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Broadening the Justifications for Inclusive Conservation: Values Associated With Nature's Contributions to People

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ABSTRACT

Overlooking the diverse values associated with Nature's Contributions to People (NCP) undermines conservation efforts. To examine this underresearched association, we combined the NCP and plural valuation frameworks to investigate how values are associated with groups of people with shared NCP preferences, referred to as NCP preference clusters. We conducted 623 surveys with 362 farmers, 50 nature conservationists, 55 tour guides, and 156 tourists within the social–ecological system (SES) of Mount Kilimanjaro, Tanzania, comprising a national park as well as inhabited and cultivated areas. We identified five distinct clusters, each expressing varying degrees of intrinsic, instrumental, and relational values. While each framework overlooks key dimensions of people–nature relationships, combining both frameworks better captures the multidimensionality of such relationships and provides pivotal insights for inclusive conservation. To recognize the distinct associations between NCP preferences and diverse values, diversifying place-based conservation approaches in SESs with (a) protected area(s), without compromising biodiversity and ecosystem functioning, is pivotal.

Title and Abstract in Swahili

Hoja zaidi za uhalalishaji wa uhifadhi jumuishi: Thamani zinazohusianishwa na Michango ya Mazingira asili kwa Watu. Kupuuza thamani anuai zinazohusianishwa na Michango ya Mazingira Asili kwa Watu (MMAW- NCP kwa Kiingereza) hudhoofisha jitihada za uhifadhi. Ili kuchunguza uhusiano huu ambao haujafanyiwa tafiti za kutosha, tuliunganisha dhana ya MMAW na ya tathmini za thamani anuai ili kuchunguza jinsi thamani zinavyohusiana na makundi ya watu wenye chaguzi sawa za MMAW, ambayo yanaitwa makundi ya chaguzi ya MMAW. Tulifanya madodoso 623 kwa wakulima 362, wahifadhi wa mazingira 50, waongozaji watalii 56, na watalii 156 ndani ya mfumo wa kijamii–ikolojia (Social–Ecological System – SES) wa Mlima Kilimanjaro, Tanzania, unaojumuisha hifadhi ya taifa pamoja na maeneo ya makazi na kulimo. Tulibaini makundi matano tofauti,

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kila moja likionyesha viwango mbalimbali vya thamani za kiasili, zenye manufaa, na za mahusiano. Ingawa kila mfumo unaacha vipengele muhimu vya mahusiano kati ya watu na mazingira asili, kuunganishwa kwa mifumo yote miwili unakamata vizuri zaidi upeo wa vipengele vingi vya mahusiano hayo na unatoa maarifa muhimu kwa uhifadhi shirikishi. Ili kutambua uhusiano mahsusi kati ya chaguzi za MMAW na thamani mbalimbali, na kuongeza mbinu za uhifadhi zinazozingatia (ma)eneo lenye/yenye mfumo wa jamii-ikolojia (Social–Ecological System – SES) lililo/yalilohifadhiwa, bila kudhoofisha bayoanuwai na utendakazi wa mifumo ikolojia, ni jambo la msingi.

1 | Introduction

The disregard for the diverse values that people ascribe to nature—people’s value pluralism—has been identified as one of the root causes of failures in conservation (Martín-López & Montes, 2015; Kenter, 2018; Pascual et al. 2023). If we frame conservation, which is per se value-laden, as the “just, sustainable [(non-)consumptive] use and cohabitation of people with nature, in a way that maintains biodiversity and ecosystem functions” (Cumming et al. 2023, 4), as opposed to fortress conservation approaches (Brockington 2002), it is necessary to consider the many ways in which people relate to nature (Martín-López & Montes 2015). Arguing that an inclusive conservation framing necessitates representing the diversity of people (hereafter diverse voices) and their perspectives in which they benefit from and value nature (Tallis & Lubchenco 2014; Raymond et al. 2022), combining the Nature’s Contributions to People (NCP) (Díaz et al. 2018) and plural valuation frameworks (Pascual et al. 2017, 2023) proposed by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) offers a promising way forward for inclusive conservation.

Beneficial NCP are nature-derived benefits that support human well-being, spanning across three overlapping groups: (1) regulating NCP, which include natural processes that influence environmental conditions, like pollination; (2) material NCP, which provide direct resources, like food; and (3) non-material NCP, which enhance subjective or psychological well-being through, for example, cultural identity (Díaz et al. 2018). Previous studies have found that people can be grouped based on their similarity in their NCP preferences, a clustering phenomenon referred to as NCP preference clusters (Schmidt et al. 2017). Ignoring that people differ in their NCP preferences can cause social tensions and jeopardize conservation success (García-Llorente et al. 2018).

While the NCP framework is key to investigating *what* aspect(s) of nature contribute(s) to human well-being, it cannot capture the full range of reasons *why* nature matters to people (Chan et al. 2016; Jax et al. 2018). The “importance, worth, or usefulness” ascribed to nature and NCP is conceptualized as specific values of nature (hereafter values) that span across three domains (Díaz et al. 2015; Pascual et al. 2017, 2023): (1) intrinsic values refer to nature’s importance regardless of human use (Arias-Arévalo et al. 2017) or experience (Pascual et al. 2017); (2) instrumental values to its importance as substitutable means to desirable ends (Arias-Arévalo et al. 2017); and (3) relational values to the meaningfulness of non-substitutable people–nature relationships and social relationships mediated by nature, comprising motivations that potentially facilitate conservation efforts (Chan et al. 2016; Jax et al. 2018).

A conservation framing that brings people–nature relationships to the foreground, while ensuring this focus does not come at the expense of biodiversity and ecosystem functioning, calls for broadening conservation approaches by moving beyond intrinsic or instrumental values to embrace value pluralism (Murali et al. 2024; Reyers & Bennett 2025). In the context of conservation, however, its empirical elicitation remains scarcely investigated (but see, e.g., Ghijssels et al. 2023). Moreover, people value nature and NCP for different reasons (Arias-Arévalo et al. 2017; Chapman & Deplazes-Zemp 2023), suggesting that multiple values can be simultaneously associated with particular NCP preferences. Yet, there is little empirical evidence on this association (but see, e.g., Brück et al. 2024; Kachler et al. 2024).

To contribute to inclusive conservation, we aimed to investigate the values associated with NCP preference clusters in the social–ecological system (SES) of Mount Kilimanjaro (hereafter Kilimanjaro), Tanzania, by combining the NCP (Díaz et al. 2018) and plural valuation frameworks (Pascual et al. 2017, 2023). Specifically, we sought to (i) identify clusters of NCP preferences expressed by different social actors and (ii) explore the values associated with these clusters. We drew on Kilimanjaro due to its ecological and social heterogeneity: It is characterized by, for example, biodiverse agroforestry systems, a national park, and manifold opportunities for nature-based tourism; hosts various social actors; supplies NCP that can meet the demand of different social actors; and nurtures diverse values (Hemp 2006; Gross et al. 2025a). Despite these opportunities, locals’ access to the national park is restricted (Holroyd 2016).

2 | Methods

2.1 | Study Area

Kilimanjaro includes the inhabited and cultivated foothills and protected highland areas of Mount Kilimanjaro—the world’s highest free-standing mountain (5895 m above sea level [masl])—and its associated social actors. It hosts unique biodiversity (Peters et al. 2016) and various social actors, particularly smallholder farmers (farmers), nature conservationists, mountain tour guides, and tourists (Gross et al. 2025a; Sanya et al. 2025). Most farmers belong to the Chagga tribe, whose members traditionally cultivate biodiverse homegardens on the southern slopes (ca. <1650 masl) (Hemp 2006). The protected Kilimanjaro National Park—ranging from approximately 1600–2350 masl to 5895 masl—and adjacent areas serve as one of Tanzania’s premier nature-based destinations, attracting tourists and guides (Holroyd 2016; TANAPA 2023). Simultaneously, the park management protects its biodiversity and profits from tourist revenues, while regulations

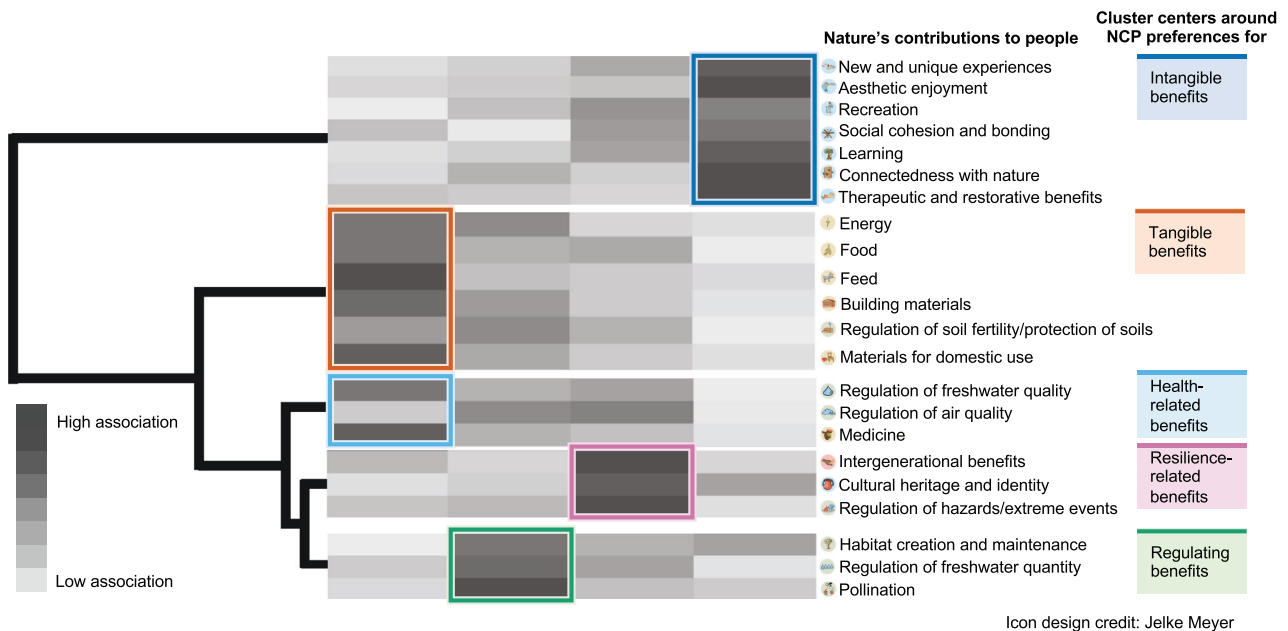


FIGURE 1 | Hierarchical dendrogram and heat map indicating five NCP preference clusters—groups of respondents similar in their NCP preferences. The colored boxes indicate the NCP set associated with each NCP preference cluster. See Figure A2 for the detailed dendrogram and Table A1 for magnified NCP icons.

limit locals' access to and benefits from the park (Holroyd 2016; TANAPA 2023). Governmental and nongovernmental bodies run conservation projects outside the park boundaries, partially coupled with tourism.

2.2 | Data Collection

We conducted 623 face-to-face surveys in Kilimanjaro with four social actors—smallholder farmers ($n = 362$ respondents), nature conservationists ($n = 50$), mountain guides ($n = 55$), and tourists ($n = 156$)—from August to November 2022. We used three independent questionnaire sections: (1) NCP preference assessment (NCP preference clusters), (2) rating of statements representing nature's values (value expression), and (3) profile attributes (questionnaire in Appendix A1; additional information on data collection, ethics, and data analysis in Appendix A2; declaration of consent in Appendix A3; and first author's positionality statement in Appendix A4). Sections (1) on NCP preferences (Table A1) and (2) on value expression (Table A2) were contextualized to Kilimanjaro based on 130 interviews with representatives from the four social groups (Appendix 2). We instructed survey respondents to (1) select up to five of 25 context-specific NCP that they considered most important and (2) indicate their (dis)agreement with 20 value statements representing intrinsic, instrumental, and relational values.

2.3 | Data Analysis

We ran Ward's hierarchical cluster analysis to identify NCP preference clusters—groups of respondents similar in their preference for the five most important NCP—and, subsequently, an indicator species analysis (Dufrene & Legendre 1997) to identify the (sets of) NCP that are characteristic of and significant for

these clusters. Two reasons justified the final cluster selection. First, we grouped respondents into several NCP preference clusters to meaningfully represent respondents' expressed preferences in maximally differentiated groups. Second, the number of clusters was increased to the maximum supported by the indicator analysis, ensuring statistical justification. Grounded in statistically significant test statistics (Table A7), this approach allowed for the greatest distinction between clusters. Then, we ran a chi-square test to explore the relation between the social actors and clusters, and identified the social actor with the highest share in each cluster—the actor with the highest representation in each. Next, we described the value expression of each NCP cluster and ran chi-square tests to explore the association between respondents' agreement with the value statements and NCP preference clusters; p -values were corrected for multiple tests. Table A6 presents the variables used in the analyses.

3 | Results

We identified five NCP preference clusters (agglomerative coefficient of Ward's hierarchical cluster analysis: 0.93) that center respondents around preferences for (1) "Intangible benefits," (2) "Tangible benefits," (3) "Health-related benefits," (4) "Resilience-related benefits," and (5) "Regulating benefits" (Figure 1; more detailed and additional results in Appendix A5), with a significant relation between the clusters and social actors (chi-square test result: $\chi^2 = 276.48, p < 2.2 \times 10^{-16}$).

The NCP preference cluster around "Intangible benefits" comprised a group of respondents similar in preferring seven non-material NCP—*new and unique experiences, aesthetic enjoyment, recreation, social cohesion and bonding, learning, connectedness with nature, and therapeutic and restorative benefits* (Figure 1;

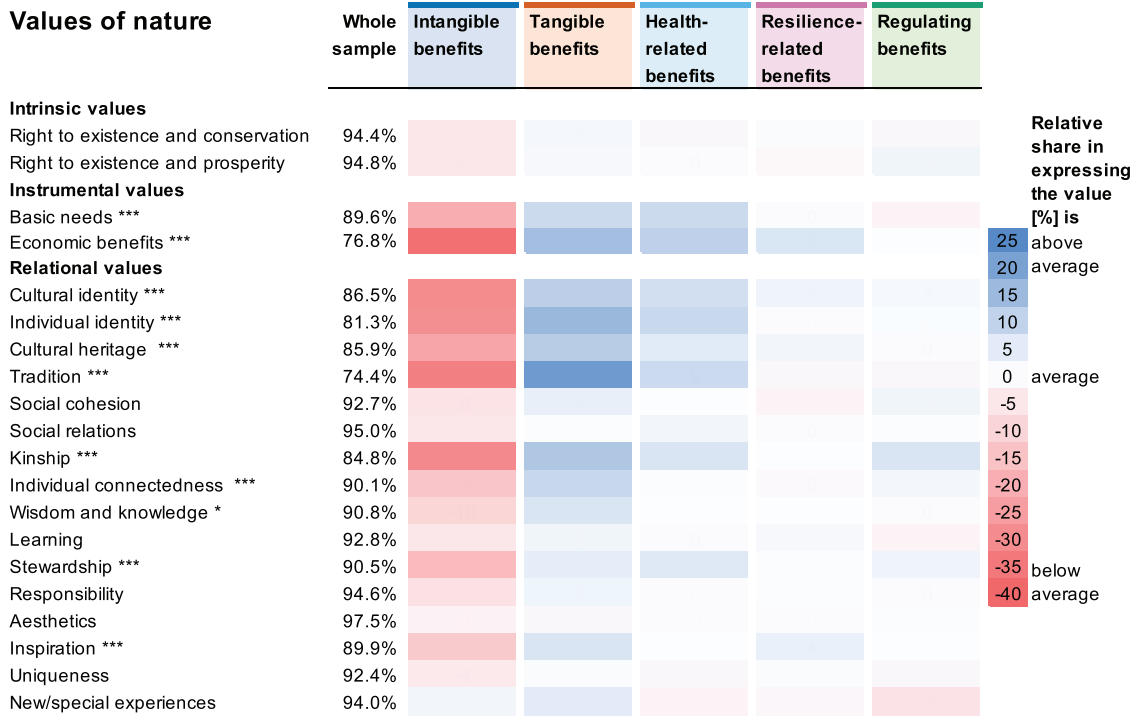


FIGURE 2 | The relative share of the whole sample (Column 2) that agrees with the value statement—expresses the value (Column 1). Color coding: Deviation in the relative share in expressing the value of nature for each value statement and in each Nature’s Contributions to People (NCP) preference cluster (Intangible benefits, Tangible benefits, Health-related benefits, Resilience-related benefits, and Regulating benefits) from the relative share of the whole sample (blue: relative share is above average; red: below average). Chi-square test results (full summary in Table A11): * $p < 0.05$; ** $p < 0.01$; and *** $p < 0.001$.

Table A7). One hundred eighty-eight respondents (17% of all respondents) constituted this cluster, of which 80% were tourists (Figure A3; Table A8); 55% of all tourist respondents—the highest share across all clusters—assembled here (Table A9). Although respondents in this cluster generally agreed with all value domains, their expression of diverse values was less prominent compared to the other clusters. They highly expressed intrinsic values and specific relational values derived from and experienced through nature-based (touristic) activities (Figure 2; Table A11).

The NCP preference cluster around “Tangible benefits” represented a group of respondents similar in preferring five material NCP—*energy, food, feed, building materials, and materials for domestic use*—and *regulation of soil fertility and protection of soils* (Figure 1; Table A7). We interpreted the regulating NCP as key to supporting the material NCP, so we named the NCP set “Tangible benefits.” One hundred twenty-four respondents (20% of all respondents) grouped in this cluster, of which 90% were farmers—the highest share of farmers across all clusters (31% of all farmers; Table A9)—and 63% were women—the only cluster with a greater share of female than male respondents (Figure A3; Table A8). Respondents in this cluster expressed a prominent value pluralism—the highest level of value expression, with three exceptions: the relational values of *social relations, stewardship, and aesthetics*, whereby only *stewardship* showed statistical differences between the clusters (Figure 2; Table A11).

The NCP preference cluster around “Health-related benefits” represented a group of respondents similar in preferring *reg-*

ulation of freshwater quality, regulation of air quality, and medicine (Figure 1; Table A7). Because respondents in this cluster expressed preferences for clean water, fresh air, and pharmaceutical resources, we termed this NCP set “Health-related benefits.” One hundred thirty-six respondents (22% of all respondents) were associated with this cluster, of which 77% were farmers (Figure A3; Table A8)—the second highest farmer share across all clusters (29% of all farmers; Table A9). Like the cluster around “Tangible benefits,” this cluster was associated with a prominent value pluralism, although value expression tended to be lower (Figure 2; Table A11).

The NCP preference cluster around “Resilience-related benefits” comprised a group of respondents similar in preferring *intergenerational benefits, cultural heritage and identity, and regulation of hazards and extreme events* (Figure 1; Table A7). This NCP set is related to guaranteeing the continuity of people–nature relationships—relevant to the future originating from the past—and emphasizing nature’s function to secure people’s integrity. Hence, we labeled this NCP set “Resilience-related benefits.” One hundred fifty respondents (20% of all respondents) made up this socially heterogeneous cluster with the highest share of guides across all clusters (44% of all guides (Table A9); 16% of the respondents clustering around “Resilience-related benefits”) (Figure A3; Table A8). The expression of diverse values was rather average—a moderate value pluralism—with minor nuances (Figure 2; Table A11). For example, the share of respondents in this cluster who valued nature in Kilimanjaro for meaningful relations regarding its *inspiration* was above average, but regarding *individual identity* and *tradition* below average.

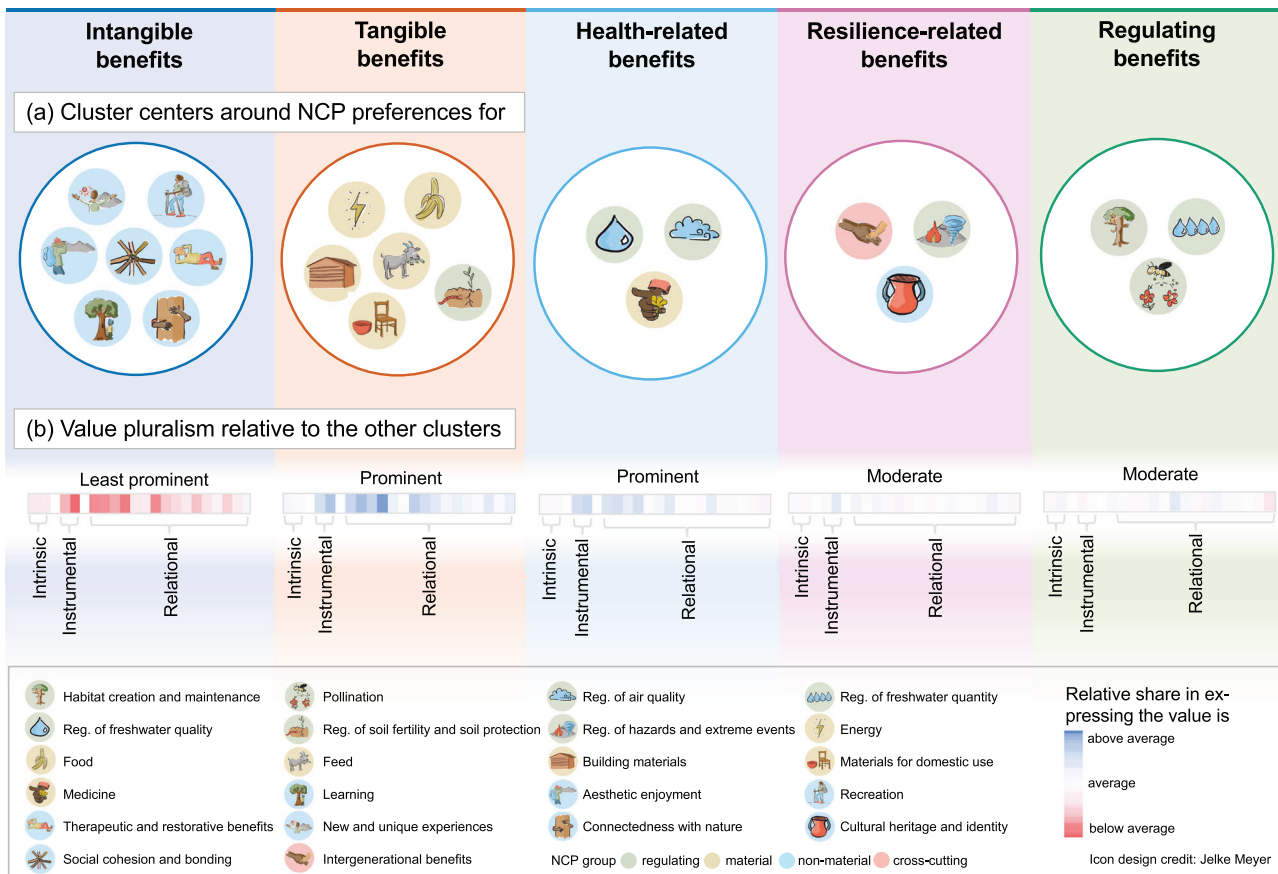


FIGURE 3 | Consolidated results from combining the Nature’s Contributions to People (NCP) and plural valuation frameworks to draw implications for inclusive conservation. Intrinsic, intrinsic values; Instrumental, instrumental values; Reg., regulation; Relational, relational values.

The NCP preference cluster around “Regulating benefits” consisted of a group of respondents similar in preferring three regulating NCP—*habitat creation and maintenance*, *regulation of freshwater quantity*, and *pollination* (Figure 1; Table A7). One hundred five respondents (17% of all respondents) belonged to this cluster characterized by a distinct social actor heterogeneity (Figure A3; Table A8). This cluster had the highest share of conservationists across all clusters (30% of all conservationists (Table A9); 14% of the respondents in the cluster around “Regulating benefits”). We found moderate value pluralism in this cluster, similar to the cluster around “Resilience-related benefits” (Figure 2; Table A11).

4 | Discussion

Combining the NCP and value pluralism frameworks showed that different degrees of intrinsic, instrumental, and relational values were associated with preferences for distinct NCP sets, for example, a prominent value pluralism with preference for material benefits (Figure 3). In doing so, this study revealed how applying complementary frameworks advances our understanding of the multidimensionality in which people relate to nature and calls for diversifying place-based conservation strategies, which both are critical to supporting more inclusive conservation research and practice.

4.1 | Broadening the Justifications for Inclusive Conservation: Complementarity of NCP and Values

We found that NCP preferences can be grouped into five NCP preference clusters (Figure 1). This implies that conservation approaches must be diversified to cover the distinct NCP preferences, a result that aligns with, for example, García-Llorente et al. (2018). In addition, our results indicate that people have different reasons for valuing nature, regardless of their preferences for NCP sets (Figure 2). NCP preferences do not reflect *why* nature matters to people and, hence, specific motivations that may facilitate conservation efforts, as opposed to, for instance, relational values (Chan et al. 2016). Hence, we argue that recognizing the diverse values associated with preferred NCP rather than solely relying on NCP preferences or values expressed might reveal complementary insights that are key to making conservation more inclusive.

4.2 | Not Only Are Instrumental Values Associated With Preferences for Material Benefits

We found a broad array of intrinsic, instrumental, and relational values—a prominent value pluralism—associated with farmer-related preferences for material benefits—represented by the clusters around “Tangible benefits” and “Health-related

benefits” (Figures 2 and A4; Table A10). This suggests that those people whose NCP preferences are geared toward material NCP recognized not only instrumental but also intrinsic and relational values. Recent studies—predominantly on smallholder farmers—revealed that relational values can coexist and even gradually overlap with instrumental and intrinsic values (e.g., Chapman & Desplazes-Zemp 2023; Ortiz-Przychodzka et al. 2023; Vizueté et al. 2025). These results support claims that aim to broaden the material-dependent understanding of preferences for material benefits by material-relating (Dawson et al. 2023), emphasizing motivations to conserve nature, which are also relevant for inclusive conservation.

4.3 | Implications for Inclusive Conservation

A social-ecological approach to protected areas suggests that conservation efforts should extend beyond the borders of protected areas and be integrated into the wider SESs in which these protected areas are embedded (Ghoddousi et al. 2022; Palomo et al. 2014). Operationalizing the more recent framing of conservation that emphasizes people-nature relationships (Cumming et al. 2023; Reyers & Bennett 2025) advocates for rethinking (inclusive) conservation as social-ecological approaches (e.g., Brockington 2002; Rai et al. 2021) that recognize diverse voices and their perspectives (Tallis & Lubchenco 2014; Raymond et al. 2022) in a manner that preserves biodiversity and ecosystem functioning. Thus, to avoid tensions between people and failure in conservation practice, it is crucial to account for diverse NCP preferences (e.g., García-Llorente et al. 2018) and refrain from prioritizing specific values (e.g., Yuliani et al. 2023). Given that our results revealed distinct clusters of people united by shared NCP preferences (Figure 1), each expressing varying degrees of value pluralism (Figure 2), this study underscores the need to leverage complementary frameworks to account for the multidimensionality of people-nature relationships in inclusive conservation research and practice (Figure 3).

We hypothesize that fortress conservation approaches (Brockington 2002), which restrict human access to natural areas, can disrupt meaningful connections with these places, diminishing relational values that can support conservation practices in- and outside protected areas (De Vos et al. 2018; Rai et al. 2021; Raymond et al. 2022). Limiting access to protected areas has eroded the sense of responsibility that relocated (Cundill et al. 2017) or currently restricted (Sanya et al. 2025) communities once held for nature. While borders around protected areas in the fortress conservation approach may support biodiversity conservation and nature-based tourism objectives, they often reflect the NCP preferences and values of nonlocals, such as tourists (Holroyd 2016), while jeopardizing locals’ interests (Xu & Huntsinger 2022). Thus, excluding locals from natural areas risks eroding key relational values, such as *stewardship* (Figure 2), that can motivate biodiversity conservation. This highlights the trade-offs of such exclusionary fortress conservation approaches, which often fail to include diverse voices and their relationships with nature.

Inclusive conservation approaches in SESs with (a) protected area(s) require fostering places where locals can also meet their NCP preferences and nurture their diverse values. We propose

that homegardens, which sustain biodiversity, long-term people-nature relationships, and livelihoods (Hemp 2006; Sébastien 2010), exemplify such places. In fact, growing evidence indicates that local management and use have historically fostered biodiversity hotspots (e.g., Rai et al. 2021). Unlike intensive farming, often tied to instrumental values (Ortiz-Przychodzka et al. 2023), the stewardship of smallholder farmers, as reflected in our results (Figure 2), supports such a threefold bottom-up conservation approach (Raymond et al. 2022). Thus, inclusive conservation must embrace place-based relational approaches that respect and represent the distinct ways people are motivated to conserve nature (Rai et al. 2021; Raymond et al. 2022; Kobluk et al. 2024).

5 | Conclusion

Broadening the justifications for inclusive conservation efforts involves acknowledging diverse voices and the multiple ways in which people relate to nature, including their diverse perceptions of *what* aspects of nature contribute to their quality of life (NCP) and *why* nature matters to them (values). By combining the NCP (Díaz et al. 2018) and plural valuation frameworks (Pascual et al. 2017, 2023), this study highlights the multidimensionality of people-nature relationships, which neither framework alone can capture. Hence, we conclude that inclusive conservation requires the application of complementary frameworks. To recognize the distinct association between NCP preferences and differing degrees of value pluralism, we call for, without compromising biodiversity and ecosystem functioning, diversifying place-based conservation approaches in SESs with (a) protected area(s).

Author Contributions

M.G., B.M.L., J.S., and J.P. conceived the ideas, identified context-specific NCP and values through interviews, and designed the methodology. M.G., J.S., colleagues of the research unit, and associated field assistants collected the survey data. H.V.W., M.G., and B.M.L. analyzed the data. M.G. supervised by B.M.L. led the writing of the manuscript. All authors contributed critically to the drafts and gave final approval for publication.

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Ethics Statement

The Ethics Committee at Leuphana University Lüneburg (reference numbers: EB-Antrag_202104-07-Martin-Lopez_KiliSES; EB-

Antrag_202109-12-Martin-Lopez_KiliSES-02; EB-Antrag_202111-17-Martin-Lopez_KiliSES-03; EB-Antrag_202206-11-Martin-Lopez_KiliSES 02) approved our survey. Additionally, the Tanzania Commission for Science and Technology (COSTECH; reference numbers: 2021-225-NA-2021-09; 2022-308-NA- 2021-09), the Tanzanian Wildlife Research Institute (TAWIRI), and Tanzanian National Parks (TANAPA) provided us with research permits.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The dataset is available in Gross et al. (2025b).

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Supplementary Materials: conl13129-sup0001-SuppMat.docx