Capturing IPBES Diverse Values of Nature for EIA by Surfacing Community Values: A Demonstration in Nigeria

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Abstract

An identified gap in existing Environmental Impact Assessments (EIA) processes is neglect of human-nature interconnectedness: a lack of accommodation of less-tangible, cultural values of nature. This contributes to poor mitigation outcomes and local discontent. Recently, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) established the crucial importance of consideration of diverse human-nature values, and specifically intrinsic and relational values. This study explores the potential of a novel approach to capture such diverse values for input into the EIA Scoping Stage. It starts with surfacing community values holistically - including the less-tangible ones. We operationalize with a three-step process: (1) surfacing community shared values using a values crystallization method *WeValue InSitu*; (2) identifying values Statements explicitly relating to human–nature relations; and (3) classifying those into instrumental, intrinsic, and relational IPBES categories. Field data collected with 17 local groups in Nigeria showed that all three IPBES value categories and hybrid forms were captured, suggesting both the usefulness of the approach and a need to revise current valuation methods which assume instrumental values are dominant and sufficient for consideration. Retrospective analysis of previously published *WeValue InSitu* data from four other countries also identified relational values, suggesting generalizability. This proof-of-concept study took place outside of any EIA project, with research design for a subsequent study having this approach embedded in a formal EIA, and the impact of including diverse and thus relational values being tracked through all EIA stages and the resulting mitigation measures, with careful consideration of operationalizability.

Keywords: diverse values of nature; relational values; IPBES; EIA; public participation; shared values

1. Introduction

In order to maintain a balance between unrestrained human development and the protection of nature and culture, many countries rely on environmental management

and appraisal tools. A widely used mechanism is the Environmental Impact Assessment (EIA) (Grubert,2018), which involves pre-assessing the environmental consequences of proposed developmental activities, identifying mitigation measures, and establishing monitoring protocols for anticipated outcomes (Esteves et al., 2012; Glasson & Thrive, 2019; João et al., 2011; Morgan, 2012). Prediction and proposed management of impacts are thus core to the EIA process (Marshall et al., 2005), and sound mitigation strategies and management activities are considered key indicators of EIA effectiveness (Momtaz & Kabir, 2013).

Recent research highlights that EIA outcomes can be significantly improved by recognizing and incorporating the diverse ways in which people associate with nature (Grubert, 2019). In practice, this is often reflected in the design of Environmental Management Plans (EMPs). However, what counts as 'values' remains underexamined in EIA contexts. Understanding values means recognizing the many ways in which people interact with nature within their wider cultural and social settings. Chan et al. (2016) proposed a framework categorizing the diverse values of nature, which has since been adopted by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (IPBES, 2022). This distinguishes three key categories: instrumental values, which are anthropocentric and represent the benefits people derive from nature (e.g., ecosystem services); intrinsic values, which affirm the inherent worth of nature independent of human use; and relational values, which reflect the multidirectional ways in which people connect with nature and with one another through nature (IPBES, 2022). These categories, collectively known as IPBES diverse values of nature, are intended to offer a holistic view of human–nature relationships.

In the context of EIA, instrumental values can be understood as the market based economic worth of an ecosystem service, estimated by determining the cost of replacement of that service (Grubert, 2018; Mancini et al., 2018). Intrinsic values are often reflected in protectionism like those under the 'Endangered Species Act' which support conserving a species based on the belief that species have inherent worth regardless of whether they offer any benefits to humans (Grubert, 2018; Batavia & Nelson, 2017). However, the third category of relational values are often overlooked, irrespective of the inherently relational nature of EIAs (Tschakert et al., 2017). This is because things valued in a relational manner cannot be easily substituted for, in the way that instrumentally valued things are, thus nees a different approach to evaluating trade-offs (Tschakert et al., 2017; Klain et al., 2017). The implications of ignoring relational values are tangible. An example is in a scenario where a road modification project influences local species richness, directly impacting local freshwater resources. However, a less tangible but equally significant impact may also occur: if a local festival associated with, say butterfly en masse hatching, was discontinued due to lost butterfly populations, then a social event which connected people to nature and to each other, would also be affected. Such a cultural loss is rarely captured in current EIA practices, because the relational value of human-nature connectedness (the

people's connection to the butterflies and thus nature) is outside current scope. This perspective might help explain why measures like habitat compensation are often viewed as inadequate (Grubert, 2018). Studies (in the context of climate change research) show that harm caused by climate change-related losses can arise from its impact on significant human connections such as a sense of place, personal and cultural identity, local knowledge, and community bonds (Tschakert et al., 2017). This highlights the fact that ecological losses can be deeply emotional and felt, rather than physical or tangible and easily measured (Grubert, 2018).

There has been a longstanding call for research to explore ways of accounting for and integrating the more complex and diverse factors that connect ecosystems and human societies, in order to better understand and mitigate the impacts of development projects through EIA (Carpenter et al., 2009). This necessitates the incorporation of diverse values into EIA. However, EIA processes have evolved from economic approaches (focusing primarily on monetization and market-based instrumental values (Lele, 2023; Grubert, 2018; Banhalmi-Zakar et al., 2018)), which intrinsically disregard the diversity of ways in which people interact with nature within broader social and cultural contexts. Concurrently, in related fields such as biodiversity and ecosystem services, similar concerns have been the subject of intensive deliberation by intergovernmental bodies in recent years. These discussions have culminated in the IPBES report, which strongly emphasizes the need to consider diverse human–nature values in valuation protocols. In both the EIA and IPBES domains, a major challenge has been that the neglected categories of values are typically less tangible, and thus more difficult to be captured, crystallized, and measured. Previous efforts have been made to expand the range of value categories captured in EIA processes both conceptually and methodologically, which we review in the following section, but the less-tangible values are still elusive.

In response to this long-standing challenge, we demonstrate in this work a new approach that starts from surfacing shared values of local community. Rather than beginning with environmental categories or expert-led classifications, this approach first facilitates the surfacing of local tacit, embodied, and culturally grounded values that are meaningful to participants in their everyday lives. For this, we adopt the *WeValue InSitu* method (Brigstocke et al., 2017; Harder & Burford, 2019), which has been shown to enable crystallization of such values through structured, experiential, and participatory process. This method generates an envelope of human-centric shared values including interpersonal, ethical, and place-based concerns, from which we then identify those that relate to nature. Those nature-related values are subsequently identified and classified, using a framework we developed for this work based on IPBES's definitional distinctions of instrumental, intrinsic, and relational values (IPBES, 2022). This three-step process constitutes the methodological contribution of our study and responds directly to the need for capturing less-tangible but socially meaningful dimensions of human-nature relationships, for incorporating them in EIA processes.

Because this approach begins with understanding the community on its own terms - rather than being embedded within the procedural structure of an EIA - it does not require data from a formal EIA project: any context in which community values are meaningfully expressed can serve to validate the relevance and applicability of this method. Here, we demonstrate proof-of-concept using real-world community data collected outside any actual EIA process, but explain how it could be integrated.

The objective of this study is thus specifically to explore whether a community-based values surfacing approach can effectively capture nature-related values that align with the IPBES typology, i.e. including intrinsic and relational values which are often overlooked in conventional tools. Results are shown to be in a useful form for informing early-stage EIA scoping processes, although this study does not integrate them into an actual EIA, they could in principle be used to determine locally important impact assessments that should be included. We also indicate how new types of mitigations could in principle result from them.

2. Literature Review

2.1. Current approaches in EIA to include diverse values and challenges – Conceptual approaches

At present, formal environmental assessment tools typically overlook societal values, focusing mainly on financial or economic valuation based on Ecosystem Services (Grubert, 2018). Ecosystem services are defined as the benefits an ecosystem offers to humans (Millennium Ecosystem Assessment,2005). This has traditionally highlighted only the services that people derive from the ecosystem: the instrumental values defined as monetary values based on the cost of replacing an ecosystem service in the context of environmental assessment (Mancini et al., 2018). For policy makers to make decisions, instrumental values are considered particularly useful since their monetary value allows for damage mitigation and/or reversal by substituting with something of equivalent or comparable instrumental value in monetary terms (Grubert, 2018).

Cultural Ecosystem Services (CES) were previously inadequately conceptualized, framed as one-way benefit flows that obscure reciprocal human-nature relationships. A framework for integrating ecosystem services into impact assessment was then developed by Landsberg et al., (2011), after which causal interactions between a project, human wellbeing, and indirect/direct drivers of ecosystem changes could be explicitly recognized (Karjalainen et al., 2013). Using that conceptual framework, systematic assessments of project impacts and local dependencies on ecosystem services are determined at the whatever EIA stage is appropriate (e.g., scoping assessing, monitoring) (Karjalainen et al., 2013). A number of studies have also highlighted the importance of the less-direct cultural ecosystem services (Carpenter et

al., 2009; Millennium Ecosystem Assessment, 2005), but using instrumental terminology, which leaves CES still ill-defined and lacking the complex and specific relations articulated by the community (Fish et al., 2016).

Intangible cultural impacts, such as on traditional practices, are typically excluded from project assessments due to challenges of measurability. The instrumentality which is intrinsic to ESS-cultural ecosystem services focuses on the benefits people receive from their environment, because that aids the economic basis of the assessment and makes monetary compensations straightforward to calculate. In this approach, only very directly-instrumental aspects are usually captured: something like the effects of industrial projects on cultural ecosystem services, such as traditional agricultural knowledge and practices, are unlikely to even be considered (Schochet al., 2010). Studies by Burdge & Vaclav (1996) note that this is largely due to the challenges associated with measuring the intangible nature of benefits that humans obtain from ecosystems.

Literature such as the above indicates that existing ESS conceptual frameworks for addressing human-nature connection and interactions in EIA - especially those emphasizing monetization (Huysegoms et al., 2018) - are currently insufficient because they cannot capture normative preferences, principles, and virtues by treating them as resources with quantifiable, knowable instrumental values (Grubert, 2018). This inadequacy can lead to EIA failures and project failures, e.g., where local people protest or withdraw cooperation because their concerns have not been noted, and thus not mitigated. This economics-based ecosystem service concept fails to accurately reflect how people value nature and heavily ignores important meanings and moral dilemmas in human-non-human interactions (Chan et al., 2012, 2016). It severely limits the applicability of issues other than utilitarian ones (Bolis et al., 2017; Fitz-Henry, 2017; Vardy & Smith, 2017), such as relational and social elements.

2.2. Current approaches in EIA to include diverse values and challenges – Methodological approaches

Methodologically, a variety of analytical-deliberative techniques have been developed to provide a more holistic valuation of ecosystem services, and increasingly applied to EIAs (Chan et al., 2012; Fish, 2011Landsberg et al., 2011).

Multi-criteria decision analysis (MCDA) is a methodological approach towards integrating value focused decision making. But it remains confined to instrumental valuation, lacking capacity to capture relational or intrinsic values. A study by Karjalainen et al., (2013) highlighted the usefulness of MCDA for value-focused decision making which could identify and weigh benefits valued differently by different people and allow trade-offs to be considered to minimize the less acceptable alternatives. However, this methodology is limited to capturing only ESS (carrying instrumental language) values and does not take into account other nature-based

values reflecting the diverse ways in which people relate to and interact with nature. Besides, this approach has not been well integrated into ESS frameworks for EIAs.

Ethnography is another method that has been widely reported as having potential to capture values of nature for use in EIA mitigation measures. Ethnographic methods produce rich qualitative data but are poorly integrated into quantitatively driven EIA processes. Hanna et al., (2016) showed that ethnography can in principle be used to gain a deeper understanding of sociocultural aspects needed for EIA mitigation, in the context of designing and implementing a social and environmental compensation and mitigation program for a hydroelectric dam in central-northern Brazil. It was useful in facilitating consultations and perspectives, but it was also acknowledged that such ethnographic fieldwork alone will not necessarily ensure that the cultural aspects will be properly inputted and considered in any project development (Hanna et al., 2016), especially because they produce rich qualitative data which the project proponents find challenging to combine with the other EIA data which is objective and usually quantitative and economics based (Burdett, 2024).

Even with the existence of such methods which might overcome challenges in capturing more diverse and integrated values of nature, the objectivist physical science/economics background of project proponents has been reported to be a crucial hindrance in the uptake of such methods (Burdett, 2024; Richardson, 2005; Wilkins, 2003). They generally avoid ethnographic techniques because they consider them to be overly time-consuming and resource-intensive, resulting in high costs (Hanna et al.,2024), compared to more common reductionist approaches like surveys (Pazhoor et al., 2025). Furthermore, project proponents are responsible for many aspects of the project, most of which are quantitative or reductionist and tangible, and ethnographic data requires a qualitative, interpretivist analyst, which would require a new type of researcher to be added to the team that is otherwise not required, and for the team to learn how to integrate the findings. By emphasizing tangible impacts (like those on environmental resources) and ignoring less-tangible impacts (like those on community interests), project proponents can avoid dealing with the type of data they are simply not comfortable or competent with (Heiner et al., 2019). Therefore, the current challenge is not only to develop approaches which can better capture diverse integrated values of nature, but also to address pragmatism and rationality concerns associated with EIA as a technical process, and to be seen to provide practitioners with support rather than an intangible complication.

These conceptual and methodological problems reveal a structural incapacity in current EIA to meaningfully account for diverse values. It is the economics-based nature of ESS approach which emphasizes values regarding direct impacts for its valuation of services, and neglects indirect societal values relating to nature (Karjalainen et al., 2013). In addition, current approaches do not assist decision making for trade-offs which need to be weighted by local preferences at the local scale (Coleby et al., 2012), because they do not naturally accommodate culturally-

sensitive ‘disbenefits,' which are then dismissed as hidden externalities (Karjalainen et al., 2013).

Without addressing these conceptual exclusions and methodological incompatibilities, EIA processes risk project legitimacy, community engagement, and effectiveness in mitigation design. It is therefore essential to seek a practical yet epistemologically expansive approach that enables the clarification and identification of diverse values of nature at the early stage of EIA. That is the focus of this work.

3. Our approach for capturing diverse values – starting from surfacing the natural envelope of shared values of local community

To address the above need requires data reflecting how communities relate to nature and express their values within a much richer cultural context than usual. Specifically, it requires capture of a wide and diverse range of nature-related values held by people. Pazhoor et al. (2025) has provided concrete evidence that community-based shared values can indeed be surfaced during the EIA scoping phase.

Building on that insight our study proposes a new approach: starting from surfacing the natural envelope of shared values of local community. By “natural envelope,” we refer to the tacit, embodied, and culturally grounded values of people’s lived experiences, without pre-filtering by expert-led classifications. This avoids the longstanding difficulty in capturing less-tangible values using conventional EIA tools (Fig 1a): our approach surfaces a broader envelope of values (Fig. 1b), from which nature-related values are systematically extracted and linked to EIA outcomes (Fig. 1c).

We use three steps. First, the *WeValue InSitu* method surfaces community shared values in their natural envelope form. Second, we identify the subset of values that pertain to human–nature relationships. Thirdly, we classify those according to IPBES-based framework (Table 1) with distinctions of instrumental, intrinsic, and relational nature. By focusing on the surfacing, identification and typological classification of community-held, nature-related values-particularly those less tangible-our study contributes a concrete and operational pathway to enrich the value base of early-stage-EIA scoping.

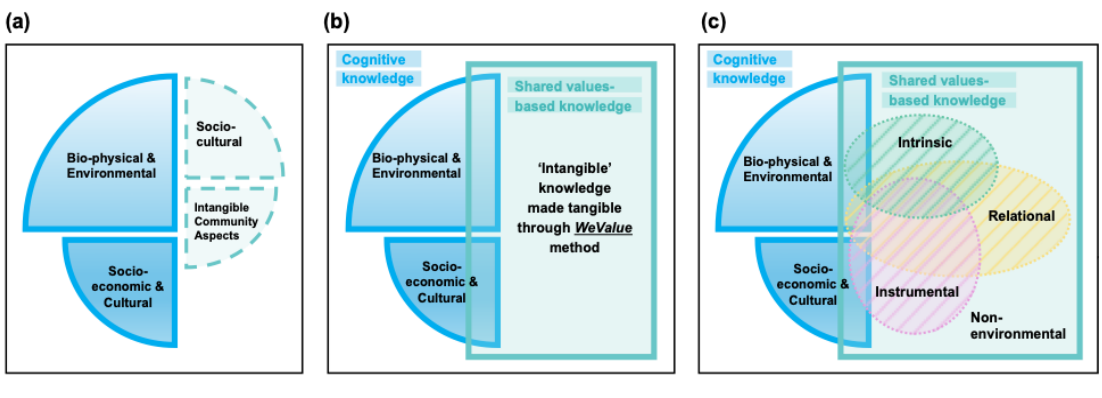

Fig. 1. Existing and proposed EIA capture of local shared values. (a) Local shared values captured in existing EIA processes (i.e., economics-based subsets); (b) Recent work to extend EIA scope to include local 'intangible' shared values captured using *WeValue InSitu* rapid-ethnographic approach (all sets potentially captured) Pazhoor et al., 2025; (c) Exploration of classifications in this work, from *WeValue InSitu* data categorized with the IPBES diverse values.

We position our study's contribution specifically within the scoping phase of EIA, where early-stage input of diverse values is both most needed and most feasible. This is because incorporating public participation during scoping or screening enables a fuller expression and consideration of these values (Lele 2023). We include in our Discussion a small section where we envision what concrete downstream mitigation measures might conceivably look like if derived from our scoping stage input. This limited projection serves only as a tentative indication of the method's potential downstream relevance, without overextending our claims. An illustration of our research and contribution scope is given in Fig.2.

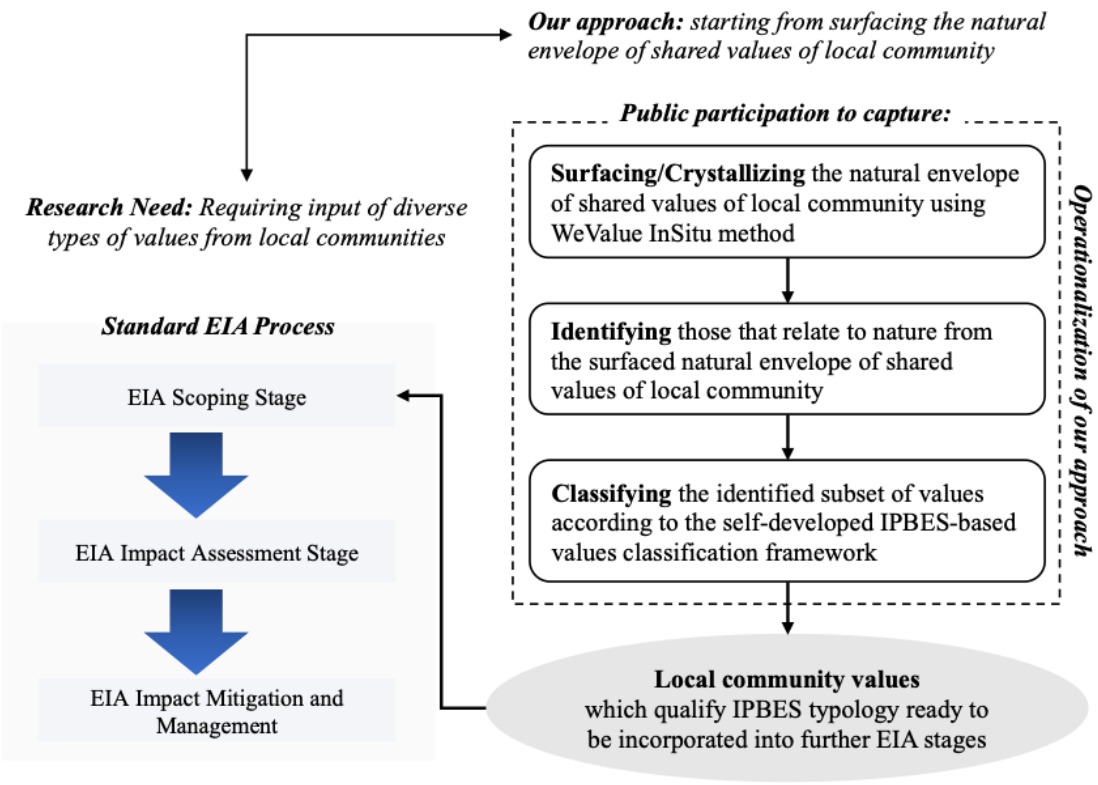

Fig 2. Research and contribution scope of this study.

3.1. WeValue InSitu method

WeValue InSitu (WVIS) (Brigstocke et al., 2017; Sethamo et al., 2020) is an approach which has many uses in a large range of disciplines (Harder & Burford, 2019). At its core is a process used with small groups of people which facilitates them to crystallize, or make concrete, what is important to them in the context of that group

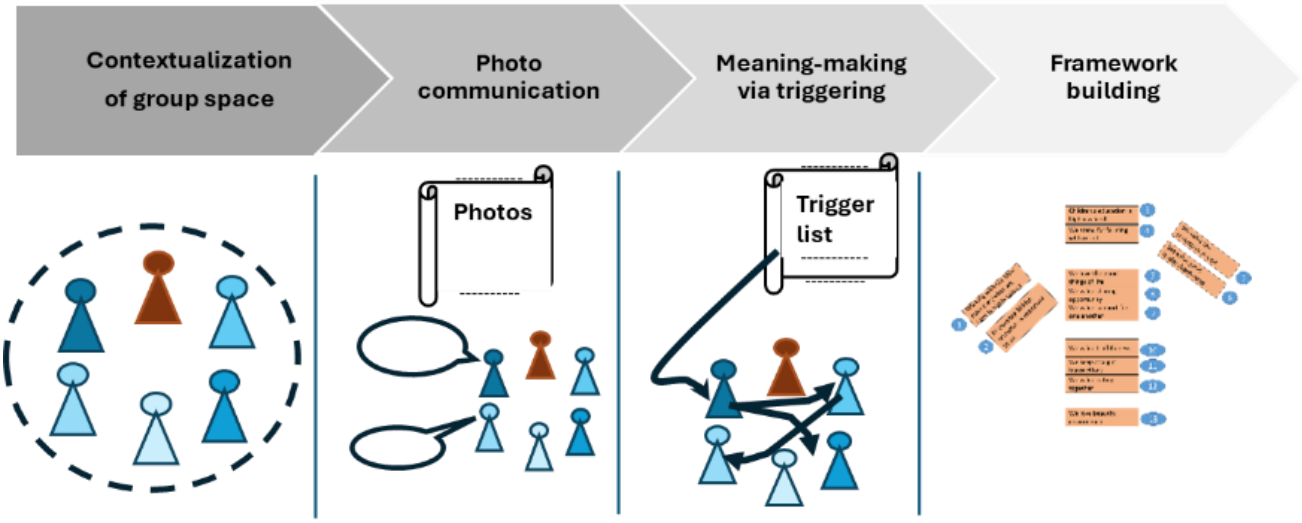

Fig. 3. A schematic showing different stages of WeValue InSitu workshop process for shared values crystallization of local groups.

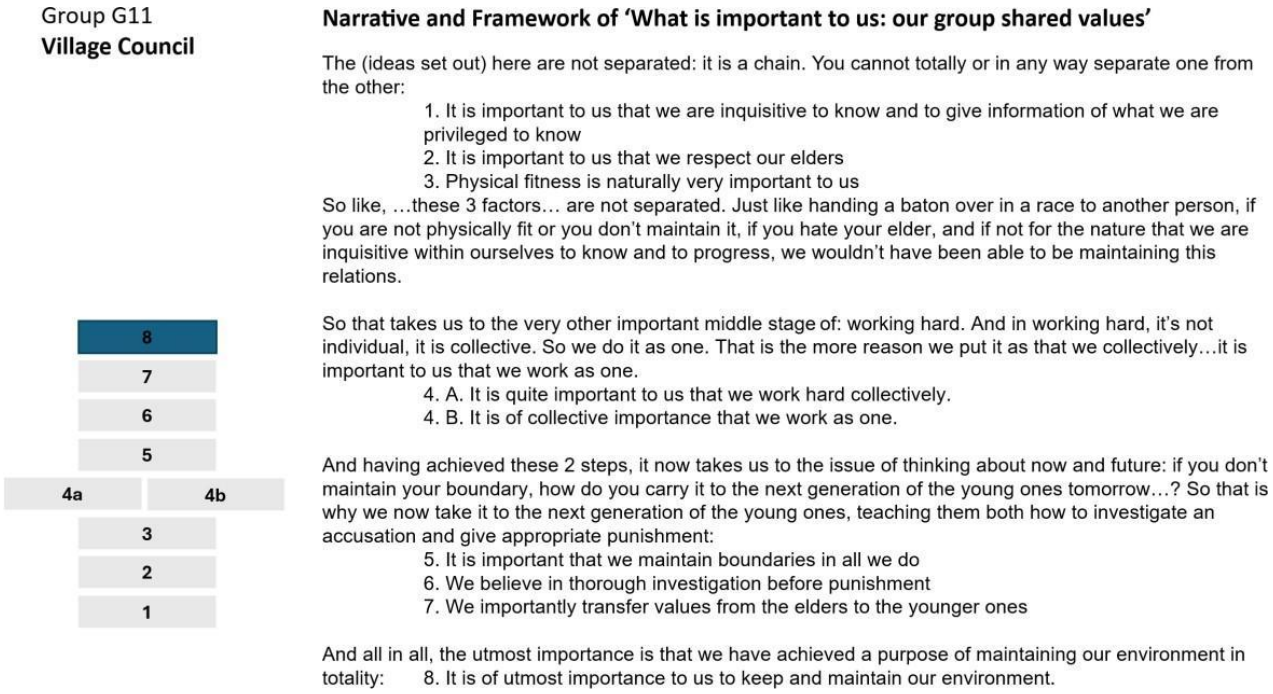

Fig.4. Typical data resulting from a WeValue InSitu workshop. A Narrative to describe the Framework of the Statements of shared values, as created and iteratively negotiated by a group (Nanka Village Council).

(Sethamo et al., 2020). It results in a set of collectively negotiated localized value Statements. This method is much deeper than public engagement or deliberation: the process involves participants negotiating their own meaning, and interactively sense-making (Odii et al., 2021) of in-situ knowledge that was previously tacit, and embedded in their common practice. These Statements of shared values are holistic, representing the set which are of highest importance to that group, and presented in local terms and local perspective and context. The stages of the *WeValue InSitu* approach are shown in Fig 3. It involves the participants triggering each other to recognize key concept areas, then crystalizing each final negotiated concept into a Statement, and arranging those in a way that shows how they are linked to each other (a Framework), and giving a Narrative description. An example of the output is given in Fig 4. A trained and experienced *WeValue InSitu* facilitator is required for this complex process, and training materials for that are currently in preparation.

3.2. IPBES-based classification framework

We developed a classification framework (Table 1) to support the identification and classification of diverse values surfaced by WVIS method, consisting of key definitions from the IPBES typology and a checklist of questions used to classify the values as intrinsic, instrumental, and relational.

Table 1. The IPBES-based classification framework we developed for this work.

Value foci		Value category	Core definition	Salient meanings summarized from the literature	Checklist of Questions to aid classification of values
Nature	**Non-anthropocentric**	**Intrinsic**	Values associated with entities worth protecting as ends in-and-of themselves. Values of entities expressed independently of any reference to people as valuers.	Non-instrumental value. Value of something that is an end-in-itself. Value independent of being valued or recognized by (human) valuer as inherent properties of other-than-human beings Regardless of importance and/or usefulness to people. Inherent moral value of natural beings (right to exist).	1) Does the Statement emphasize the inherent worth of nature without reference to its utility/usefulness to humans? 2) Does the Statement suggest the right to exist or a moral duty to protect/conserve regardless of human interests? 3) Does the Statement highlight or focus on the essence or virtue of nature rather than its practical contributions? 4) Is the Statement of value described as non-instrumental and does it have a nuance of being non-exchangeable for other things? 5) Does the Statement avoid any mention of human preferences, desires, cultural meanings, or uses? 6) Does the Statement indicate that the natural entity would still be considered valuable whether or not humans ever interacted with or benefited from it?
Nature's Contribution to People NCP	**Anthropocentric**	**Instrumental**	Values associated with living and non-living entities, as means to achieve human ends or satisfy human preferences. As means to an end, instrumental values are in principle replaceable, albeit not always in practice.	Means to an end**,** mostly in terms of usefulness, utility or benefits for humans; sometimes also for other-than-human beings. Leading to satisfaction of needs, preferences, interests and desires. Strongly associated with nature as resource, ecosystem services, capital, asset or property.	7) Does the Statement describe the usefulness and benefits of nature to humans? 8) Does the Statement portray the primary value of the entity as a means to an end (e.g., fulfilling human needs)? 9) Is nature referred to as a resource or tool for generating goods and services in the Statement? 10) Is there an emphasis on some tangible or measurable outcomes for humans (e.g., economic value, livelihood etc.) 11) Is the Statement tied to specific human activities like farming, recreation etc.? 12) Can the value of this entity be replaced by another that offers similar benefits? 13) Would the entity lose its stated value if it no longer delivered benefits or services to humans?

Good Quality of Life	**Relational**	Value of desirable, meaningful, and often reciprocal human relationships with nature, which are often specified as a particular landscape, place, species, forest etc., and among people through nature. In principle non-substitutable.	Values of or deriving from desirable, meaningful, just & reciprocal relationships with "nature" and/ or among people through nature. Values relative to or deriving from relationships that are constituent parts of cultural, individual, collective or communal identity. Values relative to or deriving from relationships that are constituent elements for living a good life (i.e. eudemonic). Values associated with care for/about specific landscapes, places, human & other-than-human others Values associated with sense of place, interconnection of cultural & sacred landscapes Value of nature as a point of connection among people, binding communities together & supporting social networks, such as in traditional markets	14) Does the Statement describe an emotional connection between people and a natural entity? 15) Does the Statement reflect cultural, traditional, individual or communal ties/identity or a sense of belonging with an entity? 16) Does the Statement highlight how nature contributes to human well-being through lived experiences, care, or spiritual significance? 17) Does the Statement express value in terms of non-material or social elements such as respect, stewardship, heritage etc.? 18) Does the Statement reflect the role of nature in fostering community bonds, social networks, or cultural practices? 19) Is the value described as non-substitutable - i.e., dependent on a specific relationship with a unique place, species, or landscape? 20) Does the Statement reflect mutual care and ethical responsibility in the relationship with nature? 21) Does the Statement indicate that the value would diminish or be lost if the specific relationship with the natural entity were broken or replaced?

4. Materials and Methods

4.1.-Study site

Before introducing the demonstration site and data collection sampling rationale, it is important to clarify the nature of the data used in this research. Although this study is motivated by challenges in EIA practice, the data we employ are not drawn from an actual EIA process, nor was the data collection originally intended to support one. Instead, they were generated through a separate community-focused project using the *WeValue InSitu* method to explore values crystallization in a real-world setting. This is entirely consistent with our methodological logic: the method begins by surfacing values embedded in lived experience, rather than from predefined environmental categories. Therefore, any setting in which communities participate to crystalize their values authentically can serve as a suitable context for our objective: to demonstrate how these values relate to nature and could inform early-stage EIA processes.

Nigeria was selected both for feasibility reasons and because its EIA system presents well-documented challenges that make this context particularly relevant to our methodological aims.

The initial selection of Nigeria was indeed shaped by practical feasibility, including an established facilitation team capable of supporting the multi-day WeValue InSitu process. However, Nigeria is also a highly policy-relevant context for exploring how crystallized values could inform environmental decision-making. Nigeria's Environmental Impact Assessment (EIA) system, governed by the 1992 EIA Act (Cap E12 LFN 2004), formally requires public participation and the consideration of social and cultural impacts. Yet, in practice, assessments often struggle to meaningfully incorporate local knowledge and values. Public participation tends to be procedural rather than substantive, with community voices entering late in the process and typically reflecting instrumental rather than relational perspectives on nature. Capacity constraints, coordination challenges across federal–state–local tiers, and the dominance of technical assessments further limit the integration of community-held values—especially tacit or culturally embedded ones. Consequently, a method such as WeValue InSitu, which surfaces shared values directly from lived experience, offers insights that are directly relevant to strengthening early-stage EIA scoping and significance determination in Nigeria. Although the present study did not collect data through an EIA, the methodological demonstration is therefore aligned with recognized national needs in environmental governance.

Within this context, we conducted our fieldwork in Ufuma and Nanka, two adjoining communities in the present Orumba-North Local Government Area of Anambra State, southeastern Nigeria. Located along the Awka-Orlu uplands, geophysically, both communities lie in Nigeria's humid rainforest belt, underlain by a basement complex of sedimentary rocks. Socio-ecologically, they are characterized by strong agricultural

livelihoods and long-standing traditional governance institutions such as elders, age grades, and lineage-based leadership systems. High rainfall, agricultural dependence, and communal land-use (Obi & Okekeogbu, 2017) structures generate and reinforce the presence of relational and intrinsic values connected to land, vegetation, water, and intergenerational belonging in local people's everyday life. In Ufuma, the historical characteristics indicate the type of place-based meanings that the WeValue InSitu process is able to surface. Ufuma was once a forested area, and thus nurtured historical memories shaping and shifting the community–nature relationships and the kinds of embodied, place-based meanings that a values-based method can capture. Separately, the ongoing gully erosion in Nanka provides a lived environmental experience that shapes values related to risk, loss, and collective responsibility. Nanka is shaped by profound gully erosion that has displaced households, destroyed farmland, and altered local political discourse (Igwe, 2018). These erosional landscapes constitute a vivid lived context for exploring values related to risk, security, loss, heritage, and collective responsibility which are precisely the types of tacit and relational values often missing in formal EIAs. Hence, the geophysical and socio-ecological characteristics shared by both communities support the suitability of the setting for examining nature-related values.

In summary, while practical feasibility motivated the selection of these sites, their geophysical and socio-ecological conditions also make them highly relevant for demonstrating how crystallized values could inform Nigerian EIA practice. Although the original project was not situated within an EIA procedure, the socio-ecological transformations experienced in Ufuma and Nanka illustrate the types of contexts in which Nigerian EIA processes demand stronger, more meaningful integration of community values. Thus, while feasibility motivated the site selection, the two communities also provide a policy-relevant and analytically robust context for demonstrating how WeValue InSitu may identify values that could complement and strengthen Nigeria’s EIA practice.

4.2. Data collection

The selection of groups was guided by two key considerations, grounded in a core requirement of the *WeValue InSitu* method: each workshop must be conducted with a group of individuals who share common experiences. First, we aimed to include a range of social groups that collectively reflect the diversity of lived experiences within the study area. This involved purposively selecting groups that occupy different social roles. Second, the aim was not statistical representativeness, but sufficient variation to demonstrate methodological viability.

We recruited participants through local networks and existing community structures starting from key informant interviews. One of our researchers was considered a local person, and we encountered little reluctance to participate. Groups included women's

associations, farming cooperatives, occupational collectives, and civic committees. Our dataset reached theoretical saturation, as confirmed later through grounded coding analysis (Table 4). That is, after a certain number of workshops, no substantially new thematic cluster of values emerged.

Our sample naturally has some limitations. The demographic profile of the participating groups was uneven: women were underrepresented relative to men, and the majority of participants were middle-aged or older adults. This skew may limit the range of perspectives surfaced, but the imbalance likely reflects underlying cultural barriers and the demographic reality of the groups involved. Regarding gender, while male voices predominated, we also conducted a dedicated workshop with a women's group. Their strong collective agency and ability to mobilize effectively when needed suggest that women's voices, though less visible in formal leadership, can be highly influential in shaping community outcomes. We fully acknowledge that these dynamics posed practical constraints during the recruitment of intact, pre-existing groups - which was a necessary condition for applying the *WeValue InSitu* method.

Despite these limitations, we argue that the assembled sample offers a credible basis for the purpose to illustrate how our approach could work. An overview of group details is provided in Table 2.

Table 2. The convenience sample of groups used in this exploratory study with basic demographic information.

Ref	Location	Group Identity	Participant	Male	Female	Age Range
G1 - G9	Ufuma	Village Councillors	31	31	0	50-80
G10, G11	Nanka	Village Councillors	7	7	0	50 - 75
G12	Ufuma	Youth Representatives	4	4	0	25 - 45
G13	Ufuma	Health Committee	3	1	2	35 - 70
G14	Ufuma	Women's Committee	9	0	9	40 - 67
G15 - G17	Ufuma	Teachers	12	4	8	25 - 50

4.3. Data analysis

Once we collected the data, we analyzed the values Statements (while maintaining links to the Narrative for increased contextualization validity). We followed an abductive approach, first using grounded coding methods of initial, focused and theoretical coding (Charmaz, 2006). This helped us understand the intended meanings of the participants in a grounded way. The thematic clusters evolved from that analysis were then mapped deductively onto the IPBES values categories of intrinsic, instrumental and relational as specified in the IPBES Conceptual framework of Nature's Contribution to People (NCP) and *Good Quality of Life* (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2022).

Our constructionist epistemology recognizes the researcher's active involvement in iterative data collection, analysis, and theory through deduction, induction, and abduction (Charmaz, 2006). Inductive reasoning was used to create clusters to represent the data, and then we tested those clusters against additional data in an iterative cycle of data collection and analysis using deductive reasoning. The process concluded by finally generating a theory for describing relationships between clusters through abduction (Charmaz, 2006; Flick, 2018).

5. Results

Here we first present the outputs of *WeValue InSitu* workshops conducted in Nigeria and the results from the grounded data analysis. We then present the results of identification and classification of the grounded data based on IPBES-based diverse values categories.

5.1 Grounded analysis of WeValue InSitu workshop outputs

The analysis of the values Statements from each of the workshops produced a list of 16 thematic clusters (Table 3)

Table 3. Grounded themes from the values crystallization process, and some example Statements.

Grounded themes from the values crystallization workshop	**Sample Statements for each theme**
Philanthropy and Social Responsibility	*It is important to us that we help the suffering and the needy.*
Environmental Awareness, Care and Protection	*It is important to us that we are able to discover natural environment.* *It is of utmost importance to us to keep and maintain our environment.* *It is important to us that we live exemplary lives.*
Legacy and Future Aspirations	*It is important that we are examples of good behavior/good works.* *We importantly transfer values from the elders to the younger ones*
Security, Law and Order	*It is important that we have good security.* *We don't want crises or anything that will cause such*
Justice and Equity	*We hate injustice. We love justice and Truth* *We value justice and equity. It brings progress*
Community Development	*It is important to us that development comes into our community.* *It is important to us that local business people contribute to development like road maintenance.*
Unity, Peace, and Love	*It is important to us that we have unity and work together* *We value that religious adherents love one another and eschew evil.* *We solve challenges together*
Education, Training, and Mentorship	*It is important to us that teachers incorporate integrated approaches to teaching and learning* *Technical know-how is better than paper qualification* *It is important to train our youth to take over from us* *Mistakes are understood as opportunities to learn and improve*
Agriculture and rural farming	*Farming is an integral part of our lives* *It is important to us that we have mechanized Agriculture to increase output*

Health and Wellness	*We value our health and desire that health/medical personnel are always available* *Physical fitness is naturally very important to us*
Morality and Spirituality	*It is important to us that everyone worships God* *We value truth and truthfulness no matter your beliefs*
Leadership and Responsibility	*It is important to us that a leader is fearless* *It is important that leaders are firm and truthful*
Hard Work and Efficiency	*It is important to us that our people are hardworking and efficient* *It is important that our young people work hard and make money* *Because we are farmers, it is important that we are hardworking and not lazy*
Economic self-sufficiency and Employment	*It is important to us that we have factories in our village. It creates employment and reduces vices* *Consequently, it is important to us that individuals have strong economic ability*
Human Rights and Dignity	*We stand against suppression and oppression of individuals* *Human Rights are sacrosanct*
Reward Systems	*It is important to us that we give people credit for the things they do for others.* *It is important that people are appreciated for the things they do*

These grounded themes represent the richness and diversity of the general human shared values of the groups and range from altruistic values such as philanthropy to egoistic values such as economic self-sufficiency, and the occurrence of both market-based and non-market-based values. Issues like employment, agriculture and community development could help the community to place a monetary value to developmental and other projects. However, many were non-monetary and have no appropriate monetary valuation but rather refer to a level of social value indicated by the groups' perceptions of reality. Examples are "leaders are firm and truthful", and "people are appreciated for the things they do". Other themes are categorized as being a mix of both market-based and non-market-based values, such as health and wellness. Although this could be partly monetized via the money spent in hospitals for treatment or prevention of health issues or diseases, it is harder to monetize aspects which contribute to greater life satisfaction.

Table 4. Evidence regarding theoretical saturation of grounded value themes emerged from community shared values. Theoretical saturation was achieved between G8 and G10.

Grp	Shared values Statement	Thematic clusters	Original source
G11	*It is important that we maintain boundaries in all we do*	Security, Law and Order	G3, G4, G5
G11	*"We value thorough investigation before punishment"*	Justice and Equity	G7, G8, G10
G11	*Physical fitness is naturally very important to us*	Health and Wellness	G2
G12	*"It is important that people are hardworking, not lazy."*	Hard Work and Efficiency	G1, G3, G5
G12	*It is important to us that we protest oppression of others: that we are careful in our judgment*	Human Rights and Dignity	G2
G12	*It is important to us that we give people credit for the things they do for others*	Reward Systems	G1

G13	*It is important to us that local businesses contribute to village development*	Community Development:	G1, G2, G3
G13	*It is important to us that we have strong family ties*	Unity, Peace, and Love	G9, G10
G14	*It is important that leaders are firm and truthful*	Leadership and Responsibility	G5
G15	*…people help to prevent and control erosion*	Environmental Awareness, Care and Protection	G1, G10
G16	*…we show compassion and help those in need (if we have).*	Philanthropy and Social Responsibility	G1, G5, G6, G10
G16	*…farming is important to us (Teachers and Students)*	Agriculture and rural farming	G1, G2, G3, G4 …
G17	*Mentorship is very important to us*	Education, Training, and Mentorship	G4, G9

5.2. Shared values related to nature and their IPBES classification

A further classification identification was conducted to separate those with and without any ecological/environmental relationships of any kind. For example, the Statements, *"we value erosion control work through volunteer activities"* (G10), *"it is of utmost importance to us to keep and maintain our environment"* (G11) and *"we are able to discover natural environment"* (G16) were clustered into grounded themes like: Environmental Awareness Environmental Care and Protection.

They were then classified using our IPBES-based classification framework (shown in Table 1). All three IPBES values categories (instrumental, intrinsic and relational) were found to occur, as shown in Table 5.

Table 5. Shared values Statements of Ufuma and Nanka communities classified with IPBES types of instrumental, intrinsic and relational values components (INS, INT, REL). Note they are found individually but also as hybrid characteristics.

Group	Shared values Statement	INS	INT	REL
G1	*It is important to us that flooding and erosion is prevented.*	y	y	
G1	*Farming is an integral part of our lives.*	y		y
G2	*Farming is very important to us.*	y		
G2	*It is important to us that we have mechanized Agriculture to increase output.*	y		
G3	*Farming is very important to us.*	y		y
G3	*It is important to us that we have increased agricultural produce.*	y		
G3	*It is important to us to engage in Agriculture for commercial purposes.*	y		
G3	*Good roads are very important to us.*	y		
G3	*It is important to us that local business people contribute to development like road maintenance.*	y		
G4	*We need bridges in order to communicate well in our community. We need bridges for easy movement of farm produce.*	y		y
G4	*We need agricultural machines to reduce our labour [because we are farmers].*	y		
G4	*It is important to us that we have proper irrigation [because we are farmers].*	y		
G4	*We love agriculture [so we need agricultural machines to produce food in abundance].*	y		

G4	*We need agricultural machines to increase our agro-output [Because we love Agriculture].*	y		
G4	*We need improved economic trees [we survive on them].*	y		
G5	*It is important that we put hands together to develop our community [take care].*	y		y
G5	*It is important to us that we have Farming Equipment for increased output and reduced suffering.*	y		
G5	*Because we are farmers, it is important that we are hardworking and not lazy [to produce enough food].*	y		y
G6	*It is very important that we have good access roads in our community [so we can transport our farm produce to the market] [anything that concerns roads is very important because any community without roads lacks significance].*	y		
G6	*Mechanized farming is important to us because it reduces death rate and increases Farm output.*	y		
G6	*We celebrate our harvest with the New Yam Festival.*	y		y
G7	*It is important to us that we are able to market our farm produce.*	y		
G7	*Agriculture is very important to us.*	y		
G8	*Farming is what we are known for [enable us to boost and increase agricultural output].*	y		y
G8	*Consequently, it is important to us that individuals have strong economic ability. [For us we have plantations, through which we raise funds to help others].*	y		
G9	*It is important to us that we ensure that family ties are maintained and that people are trained very well in the family […by joining us in farmwork and being trained in it].*			y
G9	*We value strong social relations and we support one another [working together & helping in the farm].*			y
G9	*It is important to us that we have improved varieties of economic trees (example plantains).*	y		
G9	*It is important to us that we have equipment and machines to engage in commercial agriculture.*	y		
G10	*Rural farming is central to our survival as a community.*	y		y
G10	*We value farming but we require the necessary farm inputs.*	y		
G10	*Mechanized farming is the future [For self sufficiency and food security].*	y		y
G10	*We value erosion control work through volunteer activities. [always been the basis for our survival here as a community for thousands of years because erosion is a central issue here].*	y	y	y
G11	*It is of utmost importance to us to keep and maintain our environment.*		y	
G12	*It is important to us that we are close to farming. [Apart from the normal cultivation or farming, we also have poultry farming and other types of farming. It is good in the community and it is a way of creating jobs also.].*	y		y
G12	*It is important to us that those that have strength regularly volunteer to help with the erosion or road maintenance work [...that's why we the youth took it upon ourselves by telling our elders to remove their hands from anything that has to do with road maintenance work and even erosion control because the strength is still there in the youth].*		y	y
G13	*It is important to us that we have good weather [...That is very important because if we don't have good weather, there is nothing that we cultivate that will be tangible…][Then from there, if we have good weather, (we will be able to produce food)].*	y	y	
G13	*It is important to us that our land can give us enough to sustain us [...we will have agriculture…because we have lands…] [In fact we have enough land that will sustain us in food production].*	y		
G13	*It is important to us that agricultural products are well processed and stored [Then if we produce food, we should process and store it.].*	y		y
G14	*It is important that we have our own source of water.*	y		

G14	*It is important to us that erosion problems are controlled.*	y		y
G7	*...people help to prevent and control erosion [And looking at the time that we are – August and the rainy season at that, so people should look at ways to prevent it and if those erosion has already occurred, it is important that we know how to control it so that it will not escalate into something very disastrous].*		y	
G8	*...we invest in our homes (villages, places of origin).*		y	y
G8	*...farming is important to us (Teachers and Students) [yes, farming is very important, it can sustain everybody. You just cultivate, and if you cultivate, you can eat from it].*	y		
G8	*...we are able to discover natural environment [God created many things, let us discover it, we can discover some that will help us in life.].*			y

Our results in Table 5 highlight two important aspects of the data. One is that a large number had at least some instrumental nature, and far fewer comprised relational or intrinsic nature. Secondly, around a third were hybrids, i.e., had characteristics of at least two of the categories. Agriculture and farming were the predominant themes in the Instrumental values category. Examples included Statements such as, "Agriculture is central to our survival as a community", and, "Farming Is very important to us". Other themes included access roads, community development and erosion control. The Relational values included themes on social relationships and family ties, celebrations and volunteerism. An example is, "We celebrate our harvest with the new yam festival". The Intrinsic values appeared to be more altruistic and involved Statements geared towards conservation and maintenance of the environment. An example is, "It is of utmost importance to us to keep and maintain our environment (in its totality)". In the hybrid examples, instrumental values were often seen to overlap with relational or intrinsic values. Exceptionally, one example had all three present: "…we value erosion control work through volunteer activities" (Group 10) - a blend of instrumental and intrinsic (erosion control to optimize crops and to minimize landslides) with relational values (volunteering).

6. Discussion

Our approach was to first surface holistic data on the shared values of groups, and then identify nature-related values within those, and finally classify those into IPBES diverse values of nature. The results confirm that the shared values crystallization method can capture all three categories of IPBES diverse values for EIA input, including the less-tangible and elusive relational values, which are rarely captured with other methods. The ultimate aim is to be able to include such an approach into the formal EIA process, but this proof-of-concept work was carried out outside any formal EIA setting. Our intention was not to quantify value prevalence, but to explore the occurrence of such diverse values, crystallized and captured from within culturally embedded, everyday community settings, as a potential meaningful contribution to EIA processes. It was also found that they occurred as overlapping hybrid categories. Below, we discuss the relevance of these findings to EIA studies.

6.1. Capturing IPBES diverse values of nature through surfacing, identifying and classifying community shared values

Our results show that the full range of IPBES values categories were found in the empirical data (see Table 6). There were many concrete examples of the elusive relational values category, such as, "We value strong social relations and we support one another [while working together & helping in the farm]".

The inclusion of such diverse values-and particularly relational values-is gaining growing importance in many spheres of environmental management, and has recently become a distinct concept in the intellectual discourse on ecosystem services (Chan et al., 2016; Muraca, 2011; Pascual et al., 2017). Within the specific context of Environmental Impact Assessment (EIA), scholars have called for the recognition and integration of relational values (Grubert, 2018), given that environmental implications are fundamentally socially embedded and are thus best understood through these relational lenses. Beyond reflecting how individuals and communities perceive their wellbeing and make environmental choices, relational values also reflect preferences, principles, and virtues tied to interpersonal relationships and the broader social situatedness of human-nature connections (Chan et al., 2016).

Relational values influence individual and collective decisions (Della Bosca & Gillespie, 2018), and can influence social life directly and noticeably because they evoke strong cultural sensitivities (Groves et al., 2017; Grubert & Skinner, 2017; Lukacs et al., 2016) and thus play a key role in shaping public perception and acceptance of various initiatives including developmental programs (Grubert, 2018). When projects disregard these deeply held values, they risk not only community opposition and emotional harm but also serious financial and operational setbacks, as demonstrated by the growing literature on the concept of "social license to operate" (Grubert & Skinner, 2017; Hanna et al., 2016; Colvin et al., 2016; Boudet, 2015). To avoid protests and dissension, compensation and resettlement approaches will need to take into account these dynamics and the multiple values associated with nature, including spiritual relationships, identity attachments, and social relationships that communities hold. Recognizing and incorporating diverse values of nature is increasingly seen as essential for gaining and maintaining community support for environmental initiatives (Junod et al., 2018; McEvoy et al., 2017; Voyer et al., 2015).

All of the above underline the need for balancing market-based instrumental values-based approaches with those that can incorporate relational, intrinsic, and non-market instrumental values that are also important to people (Grubert, 2018). This has been found to be particularly salient when dealing with some indigenous peoples, including where market-based monetizing approaches may result in the inflow of substantial amounts of funds, and these may have a greater impact on the community than all of the other impacts (Vanclay, 2002; Vanclay et al., 2015). Authorities, and even affected communities, sometimes believe that provision of large amounts of funds to

the community can resolve all project issues (Cernea, 2003; Esteves & Vanclay, 2009), and substantial amounts of money can be transferred and spent without consideration of the community's culture and customs (O'Faircheallaigh, 2007). Interaction with indigenous cultures is perceived as particularly complex due to cross-cultural contexts, and to require more time and resources than engagements with western groups (Hanna et al., 2016). However, the approach used here crystallizes such local shared values, and in this study, has been found to capture from villagers even the most elusive of the IPBES diverse category: relational. It only requires 90 minutes per group and typically 8 groups per population segment, and thus shows promise as a more-efficient way of obtaining shared values.

As an early exploration of the generalizability of the findings in this work, we examine below whether the diverse IPBES value categories can be captured and are consistently present in standard *WeValue InSitu* data obtained in other studies. We reviewed previously published academic studies and identified examples of shared values Statements obtained using the same standardized method, from four additional countries: China, Austria, Botswana, and Nepal. Table 6 presents illustrative value Statements drawn from these cases, demonstrating how they span the IPBES categories of intrinsic, instrumental, and relational values. This IPBES classification of diverse values has never before been made with *WeValue InSitu* data: this study is the first to demonstrate it with the Nigerian data, and then reveal it in the already-published data from other countries. Altogether, the data in Table 6 thus suggests the potential usefulness of the *WeValue InSitu* approach to surface crystallized shared values, including relational ones, in local groups in different countries. Their range of content also reinforces that there are differences in what local communities actually value, and that some are not easily monetized. In the context of EIA where such diverse values are currently often overlooked, yet vital to overall project success, any such methods that deliver on diverse values capturing could become increasingly vital.

Table 6. Illustrative shared values Statements obtained through the WeValue InSitu method, demonstrating alignment with the three IPBES value categories of nature (intrinsic, instrumental, and relational). The first seven Statements are from the Nigerian case study reported in this paper; the remaining six are extracted from published peer-reviewed WeValue studies conducted in China, Austria, Botswana, and Nepal. This is the first time their IPBES character has been examined, with the results suggesting the method's capacity to capture diverse values across varied geographical and cultural contexts.

Shared values Statements obtained through *WeValue InSitu* method	**Country/ Reference**	**Intrinsic** *(non-utilitarian: highlighting biodiversity integrity and conservation)*	**Instrumental** *(Ecosystem services valuing human well-being)*	**Relational** *(Social, cultural aspects highlighting community relationships and identities)*
It is of utmost importance to us to keep and maintain our environment	Nigeria *(This work, G11)*	Highlighting maintenance and conservation of environment		
it is important to us that we have mechanized agriculture to increase output	Nigeria *(This work, G2)*		Farming as a livelihood; provisioning services of the ecosystem services	
It is important to us that we ensure that family ties are maintained and that people are trained very well in the family	Nigeria *(This work, G9)*			Human (family) relationships are strengthened through engaging with nature
We invest in our homes (villages, places of origin)	Nigeria *(This work, G7)*	Maintenance and conservation of physical environment by investing in the ecosystem		Investment in the environment and village as a community is seen as the same
It is important to us that flooding and erosion is prevented	Nigeria *(This work, G1)*	Preventing flooding and erosion and preserving the intrinsic quality of ecosystem	Highlighting the regulatory services of the ecosystem services	
Farming is an integral part of our lives	Nigeria *(This work, G1)*		The significance of farming as a livelihood; provisioning services of the ecosystem services	The social relational and community aspects of farming as a livelihood
We value erosion control work through volunteer activities. [always been the basis for our survival here as a community for thousands of years because erosion is a central issue here]	Nigeria *(This work, G10)*	Preventing erosion and preserving the intrinsic quality of ecosystem	Highlighting the regulatory services of the ecosystem services through erosion control	Highlighting the role of joint community actions (volunteering) by engaging in nature conservation activities
..the company advocates that employees pay attention to environmental and social responsibility	Shanghai *(Huang et.al, 2022)*	Encouraging the employees for biodiversity conservation		
People understand the value of environment [The Narrative context implies a 'value' in the widest sense.]	Botswana *(Sethamo et.al; 2019)*	Valuing the environment; highlighting the intrinsic quality of environment	Valuing the environment; highlighting the services that the ecosystem (environment) provides	Valuing the environment; highlighting the value of the human relationship to nature
People respect nature and the wider community of life	Shanghai *(Wu et.al, 2024)*	Respecting nature for its intrinsic qualities		Respect for community life within the umbrella of respecting nature
Green spaces are public and forever	Vienna *(Wu et.al, 2024)*			Highlighting the social and identity aspect of green spaces
Vienna is not Vienna without its parks and green oasis	Vienna *(Wu et.al, 2024)*			The green spaces attaching an identity to the place (Vienna)

Our village requires playground and clubs in order children and even adults to spend free time and get closer to each other	Nepal *(Pazhoor et.al,2025)*	Recognizing the recreational values (cultural services) of ecosystem (playgrounds)	Recognizing that ecosystem and physical environment (playgrounds) foster socialization

6.2. Hybrids of overlapping values categories

A further important result from our empirical data is that some values categories were empirically found to often occur in overlap with other value categories. For example, instrumental values often overlapped with relational values which is of particular interest as this suggests that compensation in monetary terms or substitution/replacement cannot directly resolve all these issues associated with the destruction, depletion, or significant change of use of natural entities by development projects. To illustrate this point more concretely, two Statements are drawn from Group G9 data:

"It is important to us that we ensure that family ties are maintained and that people are trained very well in the family […by joining us in farm work and being trained in it]"

"We value strong social relations and we support one another [working together & helping in the farm]".

These Statements suggest that although a simple revegetation of a disturbed farmland or substitution with other land elsewhere might commonly be considered by project managers as adequate compensation for environmental and economic loss, it actually fails to consider the loss of valuable family and social support from not working together. This group considers their joint farming experiences as important learning and training opportunities. In other words, their relationship with their farms includes embedded cultural environmental educational values, and if they are not taken into account in an EIA, it is possible that could lead to discontent. This aspect would not have been captured with the traditional EIA focus on instrumental values alone.

6.3. Envisioning mitigation measures which could incorporate relational values

The aim of this study was to capture diverse local IPBES values of nature, through surfacing, identifying and classifying local community shared values, as a demonstration of what could be incorporated into the scoping stage of a formal EIA process. Now that the results tell us it is possible to capture them, a subsequent study could repeat this in the context of an actual formal project EIA, (i.e. with specified appropriate population sampling and project context), input them into the scoping stage, and then take them through the ensuing EIA assessment stage and development of mitigation measures stage.

These surfaced values can, in practical terms, support scoping through the identification of issues that matter to communities but are often absent from conventional Ecosystem -based approaches that only focus on instrumental values. For example, relational values may surface culturally embedded human-nature

linkages that would otherwise remain invisible, such as seasonal rituals, place-based identity, or volunteer-led erosion control. Their integration at the scoping stage could enhance the relevance of scoping and guide the identification of context-sensitive indicators for subsequent EIA impact assessment stage. This represents a clear pathway through which the community values captured here might realistically be embedded into early EIA practice.

While the study does not empirically test how these values would flow into later EIA stages, scoping outputs identified in the present study could meaningfully inform the design of impact analysis in future applications. For instance, relational values pertaining to erosion stewardship or communal farming practices might translate into assessment indicators that capture not only the biophysical effects but also community cohesion, intergenerational knowledge, or seasonal traditions. Similarly, the intrinsic values here would orient analysts to examine the impacts on species or landscapes considered culturally significant or morally important irrespective of their utility. Although it remains outside the scope of the present exploratory paper to develop full impact assessment protocols and predict their influence on mitigation design, we outline these as plausible pathways for future EIA-embedded research. Our contribution here is thus to establish an approach capable of generating the value-based evidence required at the outset of EIA processes, leaving its operationalization across impact analysis and mitigation to the subsequent full-scale study.

However, given the lack of confidence expressed in the literature at the operationalization of such less-tangible values, at this point we would like to consider if we could even hypothetically envision any such mitigation measures derived from them.

Therefore, as a preliminary exploration, we have developed a set of these, particularly focusing on the relational values surfaced through our empirical application of the *WeValue InSitu* method. We found it was indeed possible to construct some, and these are summarized in Table 7, and represent an illustrative step towards designing mitigation options that reflect not only environmental and economic, but also cultural and social value domains. From such as these, value-informed indicators can also be developed to monitor and track social impacts over time.

6.4. Relationship to the mitigation hierarchy

The IPBES values typologies align with the mitigation hierarchy which traditionally emphasizes a four-step process of avoiding, minimizing, restoring and offsetting environmental impacts. Whereas instrumental values have been much emphasized in mitigation of impacts, relational values could provide a more compelling motivation for practicing the mitigation process that goes beyond a mere technical requirement or regulatory compliance to a more sustainable and transformative process grounded in

moral and ethical environmental stewardship. Moreover, the inclusion of relational values challenges the feasibility of offsetting in the mitigation hierarchy which depends on a flawed assumption of the fungibility of nature – a concept that completely disregards the specific place-based relationships that exist between people and nature (Ives & Bekessy, 2015).

As a result, beyond the conventional 4-stage process in the mitigation hierarchy, researchers argue for a fifth step called enhancement which involves a proactive process of not just reducing negative impacts but actively improving baseline conditions to foster human-nature relationships (Kørnøv et al., 2025). This shifts the mitigation agenda from a "net-zero-loss" to a "net-positive-gain". The integration of relational values in designing enhancement measures could be beneficial for several reasons. First it naturally creates an aspiration to strengthen community bonds through ecological projects which ensures a long-term care for the project. In addition, the project design is improved through co-creation and this in turn provides a robust sociocultural metric for success. These actions ensure social equity and promote a just and sustainable outcome deriving from a values-centered mitigation hierarchy.

Table 7. Hypothetical mitigation measures envisioned as potential operationalizations for issues relating to some of the relational values surfaced by WeValue InSitu method in this study.

No	Relational Themes	Sample Statements from the *WeValue InSitu* Process	Suggested Practical Mitigation Activities
1	Social Cohesion and shared Activities/Practices	*"It is important that we put hands together to develop our community [take care...]." G5)* *"We value strong social relations and we support one another [working together & helping in the farm]." G9)*	Set up cooperatives/communal seed banks, granaries etc. Co-designing erosion control infrastructure Revive traditional governance systems (e.g., age-grade roles)
2	Intergenerational knowledge and Learning/mentorship	*"It is important that family ties are maintained and people are trained in farmwork [by joining us...]." (G9)* *we are able to discover natural environment [God created many things, let us discover it, we can discover some that will help us in life.] (G16)*	Develop and install educational signages highlighting the cultural significance of different areas Set up land-based mentorship between elders/youth
3	Cultural and Spiritual Identity/Connection/ /Heritage	*"Farming is what we are known for [enable us to boost agricultural output]." (G8)* *"We celebrate our harvest with the New Yam Festival." (G6)*	Celebrate contributions and project milestones through community festivals “Sense of Place” audits before project design Naming infrastructure using indigenous toponyms Incorporate local motifs, names, and Narratives into project signage and infrastructure
4	Environmental Stewardship, Volunteerism and Youth Involvement	*"We value erosion control through volunteer activities [basis for our survival...]." (G10)* *It is important to us that those that have strength regularly volunteer to help with the erosion or road maintenance work (G12)*	Establish or enhance communal farming plots as part of project compensation Create youth volunteer teams for erosion/road maintenance Establish youth-led environmental teams with elder mentorship

7. Limitations

This work has a specific use as an exploratory study, but it is important to specify its limitations. Firstly, this study is not designed to provide definitive evidence of the usefulness of the *WeValue InSitu* approach in improving the EIA formal process: it only establishes proof of principle of capturing IPBES diverse values through surfacing, identifying and classifying community shared values which can then be used in EIA processes. A further study of operational feasibility is now needed where the approach is integrated within the formal EIA process to demonstrate that population sampling appropriate to that EIA project can be practically achieved, that the outcomes can be incorporated easily into not only the EIA scoping stage, but also onwards to the assessment and mitigation stages. Beyond that, an evaluation study will be needed to determine whether the inclusion of relational values in EIA outcomes has any impact on the overall success of projects, which will require longitudinal and comparison research design.

Secondly, this paper has not addressed the range of challenges involved in trying to operationalize the consideration of relational values, e.g., during the subsequent EIA Assessment or operationalizing any mitigation measures. There are already immense challenges known in trying to mitigate traditionally known social impacts of development projects without introducing more from relational values which are typically non-monetizable, and likely to require involvement of experts familiar with dealing with cultural and ethnographic issues, rather than transactional details typically involved in instrumental values. We believe that consideration is very important but outside the scope of this paper. It is separately worth noting that *WeValue InSitu* method has already been applied to produce indicators in several areas of sustainability. In particular, one publication demonstrates how the WeValue shared values Statements could be used almost directly as indicators for insertion into the SuRF-UK decision support tool in common widespread use for sustainable land remediation (Odii et al., 2019). Although most fitted into the 'social' sustainability category, some also were 'environmental'.

Thirdly, there are limitations of the *WeValue InSitu* approach itself. Although it does crystallize deeper and less-tangible shared values through its meaning-making approach than many objectivist methods based on external frameworks e.g., of psychology, it also has weaknesses associated with intersubjective data collection. For example, the participants might try to give the Facilitator 'what they want to hear'; some participants might dominate; some topics might not be brought up due to social norms pertinent to the participants in the room. Most of these are highly mitigated by the intrinsic way that the *WeValue InSitu* method works, involving participants collectively describing shared experiences and then collectively undergoing meaning-making of them, which is a space where those issues do not surface strongly. The method requires the availability of a trained and experienced WeValue Facilitator, and there are currently limited places where training can be obtained at this time, although

Open Access Manuals are in preparation. Operationalizing the scaling up of the use of this method for standard EIAs would require more training opportunities, and wider dissemination of contact information of Certified Facilitators, all of which is under development on the website https://sberg.fudan.edu.cn/ and at Fudan University, China, the University of Brighton, UK, and other collaborating institutions. Since the method is already in demand for other types of social impact assessments, for urban planning and for placemaking, it is plausible that the number of trained Facilitators will expand quickly. Operationalization would also require project proponents to be prepared to contract out the work, which will be aided by the fact that many trained facilitators will be capable of handling field work packages including basic analysis and report writing. Lastly, local interpreters are used, and workshops carried out in local languages, with a local researcher providing contextual validation of all final data and the English conversions of it, where needed. The participants are recruited in groups, as a 'community of practice', so that they become focused on meaning-making in their 'tacit space' and in fact are much less aware at that time of the 'external ear' waiting to hear their final Statements. This level of local interaction should be within the competencies of the project proponents, but if not, then many of the Certified Facilitators will be capable of it.

8. Conclusion

This exploratory study was able to demonstrate that the *WeValue InSitu* standard method could capture not only less tangible local shared values, but also that they included all three of the IPBES diverse values types: instrumental, intrinsic and relational. The classification framework derived here from the IPBES specifications proved useful to identify them in the empirical data, and all could be classified. Previously published *WeValue InSitu* data from four other countries were also found to be classifiable in this manner. Local values were also empirically found to comprise more than one of the three diverse values categories, i.e., they were hybrids with overlapping values categories. Although the data was not representative of any population, the high frequency of occurrence of hybrid values categories suggests that current valuation methods which assume instrumental values are dominant might need revising, as many seem to also include relational values which are not easily substituted for.

Further work could be done to determine if these findings can be embedded into a formal EIA process at the scoping stage, using *WeValue InSitu* within the public engagement events. Investigation of the operationalizability of the relational values throughout the subsequent EIA stages is also needed. And the generalizability of the approach in different countries and cultures should be confirmed with specific research designs.

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