, 2016). Conflicting policy and political economic

incentives weaken compliance and effectiveness (Loft et al., 2017; Milne et al., 2019; Ola & Benjamin, 2019).

Institutional alignment is especially relevant to understanding the role of land tenure formalization in payments for ecosystem services, a strong focus of the literature. In contexts with overlapping or unformalized land rights and customary uses, or high state ownership of land, land tenure codification – commonly considered to be a benefit to participants – may increase land scarcity, conflict, and ‘leakage’ (Kansanga & Luginaah, 2019; Milne et al., 2019; Nigeria case), or it may undermine traditional institutions and weaken IPLC decision-making power (Bayrak & Marafa, 2016). Tenure criteria for participation may also exclude non-landowners and thus exacerbate contextual inequities (Bolivia case; Duchelle et al., 2018; Koch & Verholt, 2020; Loft et al., 2017; Robinson et al., 2019). In contrast, where well-organized community institutions are engaged, formalizing communal land rights may strengthen communities’ ability to access, manage, and sell environmental goods (Mongolia case; Brownson et al., 2019; Chhatre et al., 2012).

Studies also show the importance of alignment with existing practices and cultures of resource management (informal institutions embodying community shared values) for social outcomes, including equity (Bremer et al., 2018; Calvet-Mir et al., 2015). This accords with strong evidence showing that working lands interventions are more effective than diversionary approaches for building local capacity, enrolment, and program longevity (Ola et al., 2019; Tacconi et al., 2013; Wegner, 2016). In Australia and Mongolia, the revival and enhancement (respectively) of traditional land management practices and empowerment of local institutions served as powerful motivators for enrolment (Jackson et al., 2017; Upton, 2020). In contrast, in Nigeria reducing emissions from deforestation and forest degradation (REDD+) incentives were part of a “carrot and stick” approach that effectively criminalized livelihoods, resulting in significant negative livelihood impacts, local resentment of reducing emissions from deforestation and forest degradation (REDD+), and mass incarceration among forest-dependent communities (Isyaku et al., 2017).

Strong evidence shows that local participation in payments for ecosystem services design, implementation, and monitoring enhances social and environmental outcomes and strengthens governance institutions (Mongolia, Australia; Boerner et al., 2017; Brownson et al., 2019; Chhatre et al., 2012). However, the degree of participation matters: one review of participatory environmental monitoring cautions that participation is often limited to data collection and is routinely un- or under-compensated, weakening its social, environmental, and program benefits (Turreira-Garcia et al., 2018). Participatory mechanisms are most effective when integrated across ideation, design, implementation, and monitoring, and supported by strong community institutions or trusted intermediaries (Australia, Mongolia; Adhikari & Agrawal, 2013; Boerner et al., 2017; Brownson et al., 2019; Duchelle et al., 2018; Tacconi et al., 2013). In Australia and Mongolia, participatory design and management was enabled by significant community control over land use (70% Aboriginal ownership in Australian case) (Russell-Smith et al., 2009). Local decision-making around implementation proved especially significant in aligning values and enhancing enrolment (Australia, Mongolia, Ecuador); in Ecuador and Mexico, programs adapted over time to allow community-driven implementation to address issues with enrolment (Ecuador) and participant demands (Mexico; Joslin, 2019; Shapiro-Garza, 2013).

Case literature demonstrates that power relations shape whose values are affirmed in payments for ecosystem services design and implementation, and what kinds of knowledge are used to define environmental problems and solutions. The power of funders in framing environmental problems and solutions was clear in a number of programs (Costa Rica, Nigeria, Mexico, Ecuador) (see *Annex 2.1*) (Joslin & Jepson, 2018; Lansing et al., 2015; Muñoz-Piña et al., 2008; Shapiro-Garza, 2020). In some national and donor-driven programs (Mexico, Costa Rica, Nigeria), international actors and development institutions gained influence through alliance with domestic industries or political

actors, at times shifting domestic power relations (Lansing et al., 2015; Shapiro-Garza, 2020). In both Nigeria and Costa Rica, payments for ecosystem services / reducing emissions from deforestation and forest degradation (REDD+) was initially embraced as a response to both public debt and environmental crises, with strong influence of development institutions and international non-governmental organizations (Lansing et al., 2015). In Costa Rica, World Bank goals empowered the then-marginal forestry sector, helping the payments for ecosystem services law to win out over an alternative forestry law promoted by environmental and social movement actors (Fletcher & Breitling, 2012; Silva, 1997). Similarly, despite alternative drivers of páramo degradation in Ecuador such as development projects and water diversion, rural livelihood practices became the focus of Quito's water fund program based on input from local and international non-governmental organizations and the water utility, with limited involvement of affected communities (Joslin, 2020). These cases suggest the need for further attention to the equity implications of how payments for ecosystem services are imposed as a solution, especially where international ecosystem services markets are sought out to address fiscal issues.

4.5.3.5. Conclusions

Findings indicate that misalignment between payments for ecosystem services and local values, knowledge, and institutions are likely to negatively affect social and environmental outcomes, and that these effects can impact program longevity and effectiveness. In case studies, integration of community values and participatory decision-making power early on strengthened social outcomes, rather than tacking on social goals as co-benefits. Local participation in payments for ecosystem services was most effective where well-organized community institutions were engaged in program design and administration, and where land rights were recognized, including communal ownership. Nevertheless, even cases that modestly improved distributional and procedural justice over time showed better outcomes relative to cases that did not make those changes.

The evidence illustrates that valuation and expression of values is a political process that will not be resolved by technical solutions or methods alone (Hausknost et al., 2017; Muradian & Rival, 2012). Power relations built into program governance influence whether participant engagement is substantive or is simply used to gain consent. Further, structural factors affecting market values for ecosystem services and reliability of funding (especially in reducing emissions from deforestation and forest degradation (REDD+) and carbon markets) pose significant constraints to benefit sharing and impose market risk on participants. Gaps still remain in the understanding of payments for ecosystem services outcomes and the potential for payments for ecosystem services to support larger-scale transformation of socio-ecological systems towards sustainability and justice; see *section 4.7* for more details.

4.5.4. Sustainability certification programmes

4.5.4.1. Outcomes

We split our review on outcomes of sustainability certification programmes¹⁶ into different categories related to the IPBES conceptual framework: nature and nature's contributions to people, good quality of life, and institutions.

Nature and nature's contributions to people

Nature's contributions to people (specifically for climate regulation) and biodiversity (specifically for bird diversity and tree diversity), maintained at certified plots are somewhat higher than those of

¹⁶ Literature review on outcomes in environmental certification (<https://doi.org/10.5281/zenodo.4394498>).

the business-as-usual production systems, particularly for the case of oil palm, cacao, and coffee (Gockowski et al., 2013; Schmidt & De Rosa, 2020). The environmental outcomes, which put more emphasis on non-anthropocentric approaches to environmental ethics, cover outcomes towards a more heterogeneous landscape (Azhar et al., 2015) and better care for nature (Ingram et al., 2014). However, there were insignificant impacts on deforestation, fire incidents (Carlson et al., 2018; Morgans et al., 2018), and orangutan presence (Morgans et al., 2018).

Sustainability certification programs at a scale that may contribute significantly to the increase of nature's contributions to people are limited. A study in Ghana even concluded that the 228,000 ha of additional forest land required to produce one million tons with Rainforest Alliance (RA-Cocoa) raises questions about which system would impact environmental services the least (Gockowski et al., 2013). In the case of soybean (Tomei et al., 2010), when the certified product is processed to biofuel, the aggregate environmental outcomes of this additional demand are still detrimental.

Good quality of life

Much of the literature has focused on (lack of) economic benefits farmers perceive from participating in these schemes. It is difficult to disentangle the effects of certification on farmers' economy and working conditions, from the effects of the training program and other development initiatives which are implemented to accompany farmers in adopting sustainable practices in general (KPMG SUSTAINEO, 2013). Certification appears to be concentrated in areas important for biodiversity conservation, but not in those areas most in need of poverty alleviation, although there were exceptions to each of these patterns (Tayleur et al., 2018).

Agricultural productivity and infrastructure. Most independent smallholders in the case of roundtable for sustainable palm oil (RSPO) certification gain higher productivity as a benefit of certification (Morgans et al., 2018). However, not all these economic benefits are currently present in the context of the smallholder certification pilot projects (Brandi et al., 2013). Improvements in yield have been documented, but mostly at the estate or concession rather than at the smallholder levels (Morgans et al., 2018). In coffee, increases in physical capital are attributable to local industry infrastructure under the Fairtrade certification offering a strategic return on investment to farmers. However, the ability of certification schemes to facilitate larger investments in public infrastructure is limited, and a more realistic assessment of this impact pathway is necessary.

Economic benefit. Economic benefits are the most contested in the literature, and less likely a result of marginal price premiums than of indirect factors, such as improved yields, increased resilience, and enhanced access to credit (Bray & Neilson, 2017; see also 4.3.3). Certification is associated with increased levels of farm-level record-keeping, which may, in time, result in heightened levels of financial literacy and improved farming efficiency as farmers become more aware of the impacts on profitability of undertaking certain practices. Improved market access at the firm-level is a consistent finding in both under forest stewardship council (FSC) (Quevedo, 2007) and Rainforest Alliance (RA) certification (Markopoulos, 1998), securing new export markets and price premiums for several lesser-known timber species. However, in most of the cases, higher prices for timber have not translated into significantly higher community incomes (Markopoulos, 1998). Similar results were documented under Fairtrade, where value added stopped at the organizational level and moved down to farmers with uneven distributions (Parrish et al., 2005). The analysis of the marine stewardship council (MSC) label shows that small-scale fisheries, particularly in developing countries, have been somehow excluded in getting economic benefits from certifications (Ponte, 2008).

Health, safety and workers' rights. Sustainable Agriculture Certification (SAN) generated positive outcomes in relation to training and qualification, proper use of individual protection and equipment (Barbosa de Lima et al., 2009), improved health and safety and better working conditions, community

and workers' rights (Quevedo, 2007), though it is difficult to attribute these outcomes directly to certification (Brandi et al., 2013). The global forest stewardship council case studies clearly reveal some consistency across regions and countries in these social effects, which include improved pay and conditions for workers, the development of community infrastructure.

Institutions and social capital

Social capital is frequently enhanced in terms of the strengthening of producer organizations as a direct result of certification, and it is assumed that this generates various benefits for individual members. Fairtrade made a significant impact on social capital by increasing connectedness to both the global coffee industry and the domestic market actors, such as banks and domestic buyers along with some gradual impact on the organization's accountability, transparency and information flow mechanisms (Parrish et al., 2005). Agronomic knowledge, farm management, and good agricultural practices were frequently improved in SAN certification through the provision of training associated with certification (Barbosa de Lima et al., 2009). In general, a positive correlation between certification and education has some support in the literature, but causation is difficult to establish. In the case of forest stewardship council, the contribution of certification can be seen in improved compliance with governmental regulations (Hartsfield & Ostermeier, 2003) and better coordination, particularly on setting up the demarcation and management of protection areas (Markopoulos, 1998), relationships between timber companies and local communities (Quevedo, 2007), and the provision of training.

Participation in the case of Rainforest Alliance UTZ certification schemes may have unexpected outcomes on the role of women in cocoa marketing, as men seem to be assuming a greater role in cocoa marketing through the new farmer organization structures associated with certification (Hafid et al., 2013). The tendency for certification to be adopted by relatively better-resourced households within a community, who also assume leadership positions within organizations, suggests a link to rising inequality that may have both gendered and structural (in relation to labour) dimensions (Bray & Neilson, 2017). Debilitating weaknesses in social and institutional relations were identified by the certification process, thus certification has refocused attention on the community as the basic socio-political unit of forest management (Markopoulos, 1998).

4.5.4.2. Values

Financial values in certification are manifested in guaranteed premium prices, positive incentives for nature's contributions to people and reduced costs of certification. Premium pricing (as long as these are paid and reach them) motivates smallholders for joining certification (Brandi et al., 2013; Hutabarat et al., 2018; Saadun et al., 2018). A study on marine sustainability certification stated that such initiatives will keep putting 'sustainability' at the service of commercial interests until premiums are paid at the producer level (Ponte, 2012). However, workers' wages do not seem to benefit from the presence of certification and further along the causal chain; no evidence was found that total household income improves with certification (Oya et al., 2018). The value chain structures through which certification programmes are implemented are highly varied and strongly influence livelihood outcomes.

Smallholders, particularly independent farmers (Brandi et al., 2013; Oosterveer et al., 2014) and small-scale fisheries (Stratoudakis et al., 2016), usually lack the financial means to shoulder certification costs without financial support. Investment in developing market opportunities, infrastructures and institutional capacities in accessing financing schemes can help mobilise the support for these smallholders and fisheries (Stratoudakis et al., 2016). Independent microcredit is an alternative as more farmers require capital from outside the banking sector. Further, one approach being tested by the Forest Stewardship Council and its accredited certifiers is a lower-cost, more

streamlined assessment procedure for low-risk operations, evaluation requirement, and efforts to promote group certification (Quevedo, 2007).

Intrinsic values for nature are apparent in the environmental goals of the certification programs themselves. Scale and patterns of land-use change influence the effectiveness in supplying nature's contributions to people and producing landscape-level outcomes. Certification still struggles to effectively combat large-scale environmental problems, but can effectively contribute towards reducing negative environmental outcomes on a rather small scale (Bray & Neilson, 2017). This is due to a lack of broad market uptake that limits the effectiveness of voluntarily certified commodities and regulatory loopholes in the systems halting the contributions of countries with comparatively strong market uptake (van der Ven et al., 2018).

The case of Dolphin Safe found that certification narrowly focused and measured on specific (marine) species that may be of much more interest to consumers (Ward, 2008). Thus, the enabling condition recommended ways to reduce the problem of consumer apathy on sustainable marine fisheries as a big picture, and not only care for specific marine species. From the perspective of an intermediary, certifiers should focus their efforts on key leverage points along supply chains where changes made can have meaningful conservation outcomes (Cohn & O'Rourke, 2011).

When the certification initiative is in an isolated management unit, i.e., specific concessions or plantations, achieving positive outcomes for nature's contributions to people often requires linking existing certification mechanisms with broader landscape management approaches or expanding current certification models to consider the landscape itself as the certified unit (Tscharntke et al., 2015). Positive incentives such as a price premium linked to conservation, and greater collaboration with local governments and non-governmental organizations for forest protection, may indirectly increase forest area preservation (Carlson et al., 2018) and sustainable fish management (Ponte, 2012) after certain landscape / seascape intervention scale is reached due to the conservation interventions under the sustainability certifications.

4.5.4.3. Knowledge

The case of roundtable for sustainable palm oil in Kalimantan highlighted the importance of baseline information in measuring environmental outcomes: orangutan populations declined in both certified and non-certified concessions between 2009–2014, and the rate of decline was even faster in certified concessions (Morgans et al., 2018). As the roundtable for sustainable palm oil regulations prohibit new plantations from replacing primary forest from November 2005, forested land and viable orangutan habitat would likely have been cleared in the years prior to certification for current and potential future plantation establishment. Conversely, as no clearing regulations exist for non-certified plantations, many still contain forest patches and viable habitat, particularly concessions that have been gazetted but are at present inactive (Meijaard et al., 2017).

In addition to scientific knowledge, understanding the socio-ecological background and inherent nature of smallholders (which links to their local knowledge) is critical to designing a holistic certification scheme that does not neglect the plight of smallholders in the socioeconomic outcomes (Saadun et al., 2018). Producers' knowledge and capability to implement the certification process determine the level of their controls and power-relations with the certifiers (Melo & Wolf, 2007). Conversely, higher farmer knowledge on the certification programme can result in better implementation of good agricultural practices and better outcomes (Ingram et al., 2014; Quevedo, 2007). More active and transparent information dissemination is needed to overcome this information gap (and reduce future costs) (Ayalew, 2014; Brandi et al., 2013).

4.5.4.4. Decision-making processes, power relations and institutions

Stronger pre-existing institutions within the producer community are more likely to result in socioeconomic benefits for individual households (Bray & Neilson, 2017; Ton et al., 2007). Networking and partnership of smallholders with other stakeholders, such as private sectors, traders, and non-governmental organizations partners are deemed important to ensure the flows of social (such as facilitating the formation of producer groups) and financial (such as pre-financing the investments) benefits from participation in certification (Hidayat et al., 2015; KPMG SUSTAINEO, 2013). The case of the roundtable for sustainable palm oil certified growers suggested that a much closer cooperation between governments and the palm oil roundtable, in addition to the engagement of the palm oil roundtable members with those independent producers and local communities, could catalyse positive sustainability outcomes on the ground (Moreno-Peñaranda et al., 2015).

4.5.5. Large infrastructure projects

4.5.5.1. Outcomes

Major environmentally disruptive and irreversible projects, such as large dams and mines, pose a special challenge to decision-making, distinct from the other themes in this section. They dramatically transform ecosystems and displace people or affect livelihoods in order to provide irrigation, hydropower, or minerals—all sources of human material well-being. Trade-offs between the (largely) instrumental values of these (abiotic) natural resources and the instrumental, intrinsic and relational values that (biotic) nature provided earlier are therefore inevitable. In this context, “better decisions and outcomes” could mean different things: better resettlement or compensation for affected communities, more mitigation of post-project environmental impacts, scaling down of the project to reduce adverse impacts, or even the rejection of some projects in extreme cases.

In terms of immediate well-being, the abiotic resources mobilized through dams and mines provide substantial material well-being (Fields et al., 2009). Even after compensating for negative material impacts, aggregate material well-being may in most cases be positive (depending upon the measure and method of aggregation used). But the concept of compensation cannot be applied to intrinsic values. Moreover, aggregate measures of well-being may hide major distributional differences. Finally, most reviews suggest that projected material benefits, especially from dam projects, are often not realized fully in practice (World Commission on Dams, 2000).

On the sustainability dimension, mines are by definition ‘unsustainable’ as the mineral resource is non-renewable; sustainability then only has meaning if defined as ‘weak sustainability’, wherein financial capital substitutes for natural capital (Ayres et al., 1998; Hilson & Basu, 2003), but there is much debate about this approach (Kirsch, 2010; Shang et al., 2019). Hydropower dams, on the other hand, are seen as enhancing overall sustainability because they produce renewable energy or are carbon-neutral (Berga et al., 2006). In reality, dams have a finite life of 50-100 years because of siltation (and often less: Cooper et al., 2018), may not be zero-emission (Fearnside, 2016), and dam-based irrigation often leads to water logging and salinity (D’Souza et al., 1998; Scudder, 2005; World Commission on Dams, 2000). Finally, compensatory efforts notwithstanding, such projects inevitably lead to a decline in the intrinsic value components of nature (McAllister et al., 2001; Murguía et al., 2016; Winemiller et al., 2016).

In terms of justice, the benefits typically accrue to sections of society (urban, industrial or downstream farmers) that are quite distinct from those that bear the costs (rural, agrarian or forest-dwelling, upland farmers). The costs include displacement, health hazards, loss of livelihoods and cultural values, etc. Rehabilitation/compensation efforts have often been inadequate (Hendryx, 2015; Singh, 1990; World Commission on Dams, 2000). Moreover, large dams and mines are most often located in regions that are inhabited by indigenous people or other marginalized communities, sharpening the social injustice involved (Cariño & Colchester, 2010; Özkaynak et al., 2012; Özkaynak & Rodriguez-

Labajos, 2017). Individual mines have smaller impacts than individual large dams, but the picture in regions with a high concentration of mines is dismal (Singh et al., 2020). The windfall profits from mining versus its socio-environmental impacts present a particularly cruel paradox (Ali & Behrendt, 2001; Auty & Warhurst, 1993). Some attempts at better sharing of benefits in Canada & Australia (St-Laurent & Le Billon, 2015) and the district mineral funds established in India (CSE, 2017) notwithstanding, the distributional outcomes remain enormously lopsided.

4.5.5.2. Values

There is no simple distinction between the values articulated in favour of large infrastructure projects and those articulated in calls for their modification or rejection. Case studies from around the world (*Figure 4.10*) reveal that values for human life, material livelihood and human well-being dominate the discourse on both sides.¹⁷ Dams and mines are proposed for their instrumental values: electricity to urban consumers or irrigation water to farmers, and jobs. Those negatively affected also primarily highlight material impacts on their lives, health and livelihoods: loss of agricultural and forest-based livelihoods and displacement (the Sardar Sarovar dam in India, the Ilisu dam in Turkey, North Karanpura coal mine in India), fishing (the Hidrosogamoso dam in Colombia), livestock rearing (Ilisu dam), or health threats (North Karanpura coal). But whenever decision-makers value aggregate material well-being, whether through the use of benefit-cost analysis or contributions to gross domestic product, the objections get overruled. When additional values such as energy security, revenue generation, nation-building, or promoting industrialization are invoked they almost always prevail (Özkaynak et al., 2012).

Relational values are largely expressed by local communities: highlighting ties with the forest, farm, river or fishery that is to be modified / destroyed (Urkidi, 2010). Moreover, relational values are not limited to ecosystems—the Ilisu dam opponents highlighted the value of the historical town of Hasankeyf. The intrinsic value of nature, such as in the “rights of the river” discourse, are not very visible in the debates; the “intrinsic value of human life and livelihood” (i.e., human rights) are more commonly cited.

The major concern articulated by the negatively affected groups is “intra-generational distributive justice” (Özkaynak et al., 2012), a major drawback in all projects. Moreover, the simple aggregation of economic benefits and costs inevitably devalues the costs because they are faced by poorer communities (Hwang, 2016). Project-affected groups have also raised the two other dimensions of justice- recognition and procedural justice (Conde, 2017). They use different articulations: human rights, democratic rights, due process, “social justice” (including the rights of indigenous peoples or ethnic minorities). In most cases, however, the concept of “eminent domain” of the state and the larger “public interest” overrides such considerations. But when the judiciary supported the demand for procedural justice (Niyamgiri Bauxite Mine in India), the project ended up getting rejected.

Sustainability is invoked by opponents to hydropower dams in all cases, citing the destruction of biotic nature (forests, riverine ecosystems, agriculture), although in the case of dams, water as a renewable resource becomes the counter-argument. Pointing to the unsustainability of mining has had some impact on decisions, but terms such as ‘sustainable mining’ have been coined to counter these criticisms (Kirsch, 2010). Invoking other instrumental or intrinsic values of nature (e.g., climate regulation or biodiversity values of the forest lost to dams/mining) have had limited impact in decision-making on most projects, especially in the Global South.

¹⁷ Review on outcomes in big development projects (mining and dams) (<https://doi.org/10.5281/zenodo.4395985>).

4.5.5.3. Knowledge

There is a limited literature on the mobilisation of knowledge and its impact on decision-making in big infrastructure projects. From the case studies, it appears that both project proponents and opponents mobilized modern scientific knowledge to support their arguments. environmental impact assessments (EIAs) (or pre-EIA impact assessments) were used by project proponents but contested by others, cost-benefit analyses were challenged (Sardar Sarovar dam), social impact assessments and pollution studies were demanded (Hidrosogamoso dam, North Karanpura coal) and biodiversity inventories carried out (Ilisu dam). Affected communities articulated their traditional local knowledge (Hidrosogamoso dam) but sought also to integrate it with modern science (e.g., Hidrosogamoso dam opponents demanding an ecological study on water quality and fish decline). Alternatives or modified designs were proposed in several cases (Sardar Sarovar dam, Ilisu dam, Hidrosogamoso dam). Opposition to mining in Latin America has also looked for alternative development strategies (Avci et al., 2010; Bebbington et al., 2008), but typically lacked the resources to flesh out the alternatives, and therefore have had limited impacts on decision-making.

4.5.5.4. Decision-making processes, power relations, and institutions

Public decision-making regarding environmentally disruptive infrastructure projects has, for several decades, required some form of environmental impact analysis / assessment / appraisal (Morgan, 2012) paired with public consultation or hearings in most countries (Naber, 2012). However, there is a big gap between theory and practice, whether in terms of the technical rigour of the assessment or procedural democracy in the consultations (see *Annex 4.3*).

Hence, the World Commission on Dams (WCD) sought to extend the norms for environmental appraisal and public participation by outlining a set of principles for a good decision-making process (Dubash, 2010; Moore et al., 2010). Key among these is recognition of rights of affected communities, inclusion of stakeholders in decision-making, free-prior-informed-consent from indigenous communities, and transparent processes. The extractive industries transparency initiative (EITI) has also adopted some of these principles for mining (Rustad et al., 2017). However, the case studies indicate that these principles are rarely followed. In all cases, the “in-principle” decisions to go ahead with the projects preceded socio-environmental appraisals by years or decades. Public hearings were either not carried out because they were not legally required at that time (Sardar Sarovar dam, Ilisu dam), were carried out after construction had commenced (Hidrosogamoso dam), or were carried out perfunctorily (Niyamgiri bauxite, North Karanpura coal). Decisions to proceed were endorsed by expert committees and finalised at the political level without any wider consultations. In that sense, procedural justice was repeatedly violated, just as a utilitarian focus on aggregate benefits violated distributional justice.

Alternative forums or processes have been invoked in all cases, and were effective to some extent in a subset of cases. The first step is typically to explore the formal mechanisms involved, such as demands to hold statutory environmental impact analysis/assessment/appraisal that were skipped (Ilisu dam), public hearings that were missing (Hidrosogamoso dam), or to conduct fresh studies (North Karanpura coal). These approaches yielded some modifications or mitigation measures (Ilisu dam) but did not go beyond that. The wider literature supports these conclusions (*Annex 4.3*) that formal appraisal and consultative processes largely result in only minor mitigative measures. The Klamath river basin programme on decommissioning of dams perhaps represents one of the few multi-stakeholder efforts that were successful to an extent (Maven, 2020; Schlosser, 2011) (*Box 2.10*).

A somewhat more effective alternative strategy to get voices heard was mobilising public opinion and building cross-national networks to put pressure on project funders. In two cases (Ilisu dam and

Sardar Sarovar dam), funders withdrew from the project. But this method of value articulation appears to be less effective in mining projects, which are less capital intensive. Moreover, even when funders withdrew, the national governments went ahead with dam projects using their own funds (Ilusu and Sardar Sarovar).

Another process that has been explored and appears to provide space for broader value articulation is the judiciary. Where the judiciary has interpreted the right to life to include rights to be safe from environmental harm, or have upheld the need for due process in general and the rights of indigenous communities have a say in (Corte Constitucional de Colombia, 2013) or veto (Niyamgiri mining) projects affecting them, the eventual decision-making process has been more rigorous and democratic than the original one. However, the judiciary has focused on recognition and procedural justice, rather than on valuing particular concerns such as “sacredness”, “intrinsic value of nature”, “rights of nature” etc. even when such values have been invoked by certain stakeholders. Still, the role of the judiciary thus appears to be key (Faure & Raja, 2010; Sahu, 2016), although accessing judicial remedy remains a challenge even with green courts due to delays in hearings, appeals that prevent final decisions, among other barriers (Dilay et al., 2019).

Finally, the option of street protest has been pursued in most cases. In Sardar Sarovar dam, the anti-dam movement conducted mass actions at various scales for over two decades and, combined with litigation, led to better rehabilitation. In some mining conflicts, the innovation has been to call for local referendums on the issue (Özkaynak & Rodriguez-Labajos, 2017; Urkidi & Walter, 2011). Unfortunately, states have usually responded to protests with repressive measures: refusing permission for protest marches, counter-propaganda, and arrests.

4.5.5.5. Conclusions

The evidence indicates that much more needs to be done to improve the decision-making process around environmentally disruptive infrastructure projects, including both the quality of socio-environmental appraisals as well as the quality of decision-making procedures and the recognition of rights of affected communities (UNEP, 2019). But this is unlikely to happen unless the extreme power imbalance between growth-focused governments and profit-focused corporations on the one hand and adversely affected communities on the other is redressed (Morrice & Colagiuri, 2013). Social movements have sought to shift this imbalance through various means: building networks, deploying discursive strategies (Özkaynak et al., 2015), litigation and street protest. But this is likely to be insufficient unless there is a larger shift away from the utilitarianism of aggregate benefits, and towards value for equity, social justice and democratic process in decision-making (Jha-Thakur et al., 2009; Menon & Kohli, 2019).

4.6. Uptake of valuation of nature to support decision

4.6.1. Introduction

This section reviews evidence that valuation methods - as described in *Chapter 3*¹⁸ - are being used by stakeholders for different purposes in the policy cycle. *Section 4.6.2* reviews literature on barriers to and criteria for uptake by stakeholders and proposes a framework for assessing both literature blindspots on uptake, as well as identification of valuation best practice¹⁹. A systematic review of published research valuing nature's contributions to people in *section 4.6.3* finds continuing research blindspots regarding documentation of stakeholder uptake²⁰. *Section 4.6.4* reports on the coincidence between the amount of peer reviewed valuation research at country level, national implementation of natural capital accounting and national reporting on valuation uptake to the CBD²¹. This section also looks more closely at how valuation is implemented at different scales, including United Nations standardisation of System of Environmental Economic Accounting-Ecosystem Accounting (SEEA EA), in European Union policy and at national level with the example of the United Kingdom. The potential for uptake of local and indigenous valuation knowledge in legal designations of rights and policy plans is reviewed and exemplified in *section 4.6.5*. Finally, *section 4.6.6* contains seven case study "brightspots" - examples of how barriers to valuation uptake can be overcome for a range of methods addressing stakeholder needs at different governance scales and policy cycle stages.

4.6.2. Policy cycle and valuation uptake

4.6.2.1. Policy cycle

The development of public policy over time can be described as a policy cycle (IPBES, 2016b, 2016c; Jann & Wegrich, 2007). The ways local stakeholders may provide their knowledge and represent their values related to nature at different stages is complex and much discussed (for example Barton et al., 2018; Chan & Satterfield, 2020; Dick et al., 2017; Fisher et al., 2008; Grêt-Regamey et al., 2017; Harrison et al., 2018; Jacobs et al., 2018; Kenter et al., 2016; Laurans et al., 2013; Mandle et al., 2020; Marre et al., 2016; Marre & Billé, 2019; Martinez-Harms et al., 2015; Posner et al., 2016; Primmer et al., 2015; Rosenthal et al., 2015; Ruckelshaus et al., 2015; Saarikoski et al., 2018; TEEB, 2010; Vatn, 2009). Here uptake in the policy cycle of stakeholder values is represented by the proxy of valuation methods. Valuation uptake reviews identify the extent to which valuation literature documents actual use of valuation results (see 4.6.3). Much of the above research on valuation uptake highlights that the purpose and design of valuation must fit knowledge demands of stakeholders specific to the context and stage of the policy cycle (*Figure 4.11*). The timing of valuation to coincide with entry points in the policy cycle presents opportunities for increasing valuation uptake. At different entry points in the policy cycle valuation should be designed to meet specific purposes (Laurans et al., 2013) (*Figure 4.11*).

¹⁸Valuation Atlas (<https://doi.org/10.5281/zenodo.6468906>)

¹⁹ Systematic review on valuation uptake (<https://doi.org/10.5281/zenodo.4391335>).

²⁰ Systematic review on valuation uptake (<https://doi.org/10.5281/zenodo.4391335>).

²¹ Coincidence of Aichi target 2 reporting and valuation at country level (<https://doi.org/10.5281/zenodo.6468917>).

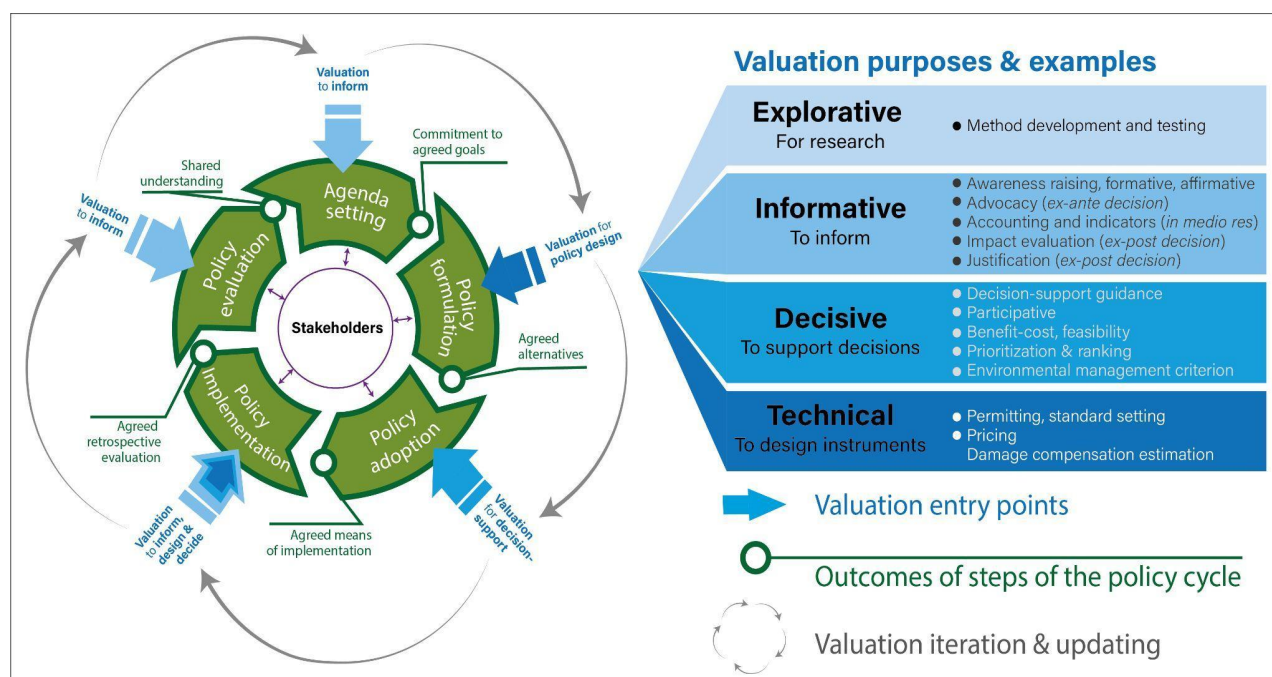


Figure 4.11. Valuation purposes, entry points and iterations through the policy cycle (adapted from IPBES, 2016c).

Valuation can be used to inform agendas and support commitment to agreed goals (e.g., Bateman et al., 2014; Kenter et al., 2016). Valuation can provide technical support for policy formulation and design, for example helping to achieve agreement on the types of alternatives under consideration (e.g., Fish et al., 2016; Marttunen & Hämäläinen, 2008) or determining voluntary incentives such as levels of payment for ecosystem services (e.g., Whittington & Pagiola, 2012; Yoshida, 2004). Valuation can be used for decisive purposes by supporting decisions for policy adoption (e.g., Clark & Turpie, 2014; Griffiths et al., 2012) and helping reach agreements about the means of implementation. Valuation can support in-course adjustments to implementation measures, or justification for continued budget allocations (e.g., Bennett et al., 2018). The use of valuation methods can also provide agreed means of retrospective policy evaluation - when applied in the context of impact evaluation (e.g., Ferraro et al., 2012) or natural capital accounting (e.g., Ouyang et al., 2020), valuation can also provide key ex-post information on the effectiveness of implementation and achievement of policy goals. Such ex-post applications of evaluation methods also serve the purpose of method development for researchers since they provide the opportunity to compare ex-ante and ex-post evaluation processes, and as such, the ability to test the effectiveness of the used methods (Boardman et al., 1994). Completing the policy cycle, valuation can contribute to renewed agenda setting and the development of new policies or projects to address emerging sustainability issues.

The Economics of Ecosystems and Biodiversity (2010) (international) initiative called for economic valuation studies to identify, demonstrate and capture economic values of ecosystem services. The large increase in publication of ecosystem service valuation studies has raised expectations of increased valuation uptake (Chan & Satterfield, 2020; Laurans et al., 2013; Mandle et al., 2020). A large portion of this peer-reviewed valuation literature has a basic research or explorative purpose and cannot be expected to document relevance for policy. Laurans et al. (2013) also point out that studies for informative purposes can have a decisive effect over time as they help reframe the policy debate. Valuation uptake over time is rarely documented. However, the exponential growth in valuation studies could be expected to reflect an observable increase in proportion of studies by valuation researchers documenting uptake. There are a number of potential barriers to uptake of valuation by stakeholders, which help explain why low uptake could be expected in the systematic reviews reported below.

4.6.2.2. Barriers to uptake

Recent systematic reviews of valuation studies published in the scientific literature point to gaps in the literature regarding use of valuation (and its outcomes) by stakeholders and impact on the ground (Chan & Satterfield, 2020; Laurans et al., 2013; Lautenbach et al., 2015; Mandle et al., 2020). Laurans et al. (2013) and Lautenbach et al. (2015) document “blindspots” in uptake of ecosystem service valuation and assessment. Patenaude et al. (2019) call for evidence of impact of ecosystem service research. Robinne et al. (2019) compile a global tool and database (GlobalDES) for the analysis of the ecosystem services concept in public policy, including case studies in languages other than English. Mandle et al. (2020) and Chan & Satterfield (2020) have conducted systematic reviews of hypotheses of lacking decision-relevance of ecosystem service assessment research. A science-policy-interface analysis study by Kieslich & Salles (2021) confirmed the persistence of an implementation gap and lack of measurable action in practice, identified in earlier reviews. In a national level example, Förster et al. (2019) used valuation experts to define a set of criteria by which they found only six of 109 valuation studies could be used in decision-making for German national policies.

Bagstad et al. (2013) defined useful ecosystem services assessment methods as quantifiable, replicable, credible, flexible, and affordable. Posner et al. (2016) assessed the importance of legitimacy, credibility, and salience for the policy impact of ecosystem service knowledge. *Table 4.3* associates explanations for blindspots in the use of ecosystem service valuation proposed by Laurans et al. (2013) to uptake criteria of (i) timeliness, (ii) salience, (iii) credibility, (iv) legitimacy, (v) process documentation and (vi) study cost. They are hypotheses. Based on systematic review findings above, studies with these characteristics are likely to be taken up and acted upon by stakeholders. Valuation uptake is defined as documented evidence of use by stakeholders. Documented uptake does not necessarily lead to nature conservation decisions, or even action – valuation may be commissioned and communicated, but ignored, or used to justify decisions to mitigate rather than protect (Singh et al., 2020).

Characteristics that explain uptake can be found in studies referred to as ‘brightspots’ in *section 4.6.6*. Conversely, lacking uptake may be explained by the lack of any of these characteristics in studies and these are ‘blindspots’. Odds are skewed against valuation uptake because studies need to meet most / all uptake criteria, while failing any of the criteria is a sufficient condition for a study not to become available for, or used by, stakeholders. *Annex 4.6* provides further evidence in the literature of each uptake criteria.

Table 4.3. Hypotheses for valuation blindspots – lacking documentation of valuation uptake.

Valuation uptake criteria	Description	Hypotheses for lack of documented valuation uptake
Timeliness	Delivering quality information when and where it is needed to assist progress in the policy cycle	H1: Time-lags between initiation and completion of studies may imply that decision processes have moved on or shifted agendas
Salience	Addressing the options in the decision arena, including budgetary and legal consequences	H2.1: Lack of 'actionable' targets within existing institutional framing and mandates of decision-makers
		H2.2: Regulatory framework not conducive to use of certain types of valuation outputs
Credibility	Building on a shared understanding of how things work, conditions and trends and prospects of consequences, through transparent methods with explicit assumptions and documented uncertainty	H3.1: Lack of support for and use of a shared understanding of the underlying patterns and processes; unsupported assumptions; and / or non-transparent methods
		H3.2: Valuation outputs that are too uncertain relative to decision-support requirements (biophysical and monetary)
		H3.3: Decision-makers do not have sufficient training in valuation methods
		H3.4: Lack of standardization of valuation methods
Legitimacy	Representing the interests of all legitimate stakeholders through composition of the team and transparency of the process followed	H4.1: Lack of full representation of the perspectives of all legitimate stakeholders and impressions of serving vested interests
		H4.2: Valuation knowledge hampers political strategies that require a certain opacity or ambiguity
Process documentation	Independent assessment of the interface between valuation study stakeholders and users of the resulting products	H5: Lack of independent assessment of influence on decision-making at appropriate timescales
Cost	Cost of information is less than and proportional to benefits of the decision under consideration	H6: The cost of ecosystem service valuation restricts its use

4.6.3. Evidence of valuation uptake in the scientific literature

4.6.3.1. Previous reviews on valuation uptake

Laurans et al. (2013) found that only 2% of valuation studies reviewed in the fields of environmental and ecological economics documented use of ecosystem service valuation be it for informative, decisive or technical purposes. More recently Mandle et al. (2020) and Chan & Satterfield (2020) conducted systematic reviews of hypotheses of lacking decision-relevance (see *Annex 4.7*). Neither of the more reviews address the specific finding by Laurans et al. (2013) that studies do not document uptake by stakeholders

Actual uptake understood as all the knowledge from valuation studies used by stakeholders may be well documented in government and consultant reports. However, with the resources available to this assessment such grey literature could not be accessed and searched systematically across, or even within countries. For some methods published reviews of use as documented in government reports

are available. For example, while reviews of actual impacts assessment reports are difficult and hence rare, there are several global and regional reviews of legislations on impact assessments (Acerbi et al., 2014; ELAW, n.d.; Loayza, 2012; UNEP, 2018). Despite the increasing use of environmental impact assessment in different parts of the world, uptake and implementation of legal requirements are found to be slow mainly due to lacking access to data on impacts on ecosystem services (UNEP, 2018) (see also 4.5.5).

The uptake review in this section focuses on documented uptake of valuation in the peer-reviewed scientific literature. Here documented uptake in scientific literature is used as a proxy indicator, which when combined with a review of national level reporting on valuation in national biodiversity strategies and action plans (see 4.6.4), provides a relative indicator of valuation uptake across countries.

4.6.3.2. Method for valuation uptake review

A large systematic review of research literature in Web of Science on ecosystem services and nature's contributions to people was carried out. The aim was to evaluate the extent to which published research literature on valuation of ecosystem services and nature's contribution to people is documenting uptake by stakeholders for informative, decisive or technical policy design purposes. For the systematic review, publications were selected from a corpus of over 79,040 studies (1990-2020), that identified at least one method family keyword in their title or abstract. This left 44,652 studies upon which the stratified sampling was based. A random stratified sample across method families and time periods was conducted. Then, a manual screening was performed by study coordinators, who agreed to leave out studies that were not about ecosystem services/nature's contributions to people and valuation applications. The final sample of papers coded by 26 contributing author reviewers was N= 1,900 ecosystem services / nature's contributions to people valuation studies²².

Categories of purposes include a number of sub-purposes which are compatible with Laurans et al.'s (2013) classification into informative, decisive and technical purposes as exemplified in *Figure 4.11*. A distinction is made between cases where uptake is only cursorily mentioned, and where it is actually documented in valuation studies. Additionally, valuation studies initiated by stakeholders were distinguished as an indicator of “actual uptake” from cases where stakeholders participate in valuation studies on the initiative of researchers, as an indicator of methodology oriented “testing uptake”. A stratified random sample by time period and method family strata was conducted in order to assess trends in valuation uptake over time. The detailed screening protocol, validation procedures, classification definitions for uptake and purposes of valuation used by reviewers can be found in the corresponding data management report²³.

4.6.3.3. Summary of systematic review findings

Documented valuation uptake among studies valuing ecosystem services / nature's contributions to people was in a range of 3.6-15.7%. The range reflects classification uncertainty among *non-expert* reviewers revealed through validation. Subdividing uptake, “actual uptake” lies in the range of about 1%-4.3% for the period 1991-2020. “Research testing” uptake lies in the range of 2.5%-11.4%.

Presumably, classification uncertainty has not been quantified in previous reviews. Nevertheless, the upper estimates reflect proportions of policy relevant features also found in the Mandle et al. (2020) and Chan and Satterfield (2020) reviews. The lower bound estimate compares to Laurans et al's

²² Systematic review on valuation uptake (<https://doi.org/10.5281/zenodo.4391335>)

²³ Systematic review on valuation uptake (<https://doi.org/10.5281/zenodo.4391335>)

(2013) findings on documentation of actual use by stakeholders. Taken together the four reviews tell a coherent story of a small but growing minority of valuation studies that have policy relevant features, but an even smaller but stagnant proportion that document how they are taken up by stakeholders. Looking across multiple valuation methods, and 7 years after the Laurans et al. (2013) blindspot study, there are only weak indications of improvement in documentation of uptake.

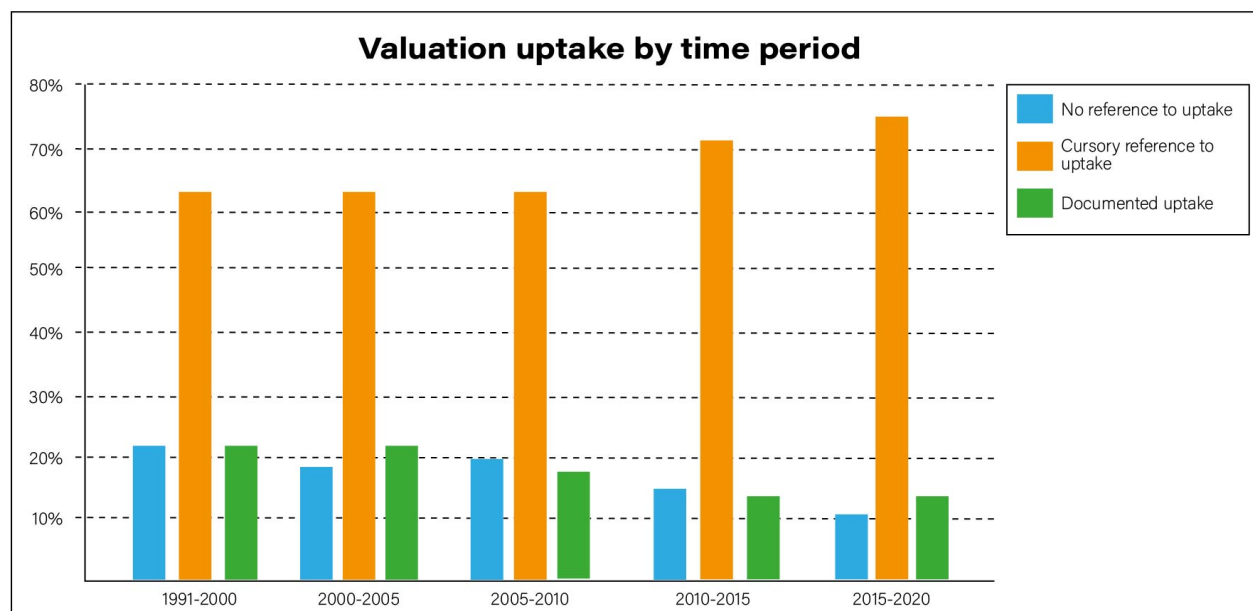


Figure 4.12. Valuation uptake by time period.

Figure 4.12 shows that the large majority of valuation studies provides only cursory reference to uptake by stakeholders. There is a small increase over the last two decades in the share of valuation studies making cursory reference to the purpose of valuation, but the share of studies with documented uptake has not increased in the period 1991-2020. Frequencies of documented uptake of 14-18% (15.7% over 1991-2020) represent uncorrected data. A validation exercise found a substantial proportion of possible “false negative” uptake studies in the coding. After correcting for false positives, documented uptake may be as low as 3.5% of the ecosystem services/nature's contributions to people valuation studies identified.

Further disaggregation of data showed 27.3% of “actual uptake” (stakeholder initiated), and 72.7% as “testing uptake” (researcher initiated). This distinction in type of uptake has not been made in previous systematic review studies of valuation. Applied to results in Figure 4.13, and extrapolating uncertainty found in the coding, “actual uptake” as a proportion of valuation studies, may lie in the range of about 1%-4.3% for the period 1991-2020. Similarly, research testing uptake would lie in the range of 2.5%-11.4% considering coding uncertainty.

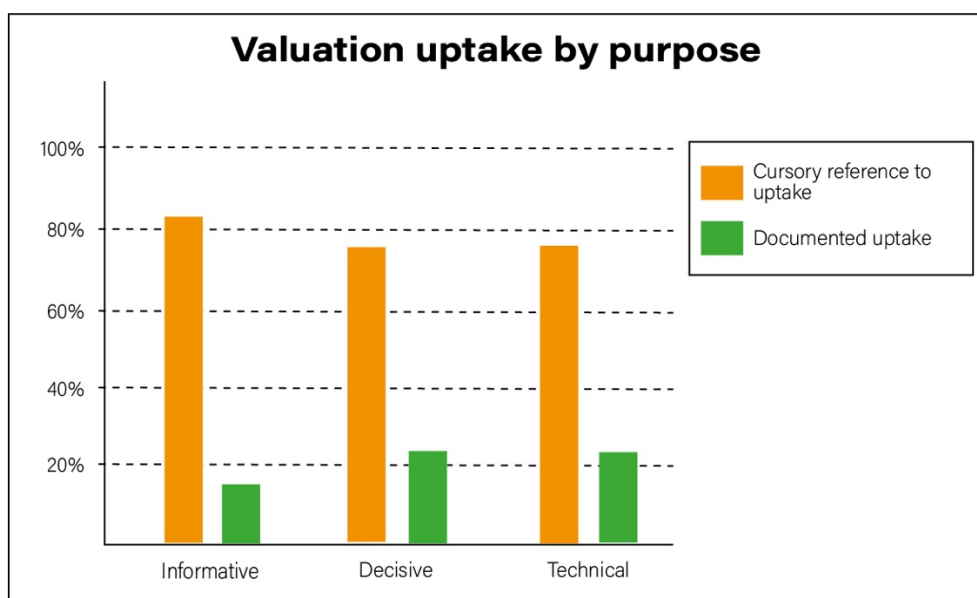


Figure 4.13. Valuation uptake by purpose

Figure 4.13 reports on valuation uptake by purpose. The hypothesis was that documented uptake would increase for studies with decisive or technical policy design purposes. There is some tendency in the review data to support this. However, the difference is small. This might be an indication that documentation of uptake is researcher, rather than stakeholder driven. The systematic review was expected to form a basis for identifying best practice of valuation uptake. In particular, studies for decision support were expected to provide a number of “brightspots” (see 4.6.6). Although use cases were numerically and proportionally higher in studies with decisive purposes, the number and proportion of papers depicting and analysing actual (and not potential) decisive use was modest.

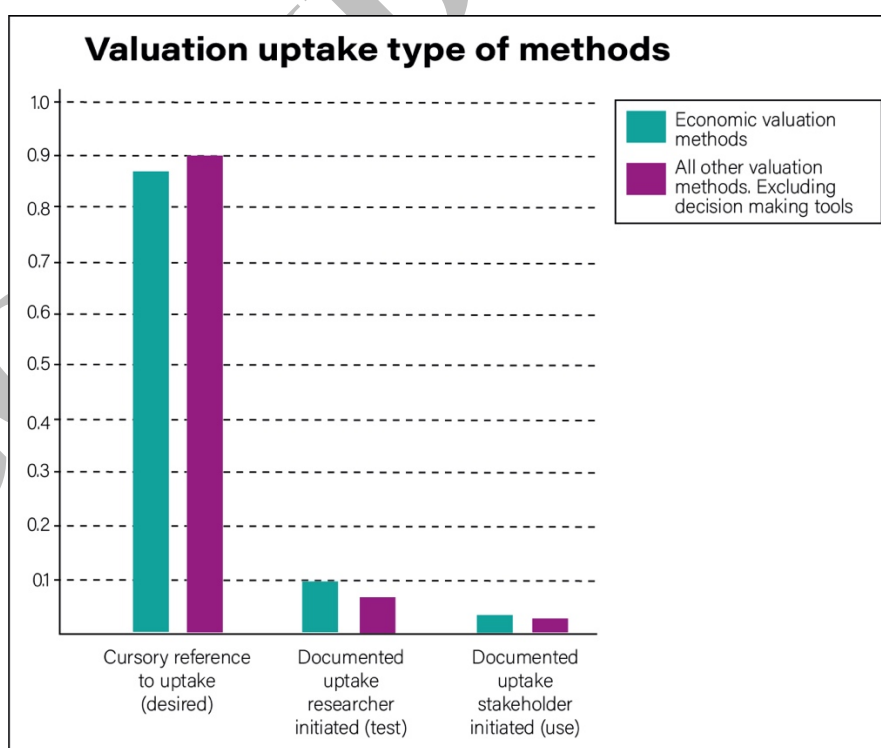


Figure 4.14. Uptake of economic compared to other valuation methods

Using the same literature corpus²⁴, but a sample for 2010-2020, *Chapter 3* conducted a parallel systematic review with in-depth classification of valuation methods (N=1024)²⁵. Using this sample, the likelihood of economic valuation methods being taken up was compared to that for other valuation methods (*Figure 4.14*), excluding decision-support tools (e.g., cost-benefit analysis, multi-criteria analysis) which often use mixed data, in order to have a more distinct comparison. Uptake findings from this independent sample show similar patterns with cursory reference to uptake constituting four fifths of the sample. Unexpectedly, economic valuation methods are only slightly more likely than other methods to document uptake than other valuation methods (researcher supply side), while there is no difference for documented uptake of studies initiated by stakeholders (demand side). Despite initiatives like The Economics of Ecosystems and Biodiversity, researchers in economic valuation are only slightly more likely to “demonstrate and capture” economic values for stakeholders, than other valuation methods. Caveats to results and further discussion with respect to different valuation purposes are provided in *Annex 4.7*.

4.6.3.4. Conclusions

Despite the significant growth in valuation studies over the last 30 years, public documentation of the uptake of valuation practice to support public policy decisions at different scales remains low. Documented uptake of economic valuation methods is only marginally higher compared to other methods. Barriers to uptake of valuation in public decision-making may be partly due to perceived lack of robustness and reliability of some valuation methods. The lack of sufficient resources to commission valuation studies, administrative cost in integrating valuation into decisions, and insufficient technical capacity become additional barriers for policy uptake of valuation in public policy decisions. Other barriers include lack of alignment of valuation results with political jurisdictions, administrative levels or sector interests, lack of timeliness of results relative to decision windows, and lack of relevance of valuation results from the perspectives of stakeholders. In addition, key stakeholders may have the power to broker knowledge from valuation - as either a potential for, or barrier to, uptake in the policy issue cycle.

4.6.4. Valuation uptake at different scales

4.6.4.1. Coincidence of Aichi target 2 reporting and valuation at country level²⁶

The valuation uptake literature review (see 4.6.3) is a representative sample of valuation knowledge available globally in public scientific journals. This subsection reviews whether a higher frequency of these ecosystem services / nature's contributions to people valuation studies in a country increases the likelihood of uptake of valuation by national government agencies. The analysis used two indicators to proxy the uptake of scientific valuation knowledge at national scale: (i) likelihood of ecosystem accounting implementation at national level indicated by the system of environmental economic accounting and ecosystem accounting, and (ii) likelihood of reporting Aichi target 2 progress in national biodiversity strategies and action plans under the CBD (Aichi target 2 “*By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems*”).

Figure 4.15 provides a visualization of the data and correlations at country level (*Annex 4.8*). Reporting on Aichi target #2 in national biodiversity strategies and action plans is incomplete in most

²⁴ Valuation Atlas (<https://doi.org/10.5281/zenodo.6468906>)

²⁵ Systematic PCIV (Principles, Criteria, Indicators, Verifiers) review on valuation methods (<https://doi.org/10.5281/zenodo.4404678>).

²⁶ Coincidence of Aichi target 2 reporting and valuation at country level (10.5281/zenodo.6468917)

countries (including categories unknown, not reported, moving away from target, some progress made *Figure 4.15*). Less than a quarter of countries reported meeting or exceeding the target (CBD, 2021). In a number of cases national governments' reporting did not reflect actual implementation of ecosystem accounting or valuation research that has been carried out in the country. Countries that reported meeting or exceeding Aichi #2 were likely not to have implemented the System of Environmental Economic Accounting-Central Framework (SEEA CF) or the System of Environmental Economic Accounting-Ecosystem Accounting (SEEA EA), and were likely to have limited to scarce national valuation research. About a third of countries implementing the System of Environmental Economic Accounting-Central Framework and ecosystem accounting were likely not to report on Aichi target #2. This indicates that as of 2020 a substantial share of national agencies compiling national biodiversity strategies and action plans were not familiar with the national statistical offices compilation of system of environmental economic accounting, and did not reflect the level of valuation of ecosystem services / nature's contributions to people in the country.

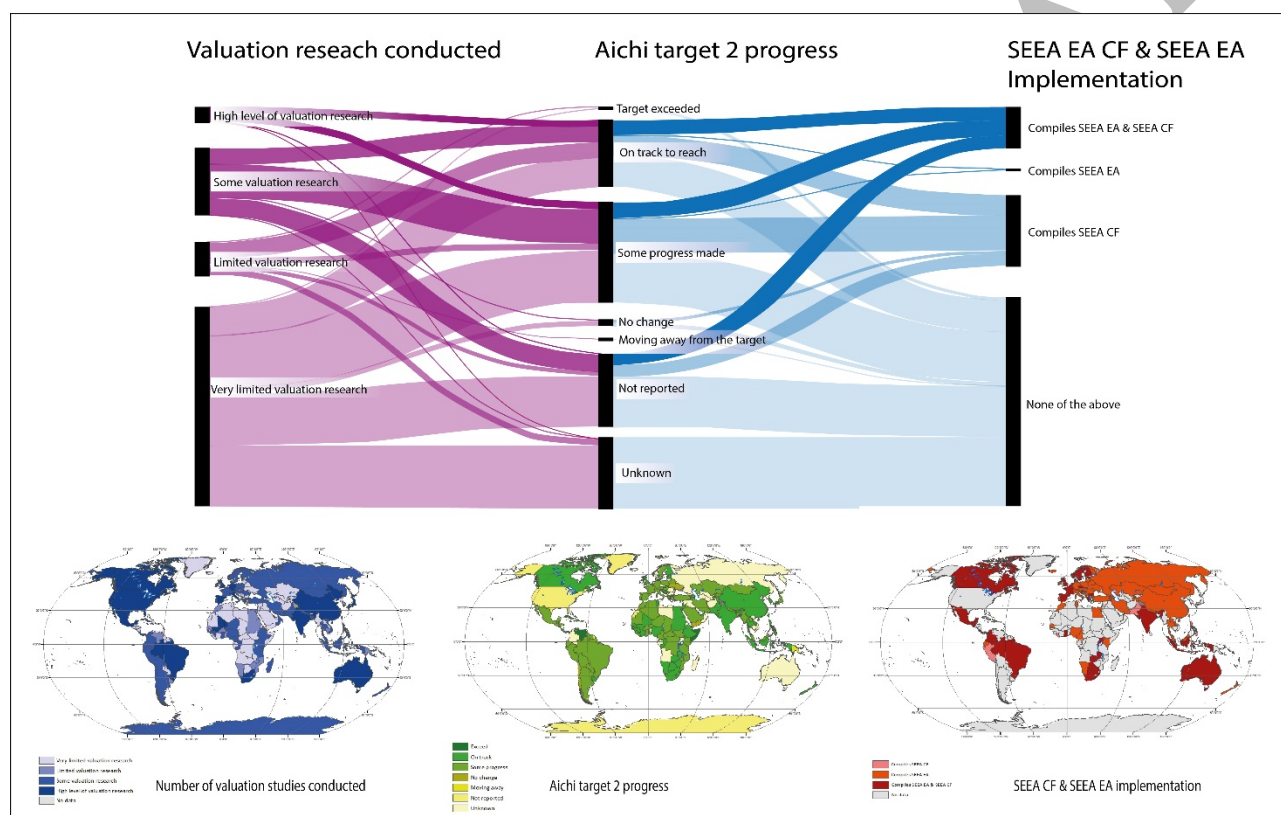


Figure 4.15. Valuation research published, Aichi #2 target progress and implementation of the system of environmental and economic accounts as of September 2020 (central framework or ecosystem accounts).

Nevertheless, a substantial proportion of countries did report on progress on valuation. The following subsections provide examples of how valuation is being taken up at different governance levels - through country implementation of United Nations system of environmental economic accounting (see 4.6.4.2); in European Union level policy (see 4.6.4.3) and in national policy documents in the United Kingdom (see 4.6.4.4); and in corporate disclosure of climate and nature risk (see *Box 4.7*).

4.6.4.2. Implementation of United Nations system of environmental economic accounting and uptake of public natural capital accounting in national policy

The system of environmental economic accounting organizes environmental and economic data in an integrated and conceptually coherent set of accounts to produce information to mainstream the environment into policymaking. Traditionally, the system of environmental economic accounting's main purpose has been to support macro-economic and sectoral decision-making, as well as reporting on the economy-environment nexus. The traditional macro-economic national accounts do not take the depletion or degradation of the environment into account, nor the various ecosystem services that society depends upon. Policymakers therefore don't have access to key information necessary to effectively pursue and track sustainable development. The system of environmental economic accounting has been developed to fill that gap, reporting on the environment-economy nexus in both physical and monetary terms. The spatial foundation of the more recent ecosystem accounting (SEEA EA) approach has the potential to inform (sub)national and local stakeholders and their decision-making needs, such as in land-use planning. The system of environmental economic accounting is also increasingly seen as providing a framework for organizing data to underpin global reporting such as on the Sustainable Development Goals and the Convention on Biological Diversity.

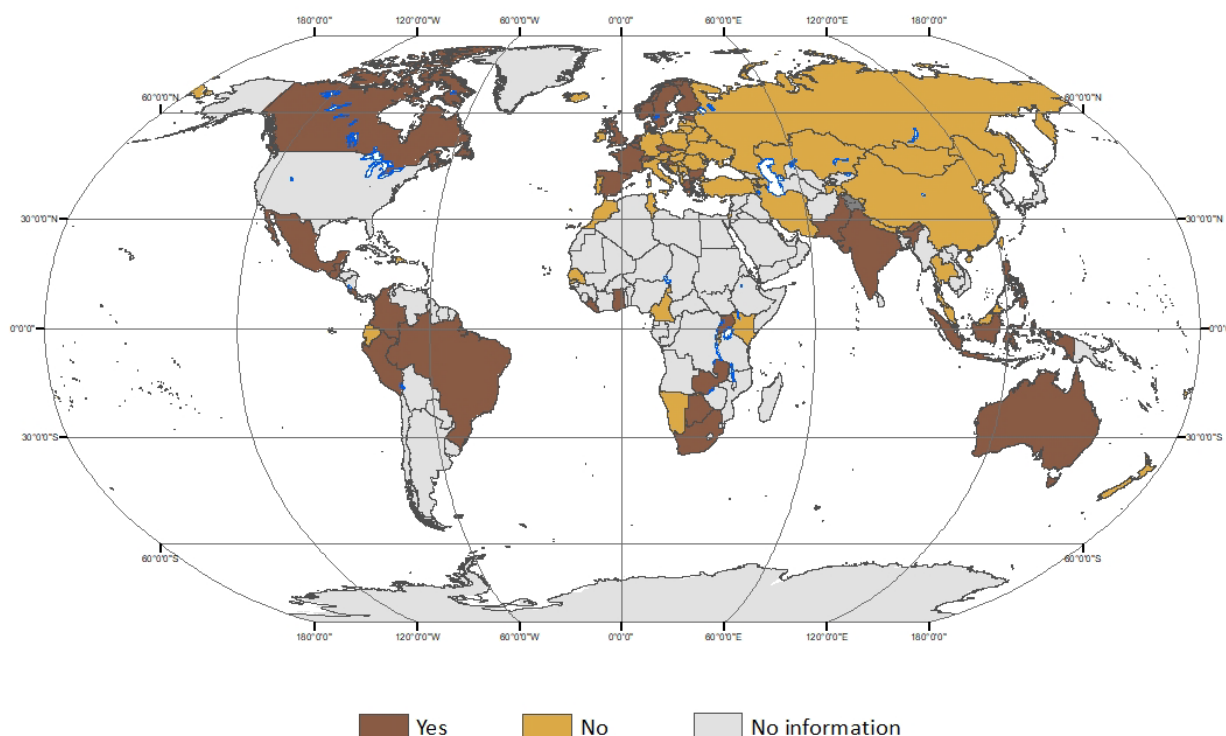


Figure 4.16. Countries compiling system of environmental economic accounting-ecosystem accounting (adapted from UN CEEA, 2020).

The number of countries implementing the system of environmental economic accounting is one of the indicators for Sustainable Development Goals Target 15.9. The target is: “By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts”. Sub-indicator (b) 15.9.1.b: Number of countries that have integrated biodiversity values into national accounting and reporting systems, defined as implementation of the system of environmental-economic accounting (SEEA)” (UNSD, 2021). The number of countries undertaking natural capital accounting is increasing. As of June 2020, 89 (UN CEEA, 2021) countries had implemented the system of environmental economic accounting

accounts, compared to 69 in 2017 (UN CEEA, 2018) and around 49 in 2006 when the first baseline was assessed (UN CEEA, 2007). The number of countries that had implemented system of environmental economic accounting-ecosystem accounting was 34 as of September 2020, with 13 additional countries that are currently experimenting (UN CEEA, 2020, 2021) (see *Figure 4.16*).

During the Global Consultation on the System of Environmental Economic Accounting-Ecosystem Accounting draft, a number of countries voiced concerns about including monetary valuation as part of the standard (UN CEEA, 2021). During subsequent discussions a compromise was found. In March 2021 the United Nations Statistical Commission (UNSC) agreed to remove the “experimental” from the title of the revised System of Environmental Economic Accounting-Ecosystem Accounting, adopting chapters 1-7 describing the accounting framework and the physical accounts as an international statistical standard. The United Nations statistical commission also recognized that, chapters 8-11 of the system of environmental economic accounting-ecosystem accounting describe internationally recognized statistical principles and recommendations for the valuation of ecosystem services and assets (UNSD, 2021), and requested to promptly resolve the outstanding methodological aspects in chapters 8-11 as identified in the research agenda.

Early accounts compilation was often developed without involvement from the intended users of the accounts (Vardon et al., 2019). They were often “supply driven” and to a lesser extent “demand/policy driven” (European Court of Auditors, 2019). The annual forum on natural capital accounting for better policy decisions held since 2016, which brings together policymakers and accounts compilers from around the globe, was established to address this need and has developed a range of principles for natural capital accounting and best-practices from countries (Vardon et al., 2019). The supply driven nature of accounts development is changing. The ecosystem accounts follow a more participatory process including stakeholder consultation, in part because of its multidisciplinary nature which necessitates collaboration across various agencies. Recently, accounts have been used to provide support to macroeconomic policy, biodiversity policy, emissions tracking and climate policy, sectoral policy and spatial planning. Further documentation of national level application of natural capital accounting to policy can be found in *Annex 4.9*, Edens (2020) and on the United Nations System of Environmental Economic Accounting webpage (UN SEEA, 2021). The United Nations common agenda (United Nations, 2021) calls for “*new measures to complement gross domestic product (GDP)*” and urges “*Member States and others to already begin implementation of the recent system of environmental-economic accounting (SEEA) Ecosystem Accounting.*”

4.6.4.3. Uptake of ecosystem service valuation in European Union policy

The EU coordinates economic and environmental policy across member states and as such represents a potential for supra-national impetus for valuation knowledge generation and influence on the uptake of valuation in national level policy assessment and design. The latest *State of Nature in the EU* report (European Environment Agency, 2020) “*underlines the need for a step-change in action if we are to have any serious chance of putting Europe’s biodiversity on a path to recovery by 2030.*” To date, although valuation evidence is increasingly used in communicating policy priorities, European Union policy has made little use of environmental valuation evidence. Some policies leave space for valuation, in particular the water framework directive (European Commission, 2020b), where environmental and resource costs and benefits can be used under article 4 (exemptions based on disproportionate costs) and article 9 (cost recovery of water services). The marine strategy framework directive calls for “*economic and social analysis of the use of those waters and of the cost of degradation of the marine environment*”, while the environmental liability directive allows valuation if resource equivalence methods are not feasible.

Greater use of valuation has been promoted in particular by the European Union biodiversity strategy for 2020 (European Parliament, 2012) which called for assessing values of ecosystem services and

for integration of values in accounting and reporting. This promising avenue has led to a sustained research effort in ecosystem service assessment, valuation, and reporting, through the mapping and assessment of ecosystems and their services (MAES) (European Commission Joint Research Centre, 2020) and knowledge innovation project on integrated system for natural capital and ecosystem services accounting (KIP-INCA) (European Commission, 2016, 2020a) and supporting research projects. Although the mapping and assessment of ecosystems and their services (MAES) is the first European Union-wide ecosystem assessment (European Commission Joint Research Centre, 2020), it does not include any monetary estimates, it lays the foundations for ecosystem service quantification and valuation at the European scale. The new European Union biodiversity strategy (EUBS) 2030 section “measuring and integrating the value of nature” has no direct mention of monetary valuation, while accounting requires it. European Union progress (European Commission, 2020a) towards ecosystem accounting that is compatible with the recently adopted United Nations statistical framework for ecosystem accounting (SEEA EA) presented by Vysna et al. (2021).

Evidence suggests that the policy relevance of ecosystem service assessment and valuation could be enhanced. There has been some criticism of the practical impact and validity of applied cost-benefit analysis when it has been used by member states to assess policy targets of European Union Directives (Feuillet et al., 2016). The European Court of Auditors (2019) found failings in the Commission’s implementation of environmental accounting that reduced their usefulness for policymakers. Although the use of ecosystem services framing is now mainstream, valuation is still often mistrusted or misunderstood by policymakers (Tinch et al., 2019). This reflects tensions between intrinsic and anthropocentric conservation motives, resistance to the concept of non-use values, and unfamiliarity with the tools and methods of valuation (*Annex 4.10*).

4.6.4.4. Uptake of ecosystem service assessment in national policy: An example from the United Kingdom

The United Kingdom national ecosystem assessment (UK NEA, 2011) demonstrated that failing to account for values of ecosystem services “*forgoes opportunities for major enhancements in ecosystem services, with negative consequences for social well-being*” (UK NEA, 2011) and called for greater inclusion of non-market values in decision-making. The natural capital committee (NCC) was established in 2011 to advise the government on sustainable use of natural capital, reporting directly to the economic affairs committee of the cabinet. The environment white paper (Great Britain & Department for Environment, 2011) took mainstreaming the value of nature in decision-making as a defining theme. The Natural Capital Committee functioned until 2020 producing annual reports (Great Britain, 2020) on the state of United Kingdom natural capital and advice on issues such as accounting for the value of nature, restoration of natural capital, and the economic case for investing in natural capital.

Defra and the Office for National Statistics (ONS) published a roadmap for natural capital (2012, 2015, 2018) (Connors, 2018) and the office for national statistics now publishes both environmental accounts (Thomas, 2020) and natural capital accounts (Dutton & Engledew, 2019). In 2014 the government commissioned the national ecosystem assessment-follow-on (UK NEA, 2014) to further develop and communicate the evidence base and enhance its relevance to decision and policymaking across the United Kingdom. In 2017, the natural capital committee (Natural Capital Committee, 2017) recommended the development of a 25 year environment plan and major revisions to the HM Treasury Green Book (HM Treasury, 2018). The resulting plan (HM Government, 2018), a *sister document* to the clean growth strategy (HM Government, 2017), draws together many targets and strategies, with a central focus on protecting and growing natural capital (Curnow, 2019). The forthcoming environment bill (Parliament UK, 2020) will provide the statutory instruments for achieving these goals.

The Green Book revision (HM Treasury, 2018) saw greater emphasis on valuing non-market impacts, measurement and monitoring of natural capital stocks, and recognition that cumulative effects on natural capital of multiple decisions must be considered, measured, and valued (Natural Capital Committee, 2020). Lower discount rates for health impacts were introduced. In both cases, much of the substance already existed (HM Government, 2018), but dispersed across different strategies and guidance, applied in a piecemeal fashion (Tinch et al., 2014). A key innovation is the plan pulling everything together under a coherent framework. Evidence of policy mainstreaming is the incorporation of the plan in the manifestos of all major political parties and in its launch in the first environment-focused speech by a British Prime Minister in 17 years (Greenhouse, 2018).

Alongside these processes, there have been major efforts in developing evidence and tools for natural capital valuation (Özdemiroğlu, 2019). Defra has drawn together tools, data sets and case studies to publish extensive guidance on enabling a natural capital approach (ENCA) (Government UK, 2020), supporting decision-makers and analysts in applying Green Book principles. Corporate natural capital accounts have been compiled by many United Kingdom public sector bodies and private companies (Dickie & Neupauer, 2019). Valuation evidence is being used to justify investment in natural capital, for example in catchment management (Mathieu et al., 2018). The treasury commissioned an independent global review of economics and biodiversity (Dasgupta, 2021) (see *Chapter 3*) (*Annex 4.11*).

Box 4.7. Uptake of nature-related financial disclosure in corporate accounting

Efforts to identify the financial materiality of nature risk in corporate accounting and reporting, using available data for environment, social and governance (ESG) scoring are in their infancy. Nature-related concerns are not yet being considered by most financial institutions and corporate reporting on environmental issues are often boiled down to climate (Adler et al., 2018). There is an increasing awareness among investors that their investments are having a direct impact on biodiversity and that deterioration of ecosystem services will impact financial returns (PRI, 2020).

Biodiversity data in environment, social and governance scoring has been called for, along the lines of climate risk, in order to integrate nature into investment decisions (WEF, 2020). Despite recent international consolidation in climate disclosure guidelines of the task force on climate-related financial disclosures (TCFD) they do not represent a template for biodiversity disclosure. For-profit biodiversity conservation investments remain negligible to and largely outside of global capital flows (Dempsey & Suarez, 2016). A review of the data sources for the risk and opportunities components of the sustainability score reveals limited information on corporate biodiversity impacts showing that data providers are not capturing physical impacts and financial materiality (TCFD, s. f.). Tools to accurately and consistently measure impact and dependencies on biodiversity are lacking (TNFD, s. f.).

Several financial institutions, government and multinational companies have initiated the task force on nature-related financial disclosures (TNFD) intended to help corporates measure, disclose and minimise their nature-related financial risks. For future transformation of investment criteria there will be a need for a framework for nature risk as parallel to climate risk and for data providers and investors to engage with companies on biodiversity disclosure, to encourage them to provide relevant biodiversity information (Global Canopy & Vivid Economics, 2020) (*Annex 4.12*).

4.6.5. Uptake of ILK in legislation, policy and planning

Uptake of ILK in policy and planning shows how decision-making processes consider diverse and diverse values in legislations, policy instruments and plans²⁷. Revised legislation which includes participation and influence of local community values on juridical valuation processes shows a scarce operationalisation of laws that have been achieved (*Table 4.4*). Similarly, the design and management of policy instruments such as protected areas, including (indigenous) community conserved areas (CCAs) show inclusion of diverse values and indigenous and local knowledge (ILK), as well as active participation of local communities. In contrast to standard top-down approaches in protected areas, community conserved areas have had positive impacts through, *inter alia*, food security, improved education, reef recovery, more resilient fisheries, and higher levels of biodiversity (Davies et al., 2013). The latter also demonstrates negative impacts such as higher rates of soil erosion outside the protected area, deterioration of farm economies, and exclusion of some local peoples (see 4.5.2) (Tran et al., 2020). Another policy instrument particularly relevant before the implementation of infrastructure projects (dams, mining, etc.) is the free prior and informed consent (FPIC) (Menton et al., 2020). Evidence illustrates that the interpretation and application in practice of FPIC remains contested and has not translated into a veto power over socio-environmentally disruptive projects (see 4.5.5). In line with this, analysing cases with the decision-making typology (DMT) general framing (see *Chapter 1*), overall, it is found that the capacity for a plan (e.g., new modes of environmental governance; planning for use of natural assets and nature's contributions to people) to meet its objectives may depend on including the values with the highest incidence (*Annex 4.13*) (e.g., Millner et al., 2020; Whyte et al., 2019a). In particular, if the aim is the equal distribution of nature's contributions to people between different local communities, more plural valuations can be needed. When the purpose is the effectiveness of a project in a management context, those values which are most likely to affect the functioning of the project can be prioritized given the interests, influence and resources of key actors (see 4.4.2)(e.g., Koehnower et al., 2015; Semitiel-García & Noguera-Méndez, 2019; Stryamets et al., 2020).

Land planning of indigenous peoples and local communities has implied up to today differential power relations (Ioki et al., 2019). Careful attention needs to be paid to genuinely achieving equitable outcomes by underlining the presence of IPLC, their occupancy through stories connected to land, places associated with names, the persistence of their local knowledges and values that link people to and enable sustainable relationships with nature and enhance their agrobiodiversity (Altieri & Nicholls, 2012). Thus, a cultural-based approach to land management, food, sovereignty, and environmental governance has taken place in different regions by emphasizing cultural diversity and the contribution of IPLCs' diverse values to global food production (i.e., farms <2 ha produce 30-34% of the world's food and 30-34% of food supply on 24% of gross agricultural area, Ricciardi et al., 2018). These efforts align with the sustainable development goals, which can serve as an important instrument for promoting plural perspectives and innovative ecological contexts as drivers for change. In particular, co-management / co-design of protected areas that include diverse and intangible values of nature have shown increased cultural well-being for local communities (Menton et al., 2020). Indeed, indigenous peoples and local communities (IPLC) have made vital contributions to meeting global goals and biodiversity conservation through values, ways of life, management systems and local economies (Forest Peoples Programme, 2020). In this way, the pursuit of self-determined development and inclusive decision-making based on participatory approaches have led to considerable rises in studies and research conducted by IPLCs into the impact of land planning on their quality of life.

²⁷ Literature review on values considered in decision-making contexts at local level (<https://doi.org/10.5281/zenodo.4396271>).

Local knowledge of nature is grounded in cultural institutions and practices. It can reduce risks during rapid environmental change and lead to insights into sustainable management. Given that ILK can also influence the adaptability of socio-ecological systems to address complexity and uncertainty, it has the potential to generate a paradigm change in policy and biodiversity conservation (Pauli et al., 2016). Land-use and occupancy studies are one of the forms of ILK uptake that document values and worldviews seeking to enhance policy planning and projects, as well as reducing potential conflicts. Those studies conducted with IPLC expose the diversity of values deeply entrenched in local languages, knowledge systems and practices about nature. In this way, impacts of large infrastructure projects and land planning can be foreseen, mitigated, or avoided by using data based upon ILK criteria of social and environmental metrics reported in this type of studies (Mbilinyi et al., 2005). Likewise, promoting diverse values and worldviews across landscape, customary sustainable use, and small-scale production contribute to sustainable and resilient economies. Therefore, ILK uptake case studies show that a significant part of the conservation of the world's remaining biodiversity depends on institutions, distinct values of nature, different forms of knowledge and actions of IPLC worldwide across scales and governance spaces (see 4.4, 4.5).

The cases evaluated here shine light on decisions and policy uptake of ILK by revealing the reciprocal relations between territory and culture as well as governance institutional arrangements for sustainable use of biodiversity and its values. In this way, valuation purposes of several IPLC show informative, decisive, and technical goals (such as river management planning; restoration programmes for lakes; consensus on the land use zoning; co-design and management of a overlapped areas, etc). For instance, substantial work has been done on the declaration of tangible (nature, biodiversity, and ecosystems) and intangible (extra-physical or metaphysical knowledge) entities as subjects of rights. *Table 4.4* focuses on recent innovative legal rights for nature i.e., giving voice to nature by granting its legal personhood. This involves recognizing nature -either as a whole, or a specific part, such as a river- as a legal person (O'Donnell & Talbot-Jones, 2018). Methods here entail processes that gave rise to those legal instruments. By contrasting methods of juridical valuation, nature elements protected, strengths, and weaknesses, this analysis suggests that recognizing rights to nature reflect institutional settings to address socio-ecological and economic problems (Berros, 2017; Kang, 2019). Despite considerable advancement in accomplishing this type of participatory regulations, the degree of implementation in decision-making, their effectiveness, efficiency, monitoring and social equity remain unclear.

Table 4.4. Legal rights for nature by contrasting methods of juridical valuation, nature elements protected, strengths, and weaknesses.

Methods	Policy instrument*	Nature (or a specified part) recognized with legal rights	Strengths	Weaknesses
LEGISLATION Elected constituent assembly, participation & representativeness.	2008 Rights of nature or Pacha Mama. Constitution of Ecuador. Chapter seven.	Nature: the right to exist, the right to its integrity, to regenerate, to its vital cycles and the right to be restored.	Acknowledging nature as a legal subject and legal person with subjective rights. Nature as a nonpassive actor (Kersten, 2017).	There are no mechanisms for enforcing rights. Flexibility to interpret regulations. The enforcement of the rights depends on the will of the government and an active society. There was no significant change in relation to property rights (Sólon, 2018). Financial support was not included.
NOMINATION BY INDIGENOUS AUTHORITIES The nomination was initiated by the communities concerned and the state endeavoured to ensure their wide and active participation; their free, prior and informed consent was demonstrated.	2011 Declaration of traditional knowledge of the Jaguar Shamans of Yuruparí as intangible cultural heritage of humanity by Unesco (Decision 6.COM 13.9; since 2011). Colombia	Indigenous knowledge and practices concerning nature and the universe; social practices, rituals and festive events.	Promotion of respect for cultural diversity Encourage dialogue concerning ILK and practices. Active participation of the communities concerned.	Minor role of state in safeguarding the intangible cultural heritage. In practice, a lack of projects that operationalise the safeguard (Borda Moreno, 2020). Financial support was not included.
LEGISLATION Elected constituent assembly, participation & representativeness. Direct public referenda. Background event (Cochabamba, Bolivia, 2010): The world's peoples conference on climate change and the rights of Mother Earth	2012 The law of Mother Earth. Law 71. Plurinational State of Bolivia Asamblea legislativa plurinacional.	Mother Earth as a whole and for 'all beings of which she is composed': rights to life and to exist; to be respected; to regenerate biocapacity and to continue vital cycles and processes free from human disruptions; to maintain identity and integrity as a distinct, self-regulating and interrelated being.	This approach views humans and nature as part of the Earth community Rights need to be regarded as the rights of the whole and all its beings and not only of the non-human (nature) part.	Time-consuming and hence costly. Difficult to reach consensus among interests of local peoples to govern themselves according to their own customs and the centralized decision-making (Postero, 2020). The ombudsman of Mother Earth (Defensoría de la Madre Tierra) oversees the compliance and enforcement of those rights. However, it has not yet been put in place (Sólon, 2018). Financial support was not included.
JUDICIAL DECISION Atrato river community councils demanded the right to legal tutelage to halt the extractive export model (mega-mining and over-exploitation of forest resources and timber).	2016 Declaration of Atrato river as subject of biocultural rights, Constitutional court ruling T-622, Colombia	The Atrato river, basin and tributaries/affluents as subject of rights to protection, conservation, restoration and management by the state and ethnic communities.	Panels to negotiate agreements. Public consultation with 26 responses. More inclusiveness and visibility of indigenous and tribal communities (Afro-descendants)	Lengthy time for administrative processes. There are many governmental sectors in different administrative levels related to decision-making. Financial support was not included.

Methods	Policy instrument*	Nature (or a specified part) recognized with legal rights	Strengths	Weaknesses
LEGISLATION Public consultation, panels and public hearings.	2017 Yarra strategic plan Yarra river protection, Parliament of Victoria, Australia	The Yarra river: river ecosystem providing material, non-material and regulating nature's contributions to people.	Broad inclusiveness and representativeness. Financial support is included (Levy-legal seizure to satisfy a tax debt). Body corporate: legal person with the capacity to hold water rights; an independent decision-maker for the river (O'Donnell & Talbot-Jones, 2018).	The extended period of time for public submissions, revision, approval, amendments.
LEGISLATION The Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 was passed as a Treaty of Waitangi settlement agreement after eight years of negotiation by Whanganui Iwi (tribe) and the Crown.	2017 Legal personhood to the Whanganui River. Te Awa Tupua (Whanganui River Claims Settlement) Act. New Zealand	The Whanganui River and its catchment; it creates a new governance framework for the river. It acknowledges the river as a living whole that stretches from the mountains to the sea, including both its physical and metaphysical elements.	Financial support was included (dedicated funding). Strategy group develops and approves, reviews, and monitors the implementation of a strategy document.	The legislation specifically precludes the creation of rights to water, and, as a result, the long-term role of Te Pou Tupua in water use decisions remains unclear
JUDICIAL DECISION Young people in the 7-25 age group demanded the right to legal tutelage for the immediate protection	2018 Declaration of Supreme Court: Court ruling STC4360-2018-00319-011. Colombian Amazon region.	Colombian Amazon as subject of rights, protection, conservation & restoration.	Commitment to formulate an intergenerational pact for life with participation of the affected parties, scientific org. and the general public.	A lack of implementation and operationalisation of measures addressed to substantially reduce deforestation in the required temporal term. Financial support was not included.

4.6.6. Valuation uptake brightspots

Previous sections in this chapter have documented blindspots in the published valuation literature with regard to uptake by stakeholders for informative, decisive and technical policy design purposes. The studies in this subsection demonstrate brightspots of valuation uptake that recognise, demonstrate and capture value (TEEB, 2010) for different informative, decisive and technical policy design purposes (defined in 4.6.3). The studies address different contexts of valuation applied at local, regional and national scales, at different resolutions and for different purposes, in different phases of policy issue cycle (see 4.6.2). The examples demonstrate overcoming different barriers to uptake to connect the supply of valuation knowledge to stakeholder demand for valuation for informative, decisive and technical purposes. Studies include:

- Case #1: use of ILK valuation to support the declaration of Atrato River as subject of biocultural rights in Colombia
- Case #2 Monetary valuation of forest ecosystem services for the design of a headwater conservation tax in Kanagawa, Japan
- Case #3 Monetary valuation of the restoration of Lake St Lucia in South Africa
- Case #4 Deliberative valuations of nature in support of United Kingdom marine and coastal policy
- Case #5 Using multi-criteria decision analysis for collaborative development of a sustainable regulation policy for a large regulated lake, Finland

- Case #6 Benefit transfer in cost-benefit assessments of United States federal regulation under the clean water act
- Case #7 Implementing gross ecosystem product (GEP) for multiple purposes in Lishui, China.

Each valuation uptake case study includes a supplement where further details are provided on barriers to uptake that were overcome in that particular setting.

Valuation uptake case #1: Declaration of Atrato river as subject of biocultural rights, Colombia

Context. Chocó area is one of the richest natural, cultural, and ethnic territories in the Pacific region. The Atrato river flows from the mountains in the south to the sea in the north of the Chocó zone. A diversity of relational, instrumental, and intrinsic values of nature, land, and rivers coexist in the Atrato basin based on different types of worldviews and territorial organization i.e., collective territories for 591 black communities, ~116 indigenous lands/*resguardos*, mixed-race (*mestizo*) communities, and two protected areas. The continued existence and survival of these local communities is inextricably linked to the territory and its resources. People see and interact with the river and forests based on specific values (e.g., religious, political, social, economic, and recreational values). Despite this, instrumental values associated with extractivism (e.g., large-scale mining) have become dominant in management decisions at regional level since the decade of the 1980s. That is an issue that has impacted on traditional ways of life, schooling, self-sustainable agroecological practices, subsistence crops, and artisanal mining (*barequeo*). Broad values of living together, peace, security, solidarity, and ethnodevelopment have also been affected as a result. Serious environmental consequences are such that it has become a priority issue (i.e., deforestation, river pollution, land degradation) at national and international level (*Annex 4.14*).

Purpose and valuation methods. Associations of the Atrato River community councils acted on their own initiative to meet together and reflect on adverse changes affecting the river. The initiative was supported by other institutions i.e., two universities, two research institutes, the diocese of Quibdó city, a non-governmental organization. Participative meetings and deliberative valuations (i.e., statement-based methods: free-flowing group-based discussions and formative sessions of focus groups) made explicit other river values assessed (e.g., effect on freshwater fish species) and gave rise to establish a legal tutelage of the river to the constitutional court in 2015. As a result, the court directly conducted a judicial verification inspection visit with a public hearing; participated in social forums including the community assembly with a river journey, and a helicopter overflight. In a 2016 ruling, the constitutional court recognized the Atrato river and its tributaries biocultural rights as a legal person (Corte Constitucional de Colombia, 2016) by the uptake of diverse values of the river and designating two river tutors: the guardian commission conformed by local actors and the ministry of environment. Thus, the goal of valuations had informative and decisive purposes in the respective phases of the policy issue cycle (agenda setting and policy formulation).

Achievements and barriers in the policy issue cycle. Collective work between the above stated organizations made valuation uptake possible in the court ruling, supporting the policy cycle. Three action lines have been set forth as part of the empowerment of local communities i.e., pedagogy; political incidence; non-formal education. A lack of political will and unfamiliarity with territorial ethnic processes were barriers that were overcome in the policy cycle. In many instances, however, an ineffective coordination and a lack of a power-sharing mechanism between stakeholders located at different spatial scales have obstructed progress through the policy cycle (e.g., ministries at national level; regional governments and environmental authorities; municipalities, community councils and indigenous *resguardos* at local level). There are still several obstacles to the full implementation of the ruling, such as the guaranteed availability of resources (budget, personnel). Recognising and empowering the local ethno-developing values can enhance both nature and rural well-being in

Chocó region. See *Annex 4.14* for further case study context and a more detailed analysis of overcoming barriers to uptake.

Valuation uptake case #2: Valuation of forest ecosystem services for design of a headwater conservation tax in Kanagawa, Japan

Kanagawa Prefecture, Japan, which is 30 km West of Tokyo (*Figure 4.17*), has long been an industrial agglomeration with a population density more than ten times the national average. Rapid increase in water demand led to 10,400 million JPY (roughly 1,200 JPY per person) of additional annual expense to conserve headwaters (Takai, 2013) by the Kanagawa Prefectural government. The government planned to introduce a new headwater conservation tax (HCT) for conservation of headwaters. In the tax design process, the government contracted an economic valuation study to estimate the value of forest ecosystem services in the prefecture. A valuation was conducted by a researcher in 2002 (Yoshida, 2003, 2004a, 2004b).

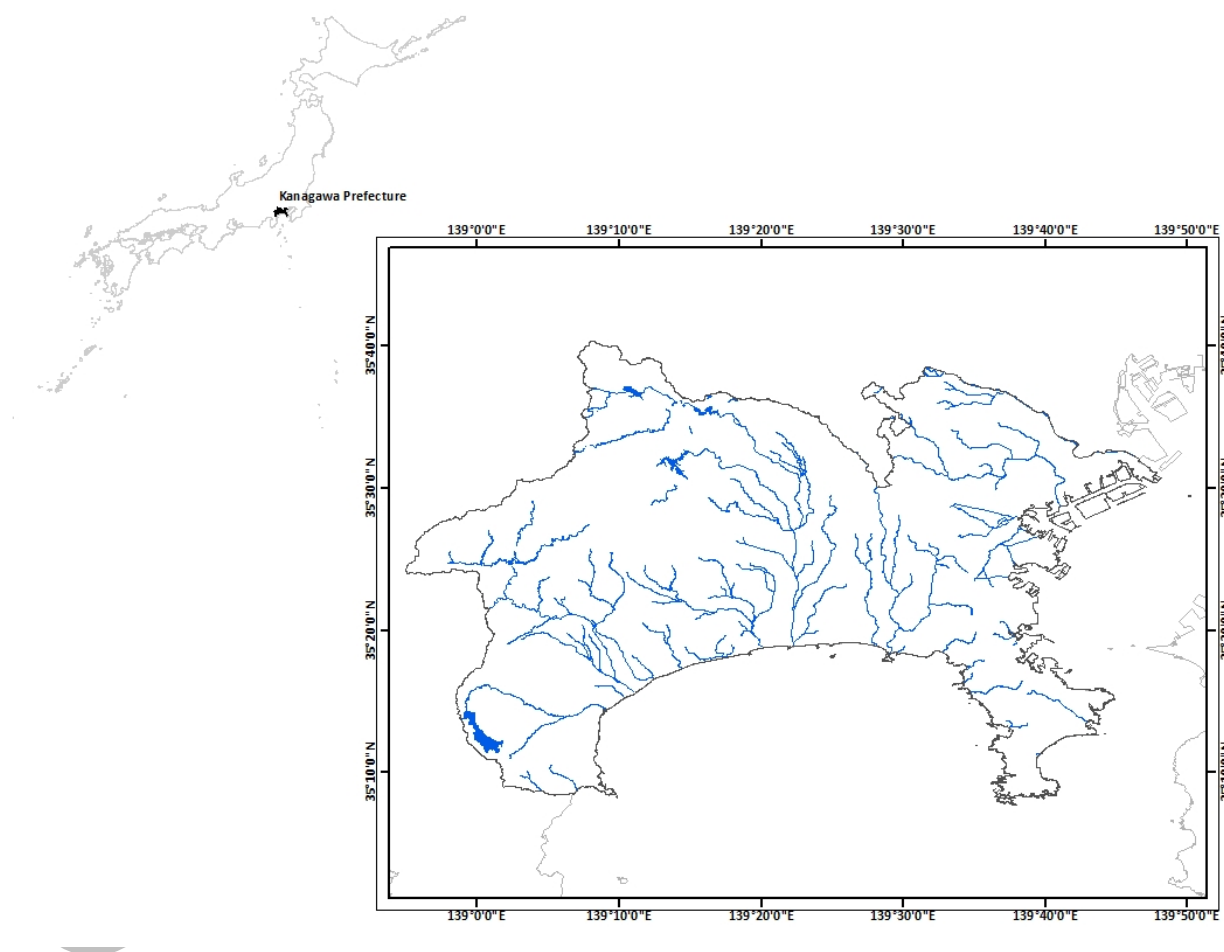


Figure 4.17. Map of headwaters and rivers in Kanagawa Prefecture

The valuation results were compared with the conservation cost to find out the cost is within residents' willingness to pay which was seen as a decisive purpose. Secondly, the valuation was used to prove that there is no difference in willingness to pay for each river basin, and the results were used as the basis for uniform taxation throughout the prefecture. Third, the results, which showed that the willingness to pay positively correlated with income, were used as part of the basis for introducing proportional taxation in the headwater conservation tax. The latter two usages were regarded as technical purposes. The second economic valuation was conducted in 2014. The results

were used to prove that the current tax level is reasonable, which was categorized into informative purposes.

When applying the hypotheses for valuation uptake to this case, of total 12 hypotheses, two are irrelevant, and seven out of the remaining ten have been addressed. In the Kanagawa case, the government corresponds to most of the hypotheses so that it can be taken up in discussion on the establishment of the headwater conservation tax. The case is demand-driven valuation that the objectives and the purposes of valuation were concretized prior to the initiation of the valuation (Hayashi et al., 2021). Therefore, H1 and H2.1 were well-considered along with the valuation design. In this case, these two hypotheses can be seen as a prerequisite for uptake. See *Annex 4.15* for further case study context and a more detailed analysis of overcoming barriers to uptake.

Valuation uptake case #3: Valuation of the restoration of Lake St Lucia, South Africa

Lake St Lucia is South Africa's largest estuarine system and one of the most important in terms of conservation value (Turpie et al., 2002). Lake St Lucia is South Africa's largest estuarine system and the dominant feature of the iSimangaliso Wetland Park, which was inscribed onto the World Heritage List on the basis of its outstanding examples of ecological processes, superlative natural phenomena and scenic beauty and exceptional biodiversity. Its main source of freshwater, the uMfolozi River, was diverted directly to the sea in the 1950s in order to minimise flood risk for sugarcane cultivation, a situation that required ongoing management. The gradual cumulative impacts of this, as well the former value of the estuary, only really became clear when the whole system dried up for an entire decade from 2002-2012, leading to massive loss of biodiversity, the cessation of recreation and tourism, and the collapse of marine fisheries. Restoring over half a century's damage would not only be costly, but posed a risk to the by now well established local sugar industry.

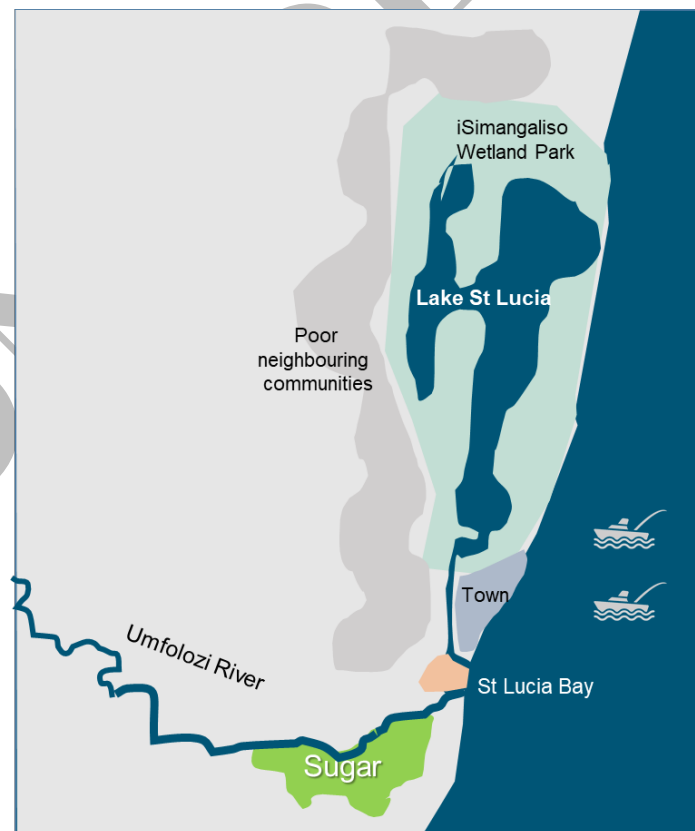


Figure 4.18. Schematic diagram of Lake St Lucia and the uMfolozi River, and the location of the “St Lucia Bay” that once existed when their mouths were combined.

With funding from the World Bank, the iSimangaliso wetland park authority commissioned a study to estimate the current value of the system and the potential costs and benefits of a range of restoration options. These included elaborate engineering solutions to deliver river water without sacrificing any of the sugar estate, leaving the system to return to a natural state on its own, or fast-tracking the recovery of the system by removing the large area of dredge spoil that had been used to divert the river. The study, which was presented in seven volumes (Clark & Turpie, 2014), was undertaken by a multidisciplinary team of researchers, and its credibility was ensured by the participation of a wide range of stakeholders and technical experts who were given the opportunity to make input at regular intervals through the three-year study (Forbes et al., 2020). In addition to detailed hydrological, hydrodynamic and ecological research and modelling, the study included the valuation of selected ecosystem services (Turpie et al., 2014). The valuation study drew on the natural experiment of the decade-long closure of the system as far as possible. Household surveys in the surrounding communities showed that tourism was an important source of employment and that the estuary's natural resources made a significant contribution to local livelihoods. Surveys of tourists and tourism businesses revealed that the area contributed a significant proportion of the province's tourism revenues, and that these revenues were strongly influenced by the health of the estuary. Data from before and after the estuary closure also allowed the quantification of its former contribution to the recreational and commercial fisheries off the coast of northern KwaZulu-Natal. The projected increases in these values as a result of the restoration of the system were considerably higher than the expected sugar production losses as a result of estuary restoration, even without considering its non-use values. Furthermore, the study showed that the best outcome for society as a whole would be obtained by removing the artificial barrier separating the uMfolozi from the St Lucia Lake system (Turpie et al., 2014).

The study led to the government's decision to stop breaching the uMfolozi river mouth and to rejoin the two systems by removing the dredge spoil from the mouth area (Forbes et al., 2020). While this was challenged, the courts found that the sugar farmers did not have the right to manipulate the uMfolozi river at the expense of the Lake St Lucia system (Earth & Life News SA, 2016). This showed that the consideration of environmental costs and benefits in monetary terms can, in some cases, tip the balance for environmental management decisions, even in the face of powerful opposition. See *Annex 4.16* for further case study context and a more detailed analysis of overcoming barriers to uptake.

Valuation uptake case #4: Values of nature in United Kingdom marine and coastal policy

The United Kingdom has an extensive and diverse coastline. The sea and coast are central in the cultural history and identity of this maritime nation, play an important role in many people's quality of life, and continue to provide important material and non-material contributions to local people including local identities, livelihoods and health and well-being. This case study highlights the application of two deliberative valuation approaches in local marine policy, with one focusing on agenda setting and the other implementation. Both studies highlight the salience of deliberative valuation for forming shared values for policy, supporting more inclusive and legitimate policy processes (see 2.4.2 and Box 2.9). Both studies, in their design, also made direct reference to the CBD ecosystem approach, with the processes explicitly seeking outcomes that supported balancing conservation and sustainable use of the sea.

Orchard-Webb et al. (2016) brought together a small but diverse group of local stakeholders within the fisheries local action group, for a three-day deliberative democratic monetary valuation process to form values around local sustainable development policy in Hastings, southeast England. The process followed the deliberative value formation model (Kenter et al., 2016), moving from deliberating on broad values, to applying these to the local context to form specific values, to expressing these in indicators, in this a collectively negotiated social willingness to pay for different

sustainable development policies. While the outcomes did not inform a single specific decision, the priorities expressed and some of the policy options formulated were reflected in the local development plan.

Ranger et al. (2016) applied the community voice methodology, a sociocultural method linking ethnographic film and deliberation, to consult stakeholders on implementation measures for two marine protected areas (*see Box 2.8*). 41 purposely selected local stakeholders were interviewed to understand their values of the sea. The film interviews were compiled in a documentary, and subsequently debated by 90 stakeholders over the course of three evening workshops in the context of evaluating potential management options. These were first systematically debated using multicriteria analysis, and subsequently voted on. The outcomes were closely reflected by the regional fisheries management authority in the consequent management plan and bylaws. The deliberative process was designed and run by experienced independent facilitators. While the deliberative value formation model again informed the design, the context was characterised by much greater pre-existing stakeholder conflict and distrust, and clear conflicts of interest between participants. As such, there was no aspiration of consensus.

There were several key enablers common to both processes that supported uptake. First, the deliberative model applied was explicitly designed for identifying shared values. This included, in first instance, shared broad values and recognition of each other's specific values of the sea, independent of the decision-making processes. Stakeholders from diverse backgrounds found they had much in common, also in their direct experience of the sea, where for example both fishermen and conservationists expressed overlapping living in nature and living as nature life frames as being very important (*see 2.3.2*). This supported trust and a more collaborative atmosphere in identifying shared values for concrete policies. Secondly, the process was independently designed and run by experienced facilitators, who explicitly built tools into the process for participants that supported participants to "fill each other's shoes", and better understand other's values. Thirdly, the processes explicitly acknowledged data gaps and uncertainties and provided space for consideration of both scientific and local knowledge, which allowed fishermen in particular to feel more confident in the outcomes. Fourthly, there was highly considered sampling of stakeholders to ensure inclusion of and balancing of multiple interests, which supported a perception of legitimacy. Finally, both cases involved direct collaboration between researchers and decision-makers, which supported the timeliness of the process and alignment of the scope of the research with the policies that were informed. In both studies, both decision-makers and participants responded very positively to the process, improving trust and building capacity for collaboration. Furthermore, it further impacted on United Kingdom coastal decisions, as it rapidly became considered as innovative best practice across the broader United Kingdom marine policy community and has subsequently been used across diverse contexts (Ranger et al., 2016) (*see Box 2.8*). *See Annex 4.17* for references and a full discussion of the context of valuation uptake for this case study.

Valuation uptake case #5: Using multi-criteria decision analysis for collaborative development of a sustainable regulation policy for a large regulated lake, Finland

An interactive multicriteria decision analysis approach was applied in a collaborative process which aimed at improving ecological and social sustainability of an existing watercourse regulation policy in the second largest lake in Finland, Lake Päijänne (ca 1 100 km²). The primary aim of using decision analysis was to improve communication and common understanding of the very complex decision situation in the steering group of stakeholders, and, thus, to improve joint problem solving. The development and comparison of alternative regulation schemes was a multistage and iterative process (Marttunen & Hämäläinen, 2008). The decision analysis was realized before defining primary objectives for the different weather conditions, and before starting hydrological simulations to evaluate how well these could be met in Lake Päijänne and the downstream watercourse. Only after

these simulations, and thorough analysis of alternatives' impacts, was it possible to design recommendations that were acceptable to participants from different parts of the large watercourse.

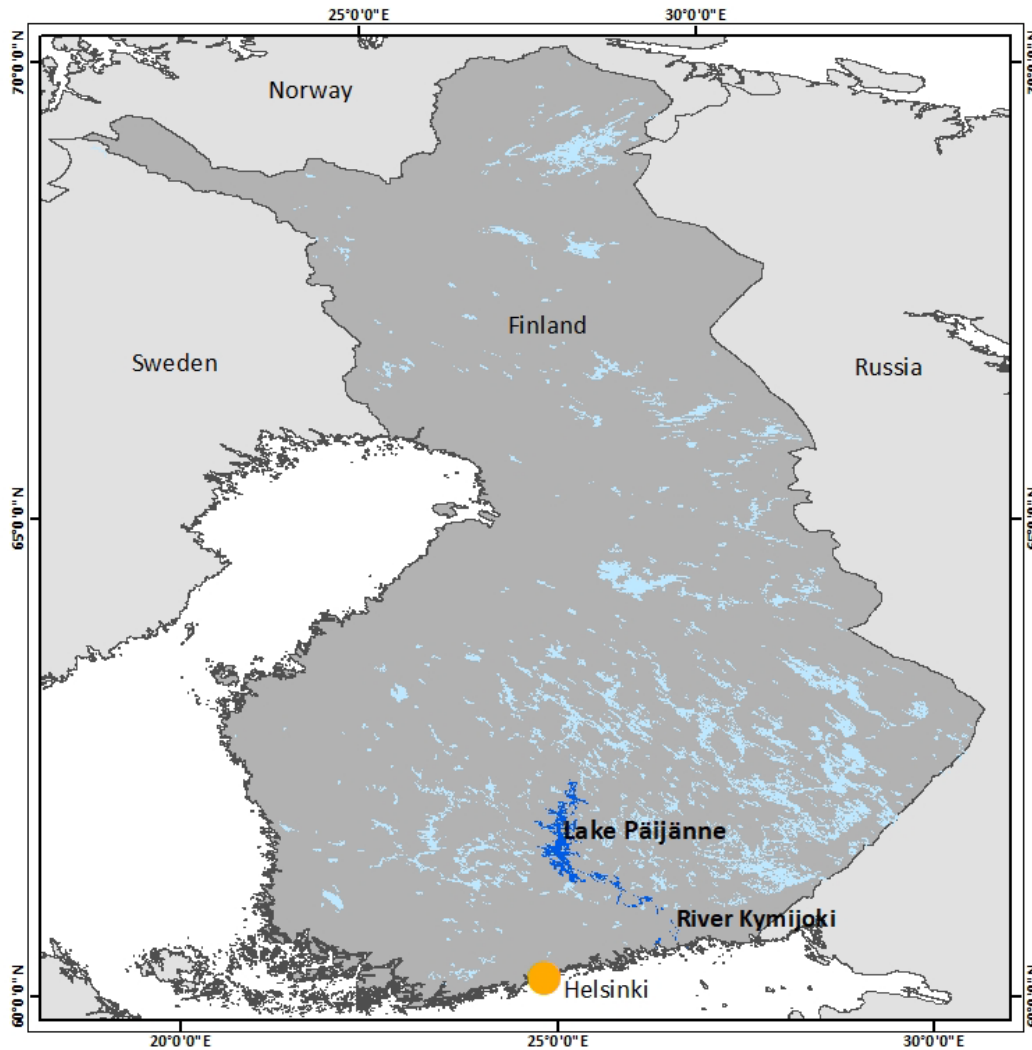


Figure 4.19. Lake Päijänne

The steering group consisting of 20 representatives was responsible for presenting recommendations for the future water level and flow regulation policy, including ministry of agriculture and forestry, regional water management authorities, regional councils, timber floating association, hydropower companies, agricultural producers and forest owners, fisheries authorities, fisheries organizations, and the environmental protection authority. Stakeholder were interviewed individually using a multi-criteria decision analysis (MCDA) (e.g., Eisenführ et al., 2010) based on a decision analysis interview (DAI) approach and Web-HIPRE software (Marttunen & Hämäläinen, 2008). The weight elicitation for attributes of the alternatives used a combination of simple multi-attribute rating technique (SMART) and SWING weighting (von Winterfeldt & Edwards, 1986) techniques. In the elicitation the impacts of the ranges of the alternatives were clearly presented to ensure that participants took into account the decision context.

In the decision analysis interview a dialogue between the analyst and the interviewee is essential. The approach pays particular attention to the comprehensive and illustrative determination of criteria weights. The analyst asks control questions to ensure that there are no misunderstandings or major inconsistencies. Participants have the opportunity to first clarify their own opinions about the alternative regulation schemes and their impacts, before starting discussions about the new lake

regulation policy. The decision analysis interview was fully integrated into the real decision-making process. The timing of the interviews in the middle of the four-year project was very opportune. It was vital that there was enough information about the impacts of past regulation practice to assess the performance of the alternatives with respect to selected ecological, social and economic criteria.

Although the starting point for the project was difficult due to a deep lack of trust between the various parties, a carefully planned and structured participatory process with personal multi-criteria decision analysis-based interviews enhanced dialogue and improved participants' learning in several ways. For example, using multi-criteria decision analysis broadened participants' thinking as it became evident that there were many objectives that needed to be reconciled in the water level and flow regulation in this large watercourse, considering different water conditions at different locations. A homogeneous policy would have resulted in unacceptably high damages or disadvantages for some uses. The benefits of applying multi-criteria decision analysis to support participatory policy planning are numerous (e.g., Marttunen et al., 2015). The added-value has been highest in the cases where multi-criteria decision analysis was applied from the beginning of the policy planning process, as in the Päijänne project. It has become one of the most successful water policy projects in Finland in recent decades. See *Annex 4.18* for further case study context and a more detailed analysis of overcoming barriers to uptake.

Valuation uptake case #6: Uptake of non-market valuation through benefit transfer in cost-benefit assessments of United States federal regulation under the clean water act

Executive order 12291 has since 1981 required benefit-cost analysis (BCA) for all proposed United States federal regulations, with an effect on the economy of more than \$100 million/year, or those designated significant by the office of management and budget (Griffiths et al., 2012). Benefit transfer (BT) is extensively used by federal agencies e.g., environmental protection agency (EPA), to conduct these analyses (Iovanna & Griffiths, 2006), as they are often bound by budget, staffing and timing of the policy processes that preclude the use of original valuation studies using primary data (EPA, 2011). Federal analysts must be prepared to make rapid adjustments to their benefit-cost analysis in response to evolving requests from managers as rule-making proceeds. Benefit estimates may be needed for all households in the nation, making it difficult to conduct new non-market valuation studies tailored to each proposed regulation. This results in a demand for applying existing non-market valuation estimates to calculate willingness-to-pay for new policy cases i.e., "benefit transfer" (Newbold et al., 2018). Nevertheless, decisive use of benefit transfer in the policy cycle depends largely on whether available valuation studies fit an often-narrow set of criteria that are more complex the more location-specific benefits are. The clean water act (CWA) is at the complex end of the benefit transfer spectrum (Newbold et al., 2018).

The United States Environmental Protection Agency developed rules beginning in 1976 for electric generators and manufacturing facilities that take water from coastal and inland water bodies for cooling purposes, based mainly on the pollution risk, but also on impingement and entrainment (I&E) fish mortality through the intake-discharge cycle. It required multiple litigations (*Annex 4.19*) to enable them to include, in their 2011 report, economic benefits to ecosystems in their required cost-benefit determination of proposed options for existing facilities with cooling water intake structures. An environmental protection agency sponsored stated preference study to estimate total (use and non-use) value of potential improvements resulting from proposed rules could not be implemented because of time constraints. Instead, they used benefit transfer to estimate marginal values per fish to show the benefit to recreational anglers of reducing impingement and entrainment mortality. The environmental protection agency (EPA, 2011) identified a large number of potential studies for benefit transfer (*Annex 4.19*), but most were disqualified because valuation data could not be correlated with avoiding or reducing impingement and entrainment mortality for specific species / habitats. Uncertainty was mostly evaluated qualitatively, though meta-analysis of recreation values

did provide some uncertainty ranges. The environmental protection agency subsequently released improved benefit transfer analyses in their 2014 final 316(b) existing facilities rule (*Annex 4.19*). *Annex 4.19* details barriers to uptake of non-market valuation that have been overcome with the use of benefit transfer in benefit-cost analysis under section 316(b) of the clean water act. Uptake challenges continue regarding compatibility of non-market valuation metrics with species-habitat dynamics and installation-specific impacts. Further refinement of benefit transfer for policy use is evident in the environmental protection agency's 2015 economic analysis on effluent limitations for steam electric power plants. Guidelines have recently been compiled to enhance validity and credibility of environmental benefit transfers (Johnston et al., 2021).

Valuation uptake case #7: Implementing gross ecosystem product (GEP) in Lishui, China

Gross ecosystem product (GEP) is the aggregate value of final ecosystem goods and services in a given jurisdiction (Ouyang et al., 2013, 2020). Gross ecosystem product comprises three categories: material services (corresponding to provisioning services), regulating services, and non-material services (broadly equivalent to cultural services). In recent years, gross ecosystem product has been adopted by many local governments in China as a benchmark for planning, management evaluation, and as a framework for market-based transactions (Ouyang et al., 2020; Pema et al., 2017; Zou et al., 2020). Lishui prefecture in Zhejiang province in particular has made significant advances.

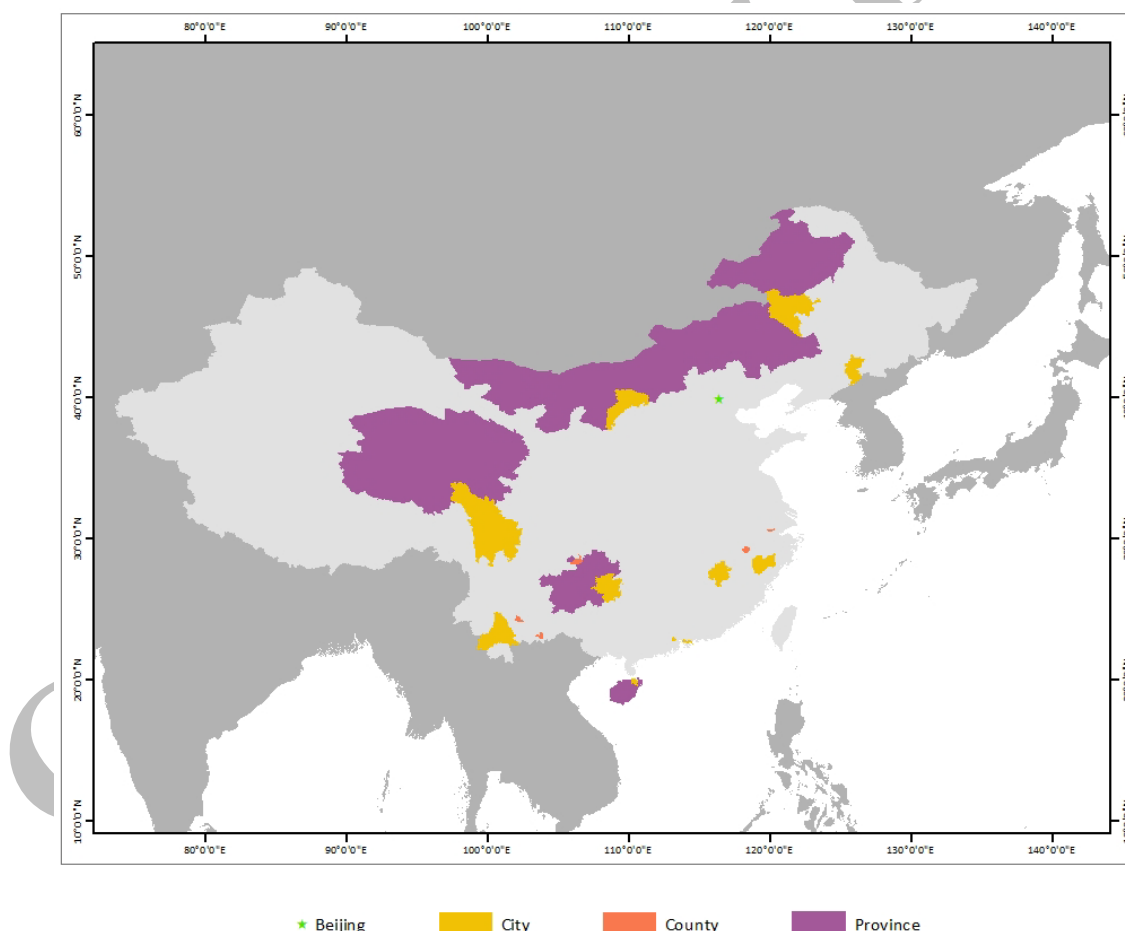


Figure 4.20. The sites of pilot gross ecosystem product accounting and applications in China. Cities: Fuzhou, Ganzi Zangzu, Haikou, Hingaan League, Lishui, Ordos, Pu'er, Qiandongnan, Shenzhen, Shunde, Tonghua. County cities: Arxan, Deqing, Eshan Yi, Kaihua, Pingbian Miao. Provinces: Qinghai, Guizhou, Hainan, Inner Mongolia Note: South China Sea Islands are also part of the pilot, but not shown in this map.

A mountainous area covering 17,275 km², Lishui had a population of 2.7 million, mostly rural residents at the end of 2019. The national government designated Lishui as the country's first demonstration site for developing mechanisms to make ecosystem services quantifiable, assessable, and tradeable. To that end, Lishui's framework for implementing gross ecosystem product is known as the "six into" system, whereby gross ecosystem product has been incorporated into six dimensions of local development: planning, decision-making, projects, transactions, monitoring, and evaluation.

In terms of planning, the Lishui government incorporated gross ecosystem product into its local 14th five-year plan for economic and social development, to ensure that gross domestic product and gross ecosystem product grow in concert. For decision-making, Lishui incorporated gross ecosystem product as a criterion for approving large-fund initiatives and into policy design. Projects, refer to ecological conservation and restoration or environmental management (e.g., waste and pollution prevention / abatement). The local government assesses impacts so that gross ecosystem product - enhancing projects are increasingly profitable and those that lower gross ecosystem product pay the price. For the latter, projects are required to engage in offsetting investments on- or off-site. In one notable case in Jingning County, gross ecosystem product fell because of land overdevelopment. In consequence, the project was forced to pay a compensation fee for off-site ecological restoration of more than nine million renminbi (RMB). In just the first nine months of 2020, courts in Lishui concluded a total of 280 such cases, leading to 27 additional ecological restoration sites covering a replanted area of 560 acres.

For transactions, the local government has promoted the creation of "two mountain businesses" to marketize the purchase of ecosystem services. The government has created a purchasing mechanism based on gross ecosystem product calculations and, after accounting for public finances, buys regulating services on the market from "two mountain businesses" that have engaged in ecological protection and restoration. The first such transaction in 2019 was worth 1.88 million renminbi (RMB), a value based on a calculated gross ecosystem product increase of two per cent from the associated ecological protection / restoration project.

The monitoring dimension is focused on establishing a unified statistical system on ecosystem conditions to provide data for gross ecosystem product accounting. In terms of evaluation, gross ecosystem product has been adopted as a key indicator of the effectiveness of county administrators in delivering ecosystem benefits to local residents. Overall, gross ecosystem product evaluation contributes to a system of environmental accountability for administrators, with both "carrots" (e.g., promotion and support for projects) and "sticks" (e.g., demotions). See *Annex 4.20* for further case study context and a more detailed analysis of overcoming barriers to uptake.

4.7. Major gaps and ways forward to support decision-making through value articulation and valuation

4.7.1. Major gaps in the understanding of values and valuation in relation to decision-making and its outcomes

During the 26th Conference of Parties of the United Nations Framework Convention on Climate Change, in Glasgow, November 2021, a comprehensive report on the status and trends and sustainable development challenges for the Amazon region was released (Science Panel for the Amazon, 2021). In the context of the IPBES *values assessment*, it may be relevant to note that there is no explicit reference to “values” and “valuation” in the 1500+ pages of the report. It is not clear from the report whether lack of valuation content is why the valuation terminology is not used in an otherwise inclusive and broad-based study, but this example serves as a reminder that the diverse values of nature and formal valuation methodologies to express them are far from institutionalized in current policy frameworks, even those most closely related to nature. In this spirit, this final section discusses the knowledge and operational gaps in the use of values and valuation in decision-making, specifically examining the relationships illustrated in *Figure 4.1* relating value articulation and uptake (arrows 1, 2), institutional implementation (2- 5), and outcomes and their feedback effects (arrows 5, 6A-D), with consideration of the power (arrows 3A-D) and knowledge (arrows 4A-D) mediating these relationships.

Gaps relating to value articulation and uptake

Evidence in *Chapter 4* on lack of uptake of plural valuation can be explained by resource and technical limitations on engaging with diverse local interests. However, the evidence has been limited by language bias towards English, as well as not being able to systematically review commissioned valuation studies that are not in the public domain. Apart from these practical limitations more research on co-production of valuation knowledge, understanding the role of power in knowledge brokerage, and better adaptation of valuation knowledge to context is called for in this section.

Resource gaps include lacking funding for conducting plural valuation and adequate public consultation, particularly in common assessment contexts such as environmental impact assessments. There is often a lack of technical capacity in public agencies to commission, carry out and interpret plural valuation processes. In the global south, there is a scarcity of plural valuation that could be at the base of environmental policies, due in part to the lack of interest of national authorities to funding researchers and ecosystem assessments and valuations. Consequently, there is a lack not only of technical capacity, but also of political interest in realizing plural valuations that could consider the local, regional, national interests and values’ diversity. Power asymmetries and interest to control territories reinforce the absence of plural valuation processes in environmental decision-making. There are limited resources to engage in validation of knowledge in the communities which will be affected by these decisions. Similarly, there is a lack of funding for system of environmental economic accounting-ecosystem accounting implementation at sub-national and local government levels. There are insufficient resources for collaborative and participatory methods during account compilation processes, combined with limited capacity of those compiling accounts to continuously engage end users of produced information (government).

Making valuation efforts more relevant for decisions requires boundary work to match supply and communication of valuation studies to demand by specific stakeholders in the process. Beyond valuation studies in search of uptake and application, demand-driven valuation studies may be more common than reflected in the literature this assessment has reviewed. With few scientific publications available there is a lack of research on the practice of non-research organizations such as corporations

and non-governmental organizations in commissioning ecosystem services / nature's contributions to people valuation consultancies and their degree of acceptance in multi-stakeholder processes.

There is a lack of publicly searchable databases of non-academic publications such as valuation reports conducted by consultants for public agencies. In particular, there is a lack of public searchable databases for environmental impact assessments which would make it possible to conduct systematic reviews of the representation of diverse values in public decision-making. This is necessary to disseminate otherwise privately held knowledge about best practice of valuation uptake in public decision-making. It is also necessary to evaluate the policy impact of research funding for valuation. More generally, there is a lack of English-language systematic reviews of uptake of explicit valuation in national and local policy documents in local languages other than English. Due to the language bias in published valuation research, there is possibly a bias in the literature reviewed here towards institutional settings of the research communities in English-speaking countries.

Further analysis is needed of the relative importance of instrumental and relational value articulations of nature for various types and styles of decision-making, including their balance between rationality and sociality (see 4.2) in relation to stages of issue and policy cycles. Such analysis could contribute to greater relevance of valuation studies and their “packaging” for the specific debates and negotiations they try to support. Instrumental values and their economic representation can justify budgetary allocations at an implementation stage, but relational values speak more to the hearts and can influence goal-setting discussions.

Where “internalization of externalities” is still understood primarily as a call for financial policy instruments, the deeper connections with “in-group” perceptions as a more profound form of internalization (see 4.2) deserves further analysis. This includes understanding of the role relational value articulations play to invoke care, stewardship and taking responsibility for individual and group-level footprints. The process of co-production of knowledge on values, rather than relying on external experts hired to do a job, may become a relevant step towards value-inclusive decision-making, beyond the objective information gathered. A social, political analysis of the processes involved is lacking for many of reported valuation studies, with or without claimed uptake.

This chapter has identified a lack of research on the operational barriers to uptake of explicit valuation outputs in policy cycles, in particular the role of power brokerage of valuation knowledge. Therefore, research is needed on explicit valuation knowledge generated by research as representing, and mediated by particular interests, and its agency and relative power in competition with implicit values of other interest in the policy issue cycle.

Particularly, there are very few studies that address the influence of power asymmetries in the decision-making processes of how values are taken up by IPLC. The existence of communality and communal authorities among IPLC does not mean there is an absence of power asymmetries. In all decision-making processes, dominant narratives and values reinforce the status quo by excluding other actors’ worldviews, knowledge and values. But there is a lack of literature that could offer us a clear understanding of how value articulation takes place among IPLC.

Research is also lacking on how plural valuation may unlock transformative change by casting light on implicit valuation biases that explicit valuation exposes to all stakeholders involved. This includes research on valuation “zero-sum games”, “crowding out”, “moral hazard” of implicit values by explicit valuation – that is, whether promoting plural valuations then will deny or ignore implicit valuation. Limited research also relates to the representation of knowledge and values held by local stakeholders and indigenous people in decision-making. Research is needed on the extent to which explicit valuation methods representing them determine the effectiveness, and social equity of project and policy outcomes relative to competing non-local knowledge systems and values.

Gaps relating to institutional implementation

There is evidence of a communication gap in a number of countries between the agencies compiling system of environmental economic accounting-ecosystem accounts and those that are reported by focal points of national biodiversity strategies and action plans. Focal points such as ministries of environment should theoretically be best informed of national environmental decision support tools. Engagement early in account compilation is key for trust building which will enable uptake. This is arguably more important than the typical practice of engagement after valuation and accounts have been compiled (e.g., presentation of a report in a big final workshop hoping for its use). Low engagement may also be due to lacking financial and human capacity resourcing of public agencies charged with public hearing processes. Many national biodiversity strategies and action plans also fail to report on valuation of biodiversity and ecosystem services that actually is taking place in a country. This can be interpreted as a lack of awareness in some national environmental agencies of accounting and valuation practice (knowledge gap). In other countries not reporting on Aichi target 2, but which are known to have national valuation research, it could indicate that explicit valuation is actually not significant as policy decision-support.

There is a growing literature on how policy discourse, design of policy instruments and the implementation processes used can reduce the risk of negative value externalities on intrinsic motivation (or even create positive ones). Several knowledge gaps still exist in the understanding of how and when appeals to collective action and responsibility can work, how the introduction of rules can undermine voluntary commitment, and how rules and motivation-based roles can synergize rather than clash. The recent and ongoing global experience with pandemic control may provide lessons for the way other global crises can be managed. By and large, the effect of different framings and / or arguments persistent in a given policy discourse on intrinsic motivations is not well understood. The available evidence is inferred from studies not measuring intrinsic motivation directly, but relying on related variables (such as policy support, interest in conservation tillage, etc.). Therefore, there is a need for more in-depth evaluations of the potential impacts of instrumental and non-instrumental arguments (or a combination of both arguments) on intrinsic motivations for conservation. It should also be noted that most of the available evidence is suggestive rather than definitive. That is, very few studies actually test the motivation crowding mechanism rigorously. Rather, most studies put it forth as a potential underlying mechanism explaining the results on behavioural outcomes. In future research, a meta-analysis could aim to extract insights that cut across the individual studies. However, the disparate research designs make this challenging.

More studies are needed on the motivational and behavioural aspects of variety of policy design and implementation features, particularly on:

- the impacts of their framing, for example testing whether framing payments for ecosystem services as a compensation, reward or co-investment rather than payment can help to reduce crowding-out or even induce crowding-in of intrinsic motivations for nature conservation,
- the impact of different types of conditionality on motivation crowding, for example whether reducing the degree of conditionality can help avoiding crowding-out,
- the impacts of specific elements of participation and combinations of these in the processes of decision-making that develop the policy instruments,
- which participative, collaborative or self-governing approaches can reduce the tendency for economic incentives to crowd out intrinsic motivations for conservation.

Such studies should cover a variety of countries, cultural contexts and community types and follow a comparable, rigorous methodology. Lab-in-the-field experiments including a no-policy baseline

and a post-policy stage would be particularly useful in this regard, as are studies directly measuring different types of motivations (e.g., financial vs. pro-environmental vs. social).

More studies that explicitly consider the interaction of policy variants with contextual factors would be helpful, as for example, the study by Lliso et al., (2021) assessing the impact of value framing for three different community types. To better understand the link between value framing and pre-existing human-nature relational models, studies from countries other than Colombia are needed to assess the generalizability of results and to appreciate contextual factors that require local fine-tuning before positive experiences can be replicated.

There are not enough studies that show how values are considered by formal and informal institutions; and even fewer on how these values are highlighted or obscured by social heterogeneity and asymmetrical structures. In general, comparable studies from different socio-cultural contexts, for example different levels of development, more collectivist vs. more individualist cultures, community types differing on the hedonic / eudaimonic spectrum, would be helpful to interpret the effectiveness of policy instruments for various contexts.

Gaps relating to outcomes and feedback effects

There is a major knowledge gap, as well as an implementation gap, linking specific valuation methods to different decision outcomes or impacts, as part of the overall adjustment of human activity to align with SDGs. Studies focusing on impact evaluation are rarely able to reconstruct the information feeding into the decision that causes the outcomes (positive or negative), and studies focusing on uptake of valuation are rarely (if ever) tracked through a policy or project cycle to monitor the impacts of the resulting decision. This is also connected to a resource gap, since conservation funding is often directed toward implementation to the exclusion of monitoring.

Furthermore, impact evaluation processes that integrate diverse local values in local-scale or voluntary interventions, such as protected areas (see 4.5.2), payment for ecosystem services (see 4.5.3), or certification of sustainable production processes (see 4.5.4), may not address large-scale and indirect drivers of land conversion and biodiversity loss. Addressing such drivers is imperative to reduce implementation gaps between high-level goals and grounded reality. However, understanding is lacking about the implications of protected areas and payment for ecosystem services for larger-scale transformative change, based on off-site and indirect impacts, including leakage of prohibited land uses beyond project boundaries, and their role in transforming governance institutions in diverse contexts. Similarly, assessing the long-term socio-environmental benefits and costs of large dams and mines and attributing them to specific projects is challenging, and rigorous and comprehensive ex-post studies are scanty.

Conflicts are common when negotiating decisions about nature and the diverse values stakeholders may hold for it. Greater diversity of values comes with the potential for clashes between different values, especially when power asymmetries prevent the full diversity of values from being represented. It is well documented that articulating ignored values is a key factor in surfacing conflict, and that non-participatory or coercive decision processes can exacerbate or prolong conflict. However, some conflicts are unavoidable because certain values cannot be reconciled, and conflicts are also sometimes helpful in raising the levels of awareness and policy interest for an issue. A key knowledge gap in understanding decision outcomes related to conflict is the degree to or means by which conflicts can be leveraged as a catalyst for transformation of values, decisions and society. Not all conflicts are negative outcomes, if they lead to meaningful realignment of values with sustainability and justice.

Tracking more diverse outcomes and understanding the interactions between them is another important gap that needs to be filled for more effective management and decision-making. Despite

goals for conservation programs being as diverse as biodiversity itself, reductionist measures such as forest cover dominate the ecological values in assessing outcomes. Economic values are much more common than any other social values in formal impact evaluation, especially when standardizing across sites or in large-scale reviews. The need for diverse values is also apparent in ex-ante evaluation of impacts, formally environmental impact assessment, for large infrastructure projects like mining and dams, which tend to focus on predefined material impacts, leave out relational values, give lower weight to interests of marginalized people, and assume that negative impacts can be simply compensated for through material compensation. Outcomes for justice (mainly procedural and distributional) are tracked much more frequently than long-term and large-scale transformation toward sustainability. Interactions between outcomes, like the extent to which program sustainability is impacted by perceptions of justice or how long-term material well-being is supported by the sustainability of nature's contributions to people is assumed but rarely documented. A clearer chain of evidence is needed to assess whether certain outcomes are primary and must be managed for while others are secondary and emerge in response to primary outcomes.

Overall, qualitative studies are under-represented in literature reviews, which represents not so much a gap in knowledge as a disjuncture between the large body of qualitative, ethnographic case-study literature and the current trends in the review literature. This is significant, as methodology of impact assessment has been shown to influence results, with qualitative research demonstrating more negative social and environmental impacts in payment for ecosystem services, for example (Blundo-Canto et al., 2018; Calvet-Mir et al., 2015).

4.7.2. Addressing knowledge and implementation gaps

This section discusses ways forward to address knowledge and operational gaps uncovered in this chapter, organized by the themes that have structured this chapter.

Sharing the responsibility of value articulation and uptake

This assessment has provided evidence of a research gap in documentation of the uptake and outcomes of valuation in public decision-making about nature. Moving forward, commissioners of research in the public interest could increase funding to valuation research that is iterated over policy cycles, and evaluates valuation purposes and impacts relative to outcomes. This will require programmatic and participatory research, which is more costly, but has superior decision-support value. Generating this knowledge requires research funding that is more predictable and stable. The complexity of the knowledge generation task required to steward nature during global change is beyond the capabilities of the public sector in most countries - it cannot be their sole responsibility to generate valuation knowledge for the common good. Policy mixes should be developed that both nudge and oblige business and finance to share the burden of data production and co-fund valuation knowledge. This includes making valuation studies commissioned by public bodies to private consultants subject to constitutional rights to environmental information (re. Aarhus Convention). This requires additional funding for searchable valuation repositories that follow FAIR principles of findability, accessibility, interoperability, and reusability.

Closing the loops between the policy cycle and valuation process

Public authorities often commission valuation at only single-entry points in the policy cycle - in many countries only for environmental impact assessments in the policy formulation & implementation stage. Valuation could be adopted formally in the ex-post policy evaluation phase to measure policy outcomes in terms of diverse values, and compare them with policy objectives for outcomes. This could promote a demand for valuation throughout the policy cycle, including to inform experimental implementation and adaptive management. Use of valuation throughout the policy cycle would

require a transformation towards a common understanding of what constitutes valuation information. It would require a common acceptance - or standardization - of valuation information in so-called “evidence-based” planning and policy-design as well as impact evaluation for adaptive management or iterative decision-making in a policy cycle. It would require funding for integrated assessment, both ex ante and ex post, to be considered an integral part of project, policy or programme investment and operation. This transformation in valuation process requires a transformation in funding for valuation research (which is already under way) towards more participatory, deliberative, and incremental methods.

Evidence from this chapter shows that more participatory and plural valuation processes only serve as vehicles for empowerment of marginalized stakeholders where those stakeholders’ rights are recognized, their voices are represented throughout the decision process, and they are given substantial influence over decision outcomes. Diversification of values can threaten the rights of IPLCs, including marginalized peoples, if these processes privilege already-powerful groups. Thus, plural valuation processes should be matched to the level of diversity in decision context, taking into consideration the stakeholders’ rights and equity.

Standardization of valuation while representing diverse values

The ideal of integrated valuation (Jacobs et al., 2018) involves tensions and trade-offs. Iterated valuation that allows for comparison of policy performance over time and over policy cycles, requires standardization in order to be relevant, robust and resource efficient. Standardization promotes cost-saving as well as robustness, and as such is a common good for public decision-making. The demand for standardization of valuation is evident in ecosystem accounting at national level for biophysical indicators (e.g., in the system of environmental economic accounting-ecosystem accounting). However, standardization of valuation is by definition in tension with representation of local, context-specific values. A way forward will have to recognise the differential use of valuation at different levels of governance and for different purposes. There is a need for better representation of multiple dimensions of quality of life and diverse values of nature in this chapter’s evaluation of the outcomes of decisions as well. Standardization of some valuation methods for certain purposes may be possible (e.g., regulatory environmental standards, biophysical ecosystem accounts), while economic and socio-cultural methods may be more informative if they can be adapted and combined to represent a high diversity of decision-settings and interests (following best practice guidance, rather than formal standards).

Moving forward, awareness is needed that what constitutes valuation knowledge and evidence can be captured by private interests and elites. Like any technology, standards for valuation in the private sector are also a means of competitive advantage, market power and market capture. Ensuring relevant, robust and resource efficient valuation is conditional on how power to generate valuation knowledge is distributed among institutions governing the policy cycle.

To increase the chance of policy uptake of valuation studies, the participation of IPLC will enrich the knowledge, experiences, and values reflected and make positive outcomes for sustainability and justice more likely.

New alliances for generation of knowledge about diverse values

Researchers have a role to play in a shift toward knowledge generation about diverse values including different forms of knowledge. A key step will be determining how to target who they work with; researchers wishing to enable transformative change should consider what the leverage points are for knowledge being most transformative with different actors. Actors as diverse as those in the private sector, government, multilaterals, big non-governmental organizations, and small or local non-governmental organizations require different types of knowledge to be most effective, and

researchers would benefit from partnerships with boundary organizations to help them navigate this space. Such knowledge brokers, sitting at the science-policy interface, can build relationships with different actors and connect researchers where they can be most effective. However, sectoral silos must be broken down to share lessons and strategies across the science-policy interface. While at the level of international conventions, climate change and biodiversity have followed parallel tracks and built separate science-policy platforms, in current public awareness and coalitions for solutions maintaining the boundary appears to be increasingly counter-productive. Deeper analysis of the resistance to change and of vested institutional interests may help find pathways to unleash the potential synergy.

Strengthening the role civil society and civil service in valuation for decision-making

Political power struggles and competition undercut the continuity of approaches (“staying the course” in terms of sustained effort), with values crosscutting through political changes. A strong civil service within government is more stable through political change-- for example, statistical agencies tend to remain while ministries may change (and more specifically, the System of Environmental Economic Accounting-Experimental Ecosystem Accounting (SEEA EEA), born of statistical agencies, provides indicators of ecosystem services contribution to GDP accepted across the political spectrum). Long-term research can strengthen local capacities and further empower civil society, providing access to education, information, and communication. National research councils might recognize their role in knowledge generation, promote joint funding involving local non-governmental organizations, who tend to be closer to the local, diverse values, and are able to integrate local stakeholder perspectives. Thus, the ways in which problems are understood, communicated, and discussed need social institutions that can assure the participation of multiple perspectives from different actors.

Brightspots revealing ways forward

This chapter has provided evidence that valuation of nature's contributions to people, including ecosystem services, is more of the exception than a rule in most policy levels and countries. The exceptions are brightspots demonstrating ways forward. Examples reviewed in *section 4.6.6* included: recognition by courts of ecosystems as legal individuals with constitutional rights with local communities recognised as custodians, reflecting indigenous communities' living as nature life frame in the governance system (Rio Atrato, Colombia); a headwater conservation tax based on valuation of forest ecosystem services, using repeated surveys of downstream communities' willingness-to-pay throughout the implementation to assess community support and financial feasibility (Kanagawa, Japan); government-led wetland restoration based on benefit-cost analysis integrating hydrological, hydrodynamic and ecological research with economic valuation and regular participation of stakeholders (Lake St. Lucia, South Africa); use of multi-criteria decisions analysis for collaborative development of a sustainable regulation policy for a large regulated lake (Lake Päijänne, Finland); agenda setting and implementation of local marine and coastal policy based on deliberative valuation methods, forming shared values for policy and a more legitimate policy process (United Kingdom); basing local development planning, decision-making, project assessment, off-setting, monitoring and evaluation on accounting of gross ecosystem product at the prefecture (sub-national) level (Lishui, China); and benefit-cost analysis of federal regulations on water quality, using benefit transfer to overcome the limitation of high costs of new non-market valuation studies (United States of America). These brightspots can serve as inspiration or templates for others to follow, or simply build confidence and understanding that such strategies can be successful. In many settings implementing similar approaches are transformative relative to the current situation, in others they are opportunities for further incremental change.

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