

Stakeholder Engagement Handbook

For transdisciplinary, co-created and impact-oriented research



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This handbook is a revised and expanded edition of Durham E., Baker H., Smith M., Moore E. and Morgan V. (2014), The BiodivERsA Stakeholder Engagement Handbook, BiodivERsA, Paris. It retains and adapts elements of the structure, guidance, and tools developed for the 2014 edition, while incorporating substantial revisions and new material. Responsibility for the revised content rests with the authors of this edition.

What is Biodiversa+

The European Biodiversity Partnership, Biodiversa+, supports excellent biodiversity research with impact for policy and society. Connecting science, policy and practice for transformative change, Biodiversa+ is part of the European Biodiversity Strategy for 2030, which aims to put Europe's biodiversity on a path to recovery by 2030. Co-funded by the European Commission, Biodiversa+ brings together partners from research funding, research programming and environmental policy across European and associated countries to work on five main objectives:

1. Plan and support research and innovation on biodiversity through a shared strategy, annual joint calls for research projects, and capacity building activities.
2. Set up a network of harmonised schemes to improve monitoring of biodiversity and ecosystem services across Europe.
3. Contribute high-end knowledge for deploying Nature-based Solutions and valuing biodiversity in the private sector.
4. Ensure efficient science-based support for policy-making and implementation in Europe.
5. Strengthen the relevance and impact of pan-European research on biodiversity in a global context.

More information: <https://www.biodiversa.eu/>

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Foreword

Biodiversity research does not operate in isolation. It intersects with economic systems, political decision-making, food and energy security, and broader societal concerns, including equity and the rights and roles of Indigenous Peoples, local communities, women, and youth. Addressing these interconnected challenges requires collaboration across disciplines and across society. Stakeholder engagement is therefore not an optional add-on, but a core component of meaningful research.

Since its start in 2008, the precursor network BiodivERsA, now Biodiversa+, has supported collaborative research to address urgent challenges in biodiversity conservation, restoration, and sustainable use.

With the first version of this Handbook, published in 2014, BiodivERsA affirmed its commitment to strengthening the science-policy-society interface. The guidance presented was designed to support researchers in engaging non-academic stakeholders, particularly policymakers, from the earliest stages of their projects.

This updated edition reflects an ongoing dialogue with key European initiatives working to enhance biodiversity knowledge and its uptake, including BioAgora¹ and Eklipe², as well as contributions from the Global Youth Biodiversity Network³ and the Biodiversa+ Enlarged Stakeholder Board.⁴ By aligning experiences and approaches, we aim to foster coherent, inclusive and effective engagement practices and community empowerment across Europe and beyond.

This Handbook is both a practical guide and an invitation: an invitation to strengthen shared standards, to deepen collaboration, and to ensure that biodiversity research contributes to informed decisions and lasting positive change. The practical guide can also be used by sectors other than research.

¹ <https://bioagora.eu>

² <https://eklipse.eu>

³ <https://www.gybn.org>

⁴ <https://www.biodiversa.eu/governance/enlarged-stakeholder-board>

PART I: INTRODUCTION

I.1. Background

Initially published in 2014, the Stakeholder Engagement Handbook has become a widely used reference for stakeholder engagement in biodiversity research in Europe and beyond, with more than 260 citations. The original edition established a structured, practice-oriented framework at a time when stakeholder engagement was still emerging within biodiversity research. It provided practical principles, tools, and methods to support participation throughout the research process at both European and international scales.

Since then, the relationship between research and society has continued to evolve. Driven by new sustainability challenges, growing attention to equity and inclusion, and increasing expectations for research impact, concepts such as stakeholder, co-creation, participation, and empowerment have been critically examined and refined across research and policy communities. At the same time, there is increasing recognition of the diversity of knowledge systems, including Indigenous and local knowledge, as well as the values and power relations that shape how research is defined, conducted, and used. Together, these developments reflect a broader shift in which stakeholder engagement is increasingly recognised as an integral component of producing relevant and impactful research rather than an optional add-on.

This shift is particularly significant in biodiversity and ecosystem research, where scientific knowledge informs decisions with important societal, economic, and political implications. Addressing these complex challenges requires interdisciplinary and transdisciplinary approaches that bring together academic disciplines, such as ecology, economics, and the social sciences, with the knowledge, perspectives, and experience of non-academic actors (Neßhöver et al., 2013). However, bringing together these diverse perspectives can be challenging, as participants often have different objectives, expectations, and understandings of both the problems and their potential solutions. Building shared understanding therefore requires clear communication, mutual learning, and carefully designed engagement processes (Young et al., 2013).

Despite widespread recognition of its importance, stakeholder engagement is still often introduced too late in research processes or fails to fully address the needs and expectations of those involved. There is no single approach that is suitable for every context. Effective engagement requires clearly defined objectives, transparency about what is feasible, dedicated time and resources, and realistic expectations among all participants. When these conditions are met, stakeholder engagement can enhance the relevance, legitimacy, and usability of research while contributing to broader transformations in biodiversity conservation, restoration, and the sustainable use of nature.

This updated edition builds on experience accumulated across the Biodiversa+ partnership and reflects emerging practices and frameworks developed through European and international initiatives, including Eklipse, BioAgora, and the International Association for Public Participation (IAP2). By integrating these complementary approaches, it aims to support research teams in designing stakeholder engagement processes that are robust, inclusive, and appropriate to their specific research context, while strengthening coherence across European research and policy landscapes.

This handbook is intended as a practical, forward-looking guide for research teams within and beyond the Biodiversa+ community. It provides guidance on designing meaningful and effective stakeholder

engagement processes, selecting appropriate engagement methods, and aligning engagement approaches with research objectives and context. In doing so, it aims to strengthen collaboration between science and society and maximise the relevance, legitimacy, and impact of biodiversity research.

I.2. How this handbook works

This handbook is designed as a practical resource that researchers can use throughout the lifecycle of a biodiversity or ecosystem research project. Rather than prescribing a single approach, it offers flexible guidance to help research teams design stakeholder engagement processes that are appropriate to their objectives, context, available resources, and the stakeholders involved.

The handbook covers the key stages of stakeholder engagement, from understanding why engagement matters and identifying relevant stakeholders to selecting appropriate engagement methods, managing challenges, and monitoring and evaluating engagement activities. Throughout, it emphasises that meaningful engagement should be tailored to each project and that different stakeholders may be involved in different ways, at different stages, and with different levels of participation.

Although the chapters are organised to follow the typical progression of a research project, they can also be used independently. Case studies, templates, practical examples, and further reading are provided throughout to support the design and implementation of effective stakeholder engagement.

I.3. What is a stakeholder?

A stakeholder is any individual, group, organisation, or institution with interests, roles, responsibilities, knowledge, or values that are relevant to, or may be affected by, the research and innovation process or its outcomes (Reed et al., 2009; Reed et al., 2024).

This broad definition includes individuals and organisations that may be directly or indirectly affected by a project, have an interest in it, or have the capacity to influence its outcomes, whether positively or negatively. Stakeholders do not need to be direct users of research results to be affected by them.

Stakeholders are often grouped into broad categories (e.g., citizens, practitioners, policymakers), but these categories rarely represent homogeneous groups (Reed, 2008). Perspectives, priorities, and capacities may differ according to factors such as the scale at which stakeholders operate (local, national, or international), the resources available to them, their perspectives on the issue, gender, age, cultural background, or other relevant characteristics. Disaggregating broad stakeholder categories into more specific sub-groups helps identify appropriate participants and tailor engagement approaches. As members of the same stakeholder group may have different interests, needs, and motivations, engagement strategies and levels should be adapted accordingly.

Farmers provide a useful example. There is no single, homogeneous 'farmer' category: farmers may be small- or large-scale, intensive or extensive, organic, agroecological, or industrial, landowners or tenants, women or men, and so on.

I.4. What is stakeholder engagement?

Public and stakeholder engagement can be understood as "effectively and ethically engaging people in processes, structures, spaces, and decisions that affect their lives, working with them to achieve equitable

and sustainable outcomes on their own terms" (Kindon, 2010). The Horizon Europe Glossary similarly defines engagement as "the series of processes and methodologies aimed at involving and including different social actors in dialogue" (BRIDGE2HE project, n.d.).

In this Handbook, stakeholder engagement refers to the planned and meaningful involvement of stakeholders throughout one or more stages of the research process in ways that generate mutual benefits for research and stakeholders. Effective engagement enhances the relevance, quality, legitimacy, and societal impact of research while recognising and supporting the knowledge, priorities, rights, and interests of those involved. This understanding is consistent with the principles of Responsible Research and Innovation (RRI), which emphasise anticipation, inclusion, reflexivity, and responsiveness in the research and innovation process (Owen & Pansera, 2019), and with broader participatory and rights-based approaches discussed throughout this Handbook.

1.5. Stakeholders and impact

Throughout this Handbook, the term 'impact' refers to the ways in which research contributes to meaningful change beyond the production of scientific knowledge. Achieving such impact is a central objective of biodiversity research and innovation, and stakeholder engagement plays a critical role in making this possible. By involving those who are affected by, use, or influence research, stakeholder engagement helps ensure that research addresses real-world needs, informs decision-making, supports the uptake and application of research findings, and ultimately contributes to positive societal and environmental outcomes.

Since the publication of the first edition of this Handbook, approaches to planning and evaluating research impact have evolved considerably. Biodiversa+ now uses the Theory of Change (ToC) framework to design, monitor, and evaluate projects and Partnership activities. A ToC describes how project activities are expected to contribute to long-term outcomes and impacts by identifying the causal pathways and assumptions that link research outputs to changes in policy, practice, behaviour, or society.

Stakeholder engagement is a fundamental component of this process. Stakeholders help identify the challenges that research should address, shape research questions and activities, identify opportunities and barriers to impact, and ensure that research outputs are relevant and usable by those who will apply them. They also contribute to testing assumptions, monitoring progress, and adapting the ToC as projects evolve, helping research teams respond to changing circumstances and emerging knowledge.

While this Handbook does not provide detailed guidance on developing a ToC, it complements the framework by focusing on one of its most important enabling processes: effective stakeholder engagement. The guidance provided throughout this Handbook—including identifying and selecting stakeholders, choosing appropriate engagement methods, facilitating collaboration, managing challenges, and monitoring and evaluating engagement activities—supports research teams in designing engagement processes that strengthen both the quality of research and its potential to generate lasting societal and environmental impact.

A note on terminology

While the term ‘stakeholder’ is widely used in the science-policy landscape, it has also been criticised for its colonial, normative, and potentially exclusionary connotations, and for reinforcing existing power imbalances (Reed et al., 2024).

For consistency and because it remains the most widely recognised term in biodiversity research and policy, this handbook uses ‘stakeholder’ throughout. However, several alternative terms have been proposed to better reflect different roles, responsibilities, and relationships in research and decision-making.

- **Interest-holders:** actors with legitimate interests in a given issue or decision, whether they are directly or indirectly affected by it or have the capacity to influence its outcomes. Depending on the context, these may include businesses, landowners, civil society organisations, researchers, resource users, or other groups whose interests are connected to the issue.
- **Rights-holders:** individuals or groups who hold legally or morally recognised rights that may be affected by research or decision-making. While all people are rights-holders under the Universal Declaration of Human Rights, certain groups—including Indigenous Peoples, women and girls, ethnic minorities, migrants, and youth—may face structural barriers to fully realising these rights. A human rights-based approach recognises rights-holders as active agents whose rights must be respected, protected, and fulfilled (McPhail, 2022; United Nations Economic and Social Commission for Western Asia, n.d.).
- **Duty-bearers:** actors with responsibilities to respect, protect, and fulfil the rights of others (Leclert & Fernández Fernández, 2021). Depending on the context, these may include governments, public authorities, employers, educators, service providers, researchers, or other organisations and individuals with legal, institutional, or professional responsibilities (Khaitan, 2015). Their role is defined by a responsibility to respect, protect, and fulfil the rights of others rather than pursuing their own interests.
- **Socially marginalised groups:** groups whose voices, perspectives, or interests are systematically overlooked or underrepresented in decision-making. Marginalisation is context-specific and may relate to factors such as gender, age, ethnicity, disability, socioeconomic status, geographic location, or other intersecting characteristics (Fluit et al., 2024).
- **Life-holders (or Earth Others):** non-human entities—including animals, plants, ecosystems, ecological processes, and environmental components such as water or climate—that both influence and are affected by human decisions. Recognising life-holders broadens stakeholder engagement beyond human interests and encourages consideration of ecological relationships and responsibilities (Kortetmäki et al., 2023). Decisions often involve trade-offs between human interests and those of life-holders, as well as amongst life-holders themselves, and win-win outcomes are rare (Wijsman et al., 2025).

PART II: WHY ENGAGE WITH STAKEHOLDERS

II.1. The importance of stakeholder engagement

Stakeholder engagement serves multiple, complementary purposes that strengthen both the quality and the societal relevance of research (Young et al., 2013; Anderberg, 2010; Reed et al., 2024; Leclert & Fernández Fernández, 2021). In particular, it can:

- **Improve the quality and relevance of research** (IPBES, 2024; Tengö et al., 2014):
 - Incorporate Indigenous and Local Knowledge (ILK) alongside scientific knowledge.
 - Integrate knowledge that may otherwise be difficult to access through formal sources.
 - Identify cross-cutting issues and adapt research to better address societal needs.
- **Strengthen legitimacy, trust, and accountability** (Young et al., 2013; Reed, 2008; Reed et al., 2018):
 - Increase the transparency and credibility of research processes.
 - Ensure that decisions reflect a wider range of perspectives and values.
 - Build trust and strengthen the social legitimacy of research and its outcomes.
- **Increase the impact of research in policy and society** (Young et al., 2013; Cvitanovic et al., 2015):
 - Strengthen links between research, policy, and practice.
 - Raise awareness beyond the scientific community and increase the uptake of research findings in decision-making, professional practice, and innovation.
 - Build support amongst those who will use or be affected by the research.
- **Foster collaboration, learning, and inclusive participation** (Reed et al., 2018; Young et al., 2013, Pickering et al., 2022):
 - Create opportunities for knowledge exchange, mutual learning, and long-term collaboration.
 - Improve communication, shared understanding, and equitable access to knowledge.
 - Strengthen stakeholder capacity, leadership, and ownership while amplifying the voices of historically excluded groups.
- **Reduce risks and support transformative change**⁵ (Pickering et al., 2022):
 - Identify concerns, conflicts, and unintended consequences early to improve research and decision-making.
 - Co-create knowledge and solutions across sectors.
 - Support systemic transformations toward sustainability.

⁵ Transformative change refers to a fundamental, system-wide reorganisation across technological, economic, and social factors, including paradigms, goals, and values, as defined by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2024). It recognises that halting and reversing biodiversity loss requires addressing its underlying indirect drivers, including unsustainable patterns of production and consumption, governance systems, and relationships between people and nature.

A detailed list of the benefits of engaging with stakeholders is laid out in [Table 1](#).

The appropriate form and intensity of engagement depend on the objectives of the research, the envisioned impact, and the purpose of engaging stakeholders.

For clarity, the Handbook outlines five levels of engagement (IAP2, 2024):

1. **INFORM** — Stakeholders are provided with balanced, accessible information about the project, its progress, or its results to support understanding.
2. **CONSULT** — Stakeholders provide opinions, feedback, or perspectives that inform decisions, although final decisions remain with the researchers.
3. **INVOLVE** — Stakeholders actively contribute to specific aspects of the research, for example by providing expertise, data, or resources. Researchers are expected to consider these contributions and explain how they have informed the research.
4. **COLLABORATE** (including **co-design** and **co-create**)⁶ — Researchers and stakeholders work together throughout one or more stages of the research process, from problem definition to implementation. Stakeholders are integrated into decision-making and contribute to shaping outcomes.
5. **EMPOWER** — Stakeholders develop the capacity to influence decisions and actions. Researchers provide knowledge and support, but stakeholders retain agency and responsibility for change (Arnstein, 1969). In some cases, this may evolve into stakeholder-led governance, where stakeholders determine project direction and resource use.

Figure 1 offers a visual representation of the five levels of engagement and their level of impact on decisions within a research project.



Figure 1: Spectrum of decision impact based on the level of engagement (Kelemen et al., 2023)

Most projects combine several levels of engagement, depending on the stakeholder group and the stage of the research. While informing is almost always necessary, higher levels of engagement may be appropriate where shared ownership, joint decision-making, or long-term collaboration are desired

⁶ **Co-design** refers to a structured, participatory process in which stakeholders (e.g., users, practitioners, experts) collaborate primarily during the ideation and planning phases to define problems and shape potential solutions. It emphasises shared understanding and the joint development of design choices (Sanders & Stappers, 2008). **Co-creation** is a broader, often more sustained collaborative approach that spans the lifecycle of an initiative—from problem definition and design through implementation and evaluation—to jointly generate knowledge, solutions, services, or other forms of value. Co-design is often regarded as a specific form or early phase of co-creation (Ferreira et al., 2023).

(Sieber et al., 2026). Evidence suggests that deeper forms of engagement—particularly co-design and co-creation—can strengthen ownership, improve the relevance of research, and increase societal impact (Broadley & Smith, 2018; Dushkova & Kuhlicke, 2024).

The levels presented above describe increasing degrees of stakeholder involvement. However, engagement may also involve challenging assumptions, questioning governance structures, or reshaping how decisions are made. In some contexts, engagement therefore extends beyond participation towards transforming institutional arrangements. Thus, transformative change requires not only inclusion and collaboration, but also critical reflection on existing power structures (Westerink et al., 2026).

Table 1: Examples of potential benefits associated with different levels of stakeholder engagement. The levels of engagement are adapted from the IAP2 Spectrum of Public Participation (IAP2, 2024), while the potential benefits are synthesised from the stakeholder engagement literature (e.g., Reed, 2008; Young et al., 2013; Reed et al., 2018; Reed et al., 2024). Note that benefits identified for lower levels of engagement are also appropriate for all higher levels (i.e., the benefits identified for the ‘inform’ level of engagement also apply to ‘consult’, ‘involve’, ‘collaborate’, and ‘empower’).

Level of engagement	Benefits of engagement		
	For the research project	For the stakeholders	For wider society
INFORM	- Increased visibility of the project - Useful contacts for future engagement - Improved dissemination of results - Enhanced impact of research - Greater awareness and understanding of the research	- Opportunities for learning - Better access to knowledge - Awareness raising - Improved policies	- Better knowledge applied in policy and practices - Stronger connections between science and society
CONSULT	- Better understanding of stakeholder needs and priorities - More knowledge for researchers - Opportunities for learning - Improved relevance of research questions - Higher data quality	- Improved access to knowledge and resources - Sense of inclusion and involvement; acknowledgement of one’s role	Improved trust and respect between science and society
INVOLVE	- Access to additional expertise, data, or resources - Potential to improve methods	- Increased influence over the research process - Development of new skills and experiences	- Better evidence for decision- making - Research that better reflects societal needs

COLLABORATE	• Improved research questions • More robust analyses and solutions • Stronger long-term partnerships	• Opportunities to influence or drive research • Sense of ownership	• More inclusive governance and shared decision-making • More relevant and inclusive research
EMPOWER	• Greater societal relevance for the research project • Potential to have real-world impact for citizens • Greater legitimacy of decisions and actions • Improved long-term uptake and sustainability of outcomes	• Greater influence over decisions • Empowerment • Ownership	• Long-term stewardship of citizens • More inclusive and participatory decision-making

Case study: Benefits of stakeholder engagement

The [Farms4Biodiversity](#) project examined how agro-ecological practices in Malawi—such as crop diversification, the use of botanical sprays, and habitat restoration—affected biodiversity, ecosystem services, and food security under changing land-use conditions. The project engaged farmers as active participants throughout the research process, alongside scientists, policymakers, and community members.

Farmers participated throughout the project by:

- Collecting ecological data on crops, pollinators, soil health, and natural enemies;
- Participating in exclusion and hand-pollination experiments;
- Sharing local knowledge through surveys, focus groups, and participatory mapping;
- Training other farmers in data collection and agro-ecological practices;
- Participating in Multi-Actor Platform meetings to discuss land-use and biodiversity management scenarios.

Researchers of the project supported these activities by providing training in GPS use, data collection, and experimental protocols.

These activities generated several benefits. For the research, they improved the quality and quantity of ecological data, incorporated valuable local knowledge into experimental design, and ensured that research reflected local farming conditions. As for participating farmers, by the end of the project they reported placing greater value on the role of forests and semi-natural habitats in supporting pollinators and other biota that underpin ecosystem services.⁷

⁷ Two papers were published by Farms4Biodiversity researchers on these findings: Kpienbaareh et al., 2020; Kpienbaareh et al., 2022.

This increased community interest in forests led the research team to undertake a follow-up study with participating villages to assess forest condition and ecosystem services.⁸ Building on the participatory activities undertaken during Farms4Biodiversity, the Malawian non-profit organisation **Soils, Food and Healthy Communities** subsequently secured a community development grant to support reforestation and natural forest regeneration on their own.

Farms4Biodiversity demonstrates how stakeholder engagement can generate lasting impacts by shaping future research priorities and supporting community-led action beyond the lifetime of a project.

II.2. Challenges to engagement

While stakeholder engagement can bring significant benefits to the research process, it also presents challenges that should be anticipated and managed. Engagement often increases the time, resources, and coordination required, particularly during the early stages of a project (Bryson et al., 2013). Although these investments can lead to more robust, relevant, and impactful research, many of the benefits only become apparent over the longer term, making it difficult to justify the immediate costs.

Researchers may also perceive stakeholder engagement as a constraint rather than an opportunity, particularly if it is seen as adding complexity or limiting scientific autonomy (Morgan et al., 2012). Stakeholders, in turn, may face barriers such as limited time, competing priorities, or distrust of science. Repeated requests to participate can also lead to 'stakeholder fatigue', whereby continued engagement reduces willingness to participate and the quality of contributions (Dushkova & Kuhlicke, 2024; Reed et al., 2018).

To reduce these risks, engagement should be proportionate to the project's objectives and designed around stakeholders' needs and capacities (Bryson et al., 2013; Turnhout et al., 2020). Methods should be accessible, relevant, and respectful of participants' time and expertise. Researchers should also communicate clearly how stakeholder contributions have informed the research and avoid generic or tokenistic approaches that may leave participants feeling their input has little value.

Poorly designed engagement can also reinforce existing inequalities. If some groups are consistently overlooked or face barriers to participation, engagement may privilege already influential voices and lead to less equitable or less robust decisions (Quick & Feldman, 2011; Turnhout et al., 2020). Researchers should therefore consider diversity, representation, and power dynamics throughout the engagement process.

⁸ Four papers were published out of this study: Kpienbaareh et al., 2026; Mohammed et al., 2025; Kpienbaareh et al., 2024a; Kpienbaareh et al., 2024b.

Table 2: Strategies to overcome common challenges in stakeholder engagement

Challenge	Strategy to overcome the challenge
Lack of inclusive representation (Reed et al., 2009; Prell et al., 2009; Quick & Feldman, 2011): Relevant stakeholders—including local communities, Indigenous Peoples, and socially marginalised groups—may be overlooked or underrepresented.	Conduct a thorough stakeholder analysis to identify relevant groups and understand barriers to participation. Adapt engagement methods to stakeholders' needs and capacities, avoid tokenistic involvement, and ensure diverse perspectives are meaningfully incorporated throughout the research. More on this in Part IV and Part V .
Unrealistically high expectations (Reed, 2008; Bryson et al., 2013): Stakeholders may have hopes that cannot be met within the project scope.	Set clear expectations from the outset by communicating project limitations and what is achievable. Integrate stakeholder input where appropriate and provide regular updates. Impact strategies can support this by prompting ongoing discussions about goals and their feasibility.
Extractive or transactional engagement (Turnhout et al., 2020; Lerclert & Fernández Fernández, 2021): Stakeholders may perceive engagement as extractive if interactions are limited to project needs and relationships end when funding finishes.	Define roles and expectations early, communicate regularly throughout the project, explain how stakeholder input has informed decisions, and close projects respectfully, even when funding ends.
Power imbalances (Turnhout et al., 2020; Quick & Feldman, 2011; De Vente et al., 2016): Differences in power, resources, or influence may result in some voices dominating discussions while others are marginalised.	Use inclusive engagement methods and skilled facilitation to ensure all participants have opportunities to contribute. Where appropriate, use techniques such as small-group discussions or separate sessions to reduce power imbalances and encourage open dialogue (see Part V for more details).
Perceived bias in facilitation or reporting (Bryson et al., 2013; Owen & Pansera, 2019): Stakeholders may feel that their views have been oversimplified or selectively reported in meeting records or project decisions.	Document and communicate clearly how stakeholder input has been considered and used. Accurately reflect both areas of agreement and disagreement, share summaries or meeting records where appropriate, and explain how decisions were reached.
Stakeholder fatigue (Reed et al., 2018; Dushkova & Kuhlicke, 2024): Stakeholders may become reluctant to participate if engagement is repetitive, poorly coordinated, or fails to produce visible outcomes.	Review previous engagement activities before starting new ones, and clearly communicate how earlier contributions have informed the research. Design engagement to be purposeful and respectful of participants' time. Where repeated engagement is necessary, demonstrate tangible benefits and coordinate with trusted local organisations or community leaders. Remember that low participation does not necessarily indicate a lack of interest.
Short-term engagement (Wyborn et al., 2019; Reed et al., 2024): Stakeholder engagement often ends with the project, limiting long-term impact.	For sustained impact, partner with local organisations and plan for the research legacy. Allocate budget and explore funding opportunities together to continue engagement beyond the project's end.

Case study: When engagement needs more time and flexibility

The **ConservES** project explored how flowering strips could enhance biodiversity and ecosystem services in agricultural landscapes. The project adopted a living lab approach, aiming to involve farmers and other stakeholders alongside researchers in the design and implementation of field experiments across several European sites.

To support engagement throughout the project, researchers used a range of methods, including workshops, Bioblitzes, field visits, informal exchanges with farmers, and opportunities to discuss research findings and practical issues. These methods served different purposes, from introducing the project and exchanging knowledge to discussing fieldwork and reflecting on the participatory research process.

However, the project also highlighted an important challenge of mixed-method engagement: using a range of methods does not necessarily result in meaningful co-design or sustained participation. Because of the project's three-year timeframe and the need to establish the flowering strips early enough to collect sufficient ecological data, important aspects of the experimental design had already been determined before farmers were fully involved. Researchers therefore had limited flexibility to incorporate stakeholder input into the research design.

Engagement was also affected by differences in expectations and priorities. Researchers were primarily concerned with obtaining robust ecological data, while farmers were more interested in practical knowledge relevant to their farms. As a result, some engagement activities became more focused on communicating research progress than on jointly shaping the research. Practical constraints, including researchers' workload, geographical distance between farms, and difficulties aligning research and farming schedules, further limited interaction.

ConservES therefore demonstrates that mixed engagement methods need to be carefully timed, coordinated and connected to genuine opportunities for stakeholder influence. The project showed the value of reflecting on what worked and what did not: its experience helped identify the importance of early engagement, shared objectives, sufficient time and resources, and regular opportunities to adapt the collaboration. These lessons are informing a subsequent, longer-term project in which the researchers aim to apply a more fully developed living lab approach.⁹

⁹ For further details on the project and the challenges encountered, see Agasse et al., 2026.

PART III: ETHICAL PRINCIPLES FOR ENGAGEMENT

Ethical engagement matters from two perspectives (Owen & Pansera, 2019):

1. **For science:** Engagement should be methodologically sound, transparent, and inclusive of all relevant knowledge holders. Poorly designed processes can compromise both scientific quality and ethical integrity.
2. **For participants:** Engagement is not neutral—it redistributes time, effort, visibility, and sometimes risk. Researchers should consider potential burdens such as administrative load, reputational exposure, emotional labour, or political risk, and take steps to mitigate them. Benefits, including access to knowledge, capacity-building, influence, recognition, or co-authorship, should be meaningful and clearly communicated. Participation must always be voluntary and informed (Owen & Pansera, 2019; Reed et al., 2018).

Core ethical considerations:

- **Transparency:** Clearly explain the purpose, scope, and limits of engagement, and how input will be used. Ensure transparency throughout the process, while respecting confidentiality and privacy where appropriate (Reed et al., 2018).
- **Voluntary participation:** Stakeholders must be free to participate, limit involvement, or withdraw without negative consequences (Reed et al., 2018).
- **Respect of rights and power dynamics:** Recognise the authority of rights-holders, avoid tokenistic consultation, and ensure influence is proportional to potential impacts (Jodoin et al., 2021; Sarkki et al., 2023).^{10,11}
- **Benefits vs. burdens:** Consider who benefits from the research and who bears its costs or risks, including long-term and intergenerational impacts (Owen & Pansera, 2019).
- **Data and knowledge handling:** Be transparent about storage, use, attribution, and dissemination of contributions. Where engagement involves Indigenous data or knowledge, researchers should also respect principles of Indigenous data governance, including the CARE Principles (see [Section III.2.3](#); Carroll et al., 2021)
- **Sustaining relationships:** Engagement does not end when funding ends. Maintain trust, provide feedback, and close projects respectfully (Reed et al., 2018).
- **Researcher reflexivity:** Researchers should reflect on their own position, assumptions, values, institutional role, and influence within the engagement process. Researchers are not external to the social and power relations surrounding a research project, and choices about who participates, how issues are framed, and how decisions are made can affect these relations. Making such positioning

¹⁰ Power can operate through formal decision-making authority, access to resources and knowledge, social or institutional influence, and less visible norms or assumptions about whose perspectives are legitimate. Researchers should therefore consider how power shapes who participates, whose knowledge is recognised, who can influence decisions, and how engagement processes may reproduce or challenge existing inequalities (Barnaud & van Paassen, 2013; Lécuyer et al., 2024).

¹¹ Participatory approaches, including Participatory Action Research (PAR), do not automatically eliminate differences in power, knowledge, resources, or decision-making authority. Researchers should therefore consider how these differences shape participation and influence (Barnaud et al., 2013; Barnaud et al., 2016; Lécuyer et al., 2024). See [Section V.1](#) for further discussion on PAR.

explicit can help researchers recognise when an apparently neutral approach may unintentionally reproduce existing power asymmetries (Barnaud et al., 2016).

Ethical engagement also requires attention to context-specific considerations. When working with Indigenous Peoples and local communities, researchers should respect collective governance, decision-making timelines, and knowledge systems, and follow Free, Prior and Informed Consent (FPIC; see [Section III.2.2](#)) as an ongoing process rather than a one-off step (FAO, 2021). Youth participation should be meaningful and accessible, avoiding tokenism, and researchers should consider intergenerational justice when decisions may affect long-term ecological or social outcomes. More broadly, researchers should consider whether different groups have equitable opportunities to participate, have their perspectives recognised, and benefit from research and its outcomes. These dimensions of equity, participation, and recognition are particularly important where research addresses contested environmental issues or seeks to contribute to transformative change (Barnaud & van Paassen, 2013; Barnaud et al., 2023).

Researchers should consider their position when power asymmetries are evident. Treating all stakeholders identically does not necessarily produce an equitable process if some participants have substantially greater resources, influence, or ability to shape decisions. Conversely, actively supporting less influential participants can raise questions about the researcher's role and legitimacy. There is therefore no universally appropriate approach: researchers should make their approach explicit, consider its implications, and be transparent about why particular measures are taken to address power imbalances (Barnaud & van Paassen, 2013; Barnaud et al., 2016).

Guiding principle: Ethics should be embedded throughout the research lifecycle. Integrating scientific integrity with participant-centred responsibility strengthens legitimacy, improves outcomes, and helps prevent reinforcing existing inequalities (Owen & Pansera, 2019; Reed et al., 2018). This requires not only protecting participants and ensuring fair procedures, but also reflecting critically on the power relations that shape the research process and its potential impacts.

III.1. Ensuring credible, relevant, and legitimate research

For research to be considered valuable, both its processes and outputs should be credible, relevant, and legitimate, commonly referred to as the **CRELE criteria** (Cash et al., 2003; Sarkki et al., 2014).

Importantly, CRELE criteria are shaped by stakeholder perceptions: what one group considers credible, relevant, or legitimate may not be perceived in the same way as by another. Ensuring CRELE therefore requires balancing not only among the three criteria, but also across differing stakeholder perspectives.

- **Credibility** refers to the perceived quality, robustness, and reliability of the knowledge produced (Young et al., 2013). Clear objectives, appropriate participant selection, and suitable methods can contribute to credibility. Excluding relevant or opposing perspectives can undermine the robustness of the knowledge produced, while continuity of participation can help develop knowledge and relationships over time.
- **Relevance** concerns how well research and its outputs respond to the needs of both stakeholders and researchers (United Nations Environment Programme & Intergovernmental Oceanographic Commission of UNESCO, 2009). Engagement should be timely, aligned with decision-making processes, and communicated in accessible language. Identifying key stakeholders early and

maintaining ongoing communication helps ensure that discussions remain focused and useful. Relevance is central to sustaining motivation and producing outcomes that matter.

- **Legitimacy** relates to fairness, inclusiveness, and perceived balance, particularly in situations involving disagreement or competing interests. A clearly defined and agreed-upon process strengthens legitimacy, especially when conflicts arise (Young et al., 2013). Participants need to feel that their perspectives are considered respectfully and impartially. Balanced representation and impartial facilitation can further support a fair and constructive process (Cash et al., 2002). However, procedural neutrality does not necessarily result in equitable outcomes when stakeholders enter the process with unequal power or influence. Researchers should therefore consider whether the design of an engagement process could unintentionally reinforce existing asymmetries (Barnaud & van Paassen, 2013; Barnaud et al., 2016).

III.1.1. Balancing CRELE in stakeholder engagement

Integrating credibility, relevance, and legitimacy into stakeholder engagement requires time and resources, and it is not always possible to maximise all three simultaneously. For example, involving policymakers may enhance relevance for some stakeholders, while others may perceive this as compromising the neutrality—and therefore the legitimacy—of the process (Cash et al., 2002).

The appropriate balance will depend on the project's context and objectives. Early engagement often strengthens both credibility and relevance, while diverse and well-considered participation enhances legitimacy. Trade-offs are sometimes unavoidable and should be made consciously rather than implicitly. Researchers should also recognise that participation alone does not guarantee equitable outcomes. In situations involving substantial differences in power, resources, knowledge, or influence, additional measures may be needed to enable less influential stakeholders to participate meaningfully (Barnaud et al., 2010; Barnaud & van Paassen, 2013).

In conflict-prone areas of biodiversity research, engagement often involves competing interests. While many researchers are not trained in conflict management and find it challenging to manage, disagreement is not a sign of failure. When approached constructively, it can improve transparency and legitimacy, as well as the outcome of the research. Participatory processes may also involve disputed values, different knowledge systems, and uncertainties that cannot be resolved simply by providing more information. Researchers should make space for these differences rather than assuming that participation will automatically produce consensus (Barnaud et al., 2023). Guidance on managing conflict is provided in [Part VI](#) of the Handbook.

III.2. Navigating data management regulations

Data management is fundamentally intertwined with ethics. Ethical data management requires protecting privacy, maintaining integrity, and obtaining consent. Failing to ethically manage data leads to bias, misuse, and compromised privacy. There are several frameworks for researchers to consider:

III.2.1. General Data Protection Regulation

The General Data Protection Regulation (GDPR)¹² establishes rules for the processing and protection of personal data in the European Union (EU, 2016). Although it was adopted by the EU, it can also apply to organisations outside the EU in certain circumstances, including where they offer goods or services to, or monitor the behaviour of, individuals in the EU (Article 3.1).

Under the GDPR, any processing of personal data, including research data containing personal information, must have a valid legal basis (Article 6). The appropriate legal basis depends on the research context. In many publicly funded research projects, personal data are processed on the basis of a task carried out in the public interest rather than on the individual's consent. However, ethical or research-participation consent may still be required even where consent is not the legal basis for processing personal data under the GDPR.

Article 5 of the GDPR establishes seven key principles for the processing of personal data, which controllers must comply with when collecting or processing personal data:

- Lawfulness, fairness, and transparency;
- Purpose limitation;
- Data minimisation;
- Accuracy;
- Storage limitation;
- Integrity and confidentiality;
- Accountability.

Researchers must also ensure that individuals are informed of the processing of their data in a manner consistent with the GDPR. This helps ensure that individuals can exercise their rights, including rights of access, rectification, and, where applicable, erasure. In cases where data have been collected indirectly (e.g., from another organisation) and providing individual notice would require disproportionate effort, collective information may be provided instead (Article 14(5)(b)). For more information on GDPR, you can consult your institution's Data Protection Officer or Data Management Guide, or visit resources such as Yale University's GDPR Guidance¹³ that provide templates for data management protocols.

III.2.2. Free, Prior, and Informed Consent

Free, prior, and informed consent (FPIC) is a right of Indigenous Peoples to participate in decision-making about activities or measures that may affect them, and to give or withhold consent through their own decision-making processes (International Institute for Human Rights and Business, n.d.). FPIC requires that consent is sought freely, before decisions or activities are undertaken, and on the basis of sufficient and accessible information. It is an ongoing process rather than a one-off step and may involve negotiating the terms under which activities are designed, implemented, monitored, and evaluated.

It is important to note that FPIC consent is not equivalent to GDPR consent, as FPIC pertains to community consent rather than individual consent and does not automatically meet all GDPR

¹² <https://eur-lex.europa.eu/eli/reg/2016/679/oj>

¹³ <https://research-support.yale.edu/media/2748/download?inline>

requirements for lawful data processing. FPIC is therefore complementary to GDPR but does not replace the need for individual data protection compliance where personal data are involved.

III.2.3. FAIR and CARE principles

Indigenous data encompass data, information, and knowledge that affect Indigenous Peoples, nations, and communities at both collective and individual levels (Carroll et al., 2021; Global Indigenous Data Alliance, n.d.). This includes data about resources, environments, and social systems. Indigenous data sovereignty, grounded in the United Nations Declaration on the Rights of Indigenous Peoples (United Nations, 2007), affirms that Indigenous Peoples have the right to control data about their peoples, lands, and resources.

FAIR principles ensure that data are Findable, Accessible, Interoperable, and Reusable. They guide how data should be managed, documented, and shared to maximise technical usability and enable future research. FAIR focuses on making data discoverable, machine-readable, and reusable by others while following standard formats, metadata practices, and licensing.

CARE principles (Collective benefit, Authority to control, Responsibility, Ethics) aim to ensure that the use of Indigenous data leads to tangible benefits for Indigenous communities, promotes equitable outcomes, supports governance and engagement, and respects Indigenous values. CARE is designed to complement FAIR principles and other data frameworks, encouraging equitable participation in data access, use, reuse, and attribution.



Figure 2: “Be FAIR and CARE”: follow FAIR and CARE principles when working with Indigenous Peoples

Together, FAIR and CARE provide a complementary framework: FAIR ensures that data are technically usable and shareable, while CARE ensures that data use is ethical, equitable, and community-centred.

The ‘Collective benefit’ principle of CARE emphasises that data ecosystems should support Indigenous nations and that the use or reuse of Indigenous data should align with community values and priorities. Where Indigenous data are held or managed by non-Indigenous institutions, data users should engage respectfully with Indigenous communities and support Indigenous governance, capacity, languages, and cultural priorities where relevant. Ethical responsibilities should also extend to how data are used and governed over time.

PART IV: SELECTING RELEVANT STAKEHOLDERS

Identifying, categorising, and understanding relevant stakeholders is essential for effective and impactful engagement. From the point of view of a research project, stakeholder selection should be guided by the research focus, the envisioned impacts of the project, and the time and resources available. But there are other considerations that should be included from the start and throughout the selection process: rights and justice, societal power relations, and the diversity of stakeholder interests, rights, and responsibilities.

The stakeholders selected for engagement directly influence both the engagement process and its outcomes (Newig & Fritsch, 2009; Reed et al., 2009; Stanghellini, 2010; De Vente et al., 2016). To ensure a balanced and meaningful process, engagement should include both:

- **High-interest, low-influence** actors, such as local communities affected by land-use change or small-scale resource users who are directly impacted but have limited decision-making power (Reed et al., 2009).
- **High-influence**, strategic actors, such as policymakers, regulators, funding bodies, or industry representatives who can shape decisions and support implementation (Reed et al., 2009).

Failing to engage relevant actors—particularly those who may oppose or challenge the project—can lead to conflict, reduce legitimacy, and limit the impact of both the research and the engagement process (De Vente et al., 2016). When the objective is to empower stakeholders, particular attention should be paid to those who are most affected by the issue but have the least influence over decisions.

Before categorising stakeholders, it is important to understand their starting position, including differences in power, rights, responsibilities, and vulnerabilities. This requires considering three complementary perspectives:

- **Understand the societal context:** Situate stakeholders within the broader social, institutional, and governance system. This includes recognising power relations, conflicting interests, and relevant justice or rights considerations.
- **Assess impact and influence:** Consider how stakeholders relate to the issue under study by identifying who is affected, who can influence decisions, and who bears the risks or receives the benefits.
- **Align engagement strategies with project objectives:** Select stakeholders and tailor engagement approaches according to the project's objectives and each stakeholder's relationship to the expected impacts.

IV.1. The three steps of stakeholder selection

Stakeholder selection is an iterative process that can be organised into three main steps (Lemke et al., 2024; Reed et al., 2009).

- **Step 1:** Identify potential stakeholders.
- **Step 2:** Assess stakeholder relevance.
- **Step 3:** Understand stakeholders.

Although presented sequentially, these steps are rarely linear. As projects evolve, new stakeholders may emerge, existing relationships may change, and priorities may need to be revisited.

IV.1.1. Step 1: Identify potential stakeholders

The first step is to identify all individuals, groups, organisations, or communities that may be connected to the research or its outcomes. The aim at this stage is to develop a broad list of potential stakeholders rather than to determine their relative importance or level of involvement.

Stakeholder identification should consider actors who:

- Are directly or indirectly connected to the research topic;
- May provide relevant knowledge, expertise, or perspectives;
- May use, be affected by, or have an interest in the research findings.

Stakeholder identification should begin early in the project but remain an ongoing process, allowing new or previously overlooked stakeholders to be included as the research evolves.

Useful approaches for identifying stakeholders include (Reed et al., 2009; Forestry Commission, 2011; Gilmour et al., 2011):

- Consulting colleagues, partner organisations, or experts in the subject matter of the research;
- Brainstorming with the research team;
- Using snowball sampling, whereby identified stakeholders recommend other relevant stakeholders within their networks;
- Creating mind maps to visualise actors and their relationships (see [Figure 4](#) for an example).

These approaches can be carried out collaboratively with stakeholders themselves, who can provide valuable insights into relevant actors, relationships, and perspectives that may not be apparent to researchers.

Typical stakeholder groups might include government agencies, non-governmental organisations, businesses, Indigenous Peoples, local communities, landowners, professional organisations, researchers, small and medium enterprises, the media, and members of the public (Jolibert & Wesselink, 2012). However, broad categories often contain diverse perspectives. A single representative from an organisation or stakeholder group may not adequately reflect the range of interests, experiences, or priorities within that group.

Furthermore, avoid relying only on the “usual suspects”. Consider who is routinely represented in similar research or decision-making processes, and whether other affected, less visible, or less organised groups may hold relevant knowledge or interests (Turlerboom, 2026).

IV.1.2. Step 2: Assess stakeholder relevance

The first step of stakeholder identification should generate a broad list of relevant stakeholders, together with an indication of their potential relevance to the research. The second step is to assess and analyse these stakeholders in order to understand their relationship to the project and determine the extent to which their involvement may be needed. Not every stakeholder or stakeholder group will need to be involved to the same degree or at the same time, and the relevance of a stakeholder may change throughout the research process.

Assessing stakeholder relevance helps researchers identify who may provide valuable knowledge or perspectives, who may be affected by the research, and whose involvement may be important for achieving the project's objectives.

Researchers can assess stakeholders according to:

- Their level of interest in the project;
- Their influence over the research process or outcomes;
- How they may be affected by the research;
- Their knowledge, expertise, or ability to contribute;
- The value and purpose of engaging with them (Reed et al., 2025; Lindenberg & Crosby, 1981; Eden & Ackermann, 1998; De Lopez, 2001);

Where stakeholder categories include different sub-groups, each should be assessed separately, as their interests, influence, and potential impacts may differ considerably.

When assessing which stakeholders are “important”, it is critical to ask, “Important to whom, and important for what?” (Turkelboom, 2026). A stakeholder might be important because:

- They are significantly affected;
- They hold knowledge that others do not;
- They have rights or responsibilities;
- They can influence implementation;
- Their participation is needed for legitimacy;
- They are otherwise likely to be excluded; etc.

In other words, there is an important distinction between *relevance* and *influence*. Both are useful to consider when choosing which stakeholders to engage.

One common approach to assessing stakeholder relevance is to consider stakeholders according to their relative levels of interest and influence. **Figure 4**, adapted from the previous BiodivERsA Stakeholder Engagement Handbook (Durham et al., 2014), plots stakeholder influence on the project against stakeholder interest in the project.

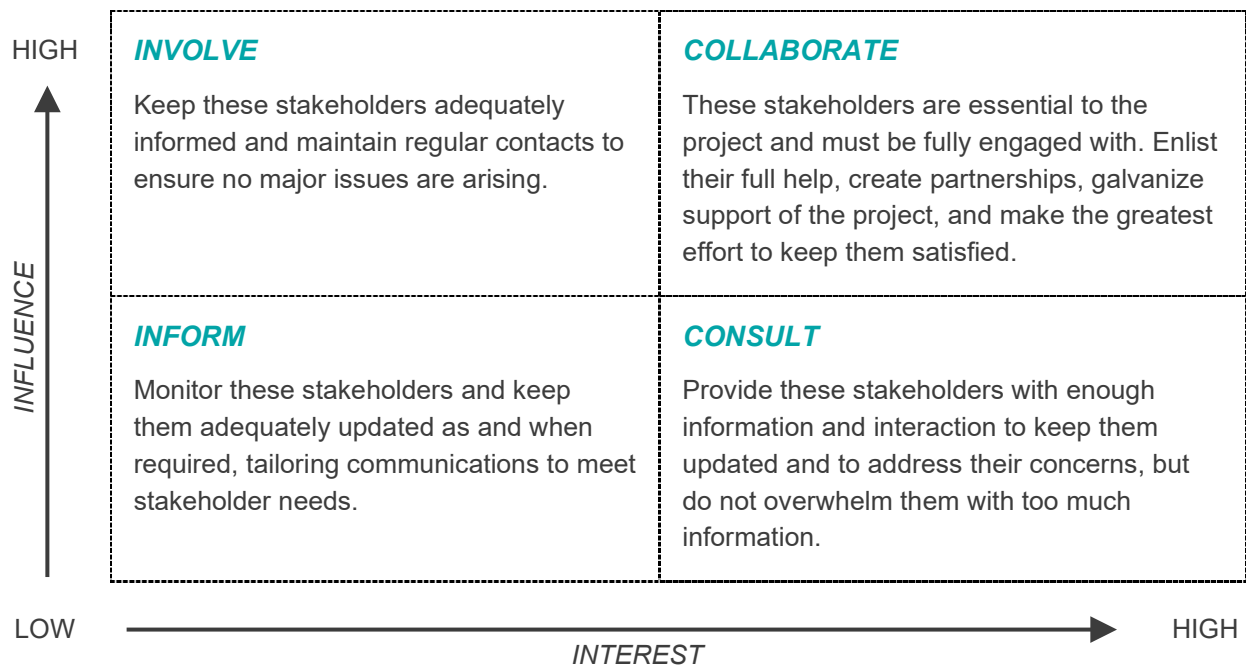


Figure 3: Plotting stakeholder influence vs. interest

Stakeholders can be plotted along these axes according to their relative levels of influence and interest and what type of engagement the researcher plans to use. This allows all three factors to be simultaneously considered. Such tools can help inform decisions about levels of involvement but should not be used as prescriptive frameworks, as stakeholder relationships, rights, and contextual factors should also be considered.

Note that **EMPOWER** is not represented in the original figure, as it has been added as a fifth level of engagement for this Handbook. Stakeholders who are both highly influential and highly interested may be among those for whom empowerment is appropriate, depending on the context.

Other visual tools exist as well. One example is a mind map (see **Figure 4** as an example). The first step in developing a mind map is identifying the major groups of users that make up the centre of the map, then progressing towards greater detail as you move towards the outer edges.

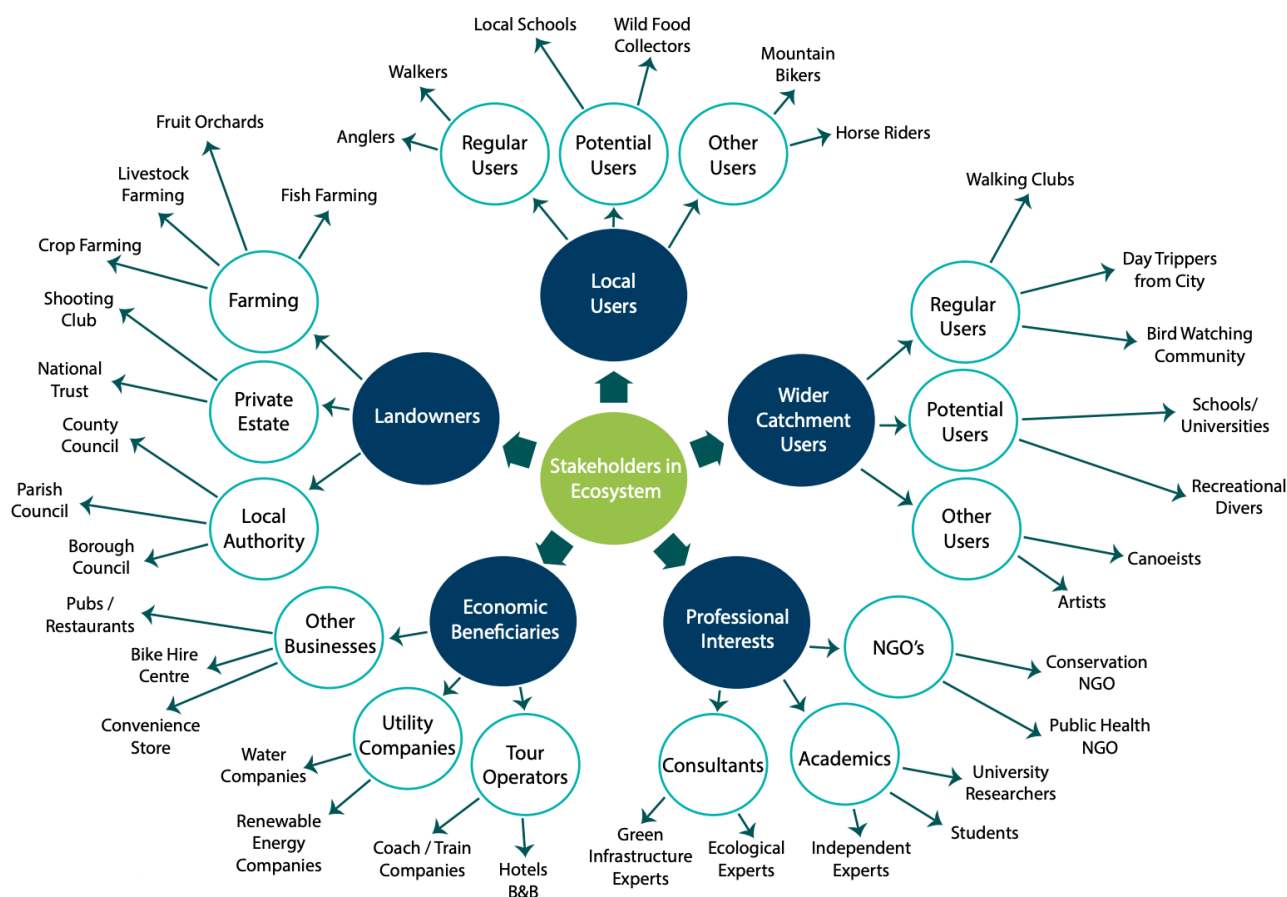


Figure 4: Example of a mind map for identifying stakeholders (adapted from Forestry Commission, 2011)

Stakeholder assessment and mapping provide a useful starting point for understanding stakeholder roles and engagement needs. However, stakeholder relationships, influence, and interests may change over the course of a project, so stakeholder analyses should be reviewed and updated as needed. Where appropriate, researchers may also wish to involve stakeholders directly in the mapping process. Participatory mapping can improve transparency, build trust, and help establish a shared understanding of stakeholder roles and engagement priorities.

When working with Indigenous Peoples or other rights-holders, standard stakeholder mapping tools should be complemented by rights-based approaches, as influence-based analyses may overlook rights, governance systems, cultural values, and historical relationships that are essential for meaningful engagement.

IV.1.3. Step 3: Understand stakeholders

After prioritising stakeholders, the next step is to develop a deeper understanding of who they are, how they relate to the issue, and what they need from the engagement process (Banerjee, 2001; Banerjee, 2008; Farr, 2017; Cronin et al., 2024).

Consider the following questions:

Who are they?

- What are their interests and concerns?

- What perspectives or knowledge do they bring?
- What rights, responsibilities, or roles do they have (e.g. rights-holder, duty-bearer, knowledge-holder)?
- Are they particularly vulnerable or likely to be disproportionately affected?

How do they relate to the project?

- What influence do they have?
- Are they likely to support or oppose the project?
- Have they participated in similar projects before?
- What motivates them to engage? A personal connection to the project or to the community? Certain expected benefits? (Turkelboom, 2026.)

What will enable meaningful engagement?

- What barriers might limit their participation (e.g., language, accessibility, time, financial resources, previous experiences)?
- How do they prefer to communicate?
- What level of participation is realistic and appropriate?

Stakeholders are rarely homogeneous. Differences in gender, age, socio-economic background, institutional role, or cultural identity may shape perspectives and priorities. Recognising this diversity helps avoid tokenism and leads to more inclusive engagement.

One useful way to organise this information is to develop a stakeholder profile or stakeholder register containing key information such as:

- Stakeholder name and role;
- Level of interest and influence;
- Key concerns and motivations;
- Preferred engagement methods;
- Potential barriers or risks to engagement.

Developing a thorough understanding of stakeholders at an early stage helps researchers design more appropriate engagement activities, manage expectations, reduce conflict, and build stronger relationships. Because both stakeholders and project contexts evolve over time, this understanding should be reviewed and updated throughout the project.

PART V: METHODS OF ENGAGEMENT

Stakeholder engagement methods should be selected according to the objectives of the activity, the stage of the research process, the expected role of stakeholders, their experience with engagement processes, and the desired level of participation. Discussing intended outcomes with stakeholders at an early stage can help identify appropriate approaches and ensure that engagement activities respond to stakeholders' needs and expectations (Reed et al., 2024; Reed, 2008; Cvitanovic et al., 2015).¹⁴

Engagement methods can be considered from two complementary perspectives:

- The **purpose of the engagement activity**, such as sharing information, opening discussion, exploring issues, exchanging knowledge, or supporting decision-making;
- The **level of stakeholder influence** in the process, ranging from informing and consulting to involving, collaborating, or empowering stakeholders.

Both perspectives should be considered when designing an engagement activity. Methods should not be viewed as inherently participatory or non-participatory: the same approach can support different levels of engagement depending on how it is designed, who participates, and how stakeholder contributions influence decisions. For example, a workshop may be used to collect feedback through consultation, or it may be designed as a collaborative process in which stakeholders jointly develop research priorities or solutions.

V.1. Various methods of engagement

Stakeholder engagement methods can broadly be distinguished according to the degree of interaction they enable. Some approaches primarily focus on providing information or gathering input, while others create opportunities for dialogue, knowledge exchange, and joint decision-making.

V.1.1. Informing and consulting

Approaches focused on **INFORMING** or **CONSULTING** stakeholders are often appropriate when the objective is to raise awareness, share research findings, gather perspectives, or reach a large audience. Examples include websites, newsletters, surveys, interviews, and consultation exercises.

Early critiques of participation, such as Arnstein's "ladder of citizen participation" (1969), highlighted the risk that engagement becomes symbolic rather than meaningful when stakeholders have little influence over outcomes. However, information-sharing and consultation remain valuable components of engagement when they are appropriate to the objectives of the activity and aligned with stakeholder expectations.

Large-scale communication approaches may generate limited interaction or feedback, depending on the context and stakeholder group. More targeted approaches, such as interviews or small-group discussions, may provide deeper insights but generally require more time and resources.

¹⁴ Where engagement involves rights-holders, the level of participation should reflect the extent to which they may be affected by the research and should not be determined solely by researchers. Engagement methods should also be adapted to align with Indigenous governance structures, decision-making processes, and timelines where applicable.

V.1.2. Participatory approaches

Participatory approaches such as **INVOLVEMENT**, **COLLABORATION**, or **EMPOWERMENT** create opportunities for dialogue, knowledge exchange, and active involvement of stakeholders throughout the research process. They can be used for different purposes, including identifying issues, exploring perspectives, developing shared understanding, prioritising options, and supporting collective decisions.

Participatory Action Research (PAR) is one approach that combines research with participation and action. It involves conducting research *with* people rather than simply researching *about* or *for* them, with participants contributing to the generation and interpretation of knowledge and, where appropriate, to decisions and actions arising from the research (Kindon et al., 2007; Chevalier & Buckles, 2019). PAR can therefore support both the production of knowledge and processes of learning, problem-solving and social change.

PAR is not a single method or technique. It can draw on a range of methods, including workshops, interviews, mapping, observation and participatory analysis, depending on the research context and objectives. The extent and form of participation can also vary, so describing research as “participatory” does not in itself indicate how much influence participants have over decisions. Researchers should consider who has the opportunity to shape the research, how decisions are made, and how differences in power, knowledge and resources are addressed throughout the process.

V.2. Participatory techniques according to their purpose

Participatory techniques can be further grouped according to the purpose they serve within an engagement process. These purposes often correspond to different stages of stakeholder involvement: **opening out** discussions to identify perspectives and issues, **exploring** these issues in greater depth, and supporting **decision-making** by evaluating options and agreeing on future actions.

V.2.1. Opening out

Opening-out techniques are used to initiate dialogue, identify issues, and gather perspectives from stakeholders. They are particularly useful during the early stages of a project, when research questions, objectives, or activities are still being shaped. These approaches help broaden understanding of an issue by bringing together different forms of knowledge and experience.

Common opening-out techniques include:

- **Brainstorming:** a rapid idea-generation method in which participants share thoughts and perspectives without immediate evaluation. It can help identify emerging issues, opportunities, and questions for further discussion.
- **Metaplan:** a structured group activity in which participants write ideas on cards or notes, which are then grouped and discussed collectively. It helps organise contributions, identify themes, and facilitate discussion.
- **Venn diagrams:** visual tools used to explore relationships, overlaps, and connections between stakeholders, issues, perspectives, or areas of interest.
- **Card-based exercises:** another visual tool that can help participants identify and compare the importance they attach to different biodiversity-related values or ecosystem services (Turlkelboom, 2026).

- **Carousel:** a rotating discussion format in which participants move between different stations or discussion topics, building on previous contributions. It encourages exchange of ideas and collective reflection.
- **World Café** (Kelemen et al., 2023): a structured conversational approach in which participants discuss questions in small groups and rotate between tables over several rounds. It is useful for exploring diverse perspectives, identifying common themes, and building shared understanding through dialogue. The process usually concludes with a collective 'harvest' of key insights.
- **Participatory futures methods:** approaches that engage stakeholders in exploring possible futures, identifying desirable pathways, and discussing actions needed in the present. They combine different forms of knowledge, including lived experience and expert knowledge, to broaden understanding of future challenges and opportunities (Lira & Gattás, 2025).

V.2.2. Exploring

Exploring techniques help stakeholders and researchers examine information, analyse different perspectives, and develop a shared understanding of complex issues. These approaches are particularly useful during the implementation phase of a project, when stakeholders can contribute knowledge, interpret findings, identify emerging challenges, and help refine research activities.

Common techniques used for exploring issues include:

- **Categorisation:** a process in which participants group ideas, information, or perspectives according to shared themes or criteria. It can help structure complex discussions and identify key areas of interest.
- **Mind mapping:** a visual technique used to capture and connect ideas, helping participants identify relationships between issues, concepts, or factors influencing a topic. Participatory mapping is more collaborative, led by the stakeholders' experiences.
- **Group Model Building:** a facilitated process in which stakeholders collaboratively develop visual representations of complex systems, such as causal loop diagrams (Hovmand, 2014). It helps participants identify relationships, feedback, and potential intervention points while building a shared understanding of the issue.
- **SWOT analysis:** a structured approach for identifying strengths, weaknesses, opportunities, and threats related to a research issue, project, or potential course of action.
- **Timelines:** a visual tool used to structure discussions around past, present, and future events. It can help identify historical trends, changes over time, and different perspectives on how issues have evolved.
- **Fishbowl:** a discussion format in which a small group of participants discusses a topic while a larger group observes. Participants from the wider group may join the discussion at agreed points, creating opportunities for reflection, exchange, and broader participation.
- **Open Space Technology:** a self-organising discussion format in which participants create their own agenda around a shared theme (Owen, 2008). It is particularly useful for complex topics involving diverse perspectives, allowing participants to propose and lead discussions on issues they consider important.

V.2.3. Decision-making

Decision-making techniques support stakeholders and researchers when options need to be evaluated, priorities established, or future actions agreed upon. These approaches can help make different perspectives visible, identify areas of agreement, and develop pathways that are considered acceptable by participants.

Common techniques used for decision-making include:

- **Ranking or scoring:** a method in which participants order options or ideas according to their preferences or perceived importance (Turkelboom, 2026). It can help identify priorities, although achieving agreement may be challenging when perspectives differ.
- **Prioritisation:** a technique in which participants allocate a limited number of votes or markers (for example, stickers or tokens) to indicate preferred options. It provides a simple way to visualise collective priorities.
- **Multi-criteria evaluation:** a systematic approach for comparing different options against multiple criteria, such as environmental, social, economic, or technical considerations (Huang et al., 2011; Linkov & Moberg, 2011). It can combine qualitative and quantitative information to support transparent decision-making.
- **Consensus-oriented decision-making:** approach that seeks decisions acceptable to all participants by identifying and addressing concerns rather than requiring complete agreement. These approaches aim to ensure that different perspectives are acknowledged and considered.
- **Plenary discussions:** although smaller-group formats are often useful for encouraging participation, some experienced stakeholders may prefer structured plenary discussions, particularly when participants are familiar with the topic or when collective reflection is needed. Well-facilitated plenary sessions can therefore remain an effective engagement format in appropriate contexts.
- **Deliberative valuation:** collaborative decision-making process in which stakeholders co-define their preferences for (“value”) certain ecosystem services (Kenter et al., 2016).

V.2.4. Culturally appropriate engagement

The techniques described above should not be considered universally applicable. Engagement approaches are shaped by cultural contexts, communication practices, and knowledge systems. Methods commonly used in research settings may not always be appropriate or accessible for all stakeholder groups (IPBES, 2022; Tengö et al., 2014).

For example, some facilitation approaches developed in Western contexts, such as World Café or Metaplan exercises, may be unfamiliar, overly structured, or inconsistent with local ways of communicating and sharing knowledge (AIATSIS, 2020a). Researchers should therefore consider approaches that reflect the cultural context of the stakeholders involved and create environments where different forms of knowledge can be expressed and valued.

Examples include approaches based on oral traditions, storytelling, and relational knowledge exchange. In Indigenous contexts, methodologies such as Yarning and Dadirri (deep listening) provide culturally grounded approaches for sharing knowledge and building relationships in culturally safe environments (Bessarab & Ng'andu, 2010; West et al., 2012).

Engagement with Indigenous Peoples requires particular attention to Indigenous rights, knowledge systems, and governance structures. Further guidance on research with Indigenous Peoples is provided in this Handbook's [Annex](#).

V.2.5. Other engagement methods

In addition to facilitated dialogue and collective decision-making processes, stakeholder engagement can involve a wide range of approaches aimed at building relationships, involving stakeholders directly in the research, communicating findings, and supporting knowledge uptake.

Direct interactions and relationship-building:

- One-on-one meetings and interviews;
- Knowledge exchange groups, such as steering groups, advisory panels, and multi-stakeholder forums.

Involving stakeholders directly in the research:

- Citizen science and participatory monitoring (see [Part 5](#) for more on this);
- Participatory mapping;
- Participatory photography and photo surveying.

Communication and awareness-raising:

- Websites;
- Social media and online discussion platforms;
- Posters, brochures, leaflets, and fact sheets;
- Videos, podcasts, newsletters, and bulletins;
- Press releases;
- Public presentations and talks.

Producing stakeholder-oriented outputs:

- Guidelines and practical tools;
- Databases and knowledge platforms;
- Accessible publications and reports;
- Policy briefs and other stakeholder-specific publications;
- Creative outputs developed with professional storytellers, artists, or musicians.

V.3. Matching methods to levels of engagement

As detailed in [Part II](#), stakeholder engagement operates across five distinct levels: **INFORM**, **CONSULT**, **INVOLVE**, **COLLABORATE**, and **EMPOWER**. The selection of a specific engagement method should be guided by your project's objectives, the stage of research, available resources, and the wider social and institutional context.

While your choice of method is critical, it is important to remember that no technique is inherently fixed to a single level. A workshop, for example, can support simple consultation or deeper collaboration depending on how it is designed, facilitated, and integrated into your decision-making process.

When selecting an engagement level, consider the following alignment with project needs:¹⁵

- **INFORM** when the objective is to communicate information about a project, decision, or initiative, particularly where decisions have already been made and stakeholder input is not required.
- **CONSULT** when feedback is sought on a specific issue, proposal, or potential solution, but decision-making authority remains with the researchers or project team.
- **INVOLVE** when the issue is complex and stakeholders' perspectives are needed to help define the problem, explore options, and identify acceptable trade-offs.
- **COLLABORATE** when stakeholders play an active role in shaping decisions, co-producing knowledge, or developing solutions to challenges that cannot be effectively addressed by a single actor or organisation alone.
- **EMPOWER** when the aim is to strengthen stakeholders' capacity to influence decisions, take action, or lead decision-making or action themselves. At this level, researchers support stakeholders in driving and owning the process.

Participatory Action Research (PAR) illustrates why the level of engagement should be assessed according to what stakeholders are actually able to influence, rather than by the name of the research approach. PAR generally involves sustained participation in defining research questions, generating and interpreting knowledge, and linking research to action (Kindon et al., 2007; Chevalier & Buckles, 2019). Depending on how the research is designed, this may correspond to Involve, Collaborate, or, where stakeholders have substantial control over decisions or action, Empower. However, describing a project as participatory does not in itself mean that stakeholders share decision-making power. Researchers should therefore consider explicitly what stakeholders can influence, who retains decision-making authority, and how differences in power and resources may affect participation.

Table 3: The different levels and methods of engagement (Sieber et al., 2026)

Method of engagement	Level of engagement				
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Websites, social media, press releases	x	x			
Forums	x	x			
Street stalls	x	x			
Public meetings and hearings	x	x			
Roundtables		x			
Preference		x			

¹⁵ In contexts involving significant impacts on rights-holders, decisions about the level of engagement may require explicit justification.

assessments					
(Semi-structured) interviews		x	x		
Surveys and questionnaires		x	x		
Advisory groups, committees, expert panels, Delphi technique		x	x		
Workshops		x	x		
Reference groups and focus groups		x	x	x	
Citizens' panels		x	x	x	
Deliberative polling, citizens' juries, citizens' assemblies, consensus conferences			x		
Open dialogue			x		
Deliberative analysis			x		
Narrative building			x		
Informed participation			x		
Joint fact finding			x	x	
Participatory stakeholder analysis			x	x	
Participatory mapping			x	x	
Participatory spatial planning			x	x	
Community-based participatory research (CPBR)					x
Stewardship building					x

In practice, meaningful stakeholder engagement often requires combining several methods rather than relying on a single approach. Some engagement methods are well established and have clearly defined procedures, such as citizens' juries (Coote & Lenaghan, 1997), World Cafés (Agger-Gupta & Harris, 2017), focus groups, and the Delphi technique (Hasson et al., 2025). Others are more flexible and are adapted to specific contexts, for example workshops, stakeholder meetings, or dialogue processes.

Regardless of the methods selected, effective engagement depends on careful planning, skilled facilitation, and a genuine commitment to ensuring that stakeholder contributions influence the process in meaningful ways (Sieber et al., 2024; 2026).

The choice of engagement method should reflect the characteristics of the stakeholders involved, the role they are expected to play, and the stage of the research process. Different stakeholder groups may require different approaches. For example, senior decision-makers or policy advisers may be more effectively engaged through targeted meetings, advisory groups, or strategic dialogues than through time-intensive participatory exercises. Similarly, communication and dissemination methods may be more appropriate than collaborative engagement for stakeholders whose primary role is to share or amplify research findings, such as journalists and media organisations.

V.4. Timeline of engagement

Stakeholder engagement is rarely static. The level and nature of engagement are likely to evolve throughout the project lifecycle as stakeholders' roles, interests, and opportunities to contribute change. Consequently, most stakeholders will be involved during specific stages of a project rather than throughout its entire duration.

To maximise the benefits of engagement, researchers should consider when stakeholders can make the most meaningful contributions, the roles they may play, and the stages at which their involvement is likely to have the greatest value. It is also important to anticipate periods of reduced engagement or disengagement and consider how these may affect project activities and outcomes.

Stakeholders can contribute in different ways throughout the project lifecycle, from helping define research questions and governance arrangements to supporting dissemination, uptake, impact monitoring, and future collaboration. [Table 4](#) presents examples of stakeholder roles and contributions across the project lifecycle. In practice, stakeholders may assume multiple roles throughout a project.

Table 4: Examples of stakeholder roles and contributions across the project lifecycle (Jolibert, 2011)

Project stage	Stakeholder role or contribution
Before	• Help define the project concept, design, and research strategy. • Help define the societal challenge and the desired societal impact. • Identify relevant stakeholders, potential roles, and additional sources of knowledge or data. • Advise on governance arrangements, risks, and implementation considerations. • Lead the identification of community priorities and help define research questions or project objectives.
During	• Provide resources (e.g., funding, equipment, facilities, expertise) and contribute to capacity-building and training. • Refine project plans, evaluate results, and support implementation. • Collect data and contribute to monitoring, modelling, analysis, and evaluation. • Support conflict resolution, co-development of tools, and interpretation of results.

	Lead project activities or decision-making through stakeholder-led or shared governance arrangements, where appropriate.
After	- Disseminate and promote research findings through appropriate channels (e.g., websites, newsletters, guidelines, social media, policy processes). - Evaluate project outcomes, the engagement process, and future research needs. - Contribute to post-project monitoring and continued stakeholder engagement. - Support the uptake, long-term use, and sustainability of project outcomes. - Lead the continuation, adaptation, or scaling of project outcomes beyond the lifetime of the project.

V.5. Designing engagement activities

Once the objectives and timing of engagement have been identified, researchers must decide how engagement activities will be structured. Design choices influence who participates, how participants interact, the inclusiveness of the process, and the resources required. There is no universally optimal approach; each design option involves trade-offs that should be considered in relation to project objectives, stakeholder characteristics, and the wider context.

Several design considerations can be applied across different engagement methods. These include decisions about whether engagement should take place individually or in groups, online or offline, in homogeneous or heterogeneous groups, and whether activities should be deliberative or non-deliberative (O’Haire et al., 2011; Petriwskyj, 2017; Reed et al., 2024). Each option offers distinct advantages and limitations. **Table 5** summarises some of the key design considerations, together with examples, advantages, and limitations.

Table 5: Design considerations for stakeholder engagement—options, examples, and key trade-offs (O’Haire et al., 2011; Petriwskyj, 2017)

Design consideration	Options	Example methods	Advantages and limitations
Individual or group engagement	Individual	Surveys, interviews, individual consultations, direct communication	Advantages: Allows tailored discussion; participants may feel more comfortable sharing sensitive views. Limitations: Does not promote exchange between stakeholders; can be time-consuming when engaging many participants.
	Group	Focus groups, meetings, deliberative workshops, stakeholder forums	Advantages: Encourages exchange between participants; enables collective learning and the identification of diverse perspectives. Limitations: Requires careful facilitation to manage different voices and power dynamics.
Group size (if group engagement)	Small group (up to 15 people)	Workshops, committees, advisory boards,	Advantages: Facilitates meaningful discussion and ensures participants can contribute.

		citizens' juries	Limitations: Engages fewer stakeholders and may capture a narrower range of perspectives.
	Large group (15 to hundreds of people)	Public hearings, forums, citizens' assemblies, large-scale deliberative events	Advantages: Enables participation from a wider range of stakeholders. Limitations: More difficult to facilitate inclusive discussion and maintain meaningful interaction.
Delivery format and setting	In situ / place-based	Field walks, farm visits, forest assessments, community visits	Advantages: Connects engagement to local contexts, practices, and knowledge systems; can strengthen trust and relationships (AIATSIS, 2020a). Limitations: Requires greater logistical flexibility and may involve additional travel costs.
	Institutional venue	Public meetings, roundtables, conferences, workshops in organisational settings	Advantages: Provides structured environments for discussion and can facilitate interaction among diverse actors. Limitations: Formal settings may discourage some participants and reinforce existing power differences (Community Places, 2024; Oliver et al., 2021).
	Online or hybrid	Online workshops, webinars, online surveys, digital discussion platforms	Advantages: Can increase flexibility, reduce travel requirements, and enable participation across wider geographic areas. Limitations: May exclude participants due to unequal access to technology, connectivity, or digital skills; can limit relationship-building (AIATSIS, 2020a).
Facilitation style	Formal / structured	Focus groups, hearings, conferences, formal consultations	Advantages: Familiar to many stakeholders; provides clarity and structure. Limitations: May discourage contributions from participants less comfortable in formal settings.
	Creative / informal	World Café, participatory photography, storytelling, arts-based methods	Advantages: Can encourage creativity, openness, and alternative ways of expressing knowledge. Limitations: May be perceived as unfamiliar or inappropriate in some cultural or institutional contexts.
Diversity	Homogeneous groups (similar interests, backgrounds, or levels of power)	Community workshops, scientific meetings, sector-specific discussions	Advantages: Easier to facilitate and can support focused discussion. Limitations: May limit diversity of perspectives and opportunities for mutual learning.

	Heterogeneous groups (different interests, backgrounds, or levels of power)	Multi-stakeholder workshops, dialogue processes, deliberative events	Advantages: Encourages exchange between different perspectives and can support conflict resolution and shared understanding. Limitations: Requires skilled facilitation to manage conflicts and power imbalances.
Degree of deliberation	Non-deliberative	Information sessions, surveys, consultations, debates	Advantages: Efficient for sharing information or collecting individual views. Limitations: Provides fewer opportunities for collective reflection and knowledge exchange.
	Deliberative	Citizen's juries, deliberative workshops, dialogue processes	Advantages: Allows participants to reflect on different perspectives and develop shared understanding. Limitations: Requires sufficient time, resources, and skilled facilitation.
Role of expert knowledge	Expert input included	Citizens' assemblies, citizens' juries, technical advisory processes	Advantages: Helps participants engage with complex topics and consider evidence-based information. Limitations: Expert authority may influence discussions or discourage participants from expressing alternative views.
	Expert input not included	Community discussions, open workshops, experience-based consultations	Advantages: Allows participants to prioritise lived experience and local knowledge. Limitations: May be challenging when technical understanding is required.
Permanence of engagement	Ongoing structures	Advisory boards, stakeholder committees, long-term partnerships	Advantages: Supports trust-building, continuity, institutional memory, and sustained influence. Limitations: Requires long-term commitment and resources.
	One-off or temporary engagement	Consultations, workshops, interviews, public events	Advantages: Flexible and appropriate for specific questions or project stages. Limitations: May provide fewer opportunities to build long-term relationships.

Researchers should not view these design choices as mutually exclusive. Effective engagement often combines multiple approaches—for example, mixing online and face-to-face activities, using homogeneous and heterogeneous groups at different stages, or alternating between individual and group-based engagement. The most appropriate design is one that reflects the objectives of the engagement activity, stakeholder needs, available resources, and the wider project context.

V.6. Planning and organising engagement activities

Careful planning is essential to ensure that stakeholder engagement activities are effective, inclusive, and feasible. Beyond selecting appropriate methods, successful engagement requires adequate preparation, skilled facilitation, thoughtful follow-up, and sustained relationship-building (Whyte et al., 2010; Reed et al., 2024; Norström et al., 2020). The following considerations can help researchers plan and deliver meaningful engagement activities.

V.6.1. Building capacity and securing support

Research teams may not always have expertise in stakeholder engagement, facilitation, communication, or social science methods (Reed et al., 2024). Where necessary, additional expertise should be sought through training, collaboration, or external support.

Effective facilitation is particularly important for participatory engagement processes, although it may require additional resources depending on the scale and complexity of the activity (Kelemen et al., 2023). Researchers should therefore plan early for facilitation needs, whether by developing skills within the project team or by involving professional facilitators, communicators, knowledge brokers, artists, or other specialists. Collaboration with experienced research teams or networks such as Biodiversa+ may also help identify suitable expertise and support.

V.6.2. Allocating time and resources

Successful engagement requires realistic planning and sufficient resources (Whyte et al., 2010; Reed et al., 2024). Rather than attempting to implement numerous engagement activities, researchers should prioritise those that are most likely to contribute to the project's objectives and stakeholder needs.

Researchers should:

- Define clear objectives for each engagement activity;
- Allocate sufficient time, budget, and staff capacity;
- Align engagement with relevant project milestones, policy processes, and external opportunities where appropriate;
- Budget for facilitation, communications, venue hire, technical support, participant reimbursement, and other logistical requirements as needed.

V.6.3. Supporting stakeholder participation

Meaningful engagement requires removing practical barriers to participation and creating conditions in which stakeholders feel able and encouraged to contribute (AIATSIS, 2020a; Reed et al., 2024).

Researchers should:

- Provide accessible and reader-friendly background materials;
- Offer introductory meetings, explanatory videos, or other supporting resources where appropriate;
- Adapt engagement methods to stakeholders' needs, experience, and preferred level of involvement;
- Respect cultural practices, language needs, accessibility requirements, and preferred forms of engagement;
- Reimburse travel expenses and participation costs, and provide logistical support where appropriate;

- Create welcoming environments that encourage informal interaction, for example through breaks and small-group discussions.

V.6.4. Facilitation and documentation

Effective facilitation is a professional skill and should not be assumed to be automatically available within a project team. Researchers should ensure that engagement activities are appropriately facilitated and that stakeholder contributions are systematically documented. For group-based activities, it may be helpful to assign a dedicated organiser or rapporteur to record discussions and capture key insights.

Researchers should also establish systems for recording stakeholder contacts, engagement activities, decisions, and agreed follow-up actions. Good documentation helps maintain continuity throughout the project, prevents the loss of institutional memory, and supports learning and reflection in future projects.

V.6.5. Transparency, recognition, and long-term relationships

Stakeholders should be treated with respect, and their knowledge, time, and trust should be valued (Reed et al., 2024; Norström et al., 2020). This requires clear communication about the purpose of engagement, the influence stakeholders are expected to have, and the expectations placed on all participants.

Researchers should:

- Clearly communicate the purpose, scope, and limitations of engagement activities;
- Address ethical considerations, including intellectual property and knowledge ownership, at an early stage (see [Part III](#) on ethical guidelines);
- Offer opportunities for stakeholders to influence the engagement process and, where appropriate, the direction of the project;
- Provide feedback on how stakeholder contributions influenced decisions and explain where suggestions could not be implemented (Reed et al., 2024; Norström et al., 2020);
- Acknowledge stakeholder contributions where appropriate, for example in reports, publications, or events;
- Report transparently on engagement activities and their outcomes;
- Keep stakeholders informed about project results and impacts, including after engagement activities have concluded and, where possible, beyond the lifetime of the project.

V.7. Engaging through citizen science

Citizen science is the voluntary participation of non-professional scientists in the research process, ranging from data collection and validation to data analysis and the co-design of research questions (Bonney et al., 2009). While there is no universally accepted definition of citizen science, and even the term itself remains contested¹⁶ (Heigl et al., 2019), citizen science has become an increasingly important approach for both biodiversity research and stakeholder engagement. Citizen science can range from structured to opportunistic data collection, take place in person or online, and involve citizens, community groups, professionals, or experts contributing on a voluntary basis (Pocock et al., 2017).

¹⁶ Alternative terminology includes participatory science and community science, among others.

Citizen science is a valuable engagement strategy in environmental and biodiversity research. Biodiversa+ has developed a dedicated Citizen Science Toolkit¹⁷ that provides practical guidance for designing, implementing, and evaluating citizen science activities.

V.7.1. Benefits of citizen science

Citizen science can generate benefits for research, participants, and society.

For research, citizen science enables cost-effective data collection across large geographic areas and over long periods of time. It contributes to biodiversity monitoring and primary research, including studies of species distributions, habitat change, climate change impacts, invasive species, and disease outbreaks.

For participants, involvement in biodiversity citizen science can increase nature connectedness, support wellbeing, promote environmental stewardship, and provide opportunities for informal learning (Ballard et al., 2024).

For society, citizen science can help bridge the science-policy and science-society interface (Pettibone et al., 2017). When citizens participate as partners in the research process, knowledge can be co-created with communities rather than produced solely by researchers. This can influence how knowledge is understood, trusted, and used by decision makers (Norström et al., 2020). Citizen science can also contribute to reporting and monitoring efforts linked to international frameworks such as the United Nations Sustainable Development Goals¹⁸ and the Kunming-Montreal Global Biodiversity Framework¹⁹ (Fraisl et al., 2020).

Across all of these dimensions, citizen science can build upon place-based knowledge, lived experience, and Indigenous and Local Knowledge systems that may not be accessible through conventional research approaches alone (Mistry & Berardi, 2016).

V.7.2. When is citizen science useful?

Citizen science is particularly useful when projects require data collection across large geographic areas, long-term monitoring, repeated observations, or the integration of local knowledge and observations. It can also be valuable when stakeholder learning, stewardship, or community participation are important project objectives.

Depending on the project, participants may contribute by:

- Making ad hoc observations;
- Gathering photo documentation or participating in photo voice activities;
- Conducting repeated surveys or transect visits;
- Collecting samples (e.g., for DNA analysis);
- Deploying equipment such as acoustic sensors;
- Running experiments (e.g., pollination studies).

¹⁷ <https://www.biodiversa.eu/2023/07/13/citizen-science-toolkit/>

¹⁸ <https://sdgs.un.org/goals>

¹⁹ <https://www.cbd.int/gbf>

In biodiversity research, citizen science data can be used to assess trends in species and habitats, monitor rare species, provide early warning of threats such as invasive species or disease outbreaks, and improve understanding of ecological change.

Citizen science is not appropriate for every project. It is most effective when public participation contributes meaningfully to both the research objectives and the participant experience. Projects should avoid involving volunteers solely to increase participation numbers or simply to satisfy funding or stakeholder engagement requirements.

V.7.3. Practical requirements of citizen science

Although citizen science can be highly cost-effective, it is not free. Successful projects require investment in participant recruitment, communication, training, coordination, and feedback. Digital infrastructure, such as websites and mobile applications, also requires maintenance and long-term support. Long-term planning should also consider how participant engagement will be maintained over time, particularly as initial enthusiasm may decline.

Where possible, researchers should build on existing citizen science platforms and infrastructures²⁰ rather than creating new systems. Existing platforms can reduce costs, increase participation, and support open science and open data principles. For biodiversity projects, this may include ensuring that data are shared through appropriate repositories (such as GBIF) where relevant.

The Ten Principles of Citizen Science²¹ (European Citizen Science Association, 2015) provide important guidance for the design and implementation of citizen science projects. These principles are relevant throughout the project lifecycle, from project design and participant recruitment to data collection, feedback, analysis, and project closure (Tweddle et al., 2012).

V.7.4. Ethical and inclusive citizen science

Citizen science should be both scientifically credible and meaningful for participants. Professional scientists play an important role in ensuring methodological rigour and data quality. At the same time, consultation and co-design help ensure that citizen science does not become purely top-down or tokenistic. While research questions are often defined by scientists, they may also emerge from communities themselves or be developed collaboratively. Some citizen science projects are entirely community-led and use scientific methods to address local concerns.

Researchers should also consider issues of inclusion and representation. Citizen science participants in Europe tend to be relatively affluent and well educated, which can exclude marginalised groups and Indigenous communities or introduce systematic biases into project outputs (Pateman et al., 2021; Rambonnet et al., 2023; Schell et al., 2020). Ethical citizen science seeks to minimise harm and maximise justice by ensuring that the time and effort contributed by participants are matched by clear and equitable benefits (Carroll et al., 2021) and by avoiding extractive approaches to participation (Vohland et al., 2021).

When working with Indigenous Peoples and local communities, projects should consider approaches such as participatory community monitoring, which emphasise local leadership, community priorities, and equitable partnerships. For example, supporting communities to use technologies such as drones for

²⁰ Examples include iNaturalist, eBird, Zooniverse, and GBIF.

²¹ <https://www.ecsa.ngo/10-principles/>

environmental monitoring can strengthen local decision-making and support community objectives while generating valuable research data (FAO, n.d.; Global Indigenous Data Alliance, n.d.).

Data ownership and governance also require careful consideration. Researchers should balance open science principles with the rights and interests of participants, particularly where sensitive information is involved, such as the locations of endangered species. Frameworks such as the CARE Principles (see [Part III](#)) can help ensure that data collection and management support community interests and avoid extractive practices (Bowser et al., 2020; Carroll et al., 2020; Carroll et al., 2021).

Case study: The benefits of citizen science

The [SoilRise](#) project studies earthworms as indicators of soil biodiversity and ecosystem health across Europe. Soil organisms are often overlooked in conservation research because they are difficult to observe and sample at large scales. Earthworms, however, are well suited to citizen science approaches because they are relatively easy to recognise and provide an accessible way to engage people with soil biodiversity.

The project combines large-scale field sampling with DNA barcoding to improve understanding of earthworm diversity, harmonise taxonomy across countries, and identify species at risk or potential non-native species. By linking earthworm distribution data with environmental and land-use information, SoilRise aims to support soil conservation in both urban and rural environments.

Citizen science is central to the project and contributes to several objectives simultaneously:

- Expanding the collection of high-quality biodiversity data across Europe;
- Raising awareness of soil biodiversity and ecosystem services;
- Strengthening engagement between researchers, students, and local communities;
- Improving species identification and taxonomy through DNA barcoding.

Students were trained as mentors in each partner country to guide stakeholders—including farmers, gardeners, and local land managers—in collecting soil samples, recording earthworm abundance and diversity, and following harmonised protocols. Volunteers participated in field sampling in agricultural and urban sites, while researchers used DNA barcoding and tissue samples to validate species identification and improve data quality. Results and experiences were then shared through outreach and awareness-raising activities.

SoilRise researchers found that volunteers engaged differently than initially expected: while some took on mentoring roles, many preferred contributing through data collection at their own sites. As a result, engagement approaches were adjusted across countries. For example, in Austria, sampling activities were integrated into agricultural university curricula, while in France the project built on an already established network of earthworm data collectors. These differences highlight the importance of adapting citizen science approaches to local contexts.

SoilRise demonstrates how citizen science can support large-scale biodiversity monitoring that would be difficult for researchers alone, while also fostering environmental awareness, local participation, and knowledge exchange. It also highlights the importance of flexibility, training, and long-term engagement in designing effective citizen science projects.

PART VI: MANAGING STAKEHOLDER CONFLICT

Conflict is a common and often unavoidable feature of biodiversity research and environmental decision-making. It arises when stakeholders hold different interests, values, rights, knowledge systems, or objectives, or when the costs and benefits of decisions are distributed unequally (Redpath et al., 2013; Redpath et al., 2015). Conflicts may occur between individuals, communities, organisations, sectors, or institutions and are often shaped by broader legal, political, economic, cultural, and historical factors.

Although conflict can present significant challenges, it does not necessarily lead to negative outcomes. When managed constructively, it can stimulate learning, innovation, strengthen relationships, improve decision-making, and lead to more robust and legitimate outcomes (Poolman et al., 2009). Rather than viewing conflict solely as something to be eliminated, researchers should recognise that many biodiversity-related conflicts are dynamic and long-term. In many cases, the objective is not to eliminate disagreement, but to create fair and transparent processes that enable stakeholders to work constructively despite differing perspectives and interests (Redpath et al., 2013; Redpath et al., 2015).

Researchers and their institutions can also influence conflict dynamics through their values, assumptions, institutional affiliations, and decisions. Reflecting on these influences, acknowledging potential biases, and being transparent about decision-making are therefore important components of responsible stakeholder engagement (Redpath et al., 2013).

Conflict prevention should begin before disagreements become entrenched. Early, transparent, and continuous engagement can help identify concerns, clarify expectations, and build trust. Rights-based approaches, including FPIC (mentioned in more detail in [Part III](#)), are particularly important when working with Indigenous Peoples, helping ensure that engagement is respectful, participatory, and based on meaningful consent (FAO, 2016). Researchers should also consider whether the design of the engagement process itself could reinforce existing tensions or power imbalances, for example through who is invited, how participants are grouped, whose knowledge is treated as authoritative, or how decisions are made (Tukelboom, 2026).

VI.1. Understanding the causes of conflict

Conflict rarely has a single cause and often results from multiple, overlapping factors (Moura & Teixeira, 2010). Understanding these different dimensions can help researchers identify appropriate approaches to engagement and conflict management.

Common causes of conflict can be:

- **Cognitive:** differences in the interpretation of information, evidence, or scientific data.
- **Related to objectives and interests:** competing priorities, resource use, or desired outcomes.
- **Normative:** differences in values, ethics, beliefs, cultural norms, or worldviews.
- **Relational:** mistrust, poor communication, historical grievances, or interpersonal tensions.
- **Process-related:** disagreements about how decisions are made, who participates, or whether engagement processes are perceived as fair.
- **Structural:** conflicts rooted in legal, political, economic, institutional, or historical inequalities.

Conflicts may be open, hidden, or latent, and often evolve over time through different stages of emergence, escalation, maintenance, de-escalation, and transformation (Groton, 1997; Moura & Teixeira, 2010).

These dimensions can overlap. For example, an apparent disagreement about scientific evidence may also reflect different values, interests, levels of trust, or perceptions of whose knowledge is legitimate. Researchers should therefore avoid assuming that providing more information will resolve a conflict.

VI.2. Understanding stakeholder perspectives

Understanding how stakeholders perceive a project is essential for identifying potential sources of conflict and designing appropriate engagement processes. Interviews, workshops, questionnaires, and other engagement methods can help reveal (Poolman et al., 2009):

- Stakeholder goals, interests, and expectations;
- Perceptions of project impacts, risks, and opportunities;
- Views on roles, responsibilities, and decision-making;
- Areas of agreement and disagreement;
- Existing concerns or emerging tensions.

Researchers should also consider whether disagreements arise from differences in evidence or from deeper differences in values, identities, rights, or knowledge systems, as these often require different approaches to engagement and conflict management.

The Positions–Interests–Needs (PIN) model can help researchers look beyond stated positions to understand the interests and underlying needs that shape stakeholders' perspectives. Positions are what people publicly say they want; interests are what they want to achieve; and needs are more fundamental requirements that may underlie these interests (Fisher et al., 2000).

Researchers should also consider what motivates different stakeholders to participate and what they hope to gain from the process. Motivations may relate to relationships with nature or the community, expected material or practical benefits, opportunities to influence decisions, or the potential to build knowledge and networks (Turlboom, 2026). Understanding these motivations can help researchers design engagement processes that are relevant and meaningful to participants.

Some conflicts can be addressed through improved communication or access to information. Others reflect broader issues of representation, legitimacy, historical injustice, or the distribution of costs and benefits. In such situations, conflict management requires more than information sharing and may involve changes to governance arrangements, decision-making processes, or stakeholder participation.

VI.3. Conflict analysis

Before deciding how to respond to a conflict, researchers should seek to understand its causes, stakeholders, relationships, and broader context. Conflict analysis can help identify opportunities for constructive engagement and reveal barriers that may hinder collaboration (Poolman et al., 2009; FAO, 2005).

Conflict analysis typically involves:

- Clarifying and prioritising the issues in dispute;
- Identifying the root causes and potential impacts of the conflict;
- Understanding stakeholder interests, values, relationships, and power dynamics;
- Collecting relevant evidence and information;
- Assessing whether existing governance arrangements are capable of managing the conflict.

Power should be considered throughout this analysis (Turkelboom, 2026). Stakeholders may differ not only in formal decision-making authority, but also in access to resources, knowledge, networks, institutional influence, social status, or opportunities to participate. These dimensions of power may intersect, meaning that a stakeholder who appears influential in one context may be disadvantaged in another.

One useful technique is to develop a conflict timeline. This enables stakeholders to reconstruct key events, understand how the conflict evolved, and identify important turning points.

A conflict timeline can be developed through three steps:

1. **Open dialogue:** Invite stakeholders to describe the history of the conflict from their own perspective.
2. **Joint structuring:** Work together to identify important events, issues, and changes over time.
3. **Verification:** Review and validate the timeline with participants to ensure it accurately reflects different perspectives.

Researchers should remain sensitive to cultural differences when using timelines. Requiring a strictly linear chronology may be inappropriate or may not reflect the ways in which some Indigenous Peoples or local communities understand and communicate about events over time (AIATSIS, 2020a; AIATSIS, 2020b). Alternative narrative approaches and community-specific understandings of time may therefore be more appropriate.

Conflict analysis should be iterative, proportionate to the complexity of the situation, and updated as circumstances change. The aim is not to collect as much information as possible, but to gather the information needed to understand the conflict and identify appropriate responses.

Effective conflict analysis should:

- Gather a broad range of perspectives;
- Distinguish between evidence, perceptions, interpretations, and claims;
- Consider the wider social, economic, political, cultural, and historical context;
- Recognise power imbalances and inequalities;
- Use participatory approaches where appropriate and safe, while recognising that direct participation by all parties may not always be feasible or desirable.

Where conflict is highly polarised, researchers should also consider whether the engagement process is reinforcing existing divisions. This may require examining who is participating, how the issue is being framed, and whether the format and tone of engagement create opportunities for participants to reconsider positions and listen to other perspectives (Turkelboom, 2026).

VI.4. Questions for conflict assessment

The following questions can help guide conflict analysis (Poolman et al., 2009):

Identifying the conflict:

- What conflicts currently exist?
- What conflicts could arise in the future?
- What are the underlying causes of these conflicts?

Understanding the conflict:

- How did the conflict develop?
- What issues, values, or interests are of greatest concern?
- Is the conflict open, hidden, or latent?
- Is sufficient information available to understand the situation?
- Are stated positions masking underlying interests or needs?
- Which issues are particularly polarising, and why?

Understanding stakeholders:

- Who is involved in the conflict?
- What are the interests, rights, and concerns of different stakeholders?
- What level of influence or decision-making power does each stakeholder hold?
- What historical relationships exist between the different parties?
- Who is represented in the process, and who may be missing or less able to participate?
- Are some participants likely to dominate discussion because of differences in numbers, status, expertise, resources, or institutional power?

VI.5. Managing conflict

Not all conflicts can or should be fully resolved. In many biodiversity-related contexts, disagreements are likely to persist because stakeholders hold legitimate but competing interests, values, rights, or objectives. Effective conflict management therefore focuses on reducing harm, maintaining constructive relationships, and supporting fair and transparent decision-making over time rather than achieving complete agreement (Redpath et al., 2013; Redpath et al., 2015).

When considering how to respond to conflict, researchers should ask:

- What outcomes or agreements might be acceptable to the different parties?
- Can the conflict be managed within the project, or is independent facilitation or mediation required?
- Who would be viewed as a credible and legitimate facilitator or mediator?
- How can agreements remain effective as circumstances change?
- What mechanisms will support accountability and continued dialogue?

Researchers should also review previous attempts to manage the conflict and assess what worked, what did not, and why. This can help avoid repeating ineffective approaches and identify more appropriate strategies.

In highly polarised situations, changing the way an issue is approached may help create space for constructive dialogue. Depending on the context, this might involve (Turkelboom, 2026):

- Starting with practical questions or shared future aspirations rather than highly contested identities, symbols, or past grievances;
- Exploring positive contributions, opportunities, or areas of shared interest before addressing more contentious trade-offs;
- Creating opportunities for participants to consider perspectives other than their own, for example through facilitated role reversal or dialogue between different stakeholder groups;
- Using a facilitation style that is humble, empathetic, and open to uncertainty rather than adversarial or overly authoritative.

These approaches should not be used to avoid legitimate disagreement or exclude stakeholders with strongly held positions. Rather, they can help prevent the most polarised positions from determining the entire engagement process and create conditions for broader participation and dialogue.

Trust-building may also require approaches that allow stakeholders to interact in less formal settings. Field visits, informal conversations, storytelling, visual or arts-based activities, and opportunities to learn about other stakeholders' perspectives can help build relationships and reduce barriers to communication. Where appropriate, working with trusted local actors or community representatives can also help establish credibility and facilitate participation (Turkelboom, 2026).

Co-creation can provide another route out of entrenched positions. Exploring possible or desirable futures can sometimes be less threatening than debating the current situation, allowing stakeholders to identify shared aspirations before considering the trade-offs and practical constraints involved in achieving them. Researchers should nevertheless make trade-offs and disagreements visible rather than assuming that co-creation will produce consensus.

Successful conflict management depends on creating processes that are transparent, inclusive, adaptive, and informed by the best available evidence. Relevant stakeholders should have meaningful opportunities to participate, power imbalances should be recognised and addressed where possible, and uncertainties should be communicated openly. Where stakeholder groups differ substantially in size or power, researchers should consider whether the process provides genuinely balanced opportunities to contribute (Turkelboom, 2026). This may require careful recruitment, smaller breakout groups, separate preparatory discussions, or adapted facilitation.

In biodiversity research, success is often measured not by the complete resolution of conflict, but by stakeholders' ability to continue working together through processes that are perceived as fair, legitimate, and respectful. This may include developing greater mutual understanding, strengthening relationships and networks, increasing capacity to participate in decision-making, or enabling stakeholders to identify workable ways of managing disagreement over time.

PART VII: MONITORING AND EVALUATING ENGAGEMENT

Monitoring and evaluation can help researchers understand whether stakeholder engagement has been effective, inclusive, and meaningful. Evaluation helps demonstrate how stakeholder contributions influenced the project, identify areas for improvement, and provide evidence of the value and impact of engagement for funders, partners, and stakeholders (Blackstock et al., 2007; Warburton et al., 2007; Duncan & Spicer, 2010).

Evaluation should consider both the engagement process and its outcomes. While some outcomes can be assessed during the project, others may emerge only over longer timeframes, including strengthened relationships, increased trust, enhanced capacities, and continued collaboration beyond the project lifetime (Fish et al., 2011). Researchers should therefore consider how relationships, knowledge, benefits, or governance arrangements may be sustained after project completion.

Evaluation is most effective when treated as an ongoing process of reflection, learning, and adaptation rather than as a one-time activity conducted only at the end of a project (Norström et al., 2020; Reed et al., 2018). This aligns with the principles of ToC, which encourages regular reflection and adaptation throughout a project's lifetime (see [Part II](#) for more on ToC).

VII.1. Types of evaluation

Formative evaluation takes place throughout the project and supports learning and adaptation. It helps identify challenges early, assess whether engagement activities are meeting stakeholder needs, and adjust approaches where necessary (Bowen & Martens, 2006; Bowen et al., 2005; Salafsky et al., 2001; Allan & Stankey, 2009; Roux et al., 2010).

Summative evaluation assesses the overall outcomes and impacts of engagement activities, typically at the end of a project. It focuses on whether engagement objectives were achieved and provides accountability to funders, partners, and stakeholders (McWilliam et al., 2003; Fazey et al., 2013).

VII.2. What should be evaluated?

Evaluation should consider three broad dimensions (Rowe & Frewer, 2004; Duncan & Spicer, 2010; UK Research and Innovation [UKRI], 2020; Forestry Commission, 2011):

Engagement process:

- Were the chosen engagement methods appropriate?
- Were stakeholders able to participate meaningfully?
- Was the process perceived as fair, accessible, and inclusive?
- Were sufficient resources allocated to support engagement?

Engagement outcomes:

- Were the objectives of engagement achieved?
- How did stakeholder input influence decisions, research activities, or project outputs?
- Did engagement strengthen relationships, trust, knowledge exchange, or stakeholder capacity?
- Did it help prevent or resolve conflicts?

Longer-term impacts:

- What broader effects did engagement have on stakeholders, communities, governance processes, or research outcomes?
- Were there any unintended positive or negative consequences?
- Did engagement contribute to empowerment, legitimacy, or benefits that continued beyond the project?

VII.3. When should evaluation take place?

Evaluation should be integrated throughout the engagement process.

During planning, researchers can define objectives, identify indicators of success, and establish baseline information where appropriate (Warburton et al., 2007; UKRI, 2020).

During implementation, ongoing monitoring can identify emerging issues, inform adaptations, and help ensure engagement remains responsive and inclusive (Patton, 2011; Fazey et al., 2013; UKRI, 2020; Forestry Commission, 2011).

At project closure, evaluation can assess engagement outcomes, progress towards longer-term impacts, and provide an opportunity to communicate back to stakeholders how their contributions influenced the project (Warburton et al., 2007; International Finance Corporation, 2007).

VII.4. Culturally informed evaluation

Evaluation approaches should be adapted to local cultural contexts, knowledge systems, and communication practices. Standard evaluation methods, particularly those relying heavily on externally defined indicators or quantitative surveys, may not fully capture the values, priorities, or ways of knowing of Indigenous Peoples or local communities (Chilisa, 2012; AIATSIS, 2020b).

Researchers should create opportunities for stakeholders to evaluate engagement in ways that reflect their own knowledge systems and communication practices. Examples include:

- Yarning: conversational and narrative approaches grounded in relationship-building.
- Dadirri: deep listening based on patience, respect, and reflection.
- Ganma: a two-way knowledge-sharing approach that brings together Indigenous and Western knowledge systems.

Case study: Using evaluation to adapt engagement and improve research outputs

The Weddell Sea Observatory of Biodiversity and Ecosystem Change ([WOBEC](#)) project aims to develop a long-term, transnational biodiversity monitoring framework for the Eastern Weddell Sea in Antarctica. The project brings together scientific institutions, governance bodies, NGOs and industry to ensure that the monitoring framework reflects scientific knowledge and stakeholder needs, and can contribute to the establishment and future operation of the Weddell Sea Marine Protected Area.

WOBEC integrated evaluation into its stakeholder engagement and knowledge co-production process from the outset. The project developed a stakeholder engagement and knowledge co-production protocol guided by principles of context-based, pluralistic, goal-oriented and interactive knowledge co-production, with attention to different knowledge systems and potential power imbalances. Regular internal evaluations were used to reflect on the credibility, relevance and legitimacy of the process and inform its continued implementation.

Evaluation informed adaptations to both engagement methods and activities. The project team recognised that group workshops may not suit all participants in an international context involving different cultural and linguistic backgrounds. Individual meetings with certain stakeholders are therefore planned to provide additional opportunities for their perspectives to be heard. Evaluation also informed changes to the focus of workshops. For example, at a workshop held during the Scientific Committee on Antarctic Research (SCAR) [Open Science Conference](#),²² the team replaced the planned future visioning exercise with a session focused on reviewing the biodiversity observatory blueprint and sharing findings from the latest WOBEC expedition to the Weddell Sea.

This adaptation generated concrete input for the research output. Participants provided suggestions for improving the observatory blueprint and clarifying the rationale behind proposed measurements. The blueprint is currently being revised accordingly. The project team also observed that participants were engaged in the discussions and tasks, as the workshop focused on topics to which they could directly contribute their expertise.

WOBEC illustrates how ongoing evaluation can help researchers adapt stakeholder engagement to participants' expertise and circumstances, while keeping engagement relevant to evolving research needs. By informing changes to engagement activities and generating feedback that contributes to the revision of research outputs, evaluation can support both the engagement process and its outcomes.

²² <https://scar2026.org/>

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ANNEX: GUIDELINES FOR RESEARCH WITH INDIGENOUS PEOPLES

Indigenous Peoples as rights-holders

A risk of the stakeholder engagement concept is that it may prioritise interests while overlooking rights. Rights-based approaches are increasingly prominent in environmental governance and research (United Nations, 2007; Jodoin et al., 2021; Sarkki et al., 2023). Indigenous Peoples are therefore best understood as rights-holders rather than simply stakeholders (Sarkki et al., 2021; see [Part II](#) for a definition of rights-holders).

This reflects their distinct rights, governance systems, knowledge systems, and longstanding relationships with lands and natural resources. Many Indigenous Peoples continue to experience the impacts of historical and ongoing colonial processes that have affected their ability to maintain and transmit cultural practices, knowledge systems, and ways of life (McGregor, 2021).

Recognising Indigenous Peoples as rights-holders has important implications for research. Engagement should extend beyond consultation and foster collaborative approaches that recognise Indigenous knowledge systems as valuable and legitimate contributions to research and decision-making. Engagement limited to informing communities about externally produced findings may fail to reflect Indigenous priorities and ways of knowing.

Why specific guidelines are necessary

Research involving Indigenous Peoples takes place within a historical context in which research has often been conducted in extractive ways and has contributed to colonial processes (Smith, 1999). This history has understandably created mistrust toward research institutions in many Indigenous communities.

These guidelines aim to support research that is ethical, respectful, collaborative, and beneficial to Indigenous Peoples involved in research processes. They emphasise self-determination, reciprocity, recognition of Indigenous knowledge systems, and meaningful participation throughout the research process.

It is important to note that many Indigenous Peoples and countries have specific legal requirements, consultation protocols, ethical guidelines, and governance processes relevant to research activities. Researchers are responsible for identifying and complying with all applicable requirements before commencing research (TRUST Project, 2018).

Core principles for research with Indigenous Peoples

1. Identify the Indigenous Peoples involved:

Clearly identify the specific Indigenous Peoples involved in the research (e.g., Inuit Nation, Baré People, Pataxó People). This reflects respect for distinct identities, governance systems, and cultural contexts.

2. Adopt a relationship-based approach:

Research involving Indigenous knowledge should be grounded in trust, respect, and sustained relationship-building. Meaningful engagement often requires time beyond the scope of a single project. Researchers should invest in developing and maintaining relationships throughout the research process.

3. Implement Free, Prior, and Informed Consent:

Projects involving Indigenous Peoples should clearly describe how FPIC will be sought, documented, and upheld throughout the project lifecycle. FPIC should be understood as an ongoing process rather than a one-time procedural requirement. For further guidance, see **Part II** of this Handbook, and the FAO Manual for Project Practitioners on FPIC²³ (FAO, 2016).

4. Respect Indigenous governance structures and protocols:

Researchers should identify and follow relevant Indigenous governance structures, community protocols, consultation processes, and cultural practices. These may differ from institutional ethics procedures and must be integrated into project design from the outset.

5. Involve Indigenous and cultural experts:

Where appropriate, projects should include Indigenous researchers, knowledge holders, or individuals with recognised expertise in the relevant cultural context. Other specialists with established experience working with Indigenous Peoples may also support culturally informed research. Such involvement can strengthen understanding, communication, and research quality.

6. Define benefits collaboratively:

The intended benefits of the research should be defined in collaboration with Indigenous partners. Researchers should consider how the project may contribute to priorities identified by Indigenous Peoples, including community wellbeing, capacity strengthening, knowledge continuity, and policy relevance.

7. Co-design the research:

Where possible, research should be co-designed with Indigenous partners from the outset. This includes collaboratively defining research questions, objectives, methods, and approaches to interpreting and communicating findings. Co-design helps ensure that research aligns with Indigenous priorities, values, and knowledge systems, while strengthening the relevance, integrity, and mutual benefits of the research.

8. Support equitable knowledge co-production:

Projects should establish clear mechanisms for shared decision-making and meaningful participation by Indigenous partners throughout the research process. Indigenous knowledge systems should be recognised as equally legitimate knowledge systems. Collaboration arrangements, authorship, compensation, and capacity-building opportunities should be discussed transparently and agreed upon jointly.

9. Ensure accessible return and reciprocal sharing:

Research findings, data, and outputs should be returned to Indigenous Peoples in accessible and appropriate formats. Researchers should plan for ongoing communication of results throughout the

²³ <https://www.fao.org/3/i6190e/i6190e.pdf>

project and, after its completion, use agreed-upon languages, formats, and dissemination methods. This supports reciprocity and helps ensure that research contributes directly to participating communities.

10. Protect Indigenous cultural and intellectual property and support data sovereignty:

Projects should explicitly address the protection of Indigenous Cultural and Intellectual Property (ICIP) and Indigenous data sovereignty (Carroll et al., 2021). Data governance, ownership, access, storage, and future use should be defined collaboratively with Indigenous partners and formalised through appropriate agreements such as Data Sharing Agreements. Researchers should recognise that Indigenous control over knowledge and data extends beyond conventional academic norms of authorship and intellectual property (AIATSIS, 2020a). (For more on the ethics of data, see [Part II](#) of this Handbook.)²⁴

Case study: Bringing local knowledge into restoration and conservation

The [NARROW](#) project explored how local communities, including Sámi communities, understand and contribute to the restoration and conservation of inland waters, wetlands and surrounding landscapes in Sweden and Finland. Rather than assessing restoration only through ecological measures, the project brought together ecological data with local narratives, values and knowledge to examine what makes locally led restoration effective and sustainable.

NARROW engaged local communities and other actors through interviews, dialogue workshops, field visits and collaborative activities. In Finnish Lapland, this included engagement with Skolt Sámi experts to explore environmental change, restoration practices and local knowledge. The project used a “braided” approach to bring Indigenous and local knowledge into dialogue with academic and expert knowledge, with engagement based on Free, Prior and Informed Consent (FPIC).

What did engagement contribute?

NARROW found that local communities can have different understandings of environmental problems, restoration priorities and appropriate management approaches from those of authorities and researchers. This highlighted the importance of understanding restoration within its specific social, cultural and ecological context, rather than assuming that approaches developed outside the local context will be appropriate.

These findings informed the project's recommendations for restoration and conservation policy. NARROW called for communities to be involved earlier in restoration processes, for local initiatives and knowledge to be recognised, and for restoration approaches to be adapted to local circumstances. The project also found that involving local communities can strengthen understanding and legitimacy of restoration measures and foster a sense of ownership, supporting the longer-term conservation of ecological and social values.

²⁴ Several organisations have developed mechanisms to operationalise Indigenous data sovereignty. These include the Murray-Darling Basin Authority's ICIP Policy (Murray-Darling Basin Authority, 2025), Canada's use of OCAP (Ownership, Control, Access, Possession) principles in shared conservation governance (British Columbia Ministry of Water, Land and Resource Stewardship, 2026), and the Aotearoa Genomic Data Repository's use of Local Contexts labels to govern access and reuse of genomic data (Local Contexts, 2026). Together, these examples illustrate practical approaches for protecting Indigenous Cultural and Intellectual Property and ensuring Indigenous control over data.