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Assessing inclusion in community-based natural resource management:
A framework and methodology

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Australian Centre for International Agricultural Research

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Executive summary

Challenging assumptions and generating data for more inclusive community-based natural resource management

Community-based natural resource management (CBNRM) is valued as a model of inclusive development and governance. While CBNRM may perform relatively well for garnering broader participation (Evans et al. 2011), it can also reproduce, and even accentuate, power imbalances, and perpetuate the exclusion of already marginalized groups of people (Cinner et al. 2011; Evans et al. 2011). To avoid inequities, and to improve gender equality in and through CBNRM, many policies, programs and projects aim to improve women's experiences of inclusion. However, these efforts too frequently reduce inclusion to attendance at CBNRM meetings and events, rather than understanding all elements of what facilitating and experiencing inclusion might entail. Moreover, social exclusion along the intersecting markers of social identity (such as wealth, age or life stage, ethnicity, race or caste, or migrant status) are often overlooked and not addressed. As such, these "participatory exclusions" (Agarwal 2001) have either been continually under-addressed, or completely ignored, in practice and policy. One reason for this oversight is the lack of a nuanced framework and methods for programs, projects and policies to understand, unpack and measure inclusion (and exclusion) more meaningfully.

This Guidance Note helps address this gap. Specifically, it offers a framework that opens the "black box" of inclusion and removes uncertainty around the meaning of inclusion—in so doing we make clear distinctions between inclusion from more superficial forms or measures, especially attendance. The Guidance Note then presents a set of mixed methods and tools to assess inclusion (and exclusion) using this framework.

Prioritizing inclusion as a key process and outcome of CBNRM is an important foundation for moving toward the larger goals of equity, gender equality and sustainable governance of resources (Leisher et al. 2014). Yet, moving from these aspirations to change requires challenging erroneous assumptions—and this in turn can be supported by data generated from appropriate frameworks and via effective methods. Together the Five Degrees of Inclusion Framework and its methods aim to contribute a way forward along this important path.

Who should use this Guidance Note

The Five Degrees of Inclusion Framework and associated methodology were developed for agencies and development professionals, such as extension agents, researchers and facilitators, who work with communities to improve the local and collaborative governance of natural resources. In particular, this methodology is ready for use by CBNRM program and project teams in early project design or implementation stages and those in interim and later stages—in sum where design or implementation of monitoring, evaluation, learning and adjustment is happening. Importantly, the earlier that this framework, indicators and/or reflection points are embedded into project, program or activity design, the more likely that work will help lead to outcomes of inclusion.

The framework and methodology will be of particular interest to data- and evidence-oriented agencies and actors who have a commitment to inclusion, gender equity, and fair management and governance. As well as enabling these agencies and actors to strengthen their own programs and projects and the CBNRM policies they inform, the frameworks, methods and insights may be of interest to communities and CBNRM groups themselves as governance actors, co-researchers and owners of CBNRM processes.

The framework and methodology were piloted in 14 communities in Solomon Islands in 2019–2020 in relation to CBNRM of fisheries. The vision for this framework and methodology is that they are accessible for use by CBNRM actors across the Pacific, as well as in Asia and Africa. We encourage users of the Guidance Note to co-design and co-refine, including aims and questions, the research methodology with relevant actors. Relevant actors include national and provincial agencies responsible for facilitating the design and implementation of

CBNRM, community members including women and men who are and who are not formal leaders, and civil society organizations who represent the interests of communities and fisheries actors.

The framework and methodology

The Five Degrees of Inclusion Framework addresses common ambiguities and assumptions by unpacking inclusion (and exclusion) into five measurable and comparable elements or stages of a CBNRM process: attending, understanding, sharing, being valued and decision-making. Although the framework is novel, it integrates and builds upon important theoretical foundations (Arnstein 1969; Pretty 1995; Agarwal 2001).

Building on the framework, the methodology presented in this Guidance Note offers an intersectional, mixed methods approach to answering the following questions:

- To what extent are different community members included or excluded from CBNRM governance processes at the local scale?
- How are different people's experiences of inclusion or exclusion associated with key social markers, such as gender? And with other aspects of social identity, like age or life stage, kindship relations, wealth, education, migration (or insider or outsider status) and other formal leadership roles?
- What changes or elements of CBNRM processes might increase or decrease experiences of inclusion or exclusion for different people?

The methodology combines quantitative and qualitative methods that allow findings to be triangulated. This improves the ability to sensibly interpret and understand what the data are saying. The use of qualitative methods and data is particularly important for this research because people's experiences of inclusion and exclusion can relate to the "countable" aspects of the process (e.g. attendance) or categories of social identify (e.g. male or female, age), but may be influenced as much or more by aspects of culture, process and context that are not well understood through survey methods. The methodology is multifaceted and designed to be flexible and adjusted to fit the context. We suggest that the qualitative aspects and the use of other qualitative data will be particularly important to these questions. We intend for these methods and tools to be adapted, further developed, and implemented to fit the context and the needs, capacities, time and resources of those who use the Guidance Note.

The framework and methodology are focused at the local or community level because of the scale of investment and focus in many countries and regions to engage communities in CBNRM. However, engagement at the local level is not the only place where inclusion or exclusion might be influenced. The conditions that enable, promote or disenable different approaches to CBNRM are also determined at sub-national, national, regional, global scales—where "the stage is set" by policy, investment and governance agency intentions and commitments (Lawless et al. 2021).

This Guidance Note presents the methodology in four phases: (1) preparation, (2) field work, (3) data analysis and then (4) integrating the analyses and interpretation to bring everything together. These phases and their components are presented in Figure 1.

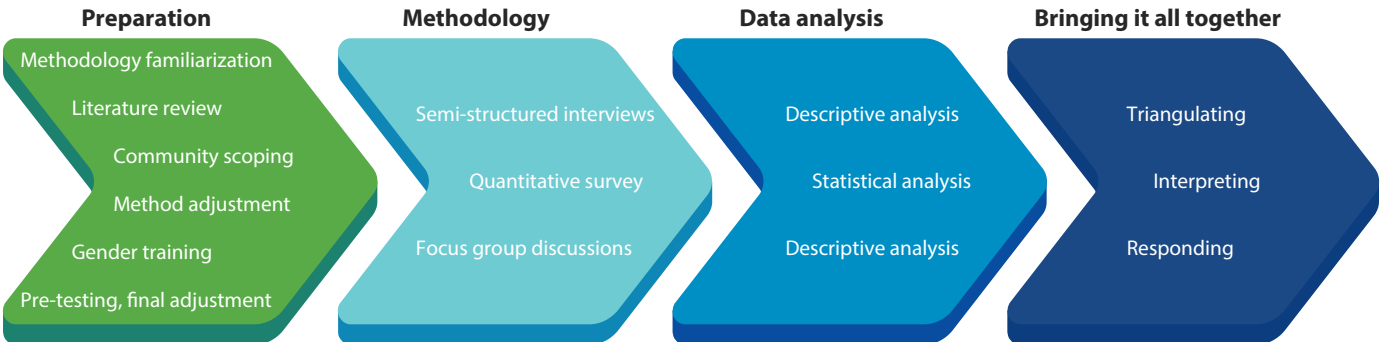


Figure 1. Structure of this Guidance Note.

Box 1. Key messages

- CBNRM may generally be more participatory in nature relative to top-down forms of governance. Yet, CBNRM can perpetuate gender and social inequalities and inequities and widen power differentials *within* communities of resource users, making participation and inclusion unequal.

- To avoid inequities and to improve gender equality in CBNRM, many policies, programs or projects aim to improve the inclusion of women. However, this is too frequently reduced to aiming to increasing or counting women's attendance at different meetings or events. Moreover, differences in inclusion or exclusion due to other markers of social identity, such as wealth, life stage and social standing, are often overlooked and not addressed.

- Different peoples experiences of inclusion (or exclusion) in governance processes can be impacted by their gender and other intersecting markers of social identities, such as age, class and ethnicity. For example, women tend to experience lower levels of inclusion than men. And young, poor or migrant women experience even greater and more frequent exclusion along the different stages of the CBNRM process.

- This Guidance Note offers a novel framework, grounded in theory, to address conflation of participation or attendance with inclusion. It unpacks the black box of inclusion by breaking it into five different stages of the CBNRM process. Visualizing and using these in monitoring and facilitation can help CBNRM move from (attempts at more) equal attendance toward a more genuine realization of gender and social inclusion.

- The Guidance Note offers a methodology that combines quantitative and qualitative methods. The methodology is multifaceted and designed to be flexible. The various methods and tools are meant to be chosen, adapted, further developed, and implemented to fit the context and the needs, capacities, time and resources of the users of the note.

- We recommend, in small communities in particular, that there is less reliance on survey methods and a greater use of qualitative methods involving quality dialogue and exchange of knowledge and experiences. Given that CBNRM is a governance process, we strongly suggest any "point-in-time" assessments are used with caution and are best combined with understandings of the CBNRM process and "lived experience"—where these understandings have been developed through time and in relationships within, and with, communities.

- The earlier that objectives of inclusion, and the use of this framework, indicators, and points of critical reflection, are embedded into design and implementation of a project, program or activity, the more likely outcomes toward inclusion will be realized.

- The Five Degrees of Inclusion Framework and associated methodology will be of particular interest to data- and evidence-oriented agencies and actors who are committed to inclusion, gender equity, and fair management and governance.

1. Introduction

1.1. Why this framework and methodology?

There has been a growing emphasis globally, particularly in natural resource management sectors in low-income nations, on collaborative governance or co-management. In many contexts, these can include CBNRM that an external facilitator facilitates, supports or informs in some way. CBNRM is often valued as a model of inclusive development and participatory governance. It has been promoted and supported in national and regional small-scale fisheries management policy frameworks, such as the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (FAO 2015) and A New Song for Coastal Fisheries – Pathways to Change: The Noumea Strategy (SPC 2015), respectively.

Co-management and CBNRM generally support relatively high levels of participation (Evans et al. 2011). Yet even within these participatory, community-scale processes, there is growing evidence that in many cases women and people from less powerful groups experience low levels of inclusion or even significant risk of exclusion from parts of the CBNRM governance process. Using a phrase coined by Agarwal (2001), these are "participatory exclusions." These exclusions can be associated with gender, but also other '"intersecting" social identities, such as age, education or ethnicity. The way different social identities correlate with experiences of inclusion or exclusion vary between different contexts and can be affected by the ways CBNRM is facilitated.

A lack of strong empirical data and assessments from CBNRM makes the challenge of overcoming such exclusions even more challenging (Agarwal 2001). In research, monitoring and practice, "participation" is commonly used as the proxy for inclusion, or even conflated with it. In the most concerning instances, inclusion is assessed by counting "attendance" of women and men. A focus on attendance alone can miss other barriers to inclusion, such as access to information, ability to speak in group settings, and norms regulating whose opinions are valued and prioritized. This Guidance Note has been developed because there are better ways to understand and improve inclusion.

One reason for this oversight is the lack of a nuanced framework and methods to provide guidance to programs, projects and policy to understand, unpack and measure inclusion (and exclusion) more meaningfully. This Guidance Note addresses this gap. Specifically, it offers a framework that unpacks inclusion and removes uncertainty surrounding inclusion from more superficial forms or measures, especially attendance. It then presents a set of mixed methods and tools to assess inclusion (and exclusion) using this framework.

Prioritizing inclusion as a key process and outcome of CBNRM is an important foundation for moving toward the larger goals of equity, gender equality and sustainable governance of resources (Leisher et al. 2014). Yet, moving from this aspiration to change requires challenging erroneous assumptions—and this in turn relies on data generated from appropriate frameworks and via effective methods. Together the Five Degrees of Inclusion Framework and its methods aim to contribute a way forward along this important path.

1.2. Who should use this framework and methodology?

The Five Degrees of Inclusion Framework and methodology were developed for agencies and development professionals, such as extension agents, researchers and facilitators, who work with communities in relation to natural resource management. The methodology and framework can be useful to these actors to systematically identify inequities or gaps in inclusion. In particular, this methodology is ready for use by CBNRM program and project teams in their early stages to inform design and in interim and later stages to offer monitoring, evaluation and learning data to inform program, project and policy improvements.

They will be of particular interest to data- and evidence-oriented agencies and actors who have a commitment to inclusion, gender equity

Box 2. Key concepts

Community-based natural resource management: CBNRM is a people-centered approach to integrating the conservation of the natural resource base (water, soil, trees and local biodiversity) with resource use and development to overcome poverty, hunger and disease (World Neighbors n.d.). It is viewed as a decentralized, self-regulated and localized system that is supposed to address the issues that centralized or top-down resource management struggles to address. CBNRM is generally viewed as a mechanism to address both environmental and socioeconomic goals and to balance the exploitation and conservation of valued resources. It requires some degree of devolution of decision-making power over the resources to communities and community-based organizations. It seeks to encourage better resource management outcomes with the full participation of communities and resource users in decision-making activities, and with the incorporation of local institutions, customary practices and knowledge systems in management, regulatory and enforcement processes (Roka 2019).

Gender: Gender refers to the social expectations and opportunities associated with being a "woman" or a "man," or in some cases a category of third gender. Biological sex is based on a combination of biological traits, but these traits do not determine the socially and culturally constructed categories of gender. Gender is a key concept in development and governance because it relates to and explains often unequal relations of power between women and men that play out in formal and informal institutions at all scales. Gender norms, relations and beliefs shape women's and men's life experiences, opportunities, benefits, burdens and risks relating to all spheres of their lives, including access to and benefits from fisheries, forests, water and natural resources.

Gender norms: These are the "informal rules and shared social expectations that distinguish expected behaviour on the basis of gender" (ODI 2015). Children learn these rules at a young age, and they shape how people treat others and expect to be treated themselves. In a fisheries context, for example, gender norms can shape the type of fishing and other fisheries labor women and men do. They can also shape how their labor is valued (including in monetary terms), what types of fish and other aquatic foods they harvest and handle, and for what fisheries benefits can they make decisions about. A 26-country study on gender norms in agriculture and natural resource management found constraining gender norms in all contexts, which led to men being better recognized and served by extension services and innovation processes (Petesch et al 2018).

Inclusive governance and CBNRM inclusion: Here we refer to CBNRM as a series of governance processes and outcomes, and *the experiences of those by the people involved*. These *equitably recognize, involve, enable and operate from the agency*, specifically the ability to make decisions and act on them, of the diverse women and men, and people of other, non-traditional genders. We do not consider inclusion as synonymous with participation, where participation is understood as attendance or even speaking up. As such, the framing of inclusion we use is informed by concepts of recognitional and procedural justice. This also reflects a way of thinking about gender and equity that is intersectional—looking at other forms of social identity and how these shape power relations, marginalization or privilege. While this Guidance Note focuses on the local (within) community scale, inclusive governance is a critical issue to address at all scales including, and up to, the national and global (Österblom et al. 2020).

Intersectionality: Women and men are not homogeneous social categories defined only by gender. Rather, people's sense of self, power, opportunities and life experiences are shaped by markers of social identity, such as ethnicity, clan, caste, class, life stage, ability, sexual orientation and more. An intersectional lens illuminates these other social identifies and how they intersect with gender. This will include identifying if, how and to what extent women and men and the gender dynamics they are embedded in are different—or similar—for different women and different men depending on their age, ethnicity and religion, etc. (WorldFish 2017).

Participatory exclusion: This describes the phenomenon in which institutions or approaches, such as CBNRM, are participatory and yet de facto systematically exclude women or other people. Agarwal (2001) coined the term in describing community forestry groups created within a participatory CBNRM approach. These groups were meant to be inclusive community institutions and were widely assumed to be so in the policy and program spheres. Yet nuanced analysis identified that women were largely excluded from decision-making. These exclusions can arise from systemic factors rooted in gender and social norms that can create multiple interacting marginalizations. As well as gender, interconnected (intersectional) factors such as age, education, disability, ethnicity, religion, migrant status and more influence people's experiences of inclusion or exclusion. While there are global patterns of exclusions, such as of youths, differently abled people and minority groups, the specific factors that drive exclusions and the social determinants of who experiences exclusions will vary between local contexts.

and fair management and governance—and a sense that despite investments to date, there is more to be done. As well as enabling these agencies and actors to strengthen their own programs and projects and the CBNRM policies they inform, the frameworks, methods and insights may be of interest to communities and CBNRM groups themselves as co-researchers in, and owners of, CBNRM processes.

1.3. Objective of the framework and methodology: What questions will it answer?

The objective of this framework and methodology is to conceptualize and assess the inclusion and exclusion of different people in decision-making processes related to CBNRM. This framework and methodology were developed around community-based fisheries management, but

they can be easily adapted to other resource management scenarios, such as water or forestry.

The framework addresses common ambiguities and assumptions by unpacking inclusion (and exclusion) across five different elements of governance associated with CBNRM: attending, understanding, sharing, being valued and decision-making.

Building on the Five Degrees of Inclusion Framework, the methodology presented in this Guidance Note offers an intersectional, mixed methods approach to answering the following questions:

- To what extent are different community members included or excluded from CBNRM governance processes at the local scale?
- How are different people's experiences of inclusion or exclusion associated with key social markers, such as gender? And with other aspects of social identity, like age or life stage, kindship relations, wealth, education, migration (or insider or outsider status) and other formal leadership roles?
- What changes or elements of CBNRM processes might increase or decrease experiences of inclusion or exclusion for different people?

It is important to note that the methodology does not assess underlying *determinants of* inclusion, such as particular policies, formal and informal support for customary or local tenure regimes, CBNRM program structures, processes or facilitation.

This Guidance Note provides a framework and tools that inspire data, critical reflection and adjustment that provide insights on how different groups in a community might experience inclusion or exclusion. This information can be used to understand the extent to which the CBNRM is or is not inclusive and for whom and identify which groups should be prioritized in strategies to enhance inclusion.

Given CBNRM is a governance process, we strongly suggest any "point-in-time assessments" are used with caution and are best combined with understandings of the CBNRM process and "lived experience gained through time and relationships within, or with, communities. Critical following steps for key actors and agencies supporting CBNRM, as well as community members, include a deeper dive follow-up with the groups identified as more excluded. The purpose is to understand *factors* at different scales driving the exclusions, understand their aspirations and any fears regarding CBNRM, and co-generate strategies with all groups that align with local visions of what inclusion and equitable governance processes can and should look like.

1.4. Background of this methodology as an innovation

The backdrop to this methodology was a multiyear applied action research engagement of WorldFish with communities and governments in the Pacific to foster more inclusive and equitable CBNRM as it applied to coastal fisheries systems. Despite significant efforts to improve the gender-sensitiveness of CBNRM facilitation and positive participation "numbers," the teams involved realized that there was a significant gap in understanding and improving the extent to which different women and men were meaningfully engaged in CBNRM.

The implications of this oversight or gap were substantial. It stymies government, NGO and research efforts to improve social and environmental outcomes of CBNRM and perpetuates experiences of exclusion by some social groups. In the worst cases, it means that well-intentioned efforts around CBNRM may widen and exacerbate existing inequalities.

"Lifting the lid" on this gap further, it emerged that part of the problem was that a clear and sufficiently nuanced framework of inclusion was lacking, and there was no fit for purpose methodology or guidance. These realizations have led to the development of this fit for purpose—and scalable—methodology, including a bespoke framework, to assess inclusion in CBNRM using an intersectional gender lens.

The methodology described here was piloted in Solomon Islands in 2019–2020. It focused on CBNRM of fisheries, or community-based fisheries management, with a view to make this appropriate and accessible for use by CBNRM actors across the Pacific and adaptable for actors working in Asia and Africa. The framework and methodology are designed to be flexible and can be adapted, further developed, and implemented by agencies actors who research or facilitate CBNRM.

2. The concepts of participation and inclusion

2.1. An evolution of participation-related frameworks

In the 1960s, the concept of participation was actively taken up by those invested in citizen involvement in governance processes. This was adopted and adapted by development practitioners, including those in natural resource management, as a priority vehicle for development. Participation was seen as instrumental to achieve both conservation and social outcomes for the women and men who rely on and manage natural resources. The rise of participation as a development strategy, however, has been followed by a critique of what participation means and who it benefits (Cornwall 2008). This critique dovetails with concerns regarding development interventions and research that treats communities as if they were homogeneous (Guijt and Shah 1998) and CBNRM like an indivisible black box unit.

In response to early critiques, researchers such as Arnstein (1969) began to deconstruct the meaning of participation. The typologies that emerged aimed to characterize the intricacies of power and decision-making. The key variable was often a continuum of self-determination by local stakeholders, who were often characterized as people without easy access to power but more directly impacted by the decisions being made. For example, Arnstein's ladder places "manipulation" at the bottom of the ladder—this is where groups of citizens are told what do to, as a form of non-participation whereas at the top of the ladder is "citizen control" which means that previously marginalized groups have the most decision-making power (Arnstein 1969).

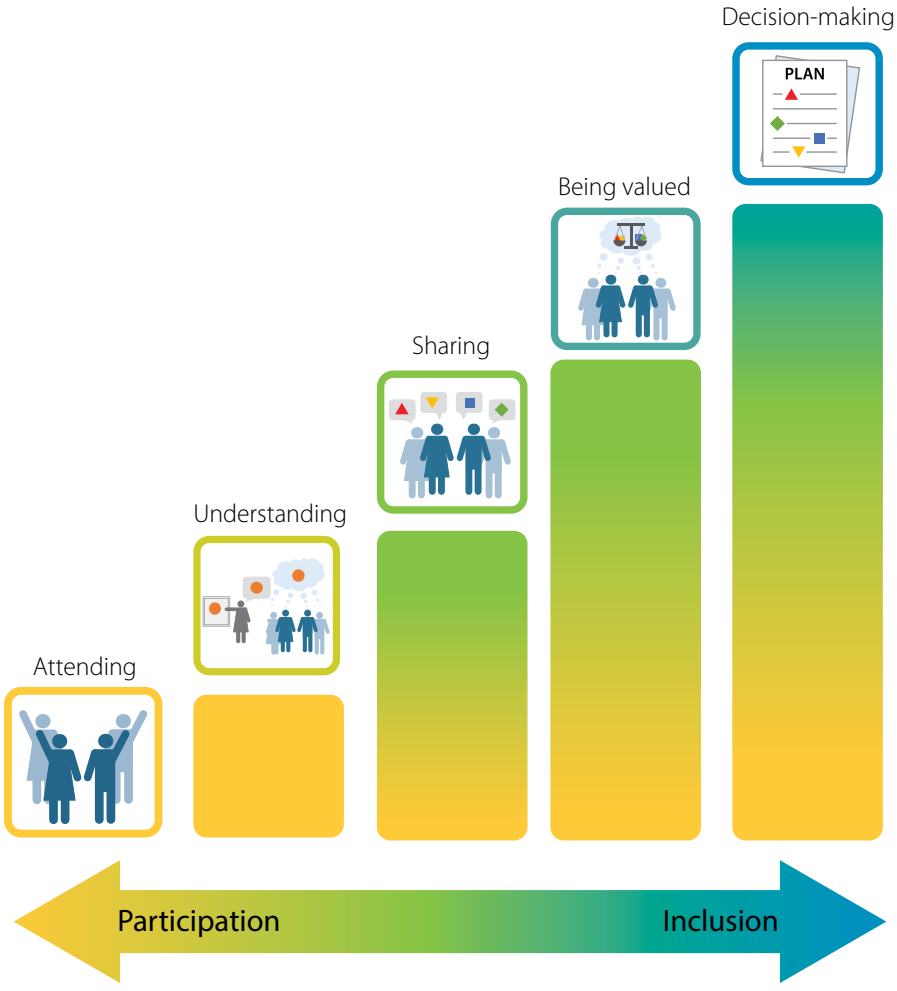
Examples along the continuum also often describe how certain types of participation are "performative." This implies that they involve participants in a program sharing power, when in fact it is the program owners who primarily still hold power. For example, "functional participation" includes an element of participation to meet an instrumental goal, such as meeting program aims, in an efficient way, but decision-making is still done by outside actors (Pretty 1995). Many others describe "consultation" as a method powerful groups use to seek advice from marginalized groups, but without giving any guarantee that their opinions will shape the final decisions. This can confer legitimacy of the participatory process, without actually sharing the power (Arnstein 1969; Pretty 1995; Agarwal 2001).

Several participation typologies focus on relationships of power between less powerful communities (White's "bottom up") and more powerful outside actors (White's "top-down") (Arnstein 1969; Pretty 1995; White 1996). By contrast, Agarwal's (2001) typology of participatory exclusions uses a feminist approach that focuses on gender to interrogate relationships of power within the community, and how women are excluded from community forestry groups in Nepal and India. Agarwal (2001) presents a valuable community-scale framework to assess intercommunity power differences in decision-making groups. Similar to Arnstein (1969), Pretty (1995) and White (1996), Agarwal's typology describes different types of participation and ranks them in terms of relative power. It starts at nominal participation in group membership as having the least power, and then moves to empowering interactive participation, which indicates influence in the groups' decisions (Agarwal 2001). While valuable, the categorization of participation using Agarwal's framework did not explicitly include barriers to participation and inclusion that were outlined in the participation and procedural justice literature. For example, having equal access to information, and having all opinions respected, is an integral step in inclusive decision-making, but it is not clearly listed in Agarwal's typology. Furthermore, by focusing less on the type of participation, and more on specific barriers, we strove to build an assessment framework that could give practitioners a clear understanding of which barriers need to be addressed. Going forward, we drew from the participation and procedural justice literature to examine other specific requirements of participation that were not detailed in Agarwal's typology, but have been recognized as barriers to inclusion in community decision-making.

2.2. The Five Degrees of Inclusion Framework

The Five Degrees of Inclusion Framework was inspired by, and draws on, scholarship of participation, gender and development, as well as recognitional and procedural justice. The framework is intended to avoid measures of inclusion being taken as—or extrapolated from—counting how many women and men attend meetings, which is a common metric for gender equity in participation.[1] Because, for example, women that show up, may still not feel able to speak. As Jackson (2006) points out: "Testimony is one of the primary ways in which we come to know, yet the ability to speak, make testimony, is often taken for granted to be independent of social identity."

The framework is a further evolution and adaption of earlier frameworks (see Section 2.1). It nudges researchers and facilitators to move from participation understood as attendance to inclusion as an experience of being fully included and experiencing agency in decision-making. The framework examines inclusion across "degrees" or elements of governance: attending, understanding, sharing, being valued and decision-making (Figure 2). Each degree represents a different, albeit interconnected, element of governance that together add up to a decision-making process where different types of people might experience inclusion or exclusion.



Note: Degrees 1, 2 and 3 set up for (but do not equate to or guarantee) degrees 4 and 5, and ultimately inclusive governance. Although the diagrammatic representation shows these degrees as equal-sized linear steps, this is most commonly not the case in reality, and moving from one degree to another will often be very different depending on the person being evaluated and the local context or the type of CBNRM.

Source: Kleiber et al. 2019.

Figure 2. Five degrees of inclusion, ranging from attendance to inclusion in decision-making.

3. Preparing for the assessment

There are five key steps that may be useful in preparing to carry out an assessment using the methodology. These preparatory steps should contribute to greater research and assessment quality in terms of relevance, legitimacy and effectiveness. While all steps are important, each can be adapted as needed, and the investment a researcher or assessment team needs to make in each step may depend, to some degree, on their gender and context expertise. Some, such as the training and pre-testing of tools, work well if used together.

STEP A: Familiarization with the framework, objectives and methodology
Before any data is collected, it is important to understand the rationale of the framework, the objectives and limitations of the methods, and the stages and approaches the methodology provides. This familiarization stage helps you and your team to understand, question and adapt how to use the methods in your specific case and CBNRM context.

STEP B: Literature review
A review of published and grey scientific and technical literature can be either structured or unstructured and will help you accomplish three objectives:

1. Build a baseline understanding of what others have found before you in terms of inclusion or exclusion CBNRM.
2. Understand social or gender norms that have been documented at local or national levels, and/or decision-making and governance structures, rules and norms that prevail in the broader context or specific location you are working in.
3. Understand national or more local approaches to CBNRM from community, facilitators and/or government perspectives, if these have been documented.

This information and the new understanding it brings may help you adjust and refine the design of the focus group discussions (FGDs), research team training sessions, the exclusion survey, the semi-structured interviews and the data required for a relevant community profile.

Once your data collection and analysis are done, revisiting what you found reviewing the literature will help you interpret your findings by relating them to other established findings and knowledge.

STEP C: Community scoping and profiles
Profiles of the communities you are working with might include collating demographic, geographic, economic, governance and social structure information. From a methodological perspective, this can help you think through and design the pragmatic and logistical aspects of data collection, and help ensure that sampling (from whom perspectives are gained) spans different demographic and social groups. A community profile is also a useful place to understand the history and/or approach to CBNRM the community has led or been engaged in.

There is no replacement for a long working relationship and deep knowledge of a community. However, a community profile may helpful in contexts to build, share and validate that knowledge with the community and different facilitators or researchers (Annex 1).

STEP D: Case-specific adaptation and pre-testing of methods and data collection tools
Designing the tools helps ensure that those tools taken into the field do the job they are supposed to, and helps to have a conversation with members of the community that generate new understandings about inclusion and exclusion in CBNRM. The methods presented in this Guidance Note will likely benefit from adjustment and adaptation to fit the context you are trying to understand. In fact, we recommend making context-specific adjustments based on your expert knowledge, the local knowledge and expertise of your collaborators and co-researchers, and the information you generate in steps A–E outlined here.

Pre-testing the data collection tools is also important to develop good research practices, understanding and confidence among the research team. We conducted our pre-testing and refinement stages alongside training (see Stage E). We went through three separate sessions involving just the research team, and we followed a discussion-comment-critique-collate-edit cycle to improve the data collection instruments. During these sessions,

we practiced using the data collection instruments in pairs, by having one pair interview each other in front of the whole group as an open forum for discussion about the survey. We also conducted a round of testing of the data collection instruments (survey and the semi-structured interviews) in the field. (We recommend testing with a minimum of four respondents.) Data generated from field tests should be used in the final stage, because at this stage interview techniques are not standardized and the final version of the data collection instrument will likely be different due to adjustments you make. During these tests of data collection instruments, you might reflect and make appropriate adjustments based on the following:

- Does the technology (paper/pencil, tablet/phone, recording device) being used for the interviews work well? Does it save time?
- Does the order of questions in the data collection instruments provide a logical and, as much as possible, conversational flow?
- How long do the interviews take to complete? Is this likely too long for an interviewer and interviewee?
- Can some questions be removed or do additional questions need to be added to reach the overall objectives and understanding we are looking for?
- Are interviewees comfortable answering all the questions? Are the answers providing information that informs the research objectives?
- Which questions pose problems with interviewees and why? What additional or different wording might work better? Or are these questions socially too sensitive and need to be adjusted?

STEP E: Building capacity to understand, undertake and interpret findings on CBNRM inclusion

Undertaking research and assessment on gender, inclusion and CBNRM is not intended to be a tick box exercise. The purpose and intent is to generate information and data that will stimulate critical reflection that might lead to adjustments in programming and practice, which in turn will lead to improved outcomes for inclusion in CBNRM. The opportunity to undertake this research and assessment also presents a chance to build shared capacity to understand, undertake and interpret findings on gender, inclusion and CBNRM.

We took this opportunity to develop and undertake a set of workshop activities that served multiple objectives. First, it provided an opportunity to build shared understanding of gender and inclusive governance principles and framings. Second, it provided the space to discuss the objectives of the study and the rationale for why and how it might contribute, ultimately, to improved outcomes around gender equality. Third, it provided the time and space to undertake the first stages of contextualizing and adjusting the data collection by refining the data to deliver better toward objectives, better answer research questions and employ appropriate language and approaches for the particular communities we would be working with.

We opened the workshop to a diversity of actors who were interested in answering similar questions and improving inclusivity and gender-equity of processes and outcomes. In addition to those researchers who would be implementing and interpreting findings, we invited and included government agency staff who work in natural resource management, local NGO staff who work in development and conservation, and community leaders who want to understand more about inclusion and exclusion.

The workshops we designed helped all of us involved understand the following:

1. What is gender? How does gender manifest in my life? And in the lives of people in the communities we work with?
2. What gender biases or inequalities might I/we unintentionally reinforce through the assessment and our facilitation of them? How can we avoid this?
3. What are common and uncommon gender and power dynamics that perpetuate exclusion in CBNRM? What are we curious to learn more about through this assessment process?

People learn in different ways, including visual, auditory, experiential and so forth. Therefore, including a range of teaching and communication strategies that account for differences in learning will help ensure all participants can exchange and build knowledge. Examples of exercises that can be used are described in more detail in Gomese et al. (2020) Building capacity for gender work in fisheries and aquaculture: Examples from the Pacific.

4. Methodology

4.1. The methods and analytical plan: At a glance

The methodology is a sequential mixed methods approach comprising three main methods: semi-structured interviews, a quantitative survey and two forms of FGDs (one conducted before and the other after the interviews and surveys). Each method supports a different purpose, generates a different type of information and requires a different analytical approach (Table 2).

Each method also offers a different opportunity to explore inclusion and exclusion. The formats of the methods we provide here are those that we refined and adjusted for the Solomon Islands context. We encourage you to adjust and adapt the questions, methods, and sampling strategies to suit your objectives and contexts.

Each method has strengths and weakness, and not all methods work in all contexts, with all people or with all groups. For example, FGDs can be a

Method component	Purpose	Type of information	Scale of information	Analysis	Link to an example method format
FGDs (Pre)	The findings are used to guide the adjustments and contextualization of the semi-structured interviews and quantitative survey.	Contextual, categorical and narrative	Group	Text-based analysis, including content coding	FGD for context
Semi-structured interviews	These can be used to collect data that can be used to provide *community-scale* descriptive information about the CBNRM process, and group exclusion. They can also be used to help interpret the results produced from the statistical analyses following the quantitative survey.	Qualitative interview data i.e. narrative	Community	Text-based analysis, including content coding	Semi-structured interview
Quantitative survey	This is for collecting data that can be used to statistically analyze the importance of different factors in determining the degrees of participation for different stakeholders.	Quantitative survey data, categorical ranking	Individual	Modeling analysis using cumulative linked mixed models	Survey
FGDs (Post)	Exploration with different key stakeholder groups can triangulate, resolve ambiguities or contradictions and add depth and nuance and explanatory information to findings from the semi-structured interviews and the quantitative survey.	Contextual, categorical and narrative	Group	Text-based analysis, including content coding	FGD for explanatory information

Table 2. The methods and tools used for the assessment.

great opportunity for in-depth group discussions that allow for a variety of voices and opinions. However, the group setting may also make it harder to hear the voices of more marginalized groups, and it takes more time from the people participating. By contrast, the quantitative survey excels at gathering specific individual information from a representative sample of the community, which allows for community-scale analysis of exclusions that may be harder to understand in a group setting. But it requires a lot of trained staff to conduct enough surveys and demands very careful survey techniques to make sure the samples are representative. Finally, semi-structured interviews share some strengths of the FGDs by allowing for more narrative information about community history with CBNRM and group exclusions, but voices are less likely to be missed by having a one-on-one setting. However, they take longer than a survey, and the results are based on a smaller sample size.

4.2. Data collection methods and tools

Method 1. Semi-structured Interviews

The semi-structured interviews use the structure of the five elements of governance (Figure 2). We tested the semi-structured interview (Annex 3) in Solomon Islands, but suggest that it should be refined and adjusted for your particular contexts, following steps in Section 3.

The semi-structured interviews have been designed to determine experiences of inclusion and exclusion at each of those elements as they relate to CBNRM. They generate information and discussion about the history and context of CBNRM, as well as local decision-making processes within a community. This information helps to interpret and triangulate data gathered in the quantitative surveys to provide a wider context for it. The semi-structured interview provides community-scale perceptions of inclusion and exclusion, rather than the individual scale found in the quantitative survey. For example, the survey asks, "Do you speak in meetings?" while the semi-structured interview asks, "Who speaks in meetings?" with follow-up questions unpacking why that is.

The sample for the people you speak with using the semi-structure interview should include people from different gender and social groups, such as women and men, youths and adults, landed and landless, as these groups likely experience inclusion or exclusion differently. For example, if the sampling frame is meant to include gender and status, as was done in the pilot (Kleiber et al. forthcoming), then a minimum of eight **semi-structured interviews** should be selected from each community.

Semi-structured interviews contain open-ended questions. When we used them, it took approximately 45 minutes to complete with respondents. Responses from this type of interview are most easily recorded on paper forms, as responses to questions can be long and varied. However, it is important that the audio is recorded to allow the field team to revisit each interview following the field visit. It can be used to provide further details in case the interviewer missed information while taking paper-based notes. It is not feasible to record semi-structured interviews by typing responses directly into a tablet or laptop computer.

Method 2. Quantitative survey

The quantitative survey is designed to generate data to quantitatively test which gender and key social characteristics, such as age and status, of individuals are correlated with experiences of inclusion/exclusion in CBNRM, and at which stage of the decision-making processes. This information can be used to determine which parts of a CBNRM processes are in most need of adjustment to improve inclusion, and for whom. The survey could also be applied across two different communities to determine differences, for example between local contexts or potentially between different CBNRM processes.

The sample for the survey should include people from different social groups within a single community.[2] To ensure statistical reliability for the surveys, we recommend surveying 50% women and 50% men from a minimum of approximately 10% of households in each community. The sample should also include individuals representing a range of the key characteristics, such as youth, adult and elderly for age categories as well as low, medium and high for social status. The smaller the community, the larger this percentage should be to ensure the survey sample is an accurate representation of the community. To have a representative and sufficient sample,

the number of respondents per community should ideally be determined in advance, as well as subgroup representation like gender, age, etc. This number can be calculated before beginning the surveys if the number of households within the community is known. If community demographic information is not available before the field visit, it can most easily be gained during the community meeting upon arrival, when the community profile questions can be asked.

Data collection is best conducted using tablet devices pre-installed with the surveys using Open Data Kit (Open Data Kit n.d.). This is because the cost of tablet-completed surveys is generally thought to be less than paper-based data collection due to reduced time needed for data cleaning and data input, which is automatic with most tablet-based data collection systems (Leisher 2014).

There are three different sampling strategies that can be used for the quantitative survey: random sampling, stratified random sampling and purposive sampling.

Random sampling is the most preferred sampling strategy in terms of statistical robustness. This approach means a surveyor visits a household once it is selected using a random number generator that refers to a map of the community with pre-numbered households. Often, an accurate map of the community will not, however, be available pre-field visit, particularly for remote communities and/or communities that have not been visited much beforehand. This sampling method will therefore not commonly be used for this type of field survey.

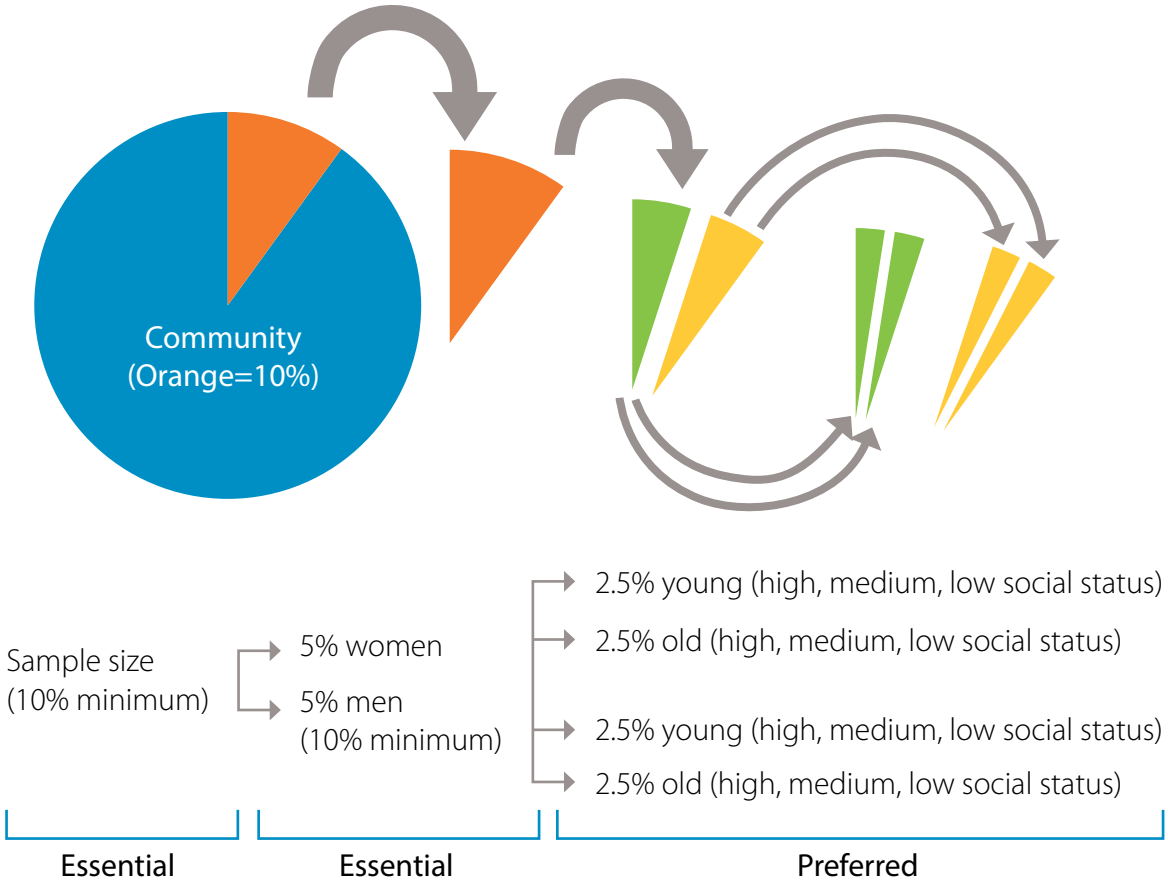


Figure 3. Optimal sampling proportions per community.

Stratified random sampling is when certain groups of households within a community area are pre-defined. For example, this could be those close to the coast versus those in the forest. These subsets will be based on census data and/or local knowledge, which is best gained at the community meeting upon arrival. Another example of stratification may be by household wealth. Stratified sampling is only viable if certain information about the community is known prior to the start of the surveys. Information related to the geographic and social layout of the community from the community meeting can also be used to help design a stratified sampling strategy. For example, if the community is divided into separate geographic "territories" of equal size (and all else being equal) it may be important that the assessment team undertakes approximately equal numbers of surveys within each territory of the community assuming they are home to approximately equal demographics. If a community has a particular social structure, such as those with low social status living by the coast while those of high social status live higher up away from the coast, it is important such layouts are considered so that the survey does not create a bias based on the number of surveys undertaken in each area.

Purposive (non-random) sampling is also referred to as judgmental or expert sampling. The main objective of purposive sampling is to produce a sample that can be logically assumed to be representative of the population being sampled (Open Data Kit n.d.). This is often the most likely approach to sample a community because detailed demographic data will not be available pre-survey and because time in the field is limited and some subjectivity is required from surveyors to ensure that enough surveys are done within each community.

Method 3. Focus group discussions

FGDs are a good way to gather people from similar backgrounds or experiences to discuss a specific topic or interest. Often, much is learned from the discussion that participants have around any topic, rather than any consensus reached. The group that is convened is guided by a moderator or facilitator and, of course, the willingness of group members to participate. The facilitator introduces topics for discussion, and facilitates what will hopefully be a lively and natural discussion. The strength of FGDs relies on allowing participants to discuss different perspectives about how different people think about an issue or experience something. They also allow a range of opinions and ideas and the inconsistencies and variation that may exist in a particular community in terms of beliefs and their experiences and practices.

The FGD sample or participants should include a range of women and men with different links to the CBNRM decision-making processes. Specifically, these women and men should represent the gender and different social characteristics of interest to the assessment, such as age, status and so forth. Participants should be made to feel as comfortable as possible, which may be more likely if groups are separated by gender and age so that power dynamics that may impede women or youths from speaking up are minimized. Among small-scale fisheries in Solomon Islands, we ran four FGDs in each community: two with groups of women and two with groups of men. These groups were arranged by a local community member and took place over the course of 2 days.

FGDs can take different approaches and comprise different tools depending on the information and discussion that has been deemed most useful to understand experiences of inclusion and exclusion in any context. We have two FGD formats. The first is to learn more about the context, which might guide refinements to the interview and survey tools. The second helps validate, situate and interpret findings or further questions arising from conducting the survey and interview data.

Pre-survey FDG (Annex 2)
To help develop the survey and semi-structured interviews, it is helpful to have an idea of which social groups will be important to inclusion in the local cultural context. While open-ended discussions can be used, other activities such as role play of a make-believe community considering a CBNRM plan can help explore the decision-making power of different social groups. In this role-playing exercise, different FGD participants explore the motivations, power, and exclusion factors of different members of the make-believe community. The community role-play characters should include people with relevant attributes that vary by gender, age, education, and family and kinship relationships,

as well as reliance on the natural resources of interest (aligned with learning from the literature review). For each of these characters, the group should be asked to consider and discuss questions that are, again, adapted to help check, deepen, clarify or explain results emerging from the other methods. For example, (1) How do different people feel about various the CBNRM rules? (2) Who makes various CBNRM decisions? (3) Who should make CBNRM decisions?

Post-survey FDG (Annex 5)
These FDGs follow the format of open-ended questions that are used to invite discussion to help ask and validate findings (is this true here?), followed up by an explanation (why is that?) and suggestions for change (what could be done to change that?).

The following will help guide questions:

- "From the surveys we found that women and men were just as likely to be in meetings, but that women were less likely to speak. Who attends and speaks in meetings here?"
- "Why do you think [insert summary of responses, from the first discussion] happens here?" Allow for discussion afterward.
- "What do you think would be the best way to overcome [insert any barriers identified in the first two discussions]?"

4.3. Data management and primary cleaning (in the field)

It is important that collation and primary cleaning, if needed, of data happens while the data is being collected. For example, missing data entries may easily be corrected in the field whereas in many cases filling in blanks once field staff are back is often difficult. It is important that all field staff are made aware of the file management and storage systems for electronic data and the correct way to name paper versions of any survey or interview instruments. Data that is collected on paper in the field, such as notes from FGDs or semi-structured interviews, should be typed up as soon as possible. Where possible, it is best to include both local language notes and their translations.

Field staff can use triangulation between the different data sources to help verify any information in surveys or interview responses that may appear erroneous. For example, if a semi-structured interview mentions something about elders not being allowed into local CBNRM meetings, and this appears strange, other semi-structured interviews should be consulted. In addition, responses from the surveys may also shed light, as will general conversation with community members. This process of soft error-checking should be maintained throughout all field visits to ensure that the chance of any potential anomalies is reduced during data collection processes. If anomalies or erroneous responses are noted, it is much easier to address them while in the field than waiting until the visit is over. If they are not addressed in the field, it may also risk further data capture and interview responses being incorrect.

If there are field staff note anomalies, it is important that correct answers are not guessed. Instead, field members should discuss the potential error and triangulate with other data sources or the original respondents to check if the data or information is correct.

Maintaining data logs and calculating basic summary statistics during field visits are very useful in helping the assessment team stay on track with data collection, highlighting potential gaps in information and refining field trip processes. When such templates are filled out during field work, they can act as a summary of progress for the assessment team to help ensure target numbers of respondents and gender and any social category ratios are being met.

5. Data analysis

5.1. Analysis of semi-structured interview data

This qualitative data can be easily managed in Microsoft Excel or a coding software such as NVivo (Qualitative Data Analysis Software | NVivo n.d.). As a starting point, responses from the semi-structured interviews can be arranged according to the questions they relate to.

We suggest using deductive coding, which means sorting, labeling or coding the parts of responses that talk about inclusion or exclusion experienced by specific groups (i.e. women, men, youths, outsiders) at specific elements of governance (i.e. attendance, speaking, etc.), the reasons the respondent gave for those differences, or the suggestions they provided for changing that pattern. One starting point to explore the data is to look at the frequency of different responses and the number of times different themes come up. This can also be useful to compare patterns in explanations or experiences that are reported in different communities, as well as themes and labels, which can also be used to compare patterns across communities. For example, we found that when counting code frequency you could report that 67% of semi-structured interview respondents reported that youths did not speak in meetings, and the most commonly given reasons for that exclusion were lack of education, discomfort with speaking in public and disinterest. However, it is important to note that frequency is not the only way to present this data.

To understand responses better and to interpret findings correctly, it is critical to engage more deeply with the responses—this means really thinking about what the person is trying to express and where this perspective might come from. One way to present these more in-depth findings back is by identifying direct quotations that either illustrate or explain a trend or pattern, or are an example of an important anomaly. For example, "The youths in this village are too shy to speak in front of the elders."

5.2. Analysis of survey data

Response and explanatory variables

Users of this method will be interested in at least one of five response variables based on the five degrees of participation (Figure 2). These represent how a person may be included in CBNRM decision-making processes. The five response variables are (1) attendance at meetings, (2) having an understanding of the regulations surrounding local CBNRM processes and access to resource managers, (3) speaking during meetings, (4) feeling respect from other members of the community, and (5) the perception of inclusion during the meetings and decision-making. Variables 1, 3, 4 and 5 can all be taken directly from responses to the survey.

This method provides an understanding of which variables may explain (i.e. explanatory variables) different outcomes (i.e. response variables). Most of the explanatory variables are easily gleaned from the quantitative survey, but some need to be categorized and/or designed (Table 3). Categorization is a simple process in which a continuous variable like age is transformed into a category like 18–25 years old, 25–35 years old, etc. Designing a variable is more complex and generally involves combining more than one answer in the quantitative survey to form a new variable. The methods used to do this depend on the variables being combined. (See also Kleiber et al. forthcoming for the variables designed for the Solomon Islands case study on CBNRM of fisheries.)

Statistical modeling

To test which explanatory variables had a significant effect on a response variable, we used what is called cumulative linked mixed models (CLMM) with a probit link function (function *clmm2* in R package *ordinal*). The code for the full model can be accessed here.

In sum, this computer model uses calculations to understand which variables explain the best outcome. Some explanatory variables may be strongly linked with response variables, which would mean that in real life they are likely to

strongly influence a person's experience of inclusion or exclusion. Others might be weak, meaning in real life they may have little effect on a person's experience of inclusion or exclusion. This approach means the analytical models take the following general basic form:

Response variable ~ explanatory variable A + explanatory variable B + C + D and so forth

Full models are built in this way to incorporate all the explanatory variables that are hypothesized to have an effect or determine one of the five response variables of interest. This means that if there are seven explanatory variables of interest the model would look like this:

Response variable ~ explanatory variable A + B + C + D + E + F

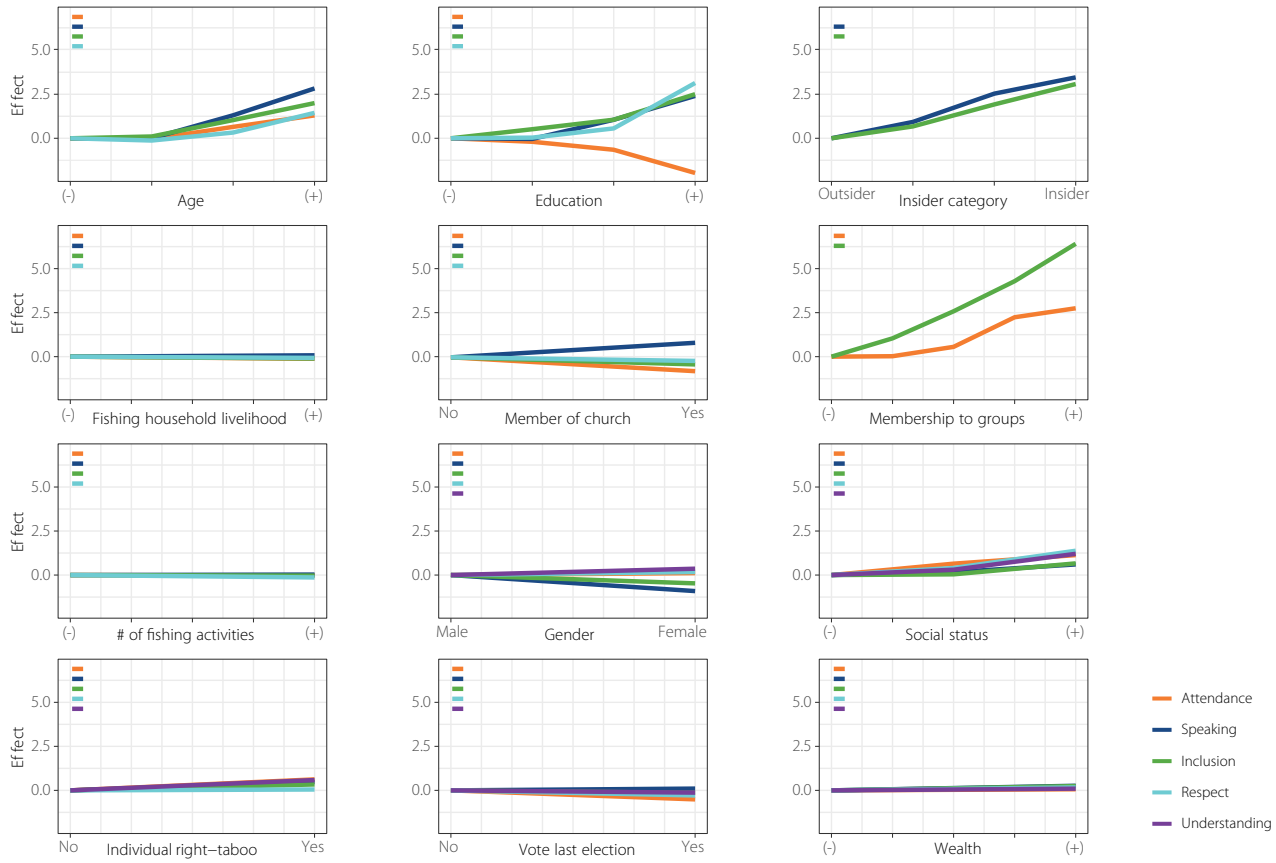
This model is run along with every combination of explanatory variables (each single explanatory variable, every pair, every triplet and so on). This means that one model run can involve hundreds or even thousands of different combinations. The reason to run all the combinations is to find the model that best predicts the response variable. That "best" model is called the "top" model and is the combination of explanatory variables that best describes the response variable. The model that produces the lowest Akaike Information Criterion (AIC) is the best model. For example:

Response variable ~ explanatory variable B + D + E (AIC = 0.9)

Response variable ~ explanatory variable D + E + F (AIC = 0.6)

In this example case, the response variable is best described by explanatory variables B + D + E because the AIC value is lower.

The statistical outputs from the CLMM also include model effects. These can be used to give more details about how much effect each explanatory variable has in the final model and whether that effect is positive or negative. These results are best visualized as graphics (Figure 4).



Note: Line colors represent the different response variables: pink is attendance, brown is speaking, green is inclusion and blue is respect. Understanding does not appear as it was not significant in any of these top models.

Source: Kleiber et al. in prep.

Figure 4. Average effects of three response variables from the strongest models from the Solomon Islands pilot case.

The results from the Solomon Islands project (Figure 3) show that age was an important explanatory variable helping to explain attendance, speaking, inclusion and respect. The second panel clearly shows that although educational status was important in explaining attendance, speaking, inclusion and respect, it was negatively correlated with attendance, meaning more highly educated respondents were less likely to attend CBNRM meetings.

The final panel shows that insider status (a designed explanatory variable based on the amount of time a respondent had lived in a community and whether their parents were from the community) was important in explaining speaking and inclusion in CBNRM processes.

In the case of Solomon Islands, there were 16 explanatory variables (Table 3).

Variable name	Description [categories]	Variable (designed or categorized)*	Used in CLMM
Village	10 village communities	NA	Yes
Gender**	[woman, man]	NA	Yes
Age group**	young (18–25), young adult (25–35), adult (35–55) and elder (>55)	C	Yes
Education	None or some primary, secondary, vocational, university	NA	Yes
Member church	Yes or no	NA	Yes
Insider index	outsider (0–0.1), immigrant (0.1–0.4), established (0.4–0.8) and local (0.8–1)	D+C	Yes
tabu_individual	Yes or no	NA	Yes
marital_status	Yes, no, widowed, separated	NA	No
children_under_5	Yes or no	NA	No
tribe_member	Yes or no	NA	No
number_fishing_activities	1, 2, 3, 4, 5 different fishing activities	NA	Yes
relative_membership (civic engagement)	v. low (0–0.2), low (0.2–0.4), medium (0.4–0.6), high (0.6–0.8) and v. high (0.8–1.0)	D+C	Yes
voting (civic engagement)	Yes or no	NA	Yes
social.status.category*	High, medium, low	D+C	Yes
wealth_category	1–5 from PC1 (12.5, -5.3, 1.9, 9.1, 16.4)	D+C	Yes
fish1_category	1–5 from PC2 (-7.1, -1.5, 4.1, 9.8, 15.4)	D+C	No
fish2_category	1–5 from PC3 (-9.5, -3.0, 3.4, 9.9, 16.4)	D+C	Yes

Note: The second-last column shows whether the variable was used directly (unprocessed) from the survey (NA), designed using different responses from the survey (D), made categorical from survey responses (C), or designed and categorized (D+C). It is important to note that in difference contexts the explanatory variables may be vastly different. The table describes those believed to be important in the test case of small-scale fisheries in Solomon Islands, but in other resource contexts these may vary. PC = principal component. Those variables with two asterisks are the variables that are essential to use in the sampling design. It is preferred if the planned sampling can also takes social status category into account to ensure an even spread of high, medium and low status individuals within each age group and sex category.

Tabe 3. Summary of explanatory variables used in the statistical model.

5.3. Analysis of FGD data

The FGD we designed to undertake before the pre-survey and the semi-structured interviews is intended to help contextualize the research. Notes from the FGD should be reviewed to understand which social groups should be focused on in the semi-structured interviews and anticipated in the survey questions. These are not used in the formal analysis, but rather as a part of developing the survey and semi-structured interview instruments.

The FGD we designed for after the survey and semi-structured interviews have been conducted is intended for validating and triangulating, but also to start to understand some of the variations and patterns of the findings from the survey and interview data. The transcripts of the FGD audio recording are coded for the purpose of validation and triangulation of the survey and semi-structured interview results and interpretation.

5.4. Bringing it all together: Triangulating, interpreting and responding to the assessment

Bringing data together from across different sources, such as the semi-structured interview, FGD and survey, increases your ability to interpret and understand your results. This means checking the results found in one method with the results found in another. You will find instances where data corroborate and where they differ. For example, if the survey responses from youths and women showed that they were less likely to speak in meetings, and most semi-structured interview respondents reported that youths and women were less likely to speak in meetings, then these two sources of data have affirmed the findings, which add confidence and coherence to that conclusion. However, these two methods may not tell you why that is the case in one community and not in the other. For the "why is this so?" and "what can be done to increase opportunities for youths to speak?" you will need to look at the responses to the questions you asked in the FGDs.

Analysis and interpretation of your data should identify consistent trends, patterns and themes in your results. But in this methodology, you are also interested in differences as much as similarities. You have set out to determine who experiences inclusion or exclusion differently, and in different elements of the governance process.

Undertaking this research and assessment on gender, inclusion and CBNRM is not intended to be a tick box exercise. The intent is to generate information and data that will stimulate critical reflection that might lead to adjustments in programming and practice or provide guidance for facilitation. This in turn will lead to more people experiencing inclusion in CBNRM. The value of using the methodology outlined here is that it can help researchers, co-researchers and community governors to understand and reflect upon which types of people are relatively easily and frequently included in CBNRM, and which tend to be more vulnerable to being excluded. The data, when examined across the five dimensions of governance, will illustrate whether these patterns and experiences of inclusion and exclusion differ along the five degrees of governance. The data itself, especially FGDs, presents the ideas from within the community about how inclusion might be improved. This information can be used to help inform positive change in CBNRM processes whether action be taken by community, NGO or government groups.

Further opportunity to determine approaches that will improve inclusion will be provided as and when findings are presented back to community groups and community leaders. This is particularly so where safe spaces for discussion and further feedback are provided. A different suite of insights are likely to be generated if the findings are appropriately shared with CBNRM program, project and policy actors, following a similar process of reporting back and critical reflection and discussion that includes generating recommendations actions and adjustments for the future.

6. Conclusion

In 2010, it was estimated that CBNRM and other forms of co-management spanned 3 million ha of coastal and marine waters in the Pacific Islands region. Empirical and modeled data strongly suggests that CBNRM has been proliferating across the Pacific (Mills et al. 2018). This is one of the main approaches to small-scale fisheries governance in Asia (Cohen et al. 2021), and many countries in Africa employ co-management for governing small-scale fisheries (Baker 2021). It is critical to ensure that the models that are proliferating are both effective and equitable. Yet, to date, while CBNRM is relatively effective at engaging resource users in management and governance, it can inadvertently perpetuate inequities and widen power differentials among resource users in aspects of governance process and fisheries outcomes.

Prioritizing inclusion as part of the CBNRM process is one important pathway toward the broader goals of equity and sustainable use of resources (Leisher et al. 2014). This objective is recognized by SDG 5.5: "Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life." We designed this method for agencies engaging with communities to develop and enact inclusive CBNRM. This method first outlines steps to identify different groups that may be excluded. These groups can be different depending on the context. In the Solomon Islands case study, women, youths, outsiders (those that came to the community as adults) faced exclusion, while those with stronger tenure rights (described as *tabu* rights) *tabu* rights holders and community leaders were always included. Second, this method helps measure and monitor specific barriers to inclusion at particular points of the process. For example, in Solomon Islands we found that women and men attend meetings in equal numbers, but that women were less likely to speak in meetings or feel included in decision-making. Taken together, this can help agencies create targeted plans for inclusion that can focus on specific groups and barriers, and also allow as an entry point for discussions on inclusion at the community level.

- Collaborative forms of management like CBNRM and various forms of co-management generally perform well, relative to other forms of governance, for enabling participation of resource users.
- Nonetheless, these forms of governance can perpetuate inequalities and widen power differentials within communities of resource users, which make participation and inclusion unequal.
- Experiences of participation and inclusion in management can be impacted by gender, age, class and ethnicity, where, for example, women tend to experience lower levels of inclusion than their male counterparts.
- To avoid inequities and to improve gender equality in CBNRM and co-management, many facilitators of management seek to improve the participation of women. However, this is too frequently reduced to aiming for and measuring success around women's attendance in different stages of management design, establishment and implementation.
- We developed a simple framework to visualize the different stages and types of inclusion that can help practice move from facilitating more equal attendance toward more genuine gender inclusion.
- Aligned to this framework, we developed, tested and presented a novel methodology to assess inclusion at different stages of the CBNRM or co-management process.
- Employing this methodology can help CBNRM facilitators and evaluators to critically reflect on where and for whom inclusion is suboptimal. When this assessment is combined with deeper knowledge of process and context, it can help to identity and shape improvements to facilitation and process design.
- This framework and methodology aim to stimulate a shift from weak and shallow forms of "equitable participation" to deeper changes and gender equality in resource governance, particularly to support the progression of SDG 5.
- Given CBNRM is a governance process, we strongly suggest any "point-in-time" assessments are used with caution, and are best combined with understandings of CBNRM process and "lived experience" gained through time spent, and relationships within, or with, communities. Any insights can be used as a point of conversation to co-generate strategies with all groups to determine local, context-appropriate visions of what inclusion and equitable governance processes can and should look like.

Notes

[1] While the framework differs from Agarwal's typology characterizing community participation, we note that it could be interesting to explore some synergies. For example, attendance without speaking in this framework could be characterized as passive participation in Agarwal's framework, while being part of decision-making could be characterized as interactive empowering participation. However, some of the other distinctions found in Agarwal's typology would require further investigations, such as understanding if women are being asked to do activity-specific participation.

[2] For the purposes of the sampling protocol and data collection, a community is defined as one or more households or group of households that share the same CBNRM plan (or will share the same CBNRM plan if one does not exist during the time of visits to communities).

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Annex 1. Focus group discussion for context (pre-survey FGD)

This outline of FGDs we developed as part of this methodology, and it was adjusted and adapted for our use in Solomon Islands. We recommend that you use this as a reference point and follow the steps laid out in section 3 of this Guidance Note to adjust these questions and the approach for your research or assessment.

Annex 2. Semi-structured interview

This is the semi-structured interview format we developed as part of this methodology, and it was adjusted and adapted for our use in Solomon Islands. We recommend that you use this as a reference point and follow the steps laid out in section 3 of this Guidance Note to adjust these questions and the approach for your research or assessment.

Annex 3. Survey and statistical model

This survey we developed as part of this methodology, and it was adjusted and adapted for our use in Solomon Islands. We recommend that you use this as a reference point and follow the steps laid out in section 3 of this Guidance Note to adjust these questions and the approach for your research or assessment. The R scripts are also openly available for your use and adaptation.

Annex 4. Focus group discussion for explanation of survey and interview data and findings (i.e. post-survey FGDs)

This outline of FGDs we developed as part of this methodology, and it was adjusted and adapted for our use in Solomon Islands. We recommend that you use this as a reference point and follow the steps laid out in section 3 of this Guidance Note to adjust these questions and the approach for your research or assessment.

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The CGIAR Research Program on Fish Agri-Food Systems (FISH) is a multidisciplinary research program. Designed in collaboration with research partners, beneficiaries and stakeholders, FISH develops and implements research innovations that optimize the individual and joint contributions of aquaculture and small-scale fisheries to reducing poverty, improving food and nutrition security and sustaining the underlying natural resources and ecosystems services upon which both depend. The program is led by WorldFish, a member of the CGIAR Consortium. CGIAR is a global research partnership for a food secure future.

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