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Current Opinion in Environmental Sustainability

Five levels of internalizing environmental externalities: decision-making based on instrumental and relational values of nature

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Some values affected by expected social and environmental impacts of decisions are considered important and are taken into account, others not. These latter, known as 'decision externalities', are of two types: unforeseen effects and foreseen impacts beyond the group decision-makers care about. One way to internalize externalities is by altering the financial consequences of impacts expected on those beyond the inner circle of decision-making (the 'in-group'). Externalities can also be internalized by setting rules (while compensating for opportunities skipped), by co-investment in environmental stewardship, or by accepting moral/ethical accountability as relational rationality, widening the 'inner circle' itself. Following up on the hypothesis that instrumental and relational modes of decision-making interface with value types and shape opportunities for internalizing environmental externalities, we reviewed five ways to internalize externalities that coexist across scales, using examples from Indonesia and the Netherlands.

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Current Opinion in Environmental Sustainability 2023, **63**:101299

This review comes from a themed issue on **Values and Decisions**

Edited by **Meine van Noordwijk, Grace Vilamor, Gert Jan Hofstede** and **Erika Speelman**

For complete overview of the section, please refer to the article collection, "Values and Decisions"

Available online 2 June 2023

Received: 5 December 2022; Revised: 16 April 2023; Accepted: 26 April 2023

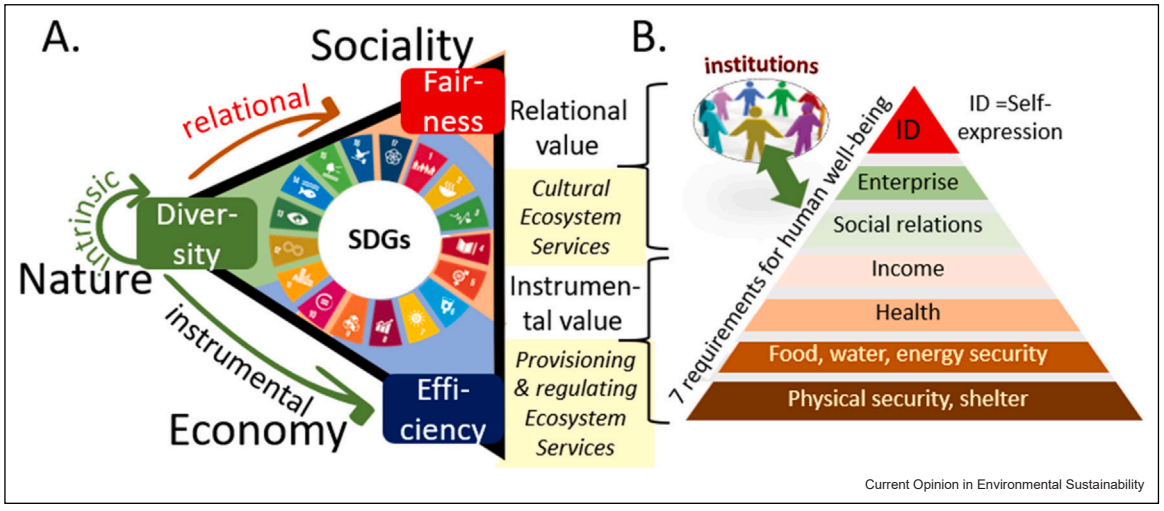
https://doi.org/10.1016/j.cosust.2023.101299

Introduction

Three types of 'specific' values of nature [1], instrumental, relational, and intrinsic (Figure 1a), are used to challenge, rationalize, and communicate decisions [2] that increase or reduce negative human impacts on other life on this planet [3], while addressing development deficits [4] weighing impacts on the triple (planet, people, and profit) bottom-line. Decisions drive issue cycles [5] in four phases: shared understanding, ambitious goals, common but differentiated responsibility for implementation (CBDR [6]), and monitoring and innovation. Since the introduction of the term 'Ecosystem Services' (ES) for 'benefits people derive', emphasizing goal-oriented 'instrumental' values, for example, linked to achieving Sustainable Development Goals (SDGs) through nature-based solutions, has been supposed to have universal appeal by emphasizing nature's contributions to people (NCP). Benefits to those in the inner circle counted most. Pronouns for 'we' can be inclusive or exclusive of the audience, for example, in the Indonesian language. The word 'internal' (and derivatives) is used in social (ingroup), educational (intrinsic motivation), psychological (inner drive, self-determination), economic (externalities), and environmental (internalization) discourses on human decision-making, with related meanings.

Two types of external effects of decisions play no role in the decision process: those that are unknown (i.e. the decision-maker is not aware of potential impacts of a decision, possibly not wanting to know as an 'Ostrich' strategy), and those about which the decision-maker simply does not care. For the first category of externalities, efforts to increase awareness and understanding can help to better inform decision-makers of likely impacts and values potentially affected [7]. For the second, decision-makers will need to change their mind on who and what they care about [7]. Internalization, as a fundamental way to reduce externalities, literally means 'bringing into the inner spheres of decision-making'. It can be based on any combination of the three basic ingredients of policy instruments: incentives, rules, and motivation [8]. The term 'internalization' in policy discourse has become mostly associated with 'economic instruments' that change financial incentives (fines and/or rewards), focussed on nudging the economic

Figure 1



Linking two critical triangles. **(a)** Intrinsic, relational, and instrumental values of nature and triple bottom-line of accountability as segments of the overall UN agenda 2030 ('SDGs') reflect ecological, social, and economic infrastructure, **(b)** Maslow-based pyramid of determinants of human well-being.
(Modified from [15] and [9], respectively).

(instrumental) rationality of individual decision- makers to reduce negative environmental impacts.

Social and environmental externalities of economy-based decisions represent two undervalued parts of the triple bottom-line. Without social inclusion, where those supposed to internalize feel internalized themselves, environmental policies will likely fail. Ubalijoro recently concluded "None of us will be safe until all of us are safe, including Mother Nature. … Right now, we have great accounting systems to look at profit and loss. We need accounting systems that internalize environmental and climate externalities while empowering all stakeholders, rather than just shareholders" [9].

Beyond a translation of the externalized consequences into financial incentives, other forms of internalization can maintain the plural, instrumental plus relational, character of human decision-making, a topic behavioral economists have gradually come to grips with [10]. In this contribution, we will develop an operational typology of 'internalization' that includes, but goes beyond the economic use of the term and apply it to case studies of internalization of externalities across scales.

The multiple meanings of 'internal'

Anthropocentric value expressions, such as ES or NCP benefitting people as an aggregated entity, are supposedly more effective in shaping coalitions than the moral, ethical, religious, and world-view underpinnings that may be powerful within rather than between groups of people that differ in background, upbringing, and perceived identity. Many 'nature-based solutions' provide feasible ways to address trade-offs between SDGs concerned with food (SDG2), human health (SDG3), water (SDG6), energy (SDG7), jobs (SDG8), liveable cities (SDG11) or climate change (SDG13), life in water (SDG14), and life on land (SDG15). Most of these refer to the lower layers of so-called Maslow pyramids ([11]; Figure 1b). However, in the educational Self-Determination Theory (SDT), reference to benefits that can be achieved is considered to be a form of 'external' (or extrinsic) motivation, while self-expression, the top of the Maslow pyramid, is 'intrinsic'. According to the SDT, motivations to participate in a given activity, such as in a Payments for Ecosystem Services (PES) program or acting as a consumer of organic foods [12], can be broadly classified as 'intrinsic' (doing something because it is inherently interesting or enjoyable, regardless of other benefits generated) and 'extrinsic' [13]. Extrinsic reasons can involve avoiding punishments or fines, or positive incentives, such as cash, in-kind rewards, or expectations of future benefits, where goals have aligned. Intrinsic and extrinsic types of motivation for 'learning' have been widely studied in relation to developmental and educational practices [14], where 'intrinsic' is seen as highly desirable where it is self-perpetuating [15]. Current SDT distinguishes four types of extrinsic motivation [16]:

- Extrinsic motivation based on goal-driven reasons,
- Introjected (subconsciously assimilated) regulation: the need to demonstrate self-worth, avoid guilt or shame, and obtain social approval,
- Integrated regulation: synchronization and synthesis of various identifications into a unified sense of self,

- External regulation: external pressure to exhibit a particular behavior through avoidable punishment or achievable rewards.

Although it is considered to be a form of extrinsic motivation, the practical reliance on goal-driven, instrumental values for the way people interact with nature, is closer to internal motivation than the use of punishments. The 'internal/intrinsic–external/extrinsic' terms are not dichotomous, but instead express a gradient. Internalization indicates a direction of change, rather than necessarily reaching the endpoint of the scale. Intrinsic values of nature, at the left triangle point of Figure 1a, attribute rights to nonhuman forms of life to exist and persist independent of human benefits. There appear to be logical contradictions if human voices claim to represent intrinsic values of nature itself — rather than their human respect for nature, as a form of 'relational' value [17], expressing the purity/sanctity axis of morality [18]. Yet, intrinsic values were accepted in [1] as a third value category, 'ecocentric' rather than 'anthropocentric', based on existing conventions.

Relational values reflect the various ways nature is part of social relations, human identity, and well-being, as the upper part of their Maslow pyramids (Figure 1b), where past analysis of cultural ES has not been conclusive [19]. Relational values of nature can be expressed with human metaphors of past (ancestors), current, and future generations [20]. For example, referring, as is common in Sumatra, to tigers as 'paman' (uncle) or 'nenek' (grandparent) in the forest whose name cannot be mentioned as it would invoke their anger, conveys a mixture of emotions, relationships, and norms of behavior. Issues of agricultural sustainability can be analyzed through the multiple human relations involved with (angry?) neighbors, (over-acting?) regulators, and (disappointed?) customers [21]. Instrumental values affected at 'symptom' level, may well have relational values underlying drivers and pressures of change [22]. The balance between instrumental and relational values can shift over time, as recently discussed as a four-step process for forests in Asia and Europe: I. Nature is powerful (relational values may dominate), II. Taming of nature (instrumental values getting the upper hand), III. Rational management of nature (focused on instrumental values), and IV. Spiritually reconnecting with nature and its relational values [23••].

Decisions link the future to the past, through expectations of social and environmental impacts and through various values weighing these impacts. As discussed elsewhere in this special issue [24], two aspects of decision-making, associated with different parts of the human brain, can be described as two types of 'rationality'. Instrumental rationality weighs risks in the expected costs and benefits from decisions, often based on explicit goals, with (typically) discounted representation of the future or of distant effects of those decisions. Relational rationality, on the other hand, accounts for the longer-term relations with 'reference groups', where status and power matter [25]. The prominent role of 'social influencers', shaping aspirations and desirable status, attests in current society to the power of reference groups, hardly constrained by the credibility of the information conveyed. Decision-makers mostly care about expected impacts on their reference group (known as 'in-group' in social and social psychology literature [26]), with a composition that depends on cultural context [27]. Nature can be part of the ingroup, or not [28], depending on the social actors that give it a voice [15] at the interface of instrumental rationality and relational sociality.

Proposed typology of internalization

Expanding from SDT, a proposed typology consists of three levels of external motivation for pro-environment behavior:

-2 Punish: It is forbidden to harm nature and I get severely punished if I do it.

-1 Fine: It is forbidden to harm nature and I get fined if I do it.

0 Tolerate: It is forbidden to harm nature but it seems I get away with doing it.

and five levels of internalization (I1–I5), with the first three derived from [29,30], described with a policy label and indicative interpretation by decision-makers/actors:

1. Compensate: New rules forbid to further harm nature, but I get compensated for the opportunities lost,
2. Traded - commoditized ES (CES): Markets pay if I meet negotiated contracts to enhance ES,
3. Co-invest in stewardship (CIS): I find partners to co-invest in transitioning to reduced-impact land-use options,
4. Re-imagine: I feel peer pressure to regulate my ecological footprint and reduce my impact on nature,
5. Re-invent (Phoenix): Not harming nature is part of our identity, moral responsibility, and the persons we want to be.

Levels I1, I2, and I3 relate to different operational paradigms within the broad family of Payments for Ecosystem Services (PES) [31]. Making environmental regulation socially acceptable and politically palatable, compensating for losses incurred relative to existing privileges to pollute or overuse of resources operates at level I1. Financial incentives for voluntary decisions to

adopt other land-use practices (or not), through commodified ES, pollution charges, and/or tradable rights to pollute, operate at level I2 and expand market trade to previously nonmarketed spheres [32]. A specific form, not commoditizing ES as such, but linking ES criteria to existing commodities, is known as ecocertification (see below). Co-investment in stewardship, expressing shared public–private responsibility and risk management, while appreciating instrumental self-interest, can only be privately achieved after investment hurdles have been taken [33,34], operates at level I3. As analyzed recently, the apparent success of a policy instrument such as PES in Costa Rica can be due to 'optimal ambiguity' that allows interpretation and rationalization to differ between high-level policy discourse (CES, a market-based instrument) and its interpretation on the ground (CIS, public co-investment in stewardship) [35•,36] implemented as a policy-mix [37]. Similarly, the observed shift in interpretation that PES concepts were interpreted as 'lost in translation' [38], may in fact indicate optimal fuzziness, 'gained in translation'.

Level I4, such as introjected (subconsciously assimilated) regulation in SDT, creates a social norm with associated peer pressure. Re-imagining a better and fairer world can draw on the footprint perspective where footprints calculated at the scale of a production unit, a unit product, or a consumer portfolio, for example, for carbon [39] and water [40], assist in self-regulation of impacts linked to 'duty of 'due diligence' concepts. Where it leads to self-articulated identity and appreciation for relational plus instrumental values involved, it can evolve into I5.

Finally, in 're-invent' (I5), externalities can be avoided by taking a universal ingroup into account, including (parts of) nature in the sense of identity, broadening emotional links toward all biodiversity and 'intrinsic' values of nature. While at the lower levels of internalization, an external agent can still see itself as an active agent 'leveraging' (in the Archimedes sense of an agent outside the system, lifting the earth on an unspecified turning point [1]) the necessary transformation of human interactions with climate and biodiversity, a 'Phoenix' image of self-initiated reinvention is the logical endpoint of internalization [41••].

Within the PES literature, the concept of 'motivational crowding', that is, change in inherent motivation by the introduction of PES, is receiving increased attention [2,31,42]. It remains a challenge to predict where PES (especially an I2 portrayal of rationales) may erode the social institutions, cultural values, and motivations that sustain a nonutilitarian view of biodiversity ('crowding out'), or be a positive opportunity for real motivational internalization ('crowding in'). Where the crowding phenomenon appears in behavioral economic experiments, it may depend on details of how programs are communicated, rather than how they are designed [43,44,45], as, for instance, in 'result-based' agri-environment programs [46,47,48]. Evidence is also emerging that positive and negative crowding effects may reflect on the match between the cultural context of target groups and the framing of the ES with emphasis on instrumental or relational aspects of nature [49•].

Multiple levels of internalization of human impacts on nature can interact, as happens in commodity value chains from nature via primary producers to consumers. Where consumers (at levels I3–5) become aware of and responsible for their footprints, they expect that the effects on nature of the primary production at the start of the value chain (arrow I in Figure 2) are reflected in choices they can make for the products or services they buy or acquire (arrow III). Further impacts along the transport, processing, retail, and waste management parts of the chain (arrow II) will also need to be reflected. Existing examples of eco- and sustainability certification operate at different levels of internalization (Figure 2), as discussed in [50,51].

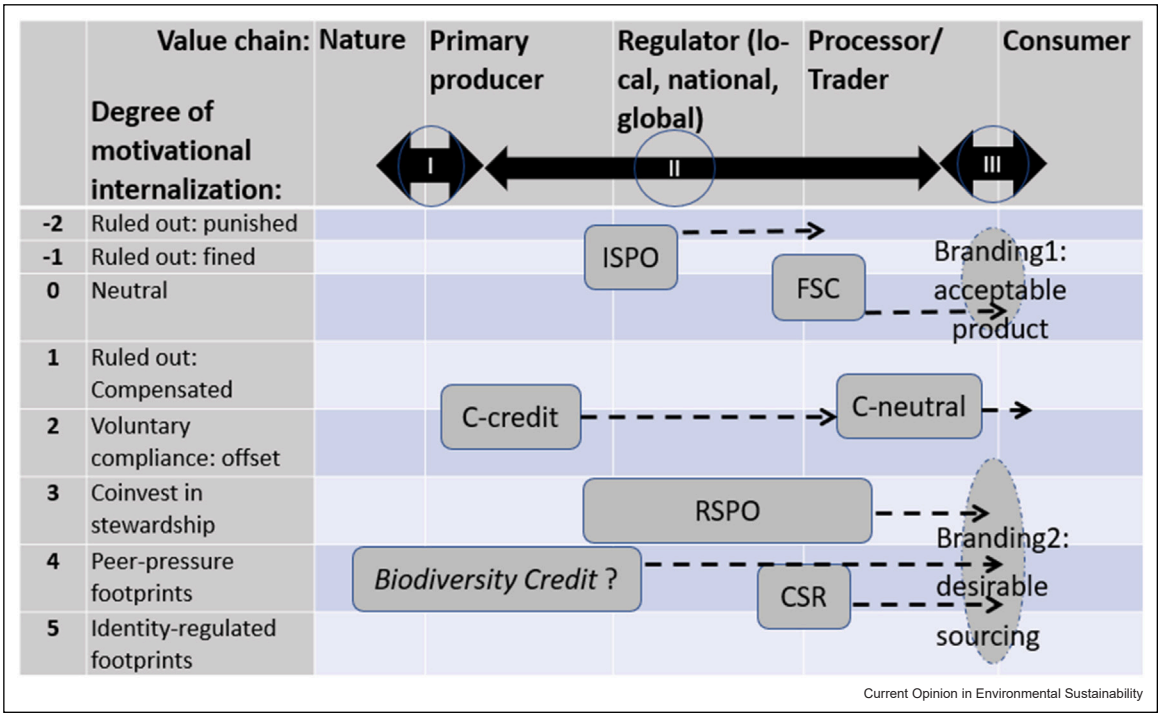
Application in three case studies

Table 1 summarizes internalization in three case studies, selected from wider sets in [2] and [33], that all started with policies aimed at solving recognized environmental problems, but ignoring local perspectives. In all cases, social inclusion interacted with internalization of environmental externalities.

Sumberjaya

Indonesia's 'protection forests' are expected to protect downstream areas from floods and landslides and secure regular river flows. In the uplands of Sumatra, current national policies still largely discount the complexity of local values and continue to treat local people as instruments for their development designs rather than as the most important reference groups [52]. Part of Sumatra's protection forest became converted to coffee gardens, by government-sponsored and spontaneous migration from densely populated Java. Environmental protection, however, had clear social externalities as forest authorities evicted farmers, uprooted coffee plants, and planted fast-growing exotic trees to reclaim the forest, probably making it worse, hydrologically [53]. The 'negotiation support' approach setup by a local consortium [54,55], started from (Sumberjaya_1) options to internalize both social and environmental externalities [56] by combining social forestry rights (I1). The conflicts between local people, forest authorities, the hydropower company, and local government were transformed with 'conditional tenure' as compensation for increased tree densities [57]. In a second stage (Sumberjaya_2), result-based river-care contracts (I2)

Figure 2



Actors along a schematic value chain from nature via primary producers to consumers, the degree of internalization of pro-environmental behavior, and examples of sustainability certification: I = interaction between nature and primary producers, II = translation along value chain, III = product certification; Branding1 = products meeting legal requirements at the jurisdictional level, Branding2 = targeting a desirable identity; ISPO = Indonesian sustainable palm oil, RSPO = roundtable on sustainable palm oil, FSC = forest stewardship council, CSR = corporate social responsibility.

and co-investment approaches (I3) demonstrated that coffee production can be reconciled with the sought-after (instrumental) watershed functions, reducing the sediment load of the river [58,59,60]. In the Sumberjaya_3 follow-up, support for the marketing of environment-friendly coffee [61] was targeting an I3 level of internalization in the landscape connecting with consumers at I4 level.

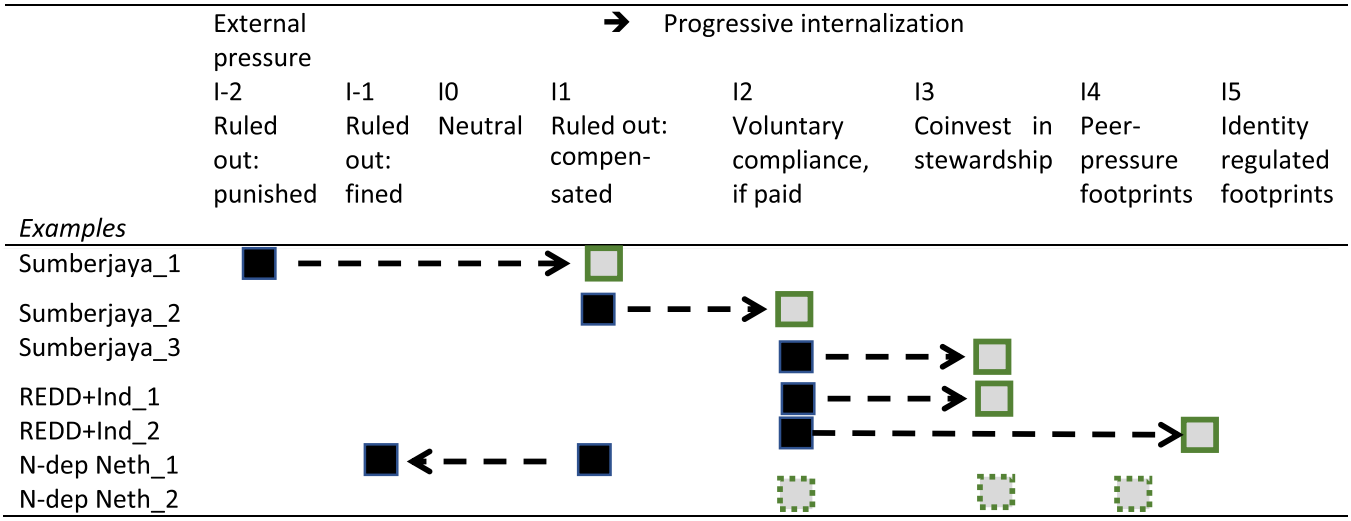
Reduce Emissions from Deforestation and (Forest) Degradation_Indonesia

From its introduction as part of the global climate change policy instruments in the Bali action plan of 2007, the modalities to Reduce Emissions from Deforestation and (Forest) Degradation (REDD+), approach have been part of a contest between the various PES perspectives as ways to internalize environmental externalities (I1–I3) and as a way to create deeper forms of internalization (I4). REDD+ was initially designed as 'compensation' for the costs of opportunities foregone by not deforesting (I1); it has since been also geared toward a 'commodification' approach (I2) by means of carbon markets [62]. Meanwhile, in reality, many of the landscape-level efforts in Indonesia had, de facto, adopted a co-investment approach [I3], partly because the *status quo* rights to emissions and CBDR of emission reduction were unclear.

From the national regulator perspective, governments in the Global South were afraid to lose control over potential income streams (portrayed as 'sovereignty') when C market expectations were raised. In Indonesia, progress was made at I4 level through Nationally Appropriate Mitigation Actions (NAMA, also agreed internationally in 2007) when the president declared the country's commitment to self-regulate its atmospheric footprint, while accepting international co-investment (I3) on top of that (REDD+Ind_1). This choice may have been helped by the realization that the economic value of exports such as palm oil was at risk, and at 20 billion USD/year far exceeded REDD+ pledges [63]. The historical path toward the initial Indonesia–Norway agreement and the compromises it contained [64] have been discussed as 'the art of not governing' [65] or the interface of co-operation or co-optation [66]. In comparison with other countries, Indonesia remained a leader in 'internalization', at least at the level of government commitments [67•], as it supported a recentralization of power in forest governance. Fundamental critiques on the market-based solution paradigms of REDD+ [68] continued, while in the articulation of Nationally Determined Commitments (successor to NAMA), the need for

Table 1

Examples explained in the text of internalization of pro-environmental choices; black squares indicate the starting points, arrows a direction of change, and gray squares the (temporary) endpoints.



an Indonesian type of 'internalization' became globally accepted as part of CBDR. Yet, confusion about REDD+ paradigms persisted [69,70]. When the Indonesian government, in 2021, withdrew from the agreement with Norway, it quoted disagreement over disbursement schedules and unilateral changes in project requirements and expressed a stronger sense of 'sovereignty' (https://news.mongabay.com/2022/09/indonesia-and-norway-give-redd-deal-another-go-after-earlier-breakup/). In 2022, a new agreement was signed (https://www.regjeringen.no/contentassets/3ea80a42af994fe9bbf45a10ec3dfde2/eng-mou-norway-indonesia.pdf) that articulated a stronger sense of an equal partnership and expressed appreciation for the progress Indonesia already made (https://kemlu.go.id/oslo/en/news/21256/indonesia-and-norway-signed-a-new-partnership-to-reduce-greenhouse-gas-emissions-from-forestry-and-other-land-use) (REDD+Ind_2), while community-level concerns remain (https://www.greenpeace.org/southeastasia/press/55535/transparency-indigenous-rights-need-inking-in-to-indonesia-norway-forests-agreement/). Overall, the REDD+ learning curve implied a progression from I1 to I2 logic toward multiple levels of internalization.

N-deposition in the Netherlands

A court decision in 2019 [71] obliged all government agencies to stop any activity (including building permits) that can increase atmospheric nitrogen deposition in natural habitats. Plans to tackle agriculture as the primary source of atmospheric nitrogen deposition led to widespread farmer protests and backtracking of provincial governments tasked with the implementation of emission reductions [72]. As reviewed in [2], the issue started in the 1970s when evidence for atmospheric nitrogen deposition as a driver of eutrophication of oligotrophic habitats and biodiversity loss started to accumulate, ultimately leading to European Policy agreements with legal status. Five-yearly monitoring studies since 1996 and various recent reports quantify the substantial support among the Dutch population for small-scale diverse rural landscapes, concern for disappearance of flowers, birds, and insect diversity, and the broad support for finance (public and through product sales) for farmers who maintain attractive landscapes [73–75]. In 2022, new waves of farmer protest erupted, with vocal farmers feeling themselves to be an externality of societal decision- making by urban-based politicians (I1) (https://issuu.com/wageningenur/docs/ww2022_02_en/10). The government acknowledged that the communication around the plans had been mishandled and promised to be more inclusive, appreciating that more consistent long-term perspectives are needed for farmers to be able to respond to the environmental targets of society as a whole (https://www.resource-online.nl/index.php/2022/10/05/wur-and-the-remkes-report/?lang=en). No stewardship without recognition, became a slogan. In the public discussion, all five 'levels of internalization' are tumbling over each other, with the threats of 'buy-outs' as the lowest level ('compensation' I1) and local farmer initiatives to self-regulate and relate to customers in what so far are niche markets as the highest level (I4). In 2023, the issue dominated the elections for provincial parliaments and gave a prominent future role to a new party that promised farmers a stronger voice.

From externally driven internalization toward self-transformative processes

The three cases discussed show that internalization involves all four phases of issue cycles [5]: shared understanding, ambitious goals, CBDR in implementation,

and monitoring and innovation. Financial compensation and investments based on instrumental values are a relevant part of reducing environmental externalities of land-use patterns, but only if social inclusion comes first when goals are agreed and CBDR is operationalized. Internalization based on financial instruments can only target the middle level of the Maslow pyramid (Figure 1). It can be progressive if the underlying securities are still insufficiently addressed, but if financial incentives do not support the social fabric, opportunities for enterprise, and identity (pride), their effects may be short-lived. Multiple levels of internalization can synergize, by linking prophets, profits, and prove-its [76]. Polycentric governance in a forestry context, combining political will, legal framework, support from higher-level governance, and capacity building [77•]. Further research of the relationships, transitions, and synergy between the five levels (I1…I5) is needed, as Phoenix metaphors of a truly self-transformative process (I5) are the ultimate target of internalization [41••], with a prominent role for relational and intrinsic values.

Editorial disclosure statement

Given his/her role as guest editor, Meine van Noordwijk had no involvement in the peer review of the article and has no access to information regarding its peer review. Full responsibility for the editorial process of this article was delegated to Gert Jan Hofstede.

Data Availability

No data were used for the research described in the article.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

Part of the ideas presented here developed during discussions for the IPBES Values Assessment. We thank colleagues, including David Barton and Thomas Hahn for being sparring partners, and anonymous reviewers for helpful suggestions. UP acknowledges funding by Maria de Maeztu excellence accreditation 2023–2026 (Ref. CEX2021-001201-M), funded by MCIN/AEI/10.13039/501100011033.

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- • of special interest
- •• of outstanding interest

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