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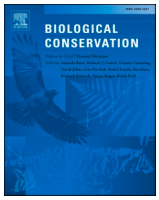

Perspective

‘Participatory’ conservation research involving indigenous peoples and local communities: Fourteen principles for good practice

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ABSTRACT

Good practice in ‘participatory’ research in conservation, especially where it involves Indigenous peoples and local communities, has become especially topical following the adoption of the Kunming-Montreal Global Biodiversity Framework in 2022. The Framework sets out three cross-cutting stipulations that have implications for conservation research: (i) that the important role that Indigenous peoples and local communities play in global conservation should be recognised; (ii) that conservation should be rights-based, and (iii) that implementation needs to be based on traditional knowledge as well as scientific evidence. This will require a paradigm shift towards more equitable, inclusive approaches to conservation that support local environmental stewardship. Conservation researchers can play a significant role in supporting this shift, and we see this as a rational next step in the advancement of conservation science as a meta-discipline. Here, we explore these issues from our perspective as a group of researchers who work with Indigenous peoples and local communities. We briefly review the history of ‘participatory’ research in conservation and discuss three cross-cutting themes relating to conservation research that involves Indigenous peoples and local communities: participation across the different stages of the research process; data collection methods and their relative strengths and weaknesses in terms of participation; and ethical issues related to Indigenous and community participation. Finally, we present fourteen broad principles for good practice, which together provide a novel framework to build greater equity into the development and implementation of conservation research involving Indigenous peoples and local communities.

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1. Introduction

Good practice in 'participatory' research, especially where it involves Indigenous peoples and local communities, has become especially topical in conservation since 196 countries adopted the Kunming-Montreal Global Biodiversity Framework (GBF) at the 15th Conference of the Parties to the Convention on Biological Diversity in 2022 (CBD, 2022). The GBF is the overarching global policy framework for biodiversity conservation over the next 25 years, setting targets and goals up to 2050. It goes further than any previous major international conservation policy framework in recognising the important role that Indigenous peoples and local communities play in global conservation (paragraph 8), calling for conservation to be rights-based (paragraph 14) and for implementation to be based on traditional knowledge as well as scientific evidence (paragraph 19) (op. cit.). In doing so, the GBF points to the need for a transformative shift in conservation towards more equitable approaches that support local environmental stewardship (Newing et al., 2023).

We believe that conservation researchers have a significant role to play in supporting this shift, and we see this as a rational next step in the advancement of conservation science as an applied meta-discipline (Meffe, 1998; Newing, 2011: 4). However, the procedural, methodological and ethical issues involved are complex, requiring advanced skills both in the social sciences and in facilitating participatory processes. Despite significant advances in social aspects of conservation science over the past 30 years, many conservation researchers still lack formal training in social science methods and/ or in applied management skills (Slater et al., 2024), and may therefore feel ill-equipped to fulfil this role. Therefore, in this paper, we provide a set of broad principles outlining good practice in designing and implementing participatory research, especially where it involves Indigenous peoples and local communities. The principles build both on our own experiences and on the existing literature (which is reviewed briefly below). We do not set out to be prescriptive about the details of how to 'do' participatory research – something that needs to be negotiated between researchers and Indigenous peoples or local communities on a case-by-case basis – nor to duplicate existing methodological frameworks that have been developed either by conservationists (e.g., see Mishra, 2016; Lichtenfeld et al., 2019) or by Indigenous peoples (several of which are mentioned below). Rather, the principles offer a novel framework to support conservation researchers with different disciplinary backgrounds and levels of experience to incorporate greater equity, respect for human rights, and support for local environmental stewardship in their work, thus meeting the stipulations in the GBF. The principles also point to the need for ethical protocols to be revised to address ethical and legal responsibilities, not only towards individual participants but also at the level of communities and peoples.

The original stimulus for writing this paper was a workshop session on participatory research for early-career conservation researchers, which was held at a meeting of the Interdisciplinary Conservation Network (ICN) in July 2021. The ICN workshops are open to applicants from universities and NGOs across the world, and the attendants are selected or invited based on an evaluation of their ability to bring new ideas and experiences that are relevant to the workshop themes (see https://iccs.org.uk/event/interdisciplinary-conservation-network-2020-2021/). In the months following the workshop, we engaged with a wider group of researchers, principally within our home institutions but also through our networks, to explore the issues that had arisen,. We targeted early-career researchers in conservation and related disciplines who were working on issues related to participation. We then engaged through informal discussions and presentations about our own experiences, both online and at a second workshop. As we did so, we interrogated the literature to clarify issues that emerged from these discussions. In a final workshop in June 2022, we invited feedback on our preliminary conclusions from a larger targeted group of (mostly) early-career researchers working on participation from a range of disciplinary perspectives spanning the humanities and the natural and social sciences. This perspective paper is the outcome of this process. In the following sections, we briefly review how the terms participation and participatory research have been applied in conservation and set out how we distinguish between these two terms. We then explore three cross-cutting themes which emerged from our discussions: (i) local participation across the research process; (ii) data collection methods and their implications for participation, and (iii) ethical issues related to participation. Finally, based on our exploration of these themes and on the three stipulations from the Global Biodiversity Framework outlined above, we present fourteen principles for good practice approaches to participation in conservation research.

1.1. Positionality statement

We are a group of researchers from diverse areas of the world and from different subdisciplines within conservation, all of whom work with Indigenous peoples and local communities. Between us, we represent ten nationalities (from Europe, Asia, and North and South America) and have field experience in 36 countries covering all continents of the world except Antarctica. Further details, including on our genders and research interests, are provided in Table S1 in Supplementary Materials.

1.2. Terminology: indigenous peoples and local communities

In this paper, we adopt the dual terminology that is used in fora related to the Convention on Biological Diversity (CBD) ('Indigenous peoples and local communities'). This dual terminology reflects the fact that many Indigenous peoples do not self-identify as discrete 'communities' but as 'peoples', based on their ethnicity. Its significance for researchers is twofold. First, engaging with Indigenous peoples and other local communities at a collective level as well as individually is a legal requirement for any activity that may affect their collective rights (Newing and Perram, 2019), although this is rarely addressed in research ethics protocols. Second, while we recognise that what constitutes a local community varies from place to place (for example, it may take the form of a clustered settlement, a village, a group of dispersed households, or a municipality, among others), and that local communities are not homogenous, autonomous, or clearly bounded (Agrawal and Gibson, 1999), engaging with Indigenous peoples and others collectively is fundamental to effective conservation wherever they manage their environment collectively (Armitage et al., 2020). Therefore, our focus is principally on collective local participation and engagement, through whatever systems of social organisation and representation local people themselves recognise (Macaulay, 2016).

1.3. Participation and 'participatory' research processes

Concepts of participation and participatory research have been debated, refined and heavily critiqued in a wide range of disciplines over several decades, and there is a confusing array of definitions, conceptual frameworks and methodologies. The lack of conceptual clarity has been identified as a barrier to effective research and practice, especially in disciplines where the concept of participation is applied uncritically (Keahey, 2021; Mosurska and Ford, 2020). Conservation science is one such discipline, and our own initial discussions reflected this, generating an extremely diverse set of perspectives on what 'counts' as participatory research in conservation (Fig. S1 in Supplementary Materials). To unpick this further, in this section, we describe several different approaches to participation that have been applied in conservation and then set out how we distinguish between the terms participation and participatory research *process* in the rest of this paper.

The most widespread form of participation in conservation research is citizen science, which at its simplest, involves the collection of data by volunteers using fixed protocols that are developed by researchers

(Frigerio et al., 2021). Citizen science is central to conservation monitoring in some parts of the world; for example, it has been estimated that in 2009, citizen scientists provided over 80 % of all biodiversity data in Europe (Schmeller et al., 2009). In its original form, citizen science involves only a passive form of participation: the participants play no part in strategic decisions about the research. However, it can also involve citizens as collaborators, or as project leaders (ECSA, 2015), and is being used increasingly by Indigenous peoples and others to actively address their own concerns (Danielsen et al., 2022; Farhan Ferrari et al., 2015; FPP, 2020).

The distinction between more passive and more active forms of participation has been a central thread in the evolution of thinking about participation. One highly influential model was Arnstein's ladder of participation (Arnstein, 1969), which described participation in public planning processes in the United States of America as a progression from initially passive forms up the rungs of the ladder to more 'genuine' (active) forms, culminating in full citizen control. Arnstein's ladder has since been criticised because participatory processes are much more complex and diverse than this suggests, and because different forms or levels of participation are appropriate in different contexts (Sterling et al., 2017; Perz et al., 2022; Vaughn and Jacquez, 2020). However, typologies from more passive to more active forms of participation continue to be widely used for descriptive purposes (IAP2, 2018). Pimbert and Pretty (1995) developed a typology of this kind in conservation to describe local participation in protected area management. They observed that the dominant forms of participation were "at best, instrumental" (op. cit.: p. 26), reflecting the fact that conservation was commonly framed by externally defined priorities and values rather than those of local people themselves.

An additional perspective on participation in conservation research and practice comes from rural development, where Rapid Rural Appraisal and Participatory Rural Appraisal were developed in the 1970s and 1980s. Rapid Rural Appraisal was designed as a quick, efficient methodology to gather information from large numbers of people in rural communities without the need for large-scale surveys. It evolved into Participatory Rural Appraisal, which was designed as a means to support local communities in working towards their own aspirations (community 'empowerment': Chambers, 1992). A toolkit of task-based interactive methods was developed for these purposes, and despite criticisms of participatory approaches, which often fail to address power imbalances (Cooke and Kothari, 2001), these methods remain in widespread use and are widely known as 'participatory methods'. They were later adopted in conservation research (see Newing, 2011 for an overview and Section 3 of this paper for further details).

Several alternative terms had been coined over the decades to refer specifically to research processes that are led or co-led by local people, including co-enquiry (Caruso et al., 2016) and community-based participatory research (Pontes Ferreira and Gendron, 2011). There is also a growing literature on Indigenous research methodologies, which emphasise procedural aspects, focusing on recognition and respect for the unique worldviews of Indigenous peoples, and for their often-profound relationship with the environment (Kirkness and Barnhardt, 1991). Transdisciplinary research represents a field of enquiry that is related to participatory research and the two terms are sometimes used interchangeably: both focus on the involvement of non-academics in knowledge generation, co-production, or co-creation (Norström et al., 2020), bridging the divide between science and practice (Lam et al., 2021; Pohl et al., 2021). However, transdisciplinary research puts greater emphasis on problem complexity and on working across multiple stakeholder groups whereas participatory research tends to refer to research involving and focusing on local communities (for example see Breckwoldt et al., 2021).

In conclusion, the term 'participatory research' continues to be used to refer to a wide range of scenarios. Part of the confusion stems from the lack of a clear distinction between participation in itself and what 'counts' as a participatory process, and therefore we distinguish between these two in the rest of this paper. We use the term participation to include the full spectrum of ways in which people can participate, from the most passive forms to the most active. In contrast, we understand participatory *process* (and by implication, participatory research) to indicate that people are involved not simply as informants or respondents during data collection, but more strategically as partners, on an ongoing basis. The term 'participatory methods' is different again, signalling a range of data collection methods and tools that are distinct from conventional academic social science methods (questionnaires, focus groups, qualitative interviews, participant observation) and were designed to provide spaces for group reflection, interaction and deliberation, thus enabling a deeper level of engagement and collaboration.

2. Emerging themes related to participation in conservation research

2.1. Local participation across the research process

A common perspective that emerged from our discussions was that the 'ideal' research program involves local participation in all stages of the research process (Cornwall, 2008; Perz et al., 2022; Reed, 2008). However, our experiences pointed to this rarely being the case, bringing up the question of what levels and forms of local engagement make for good practice in different contexts. To explore this question, we considered our own research experiences according to the six stages in research defined by Perz et al. (2022) as: (1) problem definition; (2) proposal development and methodology; (3) data collection and compilation; (4) data analysis, key insights, and conclusions; (5) dissemination and knowledge exchange; and (6) application of knowledge in action. We recognise that this linear model is a simplification of the research process, which often involves feedback between different stages (Vaughn and Jacquez, 2020). Nonetheless, institutional and funding requirements mean that individual research projects usually follow this linear sequence, at least on paper, and it serves as a useful framework to help structure reflections on how and in which ways participation was integrated (successfully and not) into our research projects (see Fig. S2 and Table S2 in Supplementary Materials).

What came from this exercise is a much more modular and flexible picture of what best practice in 'participatory research' entail in terms of process. Some of our research projects, by involving strategic participation specifically during the initial problem definition stage, allowed for the research to be co-designed, following which it was agreed for the research to be carried out by the researchers alone. The researcher-derived outputs were then shared with and used by indigenous peoples or local communities for their own practical purposes (e.g., Scenario 3 and 4 in Table S2 in Supplementary Materials). Some other projects that involved participation not in the initial framing but only in the design of the methodology and interpretation of results also enabled the participants to use the research outputs during dissemination and application. In still other projects, we as researchers had decided on the objectives, designed the methodology, and then recruited local participants for data collection. For these, this limited 'participation' was often critical to answering a research question but was not necessarily matching the highest priority of indigenous peoples and local communities.

In other words, what we took away from examining a wide range of case studies is that good practice does not necessarily require participation at every stage of each individual research project. Rather, what is important is that researchers respect rights (see the section on ethics below) and consider what level of participation is likely to be realistic and appropriate at each step in the research process, discussing this as early as possible with the participants. For example, fully participatory processes (in the sense outlined at the end of the previous section) may not be practical for projects that have a short lifetime, because the in-depth, interactive approaches that they require are often time-consuming (both for researchers and for participants) and may require

longevity to provide a return on resource investment for all those involved. Furthermore, a participatory process may only be suitable at a specific stage or stages of the research process, depending on the researcher's familiarity with the context, the degree to which the interests of the different parties coincide, and the capabilities of both the researcher and local people (including those that are related to the political and economic context, such as their political liberties, financial constraints, and economic, legislative, and social rights and freedoms; Nussbaum, 2003; Sen, 1990).

An additional important element in good practice is that researchers consider their entry and exit strategies carefully in planning and negotiating local participation in research. This will condition the kind of relationships that will be forged locally, how those will be maintained and eventually terminated, and thus ultimately the 'usefulness' of participation to all parties - both in terms of the research aims and also the impacts and benefits of the research on indigenous peoples and local communities. As stated above, researchers should enter into dialogue with the participants or collaborators as early in the process as possible, tailoring their approach to fit their familiarity with the field site (e.g., a scoping visit, an initial stakeholder analysis, coordination of a formal introduction, land access permissions). This dialogue should be open and flexible. Where Indigenous peoples have developed their own guidelines on research collaboration, these should form the basis for negotiations (No'kmaq et al., 2021). For example, the San Code of Ethics (SASI, 2017) calls for respect, honesty, justice and fairness, care and process when working with the San people. Frameworks such as Two-Eyed Seeing (*Etuaptmumk*) (Bartlett et al., 2012; Peltier, 2018) and Braided Rivers (*He Awa Whiria*) (Martel et al., 2022) provide guidance on the integration of diverse knowledge systems, aiming to bridge Indigenous knowledge and scientific knowledge in a mutually respectful and collaborative manner.

Although we recognise that researchers cannot and should not entirely control how participation will work out in practice, posing thoughtful questions regarding a project's aims and characteristics (e.g., institutional setting, researcher's capabilities, funding), as well as interests of Indigenous peoples and local communities, can help guide it in a way that integrates participatory elements as effectively and equitably as possible. How researchers and local partners navigate decision-making throughout the research process conditions the direction that a research programme takes over time, as well as its outcomes both academically and socially. This program-structuring navigation requires, we argue, a view of participation that is neither rigid nor prescriptive, countering the common view of participation as a necessary element across all research stages. Approaching local participation in research as modular and scalable, rather than using the concept as a universal project descriptor, we believe, allows for much greater clarity in the planning and execution of a research program.

2.2. Methods for participation in data collection

The second cross-cutting theme relates to the methods and tools available for participation in data collection. In this section, we highlight how certain methods used for data collection are particularly relevant for a participatory research process. This also aligns with various GBF targets, in particular Target 21, which aims to "ensure that knowledge is available and accessible to guide biodiversity action" (including traditional as well as scientific knowledge), and Target 22, which aims to "ensure participation in decision-making and access to justice and information related to biodiversity for all", which is central to a rights-based approach (CBD, 2022). We expect our review to serve as a starting point and encourage a more participatory approach in conservation for researchers with varied backgrounds.

The term 'participatory methods' is commonly used to refer to a 'toolkit' of interactive, task-based data collection tools, many of which were developed for use in rapid and participatory rural appraisals as alternatives to conventional academic methods (see above). However, by definition, all social science data collection methods involve some form of participation. More structured methods tend to involve more passive forms of participation (giving information) whereas more open-ended methods lend themselves more readily to more active participation, up to and including deliberative discussion (Fig. 1). Structured methods such as questionnaires and structured interviews, and the recording of observations in fixed formats on dedicated apps, are particularly useful for generating quantitative data on a predefined set of specific variables but they offer little opportunity for active participation. More open-ended, qualitative methods such as focus groups and semi-structured or open-ended interviews provide participants with a greater opportunity for more active participation, because they create spaces for the participants to present and discuss their views from their own perspective (Warren, 2002; Murali et al., 2022). Participant observation offers the researcher the opportunity to "gain informal, candid insights into everyday life" (Chua et al., 2022: 18) by learning from actions and behaviours of local people through direct observation, participation in group activities, and informal interviews (Crandall et al., 2018). Chua et al. (2022) have recently published a toolkit on the use of participant observation and other ethnographic research methods by conservationists, which as far as we are aware is the first of its kind.

Additionally, several transdisciplinary approaches have been developed to facilitate deeper engagement. For example, Indigenous storytelling, which can take place individually or in groups, is an effective tool for understanding and documenting cultural knowledge and biological diversity (Sium and Ritskes, 2013). Similarly, creating deliberative spaces for open discussions can better facilitate dialogue on conservation issues with Indigenous and local peoples as equal partners, with agency and voice (e.g., No'kmaq et al., 2021).

Visual methods such as photovoice, participatory video, digital storytelling, and performative social science, have proven particularly useful in conservation research (Swanson and Ardoin, 2021), partly because they can provide a 'deep' understanding of local perceptions, values, and worldviews. They can also enable participants to reflect individually and collectively upon their own realities, and better represent these realities to external actors, including researchers, conservation organisations, and government authorities (Swanson and Ardoin, 2021). When used in this way, they are powerful tools for

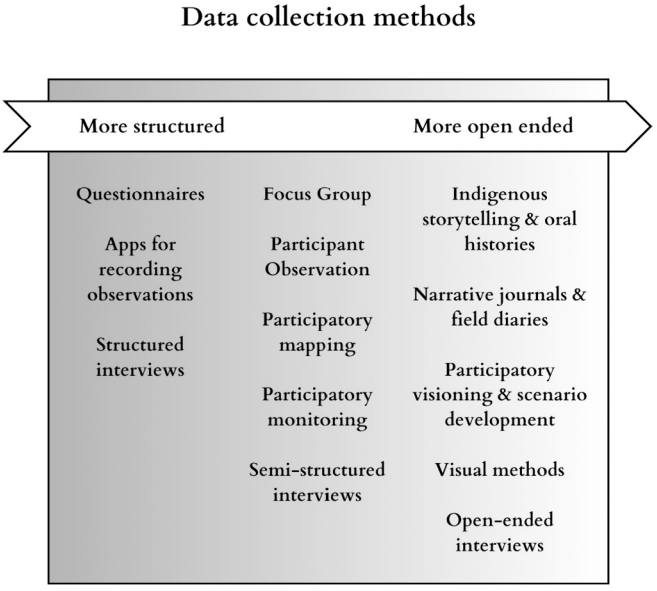

Fig. 1. Methods for data collection in conservation research involving Indigenous peoples and local communities, placed along a continuum from more structured to more open-ended. Any method may be used as part of a participatory research process, but more open-ended methods allow more active participation during the data collection stage.

strategic collaboration and participation. However, these methods may require substantial investment in terms of equipment and training. Further, cultural and context specificity matters; for example, being photographed or filmed might be considered inappropriate in some contexts.

Other methods include narrative journals and field diaries, which have been employed to record community voices in written form, often over longer time periods. For example, hunter diaries are widely used to self-report data on hunting patterns or wild meat consumption (e.g., Brittain et al., 2022), and have also been used to self-record pro-conservation behaviours (e.g., Alexander et al., 2022). Participatory visioning and scenario development offer a more forward-looking perspective, by engaging with multiple stakeholders to build alternative futures that span key uncertainties (Kok and Van Delden, 2009). Participatory visioning in socio-environmental contexts can promote active stakeholder engagement, bridging multiple knowledges and perspectives, encouraging complexity thinking of participants, and improving equity, legitimacy, and quality of environmental decision-making (Oteros-Rozas et al., 2015).

New technological advances also feature prominently in recent developments in participatory research processes. Geo-spatial information can be collected and analysed through public participation GIS (PPGIS), participatory GIS (PGIS), and volunteered geographic information (VGI). Participatory GIS has been used for 'counter-mapping', which engages explicitly with local communities and/or political movements by mapping against dominant power structures (Hodgson and Schroeder, 2002), and increased smartphone availability, network coverage, and sophistication has enabled Indigenous peoples and local communities to map their lands and resources and document environmental change (Moustard et al., 2021), although there are still issues of unequal accessibility. These methods can also be used to map and monitor spatial values, perceptions, and attitudes, behaviour patterns, everyday practices, and activities, spatially defined future preferences or visions, preferred place features such as road/trail networks, and wildlife observations (Fagerholm et al., 2021). Participatory GIS is particularly relevant to facilitate the recognition and integration of Indigenous and traditional territories in achieving area-based conservation targets, and to respecting their cultures and rights over their lands in conservation practice (CBD, 2022).

In summary, there are many innovative participatory and transdisciplinary methods that offer greater opportunities than the conventional social science methods for local engagement and agency, and for incorporation of local and traditional knowledge. However, they can also be challenging to implement. They require considerable trust, which may come only with long-term engagement. The researchers also need specific 'soft' skills. One such skill is deep listening, which involves receiving, understanding, evaluating, and responding to information shared, while cultivating respect and empathy, suppressing judgement, and recognising the agency of others (Staddon et al., 2023). Reflexivity is also crucial, and involves an approach to research that is self-critical, responsive, and adaptable (Montana et al., 2020).

2.3. Ethical issues related to local participation in research

The bottom line for ethical practice is that all research must adhere to international human rights laws and standards (Newing and Perram, 2019), in line with the stipulation in the GBF that implementation should be rights-based. To fulfil this requirement, researchers have an ethical obligation to respect human rights, and must also ensure that they are not complicit in research that contributes to human rights abuses such as forced displacement (Smallhorn-West et al., 2023).

They may also need to engage with indigenous peoples and local communities collectively as well as individually, although guidance for doing so is often lacking in conventional research ethics frameworks (e.g. AAA, 2012; ESRC 2022). According to international law (see Newing and Perram, 2019), any activity that may affect Indigenous peoples and local communities with collective rights requires their collective free, prior and informed consent (FPIC), based on full information on the implications of consenting or not. This includes any activities, including research, on their traditional lands. Therefore, researchers must seek FPIC prior to final confirmation of the study site, and must respect the right of Indigenous peoples and local communities to say no.

Beyond the fundamental requirements outlined above, we have identified five primary ethical issues related to local participation in conservation research. Firstly, shifting towards more inclusive, equitable models of research also requires that researchers acknowledge and work with power imbalances between themselves and participants, and allow space for the voluntary inclusion of any local community member's voice. Yet, this can conflict with the right of Indigenous peoples to choose their own representatives, who may exclude some people or groups. This raises both an ethical and a practical challenge: if the researcher determines participation, they hold power, at least initially, over the research questions and direction of the research. For these matters to be decided by or with the community, the researcher must relinquish at least some of their power over the direction of the research (West and Schill, 2022). An additional consideration is the unintentional exclusion of some individuals or groups due to the time-consuming nature of participatory research processes (Minkler, 2004; Wilmsen et al., 2012), or the poor legacies from previous projects that result in a sustained negative perception of the costs and benefits of participation by some members of the community (Brittain et al., 2020). Talking to the community about how to minimise the built-in barriers to participation is a way to help ensure better participation in the long-term.

Secondly, international law also recognises the collective right of Indigenous peoples to self-determination (to determine their own future), and the right to participate in decision-making processes that will affect them (Brittain et al., 2021). This may apply to research intended to inform decisions, for example, about future land and resource use (or restrictions on use). However, a key challenge for participation is that, often, the structures and underlying assumptions of research partnerships do not align with Indigenous knowledge systems (Nadasdy, 2005; Reo et al., 2017), thus hindering Indigenous peoples' exercise of their rights. Historically, western science and values have prevailed in decision-making of this kind, both nationally and internationally (Guibrunet et al., 2021). More widespread use of some of the approaches and methods outlined in the previous two sections will be valuable in addressing this challenge, opening more inclusive spaces for collective local participation that builds on Indigenous and traditional knowledge.

A third issue in ethical practice is related to the stipulation in the GBF that the important role of Indigenous peoples and local communities in conservation should be recognised. Researchers can help build the evidence base for this, taking a robust approach and facilitating equitable dialogue. Learning what the dominant challenges are in a particular site through meaningful engagement with community members, rather than framing the research purely according to external perspectives, enables researchers and local participants to jointly identify the underlying drivers of environmental change as well as their common interests or areas of conflicting interest. In this way, researchers can support more equitable partnerships with Indigenous peoples and local communities who wish to improve their environmental stewardship. There is substantial evidence that this approach results in more effective conservation (Dawson et al., 2024).

A fourth, crucial ethical issue in conservation research involving Indigenous peoples and local communities concerns intellectual property rights (IPR). Balancing collective and individual IPR is vital for fostering equitable collaboration while safeguarding the rights and interests of Indigenous knowledge-holders in conservation initiatives. Indigenous groups often hold collective IPR over traditional knowledge, based on and emphasising their communal stewardship practices (Swiderska, 2006). Concurrently, some knowledge holders may seek individual recognition and benefit (Bodeker, 2003). Navigating these

complexities needs culturally sensitive and context-specific approaches to IPR, recognising both individual and collective ownership of traditional knowledge and ensuring that benefits derived from research, such as patents or royalties, are shared equitably according to agreements negotiated in advance with the knowledge-holders. By establishing their own standards of practice, communities help to set the "rules" for research (McGregor, 2009; Shackeroff and Campbell, 2007), and create a shared understanding of self-determination. For example, research agreements can formalise partnerships, set expectations, facilitate informed consent and help researchers gain an awareness of local norms and values (Shackeroff and Campbell, 2007; Latulippe, 2015). However, codes and contracts are not a panacea; researchers might behave unethically despite standards of practice while many will behave ethically without them. Ultimately, meaningful and respectful relationships often form the basis for ethical engagement (Koot et al., 2023).

Finally, the GBF specifies that implementation should be based on both scientific evidence and traditional knowledge. Respect for traditional knowledge and practice is critical to the success of collaborative initiatives, bearing in mind that respect has culturally specific meanings and conceptualisations (Reo et al., 2017). Combining different knowledge systems requires navigation of divergent epistemological and ontological frameworks, which often poses a barrier to meaningful collaboration (Briggs, 2005; Campbell, 2002). Researchers may consciously or subconsciously prioritise western science, a bias stemming from its historical construction as intellectual and rational, and of traditional knowledge as primitive and parochial (Grosfoguel, 2013). Some may assume that Indigenous knowledge must be validated by western science, overlooking differences within and similarities between local and scientific perspectives (e.g., Agrawal, 1995; Mistry and Berardi, 2016). Further, Indigenous knowledge can be ignored intentionally due to inequitable political relationships, or unintentionally by adopting a narrow view of what Indigenous knowledge is. For example, the latter may involve recognising aspects of Indigenous knowledge that mirror thinking or approaches within western science, while dismissing values-based or ancestral knowledge that sits less easily with scientific perspectives. Entering a collaboration with a preconceived notion of what constitutes Indigenous knowledge can slow the development of initiatives (Reo et al., 2017; Latulippe, 2015).

Participatory research processes can play an important role in overcoming these kinds of challenges. They can provide a framework and employ methodologies to incorporate questions and approaches from different perspectives, enabling more equitable knowledge production and deliberation. Recognising the legitimacy of a wider range of forms of Indigenous knowledge, including ceremonial practices, is a crucial part of respect for these knowledge systems. Appreciating that the researcher is the learner regarding the community's Indigenous knowledge enables Indigenous partners to share some of the relevant aspects of their knowledge that may otherwise have been ignored (Reo et al., 2017). There is a growing number of examples of approaches based on this kind of appreciation, which give traditional knowledge and scientific knowledge an equal platform (e.g., Aini et al., 2023; Kenrick et al., 2023; Mistry et al., 2023).

3. Discussion

Based on the reflections in the preceding sections, in Fig. 2 we present a set of 14 broad guidance principles for good research practice. We are not suggesting that *all* research in conservation needs to be participatory or collaborative, but we see respect for rights and equity as fundamental to ethical practice in all conservation research, and the more widespread adoption of participatory and collaborative approaches as a rational next step in advancing and decolonising conservation science (Chilisa, 2017) as an applied, rather porous meta-discipline.

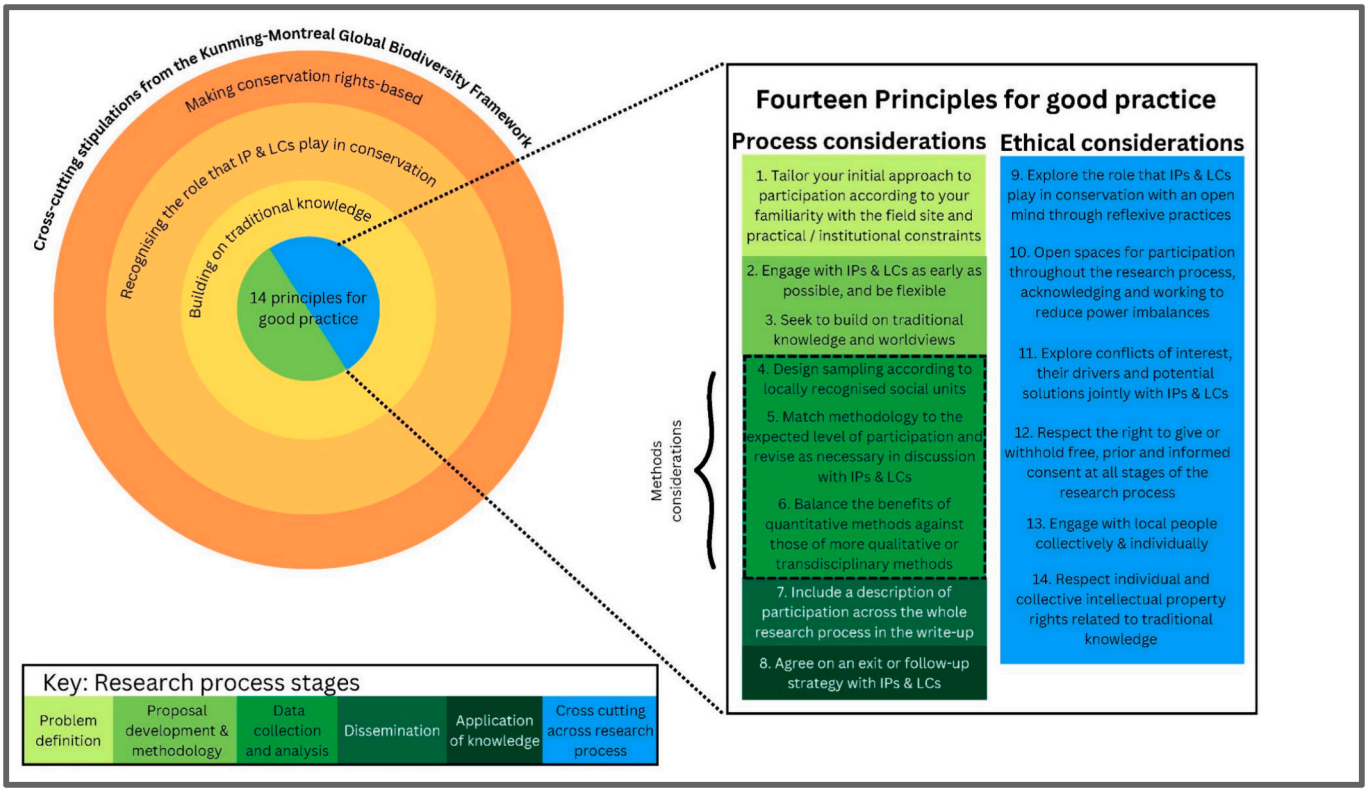

Fig. 2. Fourteen principles for good practice towards local participation in conservation research, as they apply across different stages in the research process. All of them are relevant to the three cross-cutting stipulations of the Kunming-Montreal Global Biodiversity Framework shown in the circle on the left (Ips: Indigenous peoples; LCs: local communities).

To reiterate, designing and carrying out ethical, impactful 'participatory' research requires a specific skill set – especially when it involves Indigenous peoples and local communities – and this skill set is not currently part of the standard methodological repertoire held by conservation scientists, despite increasing recognition of its importance (e.g., see Bennett et al., 2017; Slater et al., 2024). For this to change, participatory research methods and processes need to be incorporated into formal training curricula, research funding needs to be flexible enough to enable researchers to adopt exploratory, interactive approaches, and institutional requirements, including those of ethical review boards, need to incorporate measures to protect the collective as well as individual rights. We as researchers need to foster a more informed approach to research involving local and Indigenous ways of doing and knowing, including when researchers themselves are Indigenous (Grenz, 2023). As a first step in this direction, we encourage conservation researchers to reflect on the above principles and build on them through dialogue with Indigenous peoples and local communities, whether it be at their individual study sites or in national and global policy fora.

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Declaration of competing interest

None.

Data availability

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

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Appendix A. Supplementary data

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