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Incorporating diverse values of nature in decision-making - theory and practice

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Abstract: Values play a significant role in decision-making, especially regarding nature. Decisions impact people and nature in complex ways and understanding which values are prioritised, and which are left out is an important task for improving the equity and effectiveness of decision-making. Based on work done for the IPBES Values Assessment, this paper develops a framework to support analyses of how decision-making influences nature as well as whose values get prioritised. The framework is used to analyse key areas of environmental policy: a) the present model for nature protection in market economies, b) the role of valuation in bringing nature values into decisions, and c) values embedded in environmental policy instruments, exemplified by protected areas for nature conservation and payments for ecosystem services. The analyses show that environmental policies have been established as mere additions to decision-making structures that foster economic expansion that undermine a wide range of nature's values. Moreover, environmental policies themselves are also focused on a limited set of nature's diverse values.

Keywords: Nature's values, environmental policy, decision-making, institutions, power, valuation, protected areas, payments for ecosystem services, IPBES

1. Introduction

The nature crisis – manifested through high rates of habitat and species loss – reflects that a limited set of values are prioritised in our systems for decision-making – largely favouring market-based instrumental values of nature [1,2]. Various forms of policy interventions have been instituted to amend environmental problems, including those anchored in the Convention of Biodiversity [3,4]. The nature crisis continues, however, largely unabated [5]. Furthermore, the IPBES '*methodological assessment of the diverse values and valuation of nature*' (henceforth Values Assessment) [1,6] documents that the problem is not lacking knowledge or methods to assess nature's diverse values [7]. It concerns our ability to consider the broad set of nature's values when making economic and political decisions that impact nature [2].

Navigating through nature's multiple values is challenging due to the great diversity of values associated with different worldviews, knowledge systems and languages. Following the Values Assessment, we refer to nature's values as both *broad* values (guiding principles and life goals such as care for nature, equity, and justice) and *specific* values (judgements regarding the importance of nature in particular situations) [8]. Specific values may be distinguished as instrumental (nature as substitutable means to human well-being), relational (nature as basis for meaningful relationships) and intrinsic (nature as having value in-and-of itself) [9,1,8].

Decision-making geared to a more sustainable and just future requires acknowledging value diversity and to balance, as well as prioritise, among competing types of values held by different people. However, currently, economic and political decisions rely mostly on a narrow set of values, typically favouring instrumental values as reflected in markets [2]. Moreover, policies geared to support nature are either oriented towards instrumental values, viewing nature as capital offering material benefits, or in some instances focused on intrinsic values generally favouring nature protection at the expense of human use. While relational values play an important part in people's perceptions about and meaningful relationships towards nature (e.g., care, reciprocity, stewardship, etc.), they tend to be overlooked in economic and political decisions [10,9,2]. Acknowledging, balancing and prioritising across the plurality of values depend on how decision-making processes are instituted: to what extent different societal groups are involved, and how values can be expressed and considered when decisions are made [3,4]. Power relations are an important aspect of this, as the values prioritised tend to favour the interests of more powerful actors [3,11]. Hence, how to manage value pluralism (i.e., recognition of multiple and often conflicting values not reducible to a singular one) with attention to broad values such as intra- and inter-generational justice is a great challenge [12].

Here we aim to expand the insights about the shortfalls of present decision-making systems impacting nature and how they can be addressed. More specifically, we draw on the Values Assessment to develop a values-centred framework to support analyses of decision-making about nature. This framework is first applied in an analysis of the evolution of interventions towards nature protection in market economies. Thereafter it is used to study the role of valuation in bringing nature's values into decision-making. Lastly, we analyse what and whose values underlie the design of key policy instruments for nature conservation exemplified by protected areas and payments for ecosystem services.

2. A values-centred framework of decision-making about nature

Decision-making impacting nature (directly or indirectly) takes different forms. Hence, a framework for analysing such decisions should distinguish between different types of actors and decisions. It moreover needs to acknowledge that the way different actors' values influence decisions is complex. The decision-making framework developed here consists therefore of two key elements: a decision-making typology characterizing types of decisions, decision-makers and their interactions, and a representation of how values influence decision-making.

2.1. The decision-making typology

The decision-making typology (DMT) addresses the main functions and roles played by decision-makers in a generalised way that may be further nuanced to fit different contexts. Three main *types of decision-making* regarding nature are considered here. *Political decision-making* concerns making the formal rules for activities in society including defining *rights* to natural assets and associated values. It typically implies regulating conflicting interests about uses of nature, for example through legal regulations and incentives [13]. *Economic decision-making* covers production and consumption decisions over goods and services including investments and disinvestments in natural assets given politically established rules [14]. *Socio-cultural decision-making* processes regard the role of culture in forming, maintaining or changing people's relationships with nature, e.g., related to issues like identity, reciprocity, respect for nature [15]. We note that while any type of decision-making is a process, it is more difficult in this latter category to define exact moments in which decisions are made.



Regarding *actors*, we identify three general types emphasising their main roles in society. *Political actors* hold the authority to define rules for political decision-making as well as for economic activities (e.g., parliaments or community leaders allocating property and use rights or establishing regulations). *Economic actors* comprise producers holding rights to natural assets used for production, consumers of the goods and services derived from nature as well as financial actors. The third type includes *civil society*, i.e., the citizens in general, membership-based organisations and social movements organised around goals serving community interests about nature (e.g., for nature protection, recreation, research). Clearly, these are broad categories, and subcategories could be identified in different contexts.

Types of decision-making and types of actors can be combined to identify different kinds of *decision spaces* about nature (Table 1). For instance, while the space for economic actors regards decisions about use of and investment in natural assets, they can also influence political decisions given their control over strategic natural assets and through lobbying for rules favourable to vested interests and values [16]. Political actors are public representatives with specific mandates to make political decisions. They make, however, also economic decisions when e.g., allocating budgets for infrastructure developments. Public authorities may also operate as economic actors when running publicly owned companies. The key decision space for civil society is the forming of socially shared values and identities. It also plays an important

role in political decision-making through mobilising people for specific causes and establishing legitimacy to the political process underpinning decision-making about nature.

Table 1. Decision-making typology (DMT)

The decision-making typology is based on two dimensions: a) types of decisions (political, economic, and socio-cultural); b) types of actors or decision-makers (political, economic and civil society). Definitions of the three types of decisions and the three types of actors are provided as well as examples for each combination. Green cells offer examples of key decisions for each actor type. Given overlaps between types of decisions and role of actors, fuzziness between the various categories exists.

 Actors  Decisions	Political actors Hold the authority to define rules for economic activity as well as the rules for policymaking processes themselves.	Economic actors Comprise producers and consumers – i.e., actors who hold rights to different assets, including natural assets used for production, financial actors and people as consumers of these goods and services derived from nature.	Civil society actors Citizens in general, membership-based organizations and social movements organized around values that serve the interests about nature of a given collective.
Political decisions Defining and protecting rights with respect to access to and control over natural assets and associated values Mandate/allocate obligations, rights	Government (national to local) and traditional authorities' regulations – e.g., allocation of rights including ownership to land, design (dis-)incentives (pollution limits, green taxes), establishing protected areas.	Private rulemaking (e.g., product standards). Influence through formalized structures between political and economic actors; lobbying; threats with respect to moving production abroad.	Protest, demonstration, lawsuits against regulations perceived as unjust or unsustainable. Election support for specific legislations aligned with the values attributed to nature.
Economic decisions Covers production and consumption decisions over goods and services including investments and disinvestments in natural assets.	Decisions on public spending (e.g., infrastructure development, producing goods and services from nature for public service).	Decisions on investments, production and consumption (e.g., where to source natural resources, what to produce) by public or private firms, financial actors, collective associations or individuals.	Campaigns against/boycotts of firms or products misaligned with civil society values attributed to nature.
Socio-cultural decisions Regard the cultural dimension in the sense of forming, maintaining or changing people's identity and human-nature relationships.	Governments and/or traditional authorities setting rights-based approaches for the stewardship of territories and protect local people's identity and/or defence of territory (e.g., infrastructure development in the context of living in harmony with nature).	Decisions by firms, associations, and consumers oriented around supporting ways of life aligned with values attributed to nature (e.g., community supported agriculture, purchasing agreements with co-ops).	Communities (e.g., Indigenous peoples, religious groups and others) and social movements acting for the defence of human or territorial rights, or to protect relevant resources associated with their use or relationships with nature, including, for instance, spiritual connections.

There are many examples where the border between e.g., being a political and an economic actor are transgressed to economically favour political actors themselves [17]. Such transgression denotes corruption, which shows that societies observe the distinctiveness of the above categories and that mixing them raises issues with respect to (lack of) normative legitimacy of roles [18].

While the ‘functions’ of actors as defined by the DMT are found in all societies, the roles they play may not always be easily distinguishable. For instance, among Indigenous peoples and traditional communities, roles may be less distinct, but the logic underlying each type of decision remains. While the basic logic of policy-making is to serve the public interest [19], economic decision-making by private firms is typically assumed to favour their own private interests. Of course, there is variation across private economic decision-making units from e.g., individual firms to local communities, where the latter typically also include considerations about how to best maintain social relations [20]. Regarding civil society, there are moreover strong elements of ‘public’ interest in the sense of expressing common interests for specific issues or collectives.

An important element of the DMT regards the forms of interactions between actors, influencing how values are expressed and their role in decision-making. We emphasise three interaction formats: 1) *Command*: an actor has the power to decide over other actors – e.g., the power of political actors to decide on legal measures and to institute economic instruments, the power of companies to command resource use including their employees [14]; *Trade*: exchanges of goods, services and financial assets in markets demanding a common value denominator [21,22]; and 3) *Cooperation*: actors work together towards a common goal, which demands dialogue and compromises over common issues. Cooperation is often built on reciprocal arrangements emphasising a certain level of equality and shared values [23].

The three interaction formats may be combined. For example, command may be based on prior elements of cooperation through deliberations among actors – such as dialogues between the state and civil society actors leading to an agreement that is next commanded. Moreover, conflicts may arise in all interaction formats which can lead to resistance and various forms of protests [24]. Depending on power relations and the nature of the conflicts, they may persist, be resolved, or ended by forced solutions [25].

2.2. How values influence decision-making

The second element of the framework focuses on factors affecting the way values influence decision-making processes (Figure 1). Decision-making as depicted above is at the centre of the figure. It is foregrounded by a layer of institutions (i.e., conventions, norms, and legal rules) and organisations. Institutions define the spaces for decision-making. They encompass ex-ante decisions about the value basis of these spaces, including who should be given the right to

participate in decisions [26,13]. Defining the rules for decision-making has a strong impact on what values get to be represented in decision-making and in what form. In other words, institutions execute *structural power* [27,28,11]. For example, trading nature’s values through markets requires value expressions in the form of prices (i.e., a monetary measure of nature’s worth) and favours those having more purchasing power. Alternatively, cooperative as well as command formats of interaction may be able to foster other forms of value expressions [29].

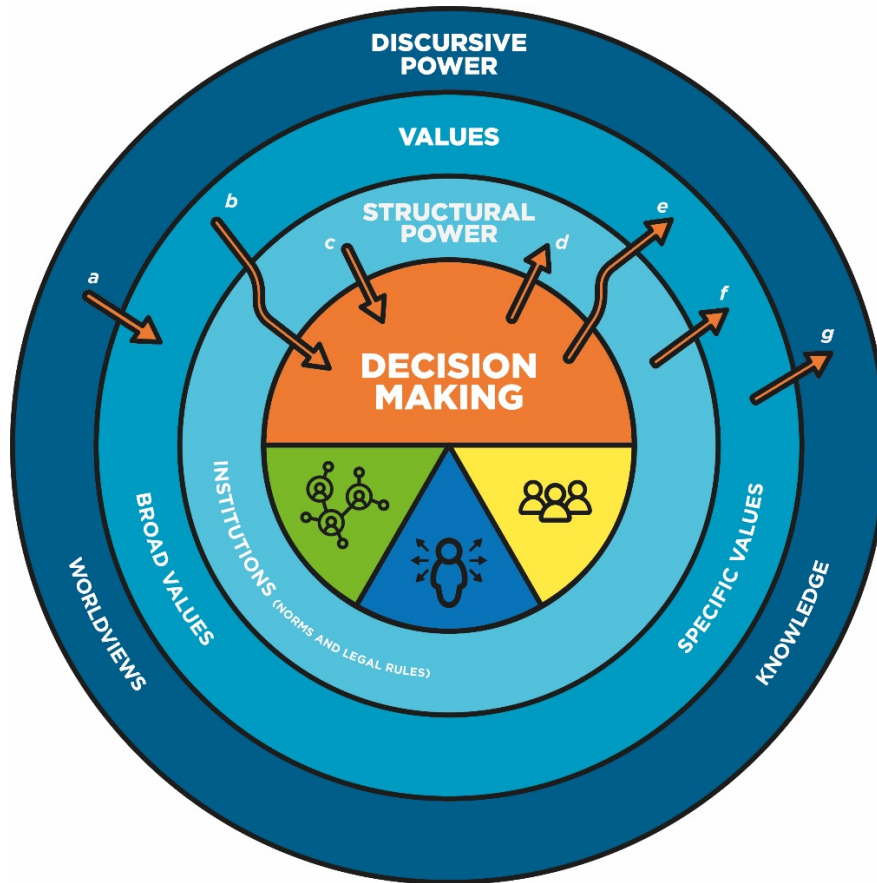






Figure 1. A generic framework to analyse the way nature’s values influence decision-making.

*Decision-making – with the type of actors , decisions  and interactions  involved – is understood as impacted by layers of influence. Discursive power in the form  producing or reinforcing worldviews and knowledge systems frame what values become important to different groups in society (arrow **a**). Values are assumed to influence decision-making as ‘filtered’ through a structural layer constituted mainly by the institutional context (norms and legal rules) (arrow **b**). This form of structural power also influences the decision-making process itself by defining how it should be undertaken – e.g., who participates and how decisions should be made (arrow **c**). There is feedback from decision-making to values and the other outer layers of influence: directly as decisions may change institutions and organisations – the structural power layer (arrow **d**). Over time, decision-making and the associated institutional change may impact the legitimisation or marginalisation of certain values (arrows **e** and **f**), which may in turn influence the acceptance or rejections of forms of knowledge and worldviews, (arrow **g**). Source: Adapted from [3,11].*

At the same time, *discursive power* – the influential capacity of discourses, narratives and knowledge production – is key in decision-making. Knowledge production is a way of exercising discursive power in terms of delimiting what is deemed true or false, and thus influencing what counts as legitimate worldviews and knowledge about nature. Socio-cultural processes play an important role in this. Discursive power is crucial for the formation and transformation of values [3,11]. It also often determines which values become hegemonic [30], for example when applying conservation instruments [31]. To illustrate, if decision-makers are attracted by the discursive power of conventional economics – that material consumption is the basis of human well-being – decisions would most likely be framed on nature’s material contributions to people and to some extent on nature’s regulating contributions insofar they are understood as important for the flow of material benefits [9,32]. Similarly, the discursive power of the mainstream conservation movement that primes an eco- or biocentric worldview favouring the idea of ‘pristine’ ecosystems, would imply emphasis on nature’s intrinsic values, ignoring many instrumental and relational values held by people living in or around those ecosystems [33,34].

Decisions also impact values and power relations (depicted in Figure 1 as feedback arrows between the layers). Decisions may directly affect institutional and organisational structures – for example, who may participate in decision-making and in what capacity. Decisions may also affect the position of certain values (i.e., strengthening or marginalising values) over time, and changes in values may in turn affect worldviews. The latter is typically gradual and may only be noticeable over longer time horizons [35].

3. Nature’s values in market economies

Using the framework to expand our understanding of the nature crisis as a values crisis, we start by analysing the evolution of nature protection in market economies in the period after WWII. We emphasise developments in value priorities, their discursive bases, and how decision-making structures – institutions, actors and interactions involved – relevant for decisions about nature’s values have evolved.

While there is considerable variation across what we broadly term market economies, we find it meaningful to describe the main narratives and policies for use and protection of nature’s values in these economies as a progression in four phases. The first phase roughly covers the period up until 1970. This period was dominated by the view that the economy could and

should be politically governed [36], reflecting experiences with the global economic crisis of the 1930s and political planning of the economy as important for resource mobilisation during the war [37]. The development of the gross domestic product (GDP) indicator to measure the size of the economy was also an important element [36]. Political decisions became geared towards the broad value of human welfare enhancement backed by the goal of sustained economic growth [38]. Important structural changes included the establishment of the Bretton Woods organisations (the World Bank and the International Monetary Fund), the General Agreement on Tariffs and Trade (GATT) and the stabilisation of exchange rates based on the US dollar, all facilitating a liberalisation of international trade [39]. Political actors at state level formulated policies based on a Keynesian discourse, using specific financial and fiscal policies to correct markets, creating a favourable environment for investments and employment. Progress was measured by GDP growth rates, capturing the expansion of market values/trade including the monetary values of nature-based commodities (e.g., traded food, fibre, fossil fuels, minerals, etc.).

This welfarist approachⁱ spurred growth in material and energy use, resulting in increased pollution and nature degradation. As these effects became visible, actions – not least by civil society actors including scientistsⁱⁱ – brought new understanding into the public discourse marking the turn to our second period lasting roughly from around 1970 until the beginning of the 1980s. In this period, the field of environmental policy was institutionalised. Political actors expanded their capacities through establishing ministries and agencies for environmental protection, using state command to create national environmental laws as well as engaging in international cooperation to create a set of international environmental agreements [40]. Natural protected areas, which had already existed for some time, expanded substantially during this era, reflecting a similar expansion in the discourse around the need to protect the intrinsic values of nature [41] (see also 5.1). The importance of curbing pollution due to its impacts on human health and the environment also became mainstream [42]. Environmental policies were still mainly additions to a system of economic decision-making based on the more powerful discourse about the benefits of market expansion and growth. So, two systems with different value bases – a dominant welfarist and a subordinate environmental and nature protectionist – came to operate in parallel. A ‘steady state’ narrative also emerged in the 1970s, criticising present policies for their long-term devastating impacts on nature’s ability to sustain human wellbeing [43]. The first international environmental ‘summit’ in 1972 – the Stockholm Conference – emphasised the role of political decision-making and governmental planning to

fight the unfolding environmental crisis. These narratives were met with substantial resistance by leading political actors and the economic growth paradigm was sustained [44].

By the early 1980s, the idea of politically led expansion of markets had faded, replaced by the discourse that ‘self-directed’ⁱⁱⁱ markets gave superior institutional conditions for allocating resources, including natural resources. This discourse was not new but gained support when the politically led system for stabilising national currencies broke down, signalling the end of the Bretton Woods era [45]. Throughout the 1980s and -90s, the neoliberal worldview was established and dominated economic and political decisions in most countries, resulting in increased liberalisation of international trade and globalising financial capital movements. Moreover, the value conflict characterising the 1970s was seemingly dissolved by the creation of a win-win discourse between economic growth and environmental concerns as epitomised in the Brundtland report introducing the concept of sustainable development [46]. This discourse was also supported by the environmental Kuznets curve narrative – embraced, among others, by the World Bank – stating that growing the economy would eventually result in reduced negative environmental impacts [47,48].

The rapid trade liberalisation – while facilitated by political decisions – implied a markedly reduced role for the state in economic decision-making and offered more power to economic actors over the exploitation of nature as a commodity. The establishment of the World Trade Organization in 1995 was an important structural representation of this. The logic of ‘market-based’ incentives was further established, via e.g., environmental taxes, tradable quotas, and payments for ecosystem services (PES), framing nature mostly in instrumental (market) value terms [42,49,13]. The power of the discourse is also illustrated by the observation that many civil society organisations turned towards market-oriented initiatives (e.g., eco-certifications), sometimes in cooperation with economic actors, in particular the business sector [50]. However, it is important to acknowledge that most of the trade-oriented initiatives ultimately hinged on state command to define the necessary institutions including property rights to natural assets, establishing *de-jure* rights about access to and control over nature [51] (see also 5.2).

In the most recent period, starting after the global financial crisis in 2008, a clearer competition between two narratives is again visible. The economic growth discourse is transformed into ideas about ‘green growth’/‘green economy’ [52,53]. While maintaining the focus on growth, there is an increased acknowledgement of the need for political actors (especially states) to engage in formulating environmental policies supporting ‘green’ technologies to combat the

climate crisis [52] and scaling up the deployment of environmental fiscal instruments and other mechanisms such as PES [54]. Over time, discourses like degrowth/post-growth and philosophies of good living (e.g., *Buen vivir*) – as defended mostly by civil society and representatives of Indigenous peoples – have brought forward an increased focus on biocultural and relational values of nature [55,56]. Currently the discourse around the green economy is firmly established in international policy fora, with an emphasis on the instrumental values of nature, while post-growth discourses tend to reflect more diverse values and highlight the inseparability of social justice issues from environmental sustainability [2].

Table 2 summarises main characteristics of the above story organised under key concepts from the framework described in Section 2.1.

Table 2. Summary of how nature values have been understood and emphasized in market economies.

	Decisions, actors and interactions	Discursive power	Values	Structural power
1945-1970	<ul style="list-style-type: none"> - Political actors as directing economic development - Markets/trade as political instrument 	<ul style="list-style-type: none"> - The economy as a governable entity - Keynesian belief system - Economic growth 	<ul style="list-style-type: none"> - Human welfare enhancement – nature’s instrumental values - Market values 	<ul style="list-style-type: none"> - Institutions/organisations to support economic growth: <ul style="list-style-type: none"> - Bretton Woods - GATT/trade liberalisation - Stabilised exchange rates - Increased state power in regulating the economy
1970-1980	<ul style="list-style-type: none"> - Increased engagement by civil society - Increased capacity for political action in the field of the environment – new decision spaces established, including international cooperation - Decreased political capacity to direct the economy 	<ul style="list-style-type: none"> - Competing discourses: <ul style="list-style-type: none"> - Dominant: Continuous growth feasible /unlimited nature - Subordinate: Nature as vulnerable and as limited 	<ul style="list-style-type: none"> - Competing values: <ul style="list-style-type: none"> - Dominant: Nature as instrument for human welfare - Subordinate: Nature’s intrinsic values; some focus on conflicts between nature’s capacity to support human welfare in the short and long term 	<ul style="list-style-type: none"> - Somewhat weakened institutions to support economic growth (ending of the Bretton Woods era) - Environmental agencies and policies to reduce effects of expanding economies as ‘add-ons’
1980-2010	<ul style="list-style-type: none"> - Increased focus on trade; economic actors/ companies gain more power - Political actors/states still important when markets ‘fail’ - Increased market orientation of environmental organisations 	<ul style="list-style-type: none"> - ‘Self-directed’ markets: the neoliberal discourse - Win-win discourse of economic growth and healthy environments 	<ul style="list-style-type: none"> - Nature’s instrumental values are prioritised - Intrinsic values of nature still emphasised by the mainstream conservation movement - Little to no emphasis on conflict between short- and long-term growth and the environment 	<ul style="list-style-type: none"> - Establishment of WTO - Accelerated market liberalisation, deregulation - Markets/PES
2010-	<ul style="list-style-type: none"> - Political actors regain increased importance – more focus on command and cooperation - A second wave of civil society engagement for the environment 	<ul style="list-style-type: none"> - Competing discourses: <ul style="list-style-type: none"> - Dominant: Green growth/green economy - Subordinate: Buen vivir; de-growth 	<ul style="list-style-type: none"> - Increased attention to value plurality, including focus on relational values of nature in addition to instrumental (still dominating) and intrinsic values 	<ul style="list-style-type: none"> - Increased role of political actors in market-like environmental policies – as motor in green transitions - Increased acknowledgement of Indigenous peoples’ rights

While some advances have been made to restore and protect the environment by the described strategies, the bigger picture is that the coupled climate and nature crisis continues largely unabated [57]. Problem ignorance and simplistic win-win narratives have over-shadowed underlying value conflicts [58]. There are important structural dimensions accompanying this. Political actors continue to mainly facilitate conditions for economic growth firmly framed by the welfarist model and materialised through models of both directed and ‘self-directed’ markets. While the focus continues to facilitate an international trade mode of interaction regarding decisions about nature, there is also support for a multilateral cooperative approach e.g., through the Convention on Biological Diversity. The latter is the weaker of the two as seen for instance, by the failure of the Aichi targets for biodiversity conservation and the Kyoto protocol as well as the current limited efficacy of the Paris Agreement on climate change. Overall, environmental policies continue to be formulated subordinately to the primary objective of economic growth – not acknowledging the fundamental value conflicts involved.

Even when well-intended, environmental and nature conservation policies face structural barriers in their design and implementation. Given the time delays between economic expansion and realised environmental degradation, the scale of problems caused by growing economies is clearly underestimated. Moreover, when action is initiated to protect the environment, interests linked to previous investments and present consumption patterns typically go against establishing environmental regulations, creating limited space for effective environmental policies [13]. Existing power structures in decision-making about nature, supported by discursive power, limit the potential for values-centred transformative changes to achieve more just and sustainable futures for both people and nature [2]. Shifting institutional and organisational structures is needed to simultaneously consider the instrumental, relational, and intrinsic values involved, instead of handling them in sequence by disjoint systems of decision-making.

4. The role of valuation in bringing nature’s values into decisions

Having outlined some overarching aspects of the nature crisis as a values crisis, we now turn to a discussion of some specific issues regarding the role of valuation in decision-making. *Valuation* is defined here as the procedure used to generate information about the values of nature and of human-nature relations to make them more visible to decision-making [7,59]. While everybody (knowingly and unknowingly) undertakes some form of *valuing* to inform

their everyday decisions, valuation – as defined here – is of particular importance for decisions with a societal purpose. Indeed, valuation of nature has been advocated since the 1960s to guide social choices. The aim has been to improve decision-making particularly related to correct decisions in market economies that do not consider negative impacts on nature well.

Valuation has often been included in economic decision-making conducted by political actors (Table 1, first column, second row). Notable examples regard guidelines for social cost-benefit analysis to evaluate impacts on nature as part of approving public infrastructure projects in many countries [60,61]. Valuation also informs political actors on the design of conservation instruments such as PES to promote participation and enhance their effectiveness [62]. Similarly, political actors rely on valuation (based on biophysical metrics, e.g., species red lists) to establish policy priorities in relation to decisions over protected areas (PAs) for biodiversity conservation. In either type of intervention, value pluralism is the exception rather than the rule [63,34] (see section 5).

Economic decisions by economic actors have also been a target for valuation of impacts on nature (Table 1, second column, second row). In this situation, valuation is typically used by political actors as a basis for adjusting market outcomes by legal regulations or modifying market prices – e.g., product bans or taxation to discourage harmful impacts on nature or subsidies to incentivise production of public goods – to make economic actors better integrate values of nature in their economic decisions [64] (Table 1, first column, first row). Information from valuation studies has also been used to define mitigation or compensation options for harmful interventions, as in the case of Environmental Impact Assessment (EIA) processes [65].

Three key goals associated with both broad and specific values have motivated nature valuation for decision-making: a) the protection of nature as a goal in itself; b) enhancing the way in which nature supports human well-being; and c) improving justice outcomes of decisions about nature [1,7]. A particular emphasis on any of the three goals reflects an irreducible level of normativity and influences what valuation methods are considered relevant. The same regards the worldviews and knowledge systems that underpin valuation in various realms of decision-making. Together this determines the role of experts, stakeholders, and citizens, the type of data including the form of value information (quantitative biophysical or monetary indicators, qualitative arguments etc.) and how this information is obtained (i.e., participants as data providers, as interest representatives, or as creators of potential solutions) [3, 66].

As an example, environmental economics typically relies on value monism (i.e., values can be represented on a common scale (money) to make diverse impacts on people commensurable).^{iv} It interprets values as preferences individuals hold which can be aggregated to form a ‘social’ value. People are for the most part seen as rational consumers of nature’s goods and services and assumed to make choices to maximise their utility. This reflects a worldview that points towards the superiority of economic valuation methods for eliciting people’s values, expressed as ‘willingness to pay (or accept)’ estimates to facilitate analysis of trade-offs in the choices among alternative policy options [67]. The social sciences, more broadly, tend to emphasise the role of social processes in forming the values people hold. They also tend to accentuate value pluralism, stressing the fact that values may be incommensurable and hence not comparable or compatible across different metrics. This has motivated the development of deliberative valuation methods including different forms of mini-publics [68]. Here, the focus is on arguments, common evaluation, including co-learning about different views and the values that are involved with the underlying assumption that it is possible to manage value pluralism and resolve value conflicts through communication [69].

The number of valuation methods is large – e.g., IPBES has assessed about 50 different methods [1,7]. The choice of what method to use is often institutionalised (structurally empowered) in the sense that specific types of assessments – e.g., cost benefit analyses or public hearing – are demanded when for example initiating or evaluating public projects. The choice of valuation method may be understood as purely technical but is actually a key normative element of the valuation process. From the above, we understand that it implies taking a stand between worldviews including the goals that valuation should seek. Hence there are both discursive and structural power dimensions related to decisions around valuation (Figure 1). It follows that valuation regards which institutions (including valuation methods themselves) and which sources of knowledge are seen as legitimate for the different decision spaces – e.g., which types of values are favoured as justification for public spending in infrastructure projects, for identifying compromises between stakeholders in conservation programmes, or for manoeuvring complex trade-offs with high levels of uncertainty [70]. Hence, valuation itself is not value free. It reflects which types of values matter for decision as well as which indicators are deemed legitimate when informing decisions. Normative perspectives about value monism versus value pluralism often come into conflict creating specific challenges for the design of policy instruments for nature conservation.

5. Values embedded in nature conservation instruments

Policy instruments are, like valuation methods, grounded in certain value perspectives. Using the decision-making framework presented above, we illustrate how traditionally policy instruments such as protected areas (PAs) and payments for ecosystem services (PES) have been mostly rooted in the assumption of value monism, but in contrasting ways: for PAs, intrinsic values, for PES, instrumental values. We also contend that such value monism has encountered resistance, especially by local community actors, and that over time new forms of PAs and PES that consider value plurality to some extent are being experimented with. Tracing the history of the two instruments, we consider i) what worldviews have strongly underpinned their reliance on value monism, ii) what key actors have typically been involved in embedding their worldviews into instrument design, iii) what types of interaction among actors are required to implement the instruments, and iv) how power dynamics result in prioritising certain formats of the instruments and their embedded values.

5.1 Protected areas

Protected areas are one of the oldest policy instruments used in modern conservation – commencing in their common form in the late 19th century and expanded worldwide, especially in the Global South based on worldviews about conservation values that originated mainly from Euro-American ideas of ‘pristine’ nature through colonial and neo-colonial cultural, institutional and political regimes (71,33). These instruments were originally conceived of by political actors, to regulate the activities of both economic and civil society actors. Early on, PAs predominantly arose as national parks, established through state command, and were typically administered by political actors. While historically many parks were created by colonial powers, international donors have also become important over time [72], but the legacy of colonial thinking and worldviews about the ideal of pristine nature continues to influence conservation [33,2,34]. While instrumental values associated with certain ecosystem services (e.g., climate regulation or ensuring the supply of water) are also being included in the goals of more recently established PAs, the dominant idea remains, i.e., to eliminate or restrict certain human uses to address (presumed) threats to biodiversity. At the same time, when clashes between intrinsic and market-driven instrumental values appear in and around PAs, intrinsic values are often underemphasised and access to resources such as timber, gold, fossil fuels, etc., are given priority, mirroring the subordination of environmental protection to economic growth. Hence, protection of ‘pristine’ areas tends to be located in economically marginal and remote areas [73] and may become vulnerable when for instance the forest

frontier and development infrastructure expand. Despite this, much of the (western) conservation movement still privileges worldviews conceiving of ‘pristine’ nature, favouring nature’s intrinsic values and considering nature to be distinct from people [33,2].

Nature’s values in PAs are typically measured by biophysical metrics based on western science, often disregarding local people’s traditional ecological knowledge. The establishment of PAs based on these premises have often resulted in (customary) land rights being removed from IPLC (Indigenous peoples and local communities), and consequently loss of livelihoods and forced displacements. This form of protection is sometimes referred to as ‘fortress conservation’ [74]. Given changes in land rights, the establishment of PAs do not only influence the livelihoods of communities within and around PAs, but also socio-cultural decision-making processes such as those based on customary law and traditional knowledge [75,76].

While such top-down approaches are still prevalent, more inclusive decision-making approaches to area conservation have emerged more recently, recognizing the interdependencies between political (e.g., governments from local to national scales), economic (e.g., the tourism industry) and civil society actors (e.g., conservation NGOs and local communities), moving from command by political actors to cooperation with civil society actors via co-management approaches [77]. Worldviews supporting a move towards such inclusive conservation approaches [78], are mixed. They may be based on respect for local communities and their identity, but also on the idea that participation is more effective than command in realising protection. This evolution has opened the opportunity to depart from value monism, bringing value pluralism into PA design. While local people may also hold intrinsic values, they depend on the PA’s natural resources for their livelihoods and socio-cultural relations in their territories are important to them. Hence, they must negotiate their instrumental, relational and intrinsic values against the intrinsic values held by external actors [34]. There are still serious challenges with some inclusive PA designs and practices – e.g., dominance of privileged (western) knowledge systems, violation of human rights, and institutional structures allowing for elite capture and corruption [79,80]. However, moving away from command-based decisions about PAs towards institution-building that relies more on cooperative interaction formats among relevant actors can help to align diverse actors around nature stewardship and broader notions of sustainability.

Table 3. Characterising PA strategies

Type of PA	Decisions, actors and interactions	Discursive power	Values	Structural power
1. Historical 'fortress conservation' approach	<ul style="list-style-type: none"> - Largely top-down political decisions - State governments and external donors involved - Interaction by command 	<ul style="list-style-type: none"> - Maintaining 'pristine nature' as dominating (colonial and post-colonial) worldview - Western science dominates in valuation of PAs 	<ul style="list-style-type: none"> - Intrinsic values of external actors dominate (value monism), based largely on western interpretations 	<ul style="list-style-type: none"> - Customary land rights typically overridden, forced relocation in many cases
2. Inclusive area protection approach	<ul style="list-style-type: none"> - Political and socio-cultural decisions - Local communities involved or leading - Interaction through cooperation with states/donors and the tourism industry 	<ul style="list-style-type: none"> - Respect for community identity and traditional knowledge - Community participation seen as necessary for effectiveness 	<ul style="list-style-type: none"> - Balancing local instrumental, relational and intrinsic values against externally defined intrinsic values (value pluralism) 	<ul style="list-style-type: none"> - Local/customary land rights are (more) respected. Local communities empowered to participate or lead - Still, power asymmetries can exist

Table 3 contrasts the two opposing PA management strategies. While we observe a spectrum of approaches within each strategy, the 'stylised' categorization illustrates some important differences that are important also for understanding how the PA formats used affect outcomes for people and nature. Indeed, a broad evidence base on PA outcomes demonstrates that the format of the PAs as decision-making structures – what discursive and structural elements are involved – are key determinants of the success of PAs in achieving conservation goals [34]. Hence, biodiversity protection is favoured by engaging with local communities and incorporating the plurality of values into PA management. In fact, taking the interests of local communities into account – i.e., positive socio-economic outcomes – are more predictive of good conservation outcomes than any physical or enforcement characteristics of PAs [81]. Evidence also shows that management effectiveness depends on institutional enablers such as community and stakeholder involvement [82] and decentralised management shows greater effectiveness compared to top-down PAs [83].

5.2. Payments for ecosystem services

The concept of PES emerged in the 1990s. It was initially viewed as a tool that could help guarantee the flow of ecosystem services by creating trade-based interactions between buyers – those demanding a given ecosystem service (e.g., water regulation) – and sellers – providers of such service through their land use decisions [49]. In this sense, the original logic of PES programs was economic – guided mostly by the broad value of efficiency [84]. This framing

of PES was aligned with the neoliberal discourse where interaction through trade was assumed as superior compared to command or cooperation for addressing environmental problems. This view was also supported by a dominant discourse originating in the 1980s and characterising nature as a form of capital that offer tradeable services and where ecosystem degradation was seen as the inevitable consequence of the lack of economic incentives to encourage rational pro-environmental behaviour [85,86]. This way, local (typically poor) communities were blamed for disinvesting in nature and degrading its instrumental values. Especially in the Global South, the implementation of PES programs that prioritized instrumental market-based values helped enforce the view in which the diversity of values held by local communities (as both economic and civil society actors) was ignored [63, 87, 94].

In practice, PES has over time been applied in ways deviating from the original idea [88]. The ideal trade-format – auctioning conservation efforts – are hardly found beyond agri-environmental programs in the US and Australia [51,89]^v. In fact, a wide variety of PES models exist – especially in the Global South – which may also involve cooperative interaction formats between different stakeholders [e.g., 90]. Water funds exemplify this. In the Andean region (Ecuador, Bolivia, Colombia, Peru) water funds typically bring together different actors (e.g., local farming and ranching communities, public agencies, NGOs, private corporations) with a plurality of values to cooperatively decide how to ensure the provision of water services through investments in conservation of natural ecosystems, such as the paramos [91].

Also, the format and meaning of ‘payments’ vary involving for instance straight quid-pro quo payments for (enhanced) delivery of ecosystem services, compensation for foregone earnings due to conservation efforts, or social recognition and reward for past/historical conservation efforts [88, 92]. There are even cases which avoid the word ‘payment’ itself [93]. Interestingly, alternative discourses to the neoliberal PES seem to have been empowered when local actors participating in some water funds in the Andes departed from using the word ‘payments’ and referred instead to ‘acuerdos recíprocos por agua’ (reciprocal water agreements) [93]. Overall, this reflects a recurring challenge for PES programs regarding finding a frame that suits local communities’ worldviews, knowledge systems and values [94]. When there are important discrepancies, PES programs risk being opposed by civil society actors, and rescoping the programs may be necessary. There is now a move towards giving more emphasis on including local actors in PES design, establishing cooperative interaction with external economic or

political actors, and recognising locally held relational values connected to livelihoods, identities and social relations [62,95].

Table 4 Contrasting PES strategies

Type of PES	Decisions, actors and interactions	Discursive power	Values	Structural power
1. The neo-liberal market approach	<ul style="list-style-type: none"> - Framed as economic decisions - Buyers and sellers of ecosystem services - Trade based interactions - State command is still important in practice 	<ul style="list-style-type: none"> - Economic efficiency, win-win solutions in terms of ecological effectiveness and poverty alleviation - Utilitarian worldview on human-nature relationships - Nature predominantly framed as capital asset - Emphasis on technical and academic knowledge systems 	<ul style="list-style-type: none"> - Emphasis on monetary instrumental values geared to optimising social welfare (based on individuals as rational utility maximisers) - Payments framed as exchange values for ecosystem service provision 	<ul style="list-style-type: none"> - Secure private land rights - Role of markets and voluntary transactions - Commodification of nature's services as a solution - Top-down (technical) design and implementation approaches
2. The community-based approach	<ul style="list-style-type: none"> - Economic and socio-cultural decisions - Economic, political and civil society actors: Communities, public agencies, NGOs, private corporations - Emphasis on cooperation but state command still important 	<ul style="list-style-type: none"> - Community participation as necessary for buy-in and effective ecological outcomes (co-management approaches) - Recognition and inclusion of local knowledge systems and worldviews about human-nature relationships - Payments framed as rewards or (individual or collective) compensations 	<ul style="list-style-type: none"> - Local communities' diversity of values recognized and captured in PES design: Relational values (e.g. equity, place attachment, social cohesion) as well as instrumental (e.g. local livelihoods) and intrinsic ones 	<ul style="list-style-type: none"> - Community-based rights, norms and rules. - Local and traditional decision-making systems - Cultural distinctions between value types - Horizontal and bottom-up design and implementation approaches

Table 4 includes a stylized description of two contrasting PES approaches which can be viewed as endpoints on a continuum, including considerable variation regarding their form of decision-making. Taking the market-logic PES type 'literally', very few PES programs qualify as conforming to this model. While PES was initiated to shift nature conservation from mainly state command to a trade-based model of interactions among economic actors, political actors – both states and local municipalities – are still dominant in PES programs. That is the case for both market-based and community-based PES approaches [51,92]. One reason is that institutional structures such as land rights are often not formally clarified, precluding economically secure trade-interactions. Therefore, political actors – e.g., states and municipalities – have had to specify land tenure rights of local economic actors. Moreover, political actors are heavily dominating as 'buyers' of ecosystem services. This is partly explained by the high

transaction costs involved in these forms of trade as compared to public authorities raising funds using command (taxing/fees) as well as by lacking interest by potential private actors (e.g., downstream water consumers in a watershed) to become buyers of ecosystem services (e.g., water services provided upstream) [51].

There is growing acknowledgement of the need to further adapt PES framings to become compatible with the worldviews, knowledges and values of nature held by local communities [62,63]. This also involves focusing on distributional, procedural and recognition-based equity issues [87,96,97] which in turn implies the need to expand the criteria for evaluating the success of PES programs. A way to broaden the value perspectives underpinning PES programs involves the application of deliberative valuation approaches [62]. A set of equity criteria like recognition (of knowledge, worldviews and values), participation (involving historically marginalised voices to co-design PES) and distribution of benefits and costs derived from PES projects need to be evaluated [87]. Decision making formats that involve cooperation to secure distributional equity as a co-benefit of PES can also be instrumental to avoid crowding out of pro-social and environmental values [96,97,98] necessary for securing nature conservation and the delivery of key ecosystem services in the longer term.

6. Conclusion

We have presented a framework to support analyses of how decision-making – with its different decision-spaces and power relations – influences which and whose nature's values are accounted for. Applying the framework to study environmental policies has brought forward several insights. The general economic policy has been found to strongly influence the space for caretaking of the values of nature. The prioritisation of the paradigm of economic growth – both discursively and structurally, through the elevation of markets as the key arena for resource allocation – has offered limited possibilities for taking account of the diversity of such values. This is partly the result of a 'growing first, correcting afterwards' strategy. This has implied that environmental policies have had to operate within rather limited spaces both institutionally and discursively. It is, however, also an effect of value monism. One policy has been to set aside certain areas of high intrinsic values for protection – as a way to distinguish between two spheres: one where market-based economic activities can continue and one where human impact is heavily restricted. Another has been to use the market as a device to protect

nature values through PES programs. In both cases a monist value perspective has underpinned the strategies.

At the same time, we observe a recent trend towards increasing emphasis on integrating diverse values into protected area and PES programs. This trend seems to be a response to demands from local communities to better reflect their interests as grounded in worldviews and decision-making procedures that do not fit the externally imposed programs. Such a shift has demanded a different discursive framing (worldviews, knowledge systems) as well as redefining who should participate in their design and implementation. This has resulted in increased focus on cooperation between local resource users and operators of the policy instruments. The ongoing emphasis on plural valuation [1] – i.e., valuation that recognizes the diversity of values about nature – seems a good travel companion to better design and implement the new generation of conservation policy instruments.

There are two ‘bigger picture’ questions that can be raised. First, one must ask to what extent environmental policies can become at all successful if they continue to be corrections to an economic system largely emphasising a set of short-term (market-based) instrumental values. Markets represent an important challenge also in another sense as PAs – often being located in more distant and marginal areas – are vulnerable to a move of the commodity frontier forward. Second, when looking at the environmental policy instruments used, we are confronted with the (implicit) issue of institutionalising rights to nature. For example, in protected areas, the global public good of biodiversity conservation can trump the territorial rights of people living and eking out a livelihood from their territories. Similarly, in PES, the ‘Provider gets principle’ may invade the ‘Polluter pays principle’. The rights issue is demanding as nature conservation implies dealing with matters of fairness – who has the right to pollute/degrade ecosystems or to be protected from such harms. Handling these ‘bigger picture’ issues are in the hands of political actors and transparent procedures are required for civil society to evaluate to what extent *discursive and structural power* influencing the decision-making processes are both effective and legitimate.

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ⁱ Welfarism is the view that the value of an outcome is wholly determined by the well-being of the individuals in a society

ⁱⁱ Engagement by individuals should also be mentioned – e.g., [99].

ⁱⁱⁱ Self-directed, is not an absolute term. Any market depends on initial distributions of property rights, which is a political decision. Moreover, in practice there are many issues where even countries which adhere to beliefs about ‘free markets’, still maintain several politically defined regulations (Bromley 2006).

^{iv} One key difference between environmental and ecological economics is that the latter promotes value plurality and recognizes normativity as being part of its transdisciplinary approach to valuation

^v While established before the PES concept was born, they have later been renamed as such.