The Nature Conservancy

INLAND FISHERIES

And Community-Based Co-Management





Acknowledgments

"A practical guide on community-based co-management of inland fisheries" supports the implementation of the community-based co-management approach for inland fisheries. It adapts the adaptive management cycle within an inland fisheries context. It focuses on the different project phases and the links among them necessary for 1) engaging and understanding, 2) planning and implementing and then, finally, 3) learning and adapting. The guide is aimed at teams overseeing project activities by providing a holistic framework to help with planning and execution of inland fishery projects, which are often complex, involving multiple stakeholders interacting within dynamic environments.

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Contents Page

Acknowledgments 2
Inland Fisheries & Community-Based Co-Management 4
What the Guide Is And Who It Is For 9
The Ten Principles For Community-Based Inland Fishery Projects 11
The Guide's Cycle Structure 12

PHASE 1 : **Identify, Engage With And Obtain Agreement of Interested Parties** 14
PHASE 2 : **Build A Holistic Understanding Of The Fishery** 18

PHASE 3: **Inland Fisheries Governance & Management** 26
PHASE 3A: **Inland Fisheries Governance** 29
PHASE 3B: **Inland Fisheries Management** 34
PHASE 4: **Consolidating & Creating Opportunities For Learning** 39
PHASE 5: **Data Collection For Evidence-Based Project Decisions** 44

PHASE 6: **Evaluating & Adapting** 50

Iterative Cycles And Transitioning To An Exit Strategy 54

Bibliography 57



Inland Fisheries & Community-Based Co-Management

TOWARDS COMMUNITY-BASED CO-MANAGEMENT OF INLAND FISHERIES

The aim of community-based co-management of inland fisheries is well-functioning governance and management of fishery resources to meet human objectives as well as the conservation and sustainable use of freshwater ecosystems and biodiversity. Among co-management approaches, community-based co-management prioritizes fisher communities as sources of expert knowledge and key participants in objective setting, implementation and responsibilities. Freshwater fish are an important natural resource, providing food for billions and supporting the livelihoods for millions of people globally. The declining health of freshwater ecosystems globally threatens the future of freshwater biodiversity and the people dependent on it.

Inland fisheries provide a unique opportunity to conserve freshwater ecosystems for people and nature as sustainable and responsible inland fisheries align with freshwater conservation goals. Fisheries productivity is dependent on the health of wild fish populations. In turn, fish populations need healthy freshwater ecosystems, requiring robust management of both fishery and non-fishery impacts. Implemented well, fisheries co-management is also a pathway towards greater equitable governance among freshwater stakeholders.



View of the Cuito River from Livambi Village in Angola. This village is a registered fishery co-operative. *(Roshni Lodhia)*

Effective fisheries co-management reflects the complex relationships between people and their environment and among the Interested Parties using or impacted by fisheries and freshwater ecosystems. This framing provides a more holistic approach towards sustainable fisheries over top-down management. It opens the process to different types of knowledge, like Indigenous Local Knowledge, and allows the inclusion of diverse values and perspectives and acknowledges that what is 'known' or 'not known' about the fishery are both social and technical issues. It enables inclusion of important equity and justice issues because community views and values are prioritized as focal users of fish for food, livelihood, cultural needs and other uses. Finally, it also places emphasis on the people most directly involved with fishing as stewards of freshwater ecosystems and biodiversity.

Addressing equity aspects of co-management requires inclusive and democratic inland fisheries management to develop local capabilities to assess, negotiate and manage inland fisheries. To succeed, project teams must recognize the importance of supporting Indigenous Peoples and local communities engaging in fisheries, who are often marginalized in policy, and apply principles that consider the inevitability of change, disputes, and unintended consequences that arise due to uncertainty and disagreement in managing inland fisheries.



Community-based co-management aims to strengthen environmental protection as well as the capacity, capabilities, rights and wellbeing of local resource-users, reinforcing the importance of responsibility and accountability in the management process. Thus, effective community-based co-management also draws attention to issues of human rights and of fairness, equity, and the rights of nature in both the process and outcomes, which can open other spaces for dialogue, knowledge creation and negotiation with other actors.

Over time, the inland fishery community-based co-management system will mature. First, the management system should evolve to be increasingly appropriate to local conditions as multiple cycles of adaptive management refine the processes of both governance and inland fisheries management. Secondly, communities, governments and other stakeholders will gain experience and greater familiarity of how things work (or don't work) and develop their capacity to take on more responsibility of management actions. While no co-management system is perfect, including community-based co-management, implementing appropriate and robust governance processes gives inland fisheries, the communities and stakeholders the ability to appropriately adapt to changing needs of people and nature.

After multiple iterations of the adaptive management cycle described in this guide, more responsibility should pass onto finish communities and other local, regional and national stakeholders. The final outcomes should be well-functioning governance and management systems able to deliver conservation and sustainable use of inland fisheries with decreasing reliance on the need for external funding and support.

THE CHALLENGE

Inland fisheries pose a significant governance and management challenge. They comprise humans closely interacting with natural ecosystems, where the human and nature components are affected by processes both within and from each other. Each inland fishery is a complex system to understand and manage.

Freshwater ecosystems are inherently diverse and dynamic, ranging from rivers, floodplains and lake systems, all experiencing daily, seasonal and interannual changes in precipitation, discharge and water availability. Freshwater fish biodiversity can be highly endemic to specific river basins, exhibiting different behaviors and life-history strategies, with constantly changing populations in response to the naturally fluctuating freshwater environment.

Critically, the health of freshwater ecosystems globally is declining faster than terrestrial and marine ecosystems, threatening the future of freshwater fish and the people dependent on them. The effects of human activities on the environment, including flow modification from dams, nutrient run-off from agriculture, and contaminants from mines and other pollution sources like wastewater and oil exploration can add to and interact with fishing-induced change.

Conventional fishery management approaches which focus solely on the control of fishing activity in response to declining fish stocks are not, by themselves, adequate to meet conservation and human goals. First, controlling fish does not address non-fishing threats arising from other watershed users. Second, implementation of restrictions, exclusions and the creation of incentives via rights-based permit schemes can undermine fisher wellbeing leading to low compliance.

Moreover, the governance of inland fisheries is critical but often not sufficiently prioritized. Inland fishers are often under-represented stakeholders, and consequently, often their interests are left out of decision-making processes and creation of management rules for freshwater resources. The process of devising catch rules often does not involve fishers nor their interests resulting in a mismatch in rules that meets the needs of humans and nature. Robust governance is an enabling condition to fishery management.

Finally, despite improved data availability about inland fisheries, many aspects of an inland fishery's social-ecological nature remain poorly understood. For most freshwater ecosystems globally, fish biodiversity has not been robustly identified and there is little understanding of population dynamics from which to develop management rules. More often, even less is known about the fishers and their communities. However, management moves forward despite this uncertainty and despite disagreement about how to address both the human and environmental consequences of fishing and how to maintain and enhance the ecological functioning of the environment.



GOVERNANCE & MANAGEMENT CHALLENGES IN INLAND FISHERIES INCLUDE:

1. Limited knowledge about the social-ecological nature and dynamics of inland fisheries.
2. In areas of challenging social and economic contexts, sustainable inland fisheries must balance the needs of the communities to meet their needs as well as the natural ecosystem health.
3. Diverse typologies of people engaging in fishing and often occurring over a wide area that makes it difficult to design appropriate management and subsequently enforce.
4. A lack of understanding of the effects of management interventions, such as catch or gear restriction, compared to environmental change from other factors such as dams or agriculture.
5. A diverse and multi-stakeholder freshwater environment of fishers and other users, often with competing interests because of differing perceptions of the economic, ecological and social value of inland fish and fisheries.
6. The inherent challenges in coming to agreement among multiple organizations and interest groups with uneven power dynamics.
7. Different opinions regarding the formal and informal institutions that regulate fishing activity as well as changes overtime within them.
8. A general underappreciation and lack of clear pathways to integrate the cultural vision, customs and traditions of local communities in the management of their freshwater ecosystems and inland fisheries.



Jacqueline Mevoghe cleans and cooks fish on Aschouka Island in Gabon. *(Roshni Lodhia)*

WHAT IS COMMUNITY-BASED CO-MANAGEMENT?

Community-based co-management emphasizes the role of local communities to overcome challenges of managing inland fisheries in collaboration with governments *(Figure 1)*. The approach promotes greater collaboration, facilitation and negotiation among communities, state and non-state agencies to navigate among differing stakeholder interests while safeguarding ecosystems and biodiversity. It nearly always involves challenging interests, perceptions, and motivations alongside continuous learning and adaptive decision-making.

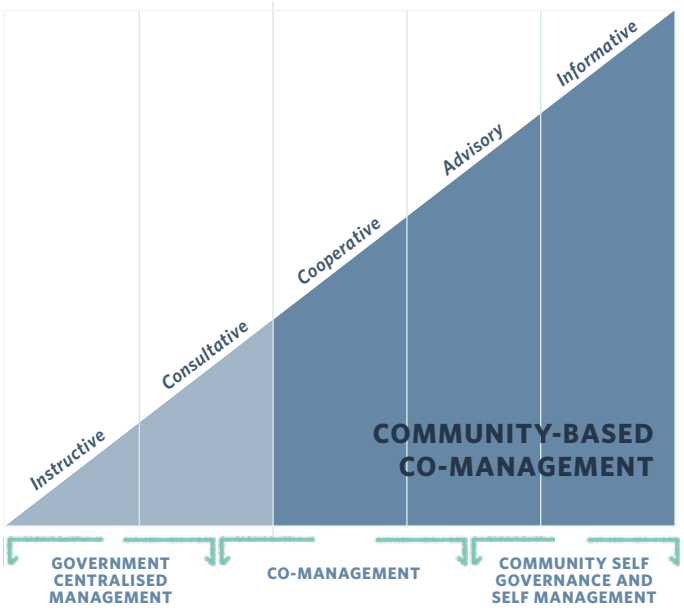


Figure 1: *Community-based co-management approaches lies within the co-management typology with decreasing government management and increasing community agency in decisions. Adapted from Pomeroy & Berkes, 1997.*

Community-based co-management starts at the local level with communities and their existing knowledge of the freshwater environment, the fishes and the fishery. The objective is to develop community capacity to collaborate effectively to assess and manage inland fisheries. It is at the local level where individuals and institutions interact and develop the actions that shape outcomes such as modifying fishing practices and fish stocks, resulting in associated environmental and social consequences. While the primary focus may be on fishing, fisheries are part of the broader freshwater socio-ecological system, and it is vital to comprehend the wider drivers of aquatic and terrestrial change across the river basin and engage in relevant development decisions.

Community-based co-management in inland fisheries aims to:

1. Develop local skills in fisheries assessment and management and fostering arrangements in decision-making bodies for designing and implementing inclusive governance and management.
2. Co-creating effective and responsible sustainable inland fisheries management that actively identifies and integrates all knowledge types.
3. Respond to changes resulting from inland fisheries activities, other human activities impacting the freshwater ecosystem, changes in markets and policies and needs of the community and other groups.

The guide outlines the process for engaging and collaborating among fishing communities, government agencies and other actors (e.g., local NGOs and universities), to assess, govern and adaptively manage inland fisheries. It pushes for co-creation and sharing of knowledge, good governance and evidence-based decision-making processes, identifying appropriate management interventions, and arrangements to address challenges outside fisheries.

What the Guide Is & Who It Is For

WHAT THE GUIDE IS:

The guide aims to support teams implementing community-based co-management projects in inland fisheries. It provides practical information at a holistic scale of key project phases to guiding teams in their planning and decision-making.

Promotes community-based co-management to inform the development and implementation of local governance and management of inland fisheries. It emphasizes partnerships and learning and, critically, empowering local people in relation to the assessment, discussion, management and use of inland fisheries. While this approach highlights the knowledge, skills and rights of local fishers and local resource users, agencies and organizations also have important roles to play.

The guide is consistent with The Nature Conservancy's ***Conservation by Design (CbD 2.0)*** and ***Voice, Choice and Action*** frameworks, which outline holistic approaches to designing and implementing conservation projects and working with Indigenous Peoples and local communities.

The guide provides a framework for community-based co-management by providing practical information and signposting external resources. Its practical directions inform how to work through different situations, reflect on how it is working and identify what resources might be required.

This guide comprises of:

1. **Ten Guiding Principles**

   Developing local skills in fisheries assessment and management and fostering arrangements in decision-making bodies for designing and implementing inclusive governance and management.

2. **Adaptive Management Cycle**

   The guide outlines the process for implementing an adaptive management cycle for community-based co-management of inland fisheries. An adaptive management cycle requires the user to review and revise management activities in response to changes in the environment and fishery stakeholders and integrates new knowledge and information for evidence-based management.

3. **An Online Reference Library**

   An online library of supporting references provides additional resources to guide users (access available on request).

WHAT THE GUIDE IS NOT:

The guide is not a one-size-fits-all prescriptive manual describing how to implement a project. While some specifics of fisheries and/or ecosystem-based management are considered, it does not provide a prescribed set of fisheries management measures or interventions that will deliver sustainable fisheries. Such a pre-defined set would have limited effectiveness because of the highly variable and dynamic nature of the people and environment of inland fisheries. Instead, the guide helps develop effective community-based co-management plans and point towards potential wider ecosystem-based challenges and approaches to address them.



WHO THE GUIDE IS USEFUL FOR:

The guide aims to support project teams working on inland fishery community-based co-management:

- The primary audience are groups playing a facilitator role with a high-level overview of the entire process. The guide will support planning of future activities, including mobilizing the appropriate team and supporting services. This role can be led by different organization types or even by community groups themselves.
- Groups involved in community-based co-management in non-facilitator roles may also find it useful to be aware of the phases and steps as well as the underlying reasons for them. This may be useful in clarifying the timing of activities and expected results.

The guide may also be useful for key enablers and/or drivers of inland fishery policies and agendas, including funding organizations and philanthropies as well as both national and intergovernmental agencies.

An increased understanding of the challenges of inland fisheries and community-based co-management will inform the design of appropriate funding, policies and other support mechanisms.

The Nature Conservancy staff at a Beach Management Unit meeting in Buhingu. A team from Zambia was here to learn about their managment practices. Jeremiah Daffa (on the left) translates from Swahili to English. *(Roshni Lodhia)*



The Ten Principles For Community-Based Inland Fishery Projects

A set of 'Ten Principles' have been identified to provide further guidance to teams implementing community-based co-management projects in inland fisheries.



1 COLLABORATIVE RELATIONSHIPS

Follow fundamental aspects of collaboration, respecting local norms, enable participation, give all actors a voice, provide space, find consensus while remaining flexible and responsive.



2 OUTCOMES DETERMINED BY PEOPLE AND ENVIRONMENT

Let the fishery define itself. Identify, clarify and prioritize issues within and outside the fishery, with particular attention to issues of class, ethnicity and gender, noting access and tenure arrangements as key to outcomes.



3 KNOWLEDGE AS EMPOWERMENT

Pursue activities to generate information and strengthen ability for local fishers and communities to undertake own assessments to elevate their voice, choice and action.



4 INTERVENTIONS NEED TO DELIVER BENEFITS

Interventions need to deliver tangible livelihood benefits and opportunities so people will be invested in fisheries management, with added considerations for the most vulnerable groups.



5 INTERVENTIONS NEED TO BE DEMAND LED AND APPROPRIATE

Diverse interventions should be explored. Interventions must be considerate to all user needs and capacities, support the environmental health and productivity of fishery while considering cost, risk, uptake and long-term adoption.



6 CREATE OPPORTUNITIES FOR ANTICIPATORY LEARNING

Recognize uncertainties and see management as an adaptive process. Plan activities to grow understanding of the fishery to help reduce disagreements and inform (alternative) management actions.



7 FORM FOLLOWS FUNCTION

Pay attention to legal pluralism and aim to strengthen existing formal and informal structures, including reinstating traditional and customary practices where these can help advance management.



8 CREATE ACCOUNTABILITY

Understand existing actors and power relations. Ensure decisionmakers are accountable to fishers, with clear roles and responsibilities and implement culturally-appropriate conflict resolution mechanisms.



9 EMPIRICAL EVIDENCE OF CHANGE

Monitor key socio-economic and biodiversity indicators as evidence of intervention success to inform future actions for adaptive decision-making.



10 SYSTEM REMAINS DYNAMIC

Work with systems already in place, but monitor and evaluate to improve existing system, remembering that change is inevitable and there is no single 'optimum.'

The Guide's Cycle Structure

The guide outlines six phases for implementing an adaptive management cycle for community-based co-management of inland fisheries. An adaptive management cycle requires project teams to undertake iterative cycles to review and revise management activities in response to changes in the environment and fishery stakeholders as well as integrate new knowledge for evidence-based management.

While presented as a linear sequence of phases, project teams during implementation may need to revisit previous phases and/or begin activities in later phases depending on context. By design, the activities and outputs of each phases have substantial overlap with other phases. For example, Phase 5 on data collection for evidence-based management has strong interactions with Phase 2 on understanding the fishery and Phase 3A & 3B on governance and management. Project teams should plan for these overlaps and connect the phases to maximise impact and efficiency of activities.

Finally, project teams must consider their exit strategy after iterative cycles to ensure a legacy of successful community-based governance and inland fisheries management. To this end, there should be **(1)** activities dedicated to developing enabling conditions for community rights to the freshwater ecosystem and its natural resources and **(2)** stakeholder capacity to strengthen institutions and policies as enabling conditions.



Fishing, A'I Cofán Sinangoe Community, Ecuador. *(Ana Guzmán León)*

The Community-Based Co-Management Inland Fishery Project Cycle

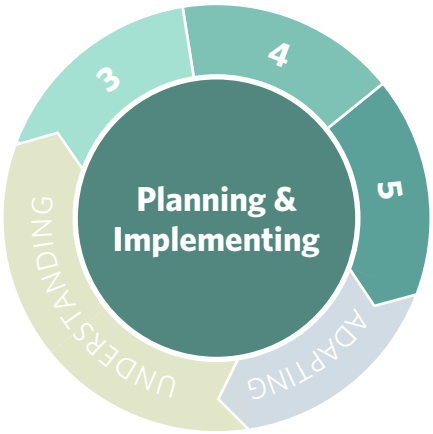


1. Engage Communities & Stakeholders

Thoughtful engagement with fishers, their organizations and other actors involved in, or impacted by, fishery management decisions, and gain their agreement to participate in the project process.

2. Build a Holistic Understanding of the Fishery

Build a comprehensive understanding of the key drivers of fishing patterns, including social, economic, ecology, environment components and external components and linkages.



3A. Strengthening Inland Fisheries Governance

Improve functioning of the community-based, co-management system by strengthening its governance, including stakeholder capacities and decision-making processes.

3B. Effective Inland Fisheries Management

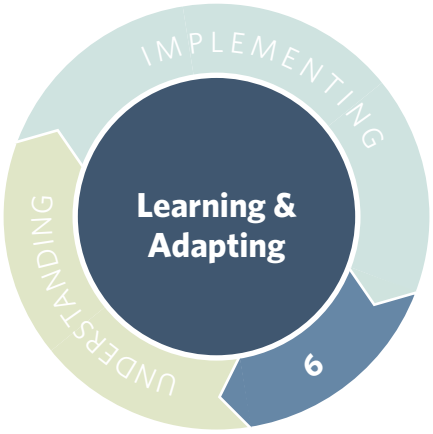
Collaboratively identify community objectives before developing & implementing a fisheries management plan and, where required, develop wider non-fishery plans to address broad-scale ecosystem processes affecting inland fisheries.

4. Consolidating & Creating Opportunities for Learning

Improve project activities by consolidating governance and management plans as well as identifying specific activities to meet information gaps and validating assumptions.

5. Data Collection for Evidence-Based Decision-Making

Support fishery governance and management by planning the collection, analysis and storage of data needed to inform evidence-based decisions and meet learning priorities.



6. Learning & Adapting

Improve future iterations of the management cycle and activities by collaboratively evaluating past activities and planning future actions to be undertaken.

1 Identify, Engage With & Obtain Agreement of Interested Parties

OVERVIEW

Phase 1 addresses the need for collaboration among Interested Parties for community-based co-management of inland fisheries. "Interested Parties" are the individuals, groups, and institutions with an interest in the fishery who can potentially affect or be affected by the proposed work. There are a diversity of Interested Parties interacting in inland fisheries and each group will have different interests, affect or be affected by management decisions differently.

It is important to engage with these groups early in the process to build trust, agree on participation and define common interests for the development of community-based co-management. As a community-based approach, communities and their subgroups are immediately identified as high priority. In some cases, communities and other Interested Parties may already be familiar and supportive of fishery management. To obtain agreement to move on to the next phase, project teams may need to raise awareness of the need to develop fishery management.

While there can often be pressure to show that change is happening, it is vital that this phase is not rushed as this can lead to difficulties later. Giving due attention to and bringing in priority groups develops trust in the process.

BACKGROUND

Successful community-based co-management of inland fisheries acknowledges, involves and learns from Interested Parties, including the fishing communities, government agencies and groups directly or indirectly interacting with the fishery.

OUTCOME

Project teams identify and carefully plan their engagement with fishers, their organizations and other Interested Parties involved in or impacted by fishery decisions and obtain their agreement to participate in the project.

OUTPUTS

1) An analysis of Interested Parties identifying the individuals, groups and institutions involved in the fishery that outlines their motivations, capacities and interests.

2) Agreement of key Interested Parties to engage with the process of developing community-based co-management of inland fisheries.

EXPERTISE

Communities, government agencies, fisheries experts, experts and/or experienced persons in decision-making, social scientists, gender specialists and economists.



Steps

1 ***Undertake an Interested Parties mapping exercise identifying and characterizing group(s) that are directly involved in community-based co-management or may have critical involvement in its success.***

For each group, describe their potential 1) involvement in the fishery, 2) current power, rights and influence in governance and management, 3) interest in fishery management and 4) sensitivity to changes in fishery management and catch.

Some potential key groups are listed below, and project teams should adjust according to the stakeholder context of their fishery:

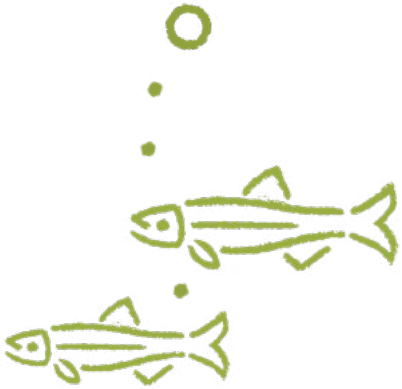
Key groups:

- **Fishers, fishing communities and their representatives, including representation from all gender and ethnic groups.**
- **Fish processors and traders associated with income generation and post-harvest activities.**
- **Other groups associated with fishing, e.g., gear preparers or boat owners.**
- **Representatives of decision-making bodies related to fishing.**
- **Local, regional or national fisheries and environmental government agencies which oversee activities affecting freshwater and fisheries at local, basin and national scales.**

Other important groups:

- **Representative of local water user groups**
- **Local land users and/or water departments**
- **Fish farmers (aquaculture)**
- **Representatives of basin or lake management authorities**
- **Non-governmental organizations (local and international)**
- **Academia and research community**
- **General public**

CONTINUED



STEPS, CONTINUED

2 ***Review and validate maps of Interested Parties with local contacts and technical experts to identify potential missing groups. In addition, for each identified group, describe, using best available knowledge, their motivations, capacities and interests to engage in the project.***

3 ***Based on Step 2, evaluate Interested Parties for their importance in objective setting and engaging in community-based co-management. Identify groups to engage with now and groups to engage with in the future.***

4 ***Work with subject-matter experts to prepare how to engage and appropriately communicate with the key Interested Parties following Free, Prior and Informed Consent and other important guidelines depending on the context.***

5 ***Engage with key Interested Parties to introduce them to the overall objectives of community-based co-management and forthcoming activities in this guide. Important messages to communicate include raising awareness of the threats to inland fisheries and the potential of responsible and sustainable use of fisheries to address them. Teams must also communicate that community-based co-management is a process requiring buy-in, collaboration and, in many cases, compromise among Interested Parties.***

Also, dedicate time in these engagements to learn directly from Interested Parties about their vision for the fishery, specific objectives in the short and long term, underlying motivations and challenges. Integrating this information builds trust and informs future phases that address understanding the fishery and governance and management activities.

6 ***Obtain formal agreement for their involvement in the process of collaborating on the development of community-based co-management for inland fisheries. If you do not get key Interested Parties consent to engage, the project ends here.***

7 ***Record and distribute to all Interested Parties all information, including shared vision, notes and observations. Ensure communicated materials are in an accessible format.***





Irma, grandmother of the El Quince community, Colombia. *(Juan Sebastián Gómez)*

HINTS & TIPS

- This is a crucial phase that should not be rushed, even by established projects because context can change over time. Approach this phase following a systematic process and be aware of personal and project blind spots and bias.
- Evaluate and integrate overlooked groups (e.g., women, youth, migrant fishers and other 'outsiders').
- Be strategic with your engagement and prioritize groups who have a large role in affecting and/or are affected by the fishery.
- Follow guidance around ethics and human subjects in engagement.
- Understand trust is built over time.
- Find the "right" person / people to engage in each Interested Parties group.
- Consider hidden incentives and motivations in engagement such as acquiring funding.

FUTURE ADAPTATIVE MANAGEMENT CYCLES

- Evaluate Interested Parties and their appropriateness for continued involvement.
- Identify gaps or biases in the Interested Parties involved and undertake activities to reduce impact.
- Assess the ability of Interested Parties in carrying out responsibilities for targeted capacity development.
- Address emerging conflict or unfulfilled expectations from previous activities.

2 Build a Holistic Understanding of the Fishery

OVERVIEW

Phase 2 increases the understanding of the inland fishery's components and dynamics from different knowledge systems to support evidence-based project decisions. Teams should develop an understanding of how both fishery and non-fishery impacts affect system functioning and exploited and non-exploited species. The socio-ecological systems approach is appropriate for inland fisheries with natural and human components interacting with each other. Natural components include hydrology, climate and weather defining freshwater environments as well as the characteristics of the aquatic species and ecosystems, like fish population dynamics, ecology and animal behavior. Project teams should understand the dynamics of species assemblages, including exploited and non-exploited species, and define key ecological attributes of the freshwater ecosystem to inform decisions about how much fish can be removed, or which areas to conserve to maintain biodiversity and population health.

In addition, managing fisheries also entails managing people, and people are complex. In community-based co-management, understanding the human component of the fishery is as important as the natural component. In this phase, project teams undertake activities to further understand the motives, activities, rights and capacities of Interested Parties identified in previous phase. Teams also need to understand how these groups may be impacted by changes in the fishery. This improved understanding of the human component is crucial to achieving equity, livelihood and governance and management objectives in the next phase.

Teams should communicate to all Interested Parties the results collected in this phase to elevate the collective understanding of the fishery. Information and knowledge held in one group should be shared with others to extract the full extent of knowledge. To this end, project teams should promote the contribution of fishers and their communities in this phase. Through their customs and experience, communities are important sources of local or traditional ecological knowledge, which can complement, and in some cases supersede, 'western' science and its limitations. Other knowledge, like data collection and analysis, are prime skills to be taught to grow local capacity and expertise.

BACKGROUND

Robust inland fisheries governance and management requires an in-depth understanding of the freshwater socioecological system's components and dynamics.

OUTCOME

A more comprehensive understanding of the key drivers of fishing patterns, including social, economic, ecology, environment components and external components and linkages.

OUTPUT

A collection of existing and new information into an accessible set of documents that systematically describe the components and drivers of the fishery, including knowledge gaps and associated future investigations, constraints and opportunities for intervention.

EXPERTISE

Social scientists, gender experts, economists, fish and river ecologists, fisheries managers, hydrologists, climate scientists, policy experts, local experts





Steps

1 ***Use a systematic approach to understand the inland fishery by gathering and analyzing current available information from all possible sources. Special attention should be given to analyzing information by gender and other underrepresented groups.***

To build a holistic understanding of the target fishery, there are five 'core areas' project teams should investigate:

- ***Freshwater environment and ecosystem*** *– the natural environment, biodiversity and ecology, especially fish populations and population dynamics.*
- ***Society*** *– the Interested Parties, including fishers, involved in or impacted by fisheries, encompassing food, livelihood, cultural and other drivers of behavior.*
- ***Fishing patterns and use*** *- how fishers interact with the freshwater ecosystem, including when, how and where they fish as well as post-harvest activities.*
- ***Fishery governance and management*** *– the process of developing (governance) and current set (management) of formal and informal rules, policies and rights influencing fisher behavior around access, allowable gear and harvest as well as compliance and satisfaction with the rules.*
- ***Non-fishery external factors*** *– activities and processes occurring outside of the interactions between fishers and freshwater resources that impact either the fishery's human and/or natural components. Examples include alterations to flow and connectivity, pollution and aquaculture as well as human side drivers like market economics, changes in demographics or government and advances in available fishing technology.*

Consult a variety of information sources in this step. Official data on inland fisheries is often limited and project teams should broaden information sources to include interviews, data from historical projects, non-published reports alongside more conventional official repositories, reports and peer-reviewed publications. Also, be aware of how the project team expertise may affect understanding and access to information across the core areas and undertake actions to address it, like targeting specific expertise.

CONTINUED

STEPS, CONTINUED

2 ***Hold workshops with a fishing communities, other Interested Parties and experts to communicate findings on the five core areas and the interlinkages from Step 1 to increase understanding of the fishery of all Interested Parties as well as validate and improve understanding. A key target audience are fishing communities and their important Indigenous Local Knowledge.***

3 ***Work with experts to critically evaluate the status of core area knowledge after consultation with Interested Parties in Step 2, and identify any remaining critical knowledge gaps that must be addressed before moving to the next phase.***

4 ***If critical knowledge gaps have been identified in the previous step, undertake appropriate activities to fill critical gaps, including considering primary data collection from the field and subsequent analysis.***

5 ***With communities and Interested Parties, jointly distill this improved understanding of the fishery's core areas into a diagram, figure or holistic system map outlining the information in each core area and interlinkages among them*** *(see Figure 2 for an example)**.***

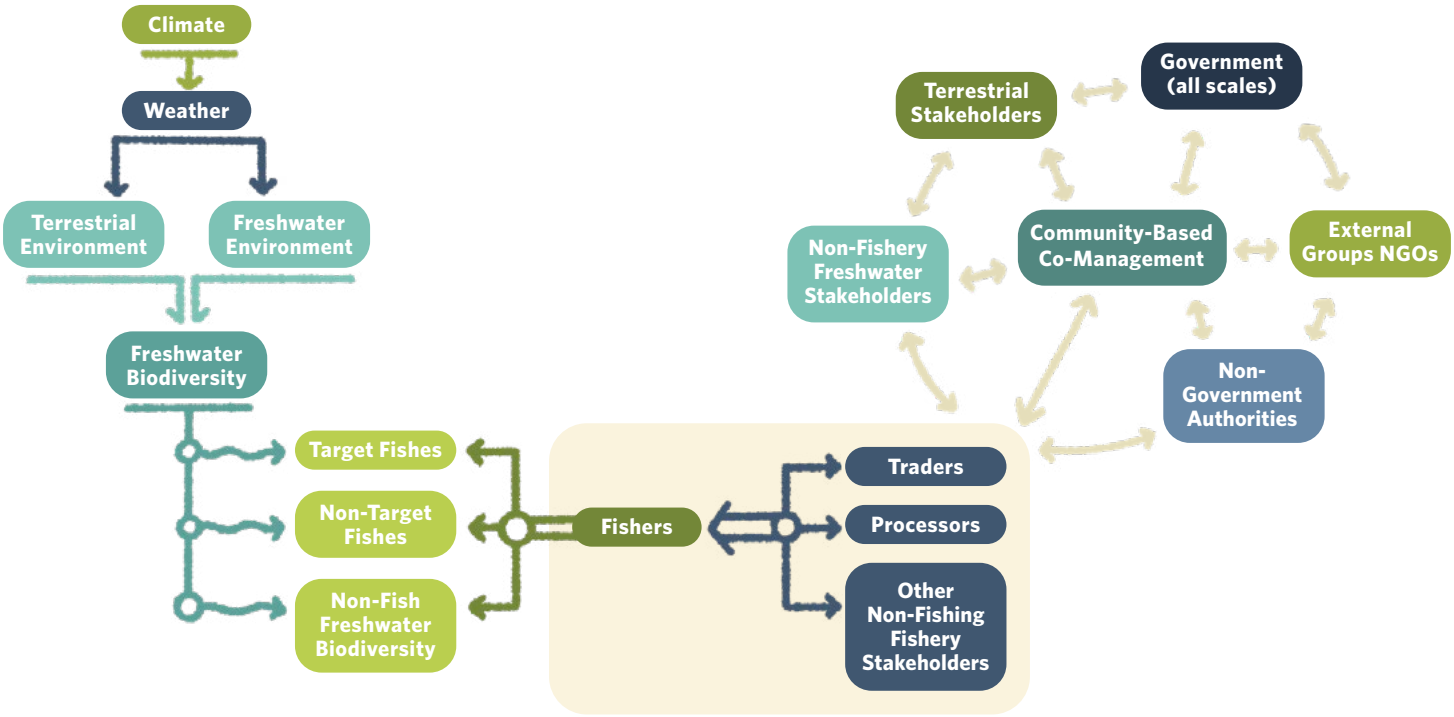
6 ***Communicate and share this understanding with any groups not participating in its creation for shared learning and review. Increasing the collective understanding of the fishery among Interested Parties will facilitate better co-design of and compliance to fishery management.***

7 ***Ask communities and Interested Parties to identify areas of unsatisfaction or desired change and tentatively categorize as 'fishery' (e.g., declining fish catch, inequity in access) or 'non-fishery' challenges (e.g., water abstraction, habitat degradation) to assist Phase 3.***

8 ***Store all documents, data and notes following a well-structured data management plan to assist easy access to all participants in the process during the design of governance and management activities (Phase 3), data collection and evaluation (Phase 5).***



Figure 2: *an example of interactions among environmental processes, fishers and other interested parties project teams may need to be aware of and engage with in community-based co-management of inland fisheries.*





Students performing fish Identification on catfish, Napo River, Ecuador. *(Ana Guzmán León)*

CONSTRUCTING A HOLISTIC UNDERSTANDING OF THE FIVE CORE AREAS

Three main sources of information for the five core areas of a fishery include *(see Table 1)**:***

1) social surveys with fishers and other experts
2) secondary and existing reports, including measured datasets or predictive models
3) biophysical and other *in-situ* data collection surveys.

New projects should focus on social surveys, Indigenous Local Knowledge and existing reports as their primary information sources. Social surveys, including interviewing fishers, are important sources of information when there is little or even a lot of data. Fishers and their communities are experts of the fishery and its dynamics, derived from direct experience or passed through customary and other types of Indigenous Local Knowledge. Consulting fishers also builds trust and naturally incorporates their values into the project. When combined with published reports and datasets, social surveys can provide an understanding of the five core areas involved in understanding an inland fishery at a level sufficient for planning and making decisions.

Biophysical data collection can provide high resolution information but can be costly and time consuming. The utility of the data from dedicated surveys (e.g., fisheries independent surveys) should be evaluated according to project needs at this phase of the project cycle. Biophysical data collection can also be planned in later phases of the project cycle when implementing fishery governance and management activities (Phase 5). More mature projects, which have undergone multiple project cycles, should incorporate previously collected data and other information gathered during community and stakeholder discussions.



Edwinson Vargas Luna is a fisherman, and the son of the cacique (primary leader), Caquetá River, Colombia. *(Juan Sebastián Gómez)*

TABLE 1

The five core areas and their subcomponents to be assessed for a holistic understanding of inland fisheries and how the information may be collected. The number of + indicates the potential relevance of the data source to assessing the core area.

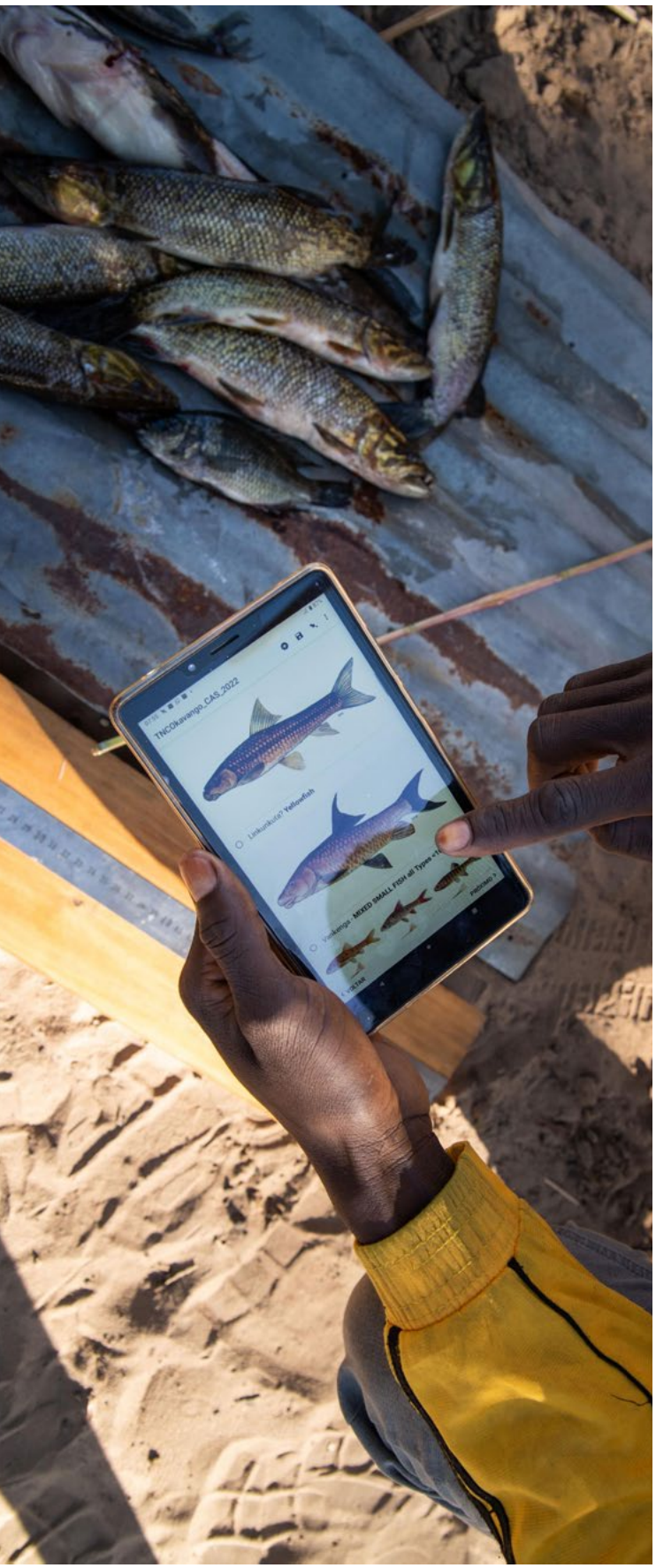
CORE AREAS & COMPONENTS TO BE ASSESSED		SOCIAL SURVEYS & INDIGENOUS KNOWLEDGE	EXISTING REPORTS & DATASETS	BIOPHYSICAL & IN SITU SURVEYS
CORE AREA 1: *FRESHWATER ECOSYSTEM*	Freshwater Hydrodynamics & Water Quality	+	+	+
	Seasons – Precipitation, Wind, Temperature	+	+	+
	Extreme Events	+	+	+
	Fish Species (Targeted & Non-Targeted) and Overall Biodiversity	++	+	+
	Fish Stock Assessment & Population Dynamics	+	++	+
	Fish Distribution, Habitat Association and Movements	+	+	++
	Other Important Freshwater Species, Like Megafauna and Red Listed Species	+	+	+
CORE AREA 2: *SOCIETY — FISHING COMMUNITY & OTHER STAKEHOLDERS*	Who Is Fishing, Their Motivation and Ties To Fishing	++	+	+
	Livelihood, Economics, Nutritional, CulturalOr Other Use	++	+	
	Other Non-Fishing Livelihood Or Nutritional Activities	++	+	+
	Post-Harvest Activities & Supporting Services	++	+	+
	Motivation and Objectives With Fish & Fisheries	++	+	
	Motivation and Objectives With Freshwater Ecosystem	++	+	
	Long-Term Interests	+	++	

CONTINUED



TABLE 1, CONTINUED

CORE AREAS & COMPONENTS TO BE ASSESSED		SOCIAL SURVEYS & INDIGENOUS KNOWLEDGE	EXISTING REPORTS & DATASETS	BIOPHYSICAL & IN SITU SURVEYS
CORE AREA 3: ***FISHING ACTIVITIES, PATTERNS AND USE***	Fishing Gear & Techniques Used, Cost, Availability And Access	++	+	++
	Patterns Of Fishing Gear Use, IncludingTiming And By Who	++	+	+
	Post-Harvest Preservation & Processing Activities	++	+	++
	Daily & Seasonal Fishing Behaviour	++	+	+
	Decision-Making Process In Engagement Of Fishing & Post-Harvest Activities	++	+	
	Value Chain & Resource Flows In Fishing Services And/Or Post-Harvest	+	+	+
CORE AREA 4: ***FISHERY RULES & GOVERNANCE***	Formal And Informal Rules Directly & Indirectly Defining Fishing Activities	++	+	
	Awareness & Compliance Of Rules	++		
	The Beneficiaries And Losers Of Rules	+		++
	Legislative Context Addressing & Supporting Communities, Co-Management And/Or Fisheries	+	++	
	Actors, Power Structures & Motivations In Governance & Decision-Making	++	+	
	Decision-Making Process, Including Effective Participation, Perceptions And Interests	++	+	
CORE AREA 5: ***NON-FISHERY EXTERNAL FACTORS***	Terrestrial & Aquatic Threats To The Freshwater Ecosystem And Fish Biodiversity	+	++	
	Atypical Events Impacting Freshwater Ecosystems And Fish Biodiversity	+	++	
	Changes In Local, Regional & National Governance In Short & Long-Term Timescales	+	+	
	Changes In Community & Stakeholder Motivations And Interests	+	+	



Manuel Vipuali Armando, a fish monitor for Liavela Village in Angola, documents the tigerfish he caught that morning. *(Roshni Lodhia)*

HINTS & TIPS

- Build a broad understanding of the fishery in this phase to expand the options for management interventions.
- Allow fishing communities to lead conversations and learn from their knowledge of the ecology and human components of the fishery.
- Store information in a central and easily accessible location to facilitate communication with project partners.
- Engage stakeholders and learn from others to grow the collective understanding of the fishery.
- Understand how socio-ecological context and decision-making influences outcomes.
- Pay specific attention to people who are most dependent on the fishery.
- Include all types of knowledge in the assessment.
- Target knowledge gaps as part of data collection and monitoring (Phase 5).

FUTURE ADAPTIVE MANAGEMENT CYCLES

- Identify and dedicate resources to increase understanding of core areas where there is limited information.
- Integrate data collected or other sources of information from previous management cycles to continue learning about the fishery.
- Be aware that fisheries are dynamic and constantly changing. Project teams must constantly validate or update previous knowledge and understanding of the fishery.
- If there are new revelations in the understanding of the fishery, spend time to understand causes of previous knowledge limitations and apply them moving forward.

3 Inland Fisheries Governance & Management

PHASE 3

Phase 3 is divided into two parallel sub-phases to address governance and management activities, two complementary aspects of community-based co-management of inland fisheries. The two subphases are:

PHASE 3A: INLAND FISHERIES GOVERNANCE

In this guide, 'governance' relates to how decisions are made in fisheries and who is involved. This phase promotes the community-based, co-management approach, which emphasizes inclusivity of stakeholders, especially communities and their knowledge in decision-making discussions.

PHASE 3B: INLAND FISHERIES MANAGEMENT

In this guide, 'management' is the process of designing and implementing formal and informal rules for the activities of fishing communities and stakeholders (i.e., what decisions are made and how activities promote compliance). This phase outlines the co-creation of management activities to achieve equity, conservation and sustainable use objectives.

PHASE 4

CONSOLIDATING & CREATING OPPORTUNITIES FOR LEARNING

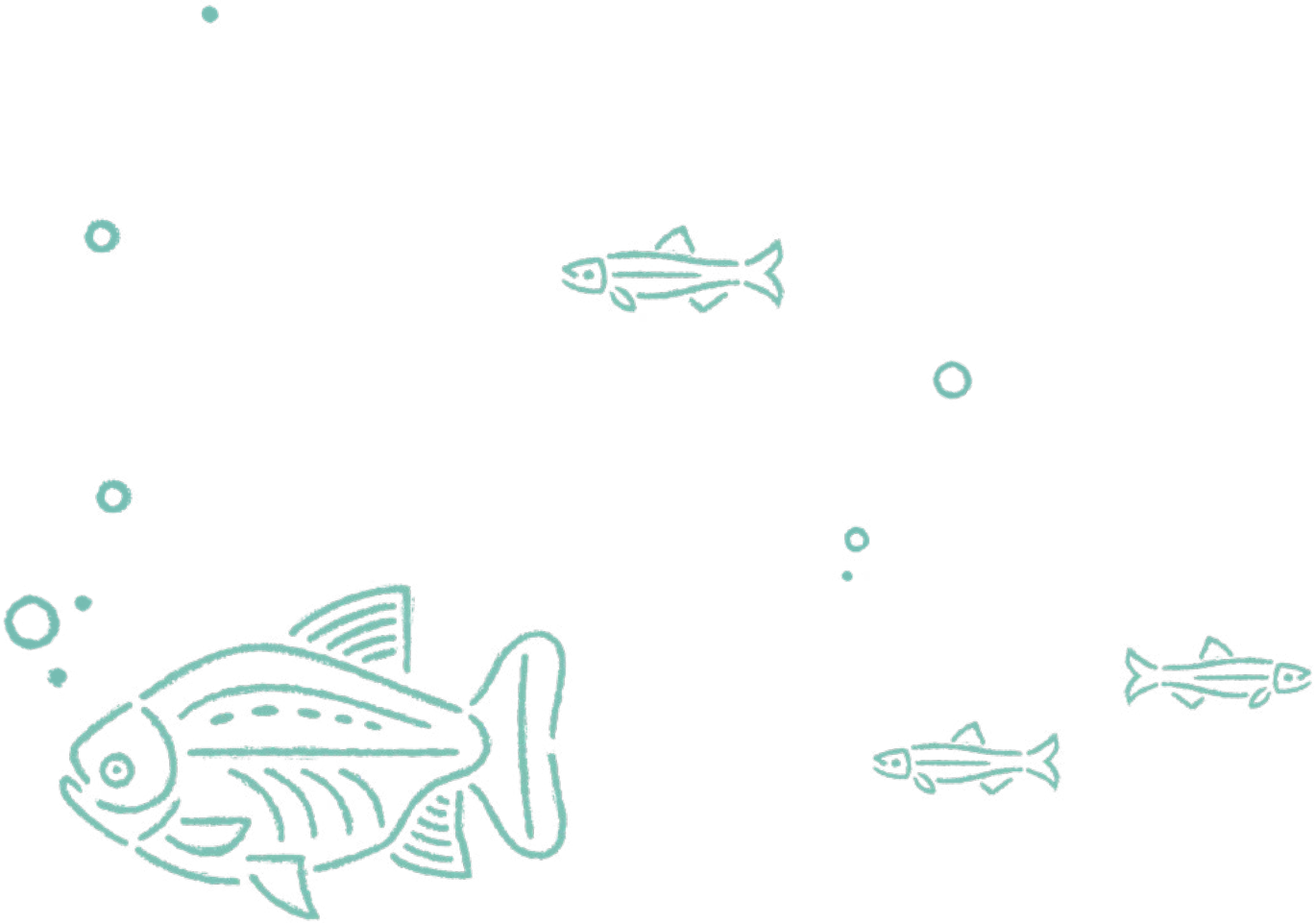
This separation highlights the need to consider the interaction of inland fisheries governance and management, and the necessity for project teams to have dedicated activities to both aspects. If a project only addresses governance challenges and not fisheries management, the team may not see desirable biodiversity or sustainable use outcomes. Similarly, if only fishery management is included in a project, desirable governance outcomes may be missed that are evidence-based, adaptive and socially relevant.

While project teams need to consider both governance and management aspects, the relative level of effort spent on each will depend on the context of the fishery and project objectives. Nevertheless, all project teams should undertake activities in both areas to promote good governance and sustainable inland fisheries management.

Steps

To facilitate co-creation of objectives and activities, project teams should review outputs from Phase 1 & 2 and discuss them with communities and other stakeholders. It may help if project teams draft inland fisheries governance and management challenges and objectives to use as starting points for community and stakeholder discussions. Ultimately, the scope of the discussions should be defined the fishery challenges and stakeholder priorities.

1. ***Identify and analyze the motivations and high-level objectives for each stakeholder group (from Phase 1) including the overall project team.***
2. ***Sort high-level objectives as either 'governance' (i.e., community-based) or 'management' activities to help with project planning.***
3. ***Work through governance objectives in Phase 3a and management objectives in Phase 3b.***





Fisherman, Aracampina, Amazon River, Brazil. *(Ana Guzmán León)*

HINTS & TIPS

- Sort objective(s) into either inland fishery governance or inland fishery management. Phase 3a and 3b are run concurrently to account for the natural governance and management overlap.
- All projects need to address both governance and management aspects respective to fishery context and community objectives, and not pre-determined by the project team or funders.
- The relative focus given to governance and management aspects will depend on various factors, including the challenges and threats facing the community, the community vision for the fishery, as well as project and stakeholder interests.

3A Inland Fisheries Governance

OVERVIEW

Phase 3A helps Interested Parties come to a shared agreement on desired changes in the governance of inland fisheries as well as the activities needed to achieve the desired change. Refining governance can be a complicated process that requires building trusting with communities and stakeholders through active listening. Often governance is multifaceted and project teams need to be able to navigate both formal to informal arrangements to be successful.

The objectives of inland fishery governance should adhere to the principles of transparency, responsibility, accountability, participation and responsiveness. These standards address power dynamics, elevate communities' roles in inland fishery decision-making, and overcome conflict among and within stakeholders and communities. Projects may need to consider governance both within the fishery and of the wider freshwater ecosystem, including fishery and non-fishery stakeholders.

Addressing inland fishery governance must be sensitive towards, and demonstrate consideration of, the fishery's social and cultural context. Project teams should build off existing governance processes as a starting point. Attempting to introduce radical change can cause conflict and reduce trust in the project team and objectives. Activities should improve the capacities of communities and stakeholders to be involved in fair inland fishery governance.

BACKGROUND

'Governance' relates to how decisions are made in fisheries and who is involved. Well-functioning governance in inland fisheries is critical for adaptive management, also influencing the achievement of human and nature objectives.

OUTCOME

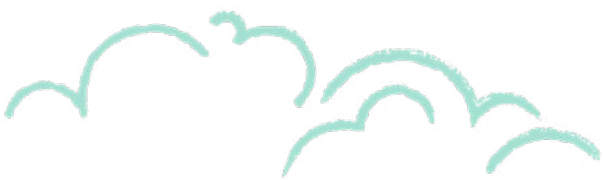
Improved functioning of the community-based, co-management system by strengthening its governance, including stakeholder capacities and decision-making processes.

OUTPUT

A set of community and stakeholder co-created governance objectives, and a corresponding set of project activities to achieve them, with clear responsibilities and expected timelines to which project partners have agreed.

EXPERTISE

Social science, gender experts, anthropologists, economists, local experts with familiarity of decision-making



Steps:
DEFINING GOVERNANCE OBJECTIVES

1 ***Work with subject matter experts to review outputs from Phase 1 & 2 to better understand the fishery's governance. Aspects to focus on include understanding representation, involvement and power dynamics in creating, communication and enforcing formal and informal rules around fishing as well as to the wider freshwater environment. Methods to consider using include:***

- Mapping decision-making processes and existing governance structures, and identifying actors and their roles.
- Analyzing the power distribution in the governance system, and identifying key individuals and stakeholder groups with power as well as those who are less well-represented.
- Understanding the context of fisheries and a fisheries management plan within the wider governance of freshwater ecosystems and other ongoing projects.

2 ***Assess the current governance system of the inland fishery to identify potential areas for targeted intervention to improve governance according to principles of:***

- Transparency
- Responsibility
- Accountability
- Participation
- Responsiveness (to the needs of the people)

3 ***Hold workshops with fishing communities and Interested Parties to:***

- come to a shared agreement on the overall desired vision of fishery governance and objectives for change and
- validate the project's interpretation of the fishery's current governance. The good governance principles listed in Step 2 are a potential starting point for these objectives.

4 ***Additionally, revisit identified fishery and non-fishery threats to the fishery from Phase 2 and assign them to be addressed governance (Phase 3a) or fishery management phases (Phase 3b). Non-fishery threats that are more appropriately addressed through governance activities include impacts like pollution, flow management and aquaculture. Increasing representation and inclusion of community interests and the need for healthy ecosystems and wild fish populations to other freshwater users may be necessary, depending on context.***

Steps:
DESIGNING ACTIVITIES TO ACHIEVE GOVERNANCE OBJECTIVES

5 ***Work with subject-matter experts, Interested Parties and community representatives to identify potential pathways for change to achieving the governance objective(s).***

6 ***Work with subject-matter experts, stakeholder and community representatives to create a theory of change that identifies and validates activities along those pathways of change, clarifies assumptions in the logic and defines expected timelines for realizing change.***

7 ***Hold workshops with communities and stakeholders to refine and ultimately agree to the activities to achieve governance objectives, including conflict resolution, and identify roles and responsibilities in implementing activities.***

8 ***Combine information from Steps 5-7 into a draft governance workplan that integrates actions, assumptions, timelines and responsibilities.***

9 ***Communicate and solicit feedback on the workplan from any group(s) that have not been involved in planning so far.***

10 ***Continue to negotiate among involved groups to revise workplan accordingly until there is agreement on expectations of results (when and in what form), stakeholder responsibilities and timeline of activities.***



CASE STUDY

Achieving gender equity objectives in community-level governance.

TNC's projects in Ecuador and Colombia elevate the voices of women in freshwater decision-making spaces. Gender action plans identify the strategies prioritized by women, including capacity building in hard and soft skills to improve their participation in decision-making spaces and processes, support for economic activities and contribution to fresh-water conservation, fisheries and leadership. This approach recognizes the roles of each community member, promoting the equitable distribution of benefits and participation in territorial governance. The team works hand-in-hand with the communities to reduce the existing gaps.



Women from the El Quince Community, Colombia showing around the "chagras," an ancestral system that produces fruits and vegetables. *(Juan Sebastian Gómez)*

CASE STUDY

Achieving enabling policy objectives in stakeholder-level governance.

Lake Tanganyika in East Africa is bordered by four different countries. TNC's Tanzania community-based fisheries project engages with Lake Tanganyika Authority, the multilateral institution managed by Tanzania, Zambia, Democratic Republic of Congo and Burundi. The project team engages with the Lake Tanganyika Authority on wild-capture fisheries and aquaculture to address transboundary challenges affecting fishing communities on the lake's shorelines.
To strengthen enabling conditions for successful community-based governance and management at the local level, the project team works with communities and their knowledge on research, technical and policy actions and elevates biodiversity and community interests with non-fishing stakeholders at national and international scales.



Juma Mustapha Mahmoud gillnet fishing on Lake Tanganyika. *(Roshni Lodhia)*



Fish being sold at the morning market on the Lake Tanganyika shoreline. *(Roshni Lodhia)*

HINTS & TIPS

- Project teams must work with subject-matter experts and trusted community members to carefully plan workshops to reduce uneven power dynamics and/or ensure adequate representation of groups in discussions.
- Changing governance is a long-process and may not always be desired by all stakeholders. There should be a focus on fishery actions improving livelihood, nutrition, conservation and other topics identified by the community and other stakeholders.
- Starting small with initial objectives and activities can help build the trust necessary to achieve larger objectives.
- Working with current governance structures is easier and faster than proposing new structures, and whole-scale change in governance is difficult and not always desirable.
- The community's vision is at the forefront of objectives. These can be articulated and complemented with other project objectives such as gender equity and intergenerational approaches, and the objectives can be aligned so that inequalities are not generated in the process.
- Be aware of biases in objective setting, including that of the project team.
- Consider experience-sharing visits from countries with desired governance structures and that have experienced similar challenges.

FUTURE ADAPTIVE MANAGEMENT CYCLES

- As projects mature, they should have frequent review by external groups to address potential blind spots in governance objectives and activities, especially in negative outcomes that promote undesirable governance and power imbalance.
- Honest review and proactive addressing of challenges builds trust in the project as well as among communities and stakeholders.
- Projects should have activities addressing both the capacity of individuals and groups to participate in governance activities and process.

3B Inland Fisheries Management

OVERVIEW

In Phase 3B the project team works with the community, stakeholders and experts on the management of inland fisheries. Sustainable and responsible inland fishery management balances the overall health of fish populations with the benefit of their extraction to fisher and community well-being. Inland fisheries typically contribute to community nutrition and livelihoods, as well as to social and cultural interests. The challenge for inland fishery managers is to continue meeting these needs in the face of threats from within and external to the fishery.

The objectives of inland fishery management should be grounded in the community's vision and objectives for their environment, economic development and social well-being. To be considered community-based co-management, fishery management rules must, at the very least, positively and tangibly contribute to community objectives. Indeed, communities are often the most aware of the need for the sustainable use and conservation of fishing, and undesirable practices are often a result of external drivers or a lack of options. Project teams must raise awareness and overcome potential conflicts within and between communities and other stakeholders to work towards mutually agreeable project objectives.

Fisheries management can exist in different forms. Formal management often entails a set of clearly stated rules whereas informal management is generally based on unwritten cultural norms that can take time for non-community members to understand. Project teams should also be aware of the impact from activities that seemingly have little direct connection to the fishery but may ultimately impact biodiversity and sustainable use objectives. For example, cultural perceptions of fish may influence the extraction of certain fish species. Nevertheless, while this complexity is a challenge for effective fishery management, it also expands the range of possible pathways and interventions to meet management objectives.

BACKGROUND

An inland fisheries management plan outlines how fishing happens in the area under management. Working with communities and stakeholders can provide a diversity of locally appropriate actions and rules to achieve community and conservation objectives.

OUTCOME

A collaboratively developed community and stakeholder driven fisheries management plan and, where required, plans addressing broad-scale ecosystem processes affecting inland fisheries.

OUTPUT

Management plan with clear objectives and expectations that also documents the rules, rights, roles and responsibilities to achieve them.

EXPERTISE

Social scientist, gender experts, anthropologists, economists, fisheries, fish ecology, freshwater ecologists and conservation scientists



Steps:
DEFINING MANAGEMENT OBJECTIVES

1 ***Work with experts to review outputs from Phase 1 & 2 to understand opportunities and challenges in the fishery by focusing on how current fishing and non-fishing activities impact 1) the underlying fish populations & wider freshwater ecosystem and 2) the people fishing and benefiting from fishing and 3) other Interested Parties and affected stakeholders.***

For fishing and non-fishing impacts on the freshwater ecosystem, consider how they affect:

- fished and non-fished populations
- other aquatic biodiversity
- freshwater habitat and ecosystem function
- other key ecological attributes of freshwater ecosystems like connectivity, hydrological regime and water quality

For impacts on the people fishing, examine the interactions of:

- the behavior of fishers (when, how and why)
- access to nutrition
- livelihood and other economic aspects
- other social components important to the community (e.g., cultural needs, agency, resilience)

2 ***Hold community and stakeholder workshops to present the overview of opportunities and challenges in the fishery and to learn about their respective visions and objectives for the fishery.***

It is important to investigate the underlying motivations for fishing beyond 'more fish' and 'more money', or to meet a pre-defined target with local authorities and government. To design relevant activities, it is critical to understand the underlying reasons why communities fish . This information also expands the range of activities to be considered by the project team, including non-fishery activities, where appropriate (see below).

3 ***Working from community and stakeholder visions, agree on the project's objectives for fishery management, including both the exploitation and the conservation of fish populations. The list of opportunities and challenges identified in Step 1 is a potential starting point for defining objectives. This list can be used to determine what must be preserved and what needs to be changed.***

Steps:
DEFINING ACTIVITIES TO ACHIEVE MANAGEMENT OBJECTIVES

4 ***Work with subject-matter experts, communities and other stakeholders to develop a theory of change to identify potential activities to meet fishery management objectives. During this process, the project team can assess challenges and opportunities associated with existing formal and informal management, and the local environmental, ecological, social, economic and governance context (Phase 2).***

5 ***Design a plan for how to implement activities, considering strength of evidence, contribution towards objectives, feasibility, cost, available funding, timeline, risks, potential conflict among fishers and stakeholders and other project factors.***

6 ***Present theory of change and activity plans to stakeholders and community members for discussion and validation. Communicate assumptions and timelines for expected changes, for transparency and to manage expectations.***

7 ***Work with stakeholders and community members to further refine the implementation plan for appropriateness of local context, integrating Indigenous Local Knowledge of the ecosystem, adjustments to improve compliance, and budgeting funding and other resources needed for successful implementation*** *(see Table 2)*.

8 ***Document refined activities into a draft inland fishery management plan with sections addressing components including, but not limited to:***

- The target fishery
- The goals and objectives of the plan
- The stakeholders involved
- The agreed upon actions and roles and responsibilities of each stakeholder
- Penalties, enforcement and other compliance mechanisms
- Resourcing the plan
- Stakeholder governance and conflict resolution



TABLE 2

Examples of fishery and non-fishery activities that project teams, communities and experts can develop to achieve inland fisheries management objectives. Project teams should build from local context and existing management rules (Phase 2) while also negotiating necessary changes with the community and stakeholders to develop the fishery management plan.

OBJECTIVE TYPE	TYPE OF ACTIVITIES	POSSIBLE OUTCOMES
FISH POPULATION & BIODIVERSITY	Fishing Activity Management, Conservation	**i)** reduce fishing effort or restrict gear, **ii)** develop spatial and/or temporal rules to protect key habitats and time periods during fish population cycle, **iii)** encourage fishing efforts to take place during more productive periods and **iv)** stock enhancement.
FRESHWATER HABITAT ENVIRONMENT	Ecosystem-Based Approach To Fisheries	**i)** address non-fishing impacts and threats by engaging with wider freshwater ecosystem stakeholders and **ii)** restore freshwater ecosystem and habitat.
NUTRITIONAL & ECONOMIC	Post-Harvest & Livelihood Activities	**i)** improve the fisheries value chain, **ii)** increase catch effort or selectivity, **iii)** change fishing patterns to occur in periods of higher fish production, **iv)** reduce post-harvest waste and loss
SOCIAL & CULTURAL INTERESTS	Rights & Tenure Arrangements, Social & Healthcare Programs	**i)** address rights for fisher access, management, exclusion and transferability of rights, **ii)** facilitate tenure agreements with governments and other 'owners', **iii)** implement gender and other social / healthcare programs



Hilario Kandonga is a member of the Livambi fishing cooperative in Angola. Here he is using a traditional hand-made fishing trap to catch fish in the channels. *(Roshni Lodhia)*

HINTS & TIPS

- Do not rush the collaborative process of developing a fishery's management plan. The trust built and knowledge shared through the journey of plan development are important outcomes.
- Always communicate realistic expectations to the community and other stakeholders. Developing a fishery management plan can take time and benefits are not guaranteed given the uncertainty and dynamics of freshwater ecosystems and inland fisheries. Moreover, results can sometimes take time to be realized and may include catching less fish to achieve other desirable objectives like increased predictability and secured tenure to the resource.
- Work with/build off current management rules for easier agreement and adoption, especially by stakeholders who have long held customs or large amounts of decision-making power.
- If early 'results' are needed to build trust with communities, work with experts to identify generally beneficial and low-risk activities that positively contribute to fisheries or the needs of fishing communities. Examples include reducing post-harvest waste to increase the return to a fisher or participating in conflict resolution sessions among communities or stakeholders to address existing issues.
- Clearly communicate the activities, roles and responsibilities in creating, agreeing and enforcing the plan to sensitize the work.
- Keep plans simple, especially at the start of work. The final fishery management plan can be as detailed as required by project context and partners.
- Be creative and open-minded with the fishery's context to develop locally appropriate plans.

FUTURE ADAPTIVE MANAGEMENT CYCLES

- Identify, evaluate and improve project activity equity by adapting activities to the 'winners' and 'losers' of previous management activities (Phase 5 and 6 of previous cycles).
- Increase the integration and use of data collected from previous cycles to validate or modify management activities.
- Provide data to reduce uncertainty in catch and increase prediction power of future productivity to improve planning (e.g., wet / dry season forecasts).
- Promote and validate the results of community-led fishery management plans with government and local authorities for official recognition.
- Increase resilience of the fishery management plan through scenario planning for potential changes, including climate change, external development (e.g., hydropower dams) and changes in government policies.



4 Consolidating & Creating Opportunities For Learning

OVERVIEW

Phase 4 improves project efficiency by identifying and integrating synergies between governance and management plans. The guide acknowledges differences between governance and management plans, including the importance of the distinct objectives and activities, as outlined separately in Phases 3A and 3B. However, the close interaction between governance and management aspects of inland fisheries means the two plans will have overlapping objectives and activities. For project teams, it is efficient to identify these interactions to reduce potential duplication and take advantage of complementary impact.

Phase 4 also improves the project team's understanding of the fishery by identifying information needs and opportunities for learning during governance and management activity implementation. Through deliberate planning and implementation of activities (this phase) and associated data collection (Phase 5), projects can act as a 'living laboratory' that can be used to address emerging challenges and uncertainties and test assumptions. For example, project teams can track how the fishery responds to co-management by investigating the relationship between the size of fish reserves and species conservation. Furthermore, interactions with communities are a rich source of local knowledge that provide different and complementary information.

BACKGROUND

Project teams should aim to increase their understanding of the fishery through project governance and management activities, which will inform and provide supporting evidence for decision-making and future project cycles.

OUTCOME

Improved understanding of the fishery and future adaptive management cycles by **1)** consolidated governance and management plans, **2)** activities filling information gaps and **3)** validation of assumptions in planning and decision-making.

OUTPUT

A consolidated project plan that identifies specific activities and generate new insights about the fishery for anticipatory learning.

EXPERTISE

Social scientist, gender experts, anthropologists, economists, fisheries, fish ecology



Steps:
CONSOLIDATING GOVERNANCE & MANAGEMENT PLANS

1 *Identify points of interaction between governance and management plans, including in objectives, actors, activities, flow of information, timing and expertise.*

2 *Revise governance and management plans to take advantage of positive interactions, reduce duplication, maximizing information use and minimize the number of meetings and surveys. Revisions should not compromise the function or results of activities in delivering to governance or management plan objectives.*

3 *Consolidate governance and management plans into a single combined management plan, while maintaining labelling of governance and management activities for helpful reference.*



Steps:
IDENTIFY OPPORTUNITIES FOR LEARNING

4 ***Work with subject matter experts to review the current understanding of the fishery (Phase 2) and project plans (Phase 3) to identify learning priorities associated with uncertainties in knowledge, emerging challenges and potential opportunities to the fishery. Evaluate the potential impact these may have on delivering governance and management objectives and overall long-term status of the community and the fishery.***

5 ***Work-with subject matter experts, community members and stakeholders to identify potential activities to meet identified learning priorities. These activities can take the form of*** *(and see Table 4)**:***

a. Collecting and sharing of existing knowledge
b. Passive or active experimentation
c. Dedicated training and skill development

6 ***Evaluate the potential contribution of the learning activities to filling information gaps, including their practicability and cost, and integrate those considered highest priority activities into the combined governance and management plan. Selected learning activities should link to data collection and evaluation phases (Phase 5 & 6).***

TABLE 3

Examples of types of learning priorities and activities.

PROJECT OBJECTIVE	LEARNING PRIORITY	POTENTIAL LEARNING ACTIVITY
Scaling the project by inviting new communities to participate in an existing shared management plan.	Validate assumption that new communities will co-operate and assimilate smoothly into current group.	Workshops to understand cultural norms and history of cooperation and conflict among communities.
Conservation of specific fish species by proposing regulation of current fishing techniques.	Address uncertainty in the effectiveness of proposed fishing regulation.	**1)** Where there is sufficient existing variation in types of gear used among fishers (including use of the gear to be regulated), observe and analyze fish catch by different fishing technique. **2)** Where there is not sufficient variation in types of gear used among fishers, consider experiments to measure impact of different fishing gears and the type of fish they catch.
Increase gender equity in fishery governance decisions.	Validate assumption of gender representation in position of power is able to deliver gender equity.	Measure the impact of gender representation on decisions through the variation in the percentage of women in positions of power in co-operatives.
Increase participation in adaptive management decisions.	Increase awareness and understanding of current fish populations and population dynamics.	Training for communities and local authorities to lead or participate in fish stock assessments. Conduct surveys to collect Indigenous Local Knowledge to share with project team and partners.



The Nature Conservancy's Peter Limbu plays with children next to Lake Tanganyika, Tanzania. *(Ami Vitale)*



Children play in Liavela Village, a fishing cooperative in Angola. *(Roshni Lodhia)*

HINTS & TIPS

- Consolidation of governance and management plans, especially combining shared activities, promotes integration of governance and management components of fisheries.
- Embrace the contribution of Indigenous Local Knowledge as a standalone source of information to complement and validate 'western' science.
- For active experimentation, prioritize low-risk learning opportunities to reduce potential undesirable experimental impacts.
- Be transparent about uncertainties and needs for learning with communities upfront to set expectations and garner support.
- Discuss uncertainties and learning needs with communities and other stakeholders because they will have useful insights and existing knowledge.
- With communities, define their interests and learning needs.

FUTURE ADAPTIVE MANAGEMENT CYCLES

- Understand the flow between governance and management aspects of inland fisheries, especially how the activities may affect each other, and build on synergies for greater coherence in future cycles.
- Expand learning opportunities for addressing community interests about the fishery to give community members agency and to promote investigative skills as they take on more responsibilities.

5 Data Collection For Evidence-Based Project Decision-Making

OVERVIEW

Phase 5 covers the careful planning of data collection activities to underpin project team decisions and activities and is informed by the previous phases. Data collection must serve the needs of fisheries governance and management objectives and activities (Phase 3), validate assumptions and create learning opportunities (Phases 2 & 4). Teams should only collect data that meet a clearly defined project purpose identified in the previous phases and avoid being too ambitious or copying data collection plans from other projects with different objectives, budget, context and information needs.

To determine the scope of data collection activities, project teams begin planning data collection by reviewing the outputs of Phases 2, 3 and 4. Teams may decide to revise outputs from these earlier phases to ensure coherence between data collection and management activities. To inform big picture planning, teams should seek to map the full sequence of data activities. There should be clear and coherent plans beginning from identified data needs, data collection, including training to communities or other groups, and post-collection activities, like data cleaning, analysis and storage. Data collection should be as simple as needed to avoid overburdening community and project partners involved in the activity, who may have time, capacity and resource constraints. Both qualitative and quantitative data types should be considered in meeting the needs of the end-user of the information and the subsequent action or decision to be made.

It is important manage and store all data correctly to ensure they serve project objectives and support use in future phases and cycles as well as after the project has ended. Project teams should follow best practices around security and sharing. Data ownership and access rights need to be clearly defined and adhere to the Free, Prior and Informed Consent (FPIC) process and approval.

BACKGROUND

A key factor for successful adaptive management is the collection of data to support project activities and decision-making, including monitoring and evaluation. Careful and deliberate planning of data collection activities is critical for effective and efficient project activities.

OUTCOME

The collection, analysis and storage of data needed to inform evidence-based fishery governance and management plans and meet learning priorities previously identified.

OUTPUT

A data collection plan outlining the roles and responsibilities of the project team, including any necessary support from external sources, around data collection and storage that provides useful data at the resolution required.

EXPERTISE

Social scientist, gender experts, anthropologists, economists, local experts with familiarity of decision-making, ecologists and fishery scientists

Steps:
IDENTIFY & PRIORITIZE INFORMATION NEEDS FROM PREVIOUS PHASES

1 ***Project teams work with subject-matter experts to review objectives and activities in governance, management and learning plan outputs from previous phases to compile a list of potential data needs:***

- Inform decision-making in key points of governance and management activities (Phase 3a & 3b outputs).
- Evaluate impacts and reporting of activities in achieving objectives (Phase 3a & 3b outputs).
- Improve understanding of the fishery by validating critical assumptions or meeting knowledge gaps (Phase 2 & 4 outputs).

2 ***Prioritize data collection activities by ranking potential needs and evaluating the contribution of the data to project success. This can be done by scoring the potential contribution of the data to key project needs including:***

- There is a clear audience and purpose for the data (Phase 2, 3a & 3b outputs).
- Validation of critical links in the theory of change (Phase 3a & 3b outputs).
- Ability to fill gaps in evidence (Phase 4 outputs).
- Ability to screen for risk or unintended outcomes.



Steps:
PLAN DATA COLLECTION ACTIVITIES TO MEET PRIORITIZED DATA NEEDS

3 ***For the highest jointly prioritized data needs, work with experts to identify and design appropriate metrics and indicators*** (see Table 4 for examples)***. Secondary indicators may also be used to complement primary indicators to further contribute to data needs.***

- A "metric" is a value and a unit of measure, often a standard means of assessing the size, amount, degree or quality of a variable.
- An "indicator" is a context-specific, quantitative variable or qualitative statement to inform a "metric."

4 ***For each indicator and associated metric, understand who will use the data and how they will use it. Identify the minimum characteristics to fulfill their data needs, including but not limited to qualitative versus quantitative, minimum resolution, scale and frequency. Other factors to prioritize indicators include:***

- Existing data or tools (i.e., if data for the indicator can be collected from existing secondary sources or if tools already exist to facilitate data collection).
- Internal skills and resources.
- Timeliness (i.e., consider if the indicators provide needed information in the timeframe required by the target audience/user to influence relevant decision-making). For example, some data can only be collected during the rainy season, but if data are needed prior to that these data might not be appropriate.
- Context appropriate, consider if there are potential questions around the ethics or cultural sensitivity of collecting data (e.g., income).
- Reasonable cost, consider if data can be collected and analyzed at a reasonable cost.

STEPS: PLAN DATA COLLECTION ACTIVITIES, CONTINUED

5 ***Work with subject-matter experts, communities and stakeholders to design and plan data collection activities and any analyses required to meet data needs. It is suggested data collection, analyses and management activities should account for at least 10% of the overall budget with priority given to governance and management activities.***

6 ***Identify the roles and responsibilities for team members responsible for data collection. Assess necessary ethics and equity considerations in data collection and management, including following the Free, Prior and Informed Consent (FPIC) process.***

7 ***Identify and implement necessary training and procure required supplies and equipment.***

8 ***Design and undertake a pilot data collection study to validate data collection design and identify areas for possible improvement (e.g., improve the structure of recorded data collection or evaluate the need for further trainings).***

9 ***Design the data management protocol and related data archiving processes, including data security and privacy considerations, and assign responsibilities to tasks and access rights.***

10 ***Combine steps 1-6 and streamline activities into a data collection and analysis protocol before adding to consolidated management and governance plans.***



TABLE 4

Examples of metric and indicator planning to meet project data needs.
Primary indicators may be supported by secondary indicators to further contribute to data needs.

DATA NEED	OBJECTIVE/ GOAL	RATIONALE	METRIC	PRIMARY INDICATOR	SECONDARY INDICATORS
Inform Decision-Making for Governance & Management Activities	Promote sustainable fisheries within project area	Fishing effort and potential catch is directly related to natural variation in ecosystem productivity, which follows flooding cycles	The strength & duration of flooded and dry seasons	Precipitation of rainy season	Precipitation in previous rainy seasons, forecasts of upcoming rain, previous catch totals, indicator species stock assessments, fishing effort
Evaluate Success of Activities In Achieving Objectives	Improved community economic interests	Community well-being, including economic prosperity, is essential for successful fisheries management	Household income	Total household income, disaggregated by fishery and non-fishery sources	Perceived security in household income / livelihood security / livelihood options, number of households with increased interests
	Fishery remains productive	Productive fishery is essential to support human use	Efficiency of catch	Catch-per-unit effort	Total catch per community or freshwater body
	Biodiversity of fished species is conserved	Freshwater ecosystems tend to be most stable and able to support community use when the species composition is as close to a baseline status as possible	Population health of fished species	Stock assessment of fished species	Spawning stock biomass; increase in overfished species, decline in invasive species
Improve Understanding of the Fishery by Validating Critical Assumptions Or Filling Knowledge Gaps	Validate the assumption that representation of marginalized groups in positions of power leads to improved equity	A minimum threshold in positions of power is needed to promote and protect the interests of marginalized groups in fishery governance and management	Women & youth-positive decisions	Number of governance & management plans that benefit and/or protect interests of women and youth	Number of women & youth in decision-making positions, income and food metrics disaggregated by gender, perceived opportunities and representation by marginalized groups

HINTS & TIPS

- An appropriate data collection plan is not characterized by the number of indicators it tracks but rather by the relevance of indicators and their ability to detect changes at the timescale required to inform the adaptive management process.
- Ensure team members have clarity on who is responsible for planning and collecting data as well as data management. It is recommended to have one person in charge of these activities, ideally, with their entire time dedicated to managing these efforts.
- In this guide, data collection (this phase) as well as Phases 4 and 6 are components of Monitoring, Evaluation and Learning (MEL) planning.
- Review data collection activities in Phase 2 and continue activities useful for project needs.
- Where possible, community and stakeholders should be involved in data collection to build capacity.
- Where possible, record data in both locally relevant and standardized units, and provide meta-data that describes data collection method and definitions of data metrics and indicators.
- To avoid inefficient or unnecessary data collection, prioritize data collection activities according to contribution and use in management decision-making and achieving objectives.
- Consider undertaking 'quick' reviews of collected data with community members and stakeholders to validate metrics and design efficient collection.
- Follow best practices around data management and ensure there are adequate resources and time to support data collection and management, including data storage and cleaning, to maximize usefulness and longevity.
- If external consultants are used, ensure all raw data are stored with the project team.
- If data is collected by the community members and on a voluntary basis, try to develop activities that keep them engaged over time.

FUTURE ADAPTIVE MANAGEMENT CYCLES

- Increase efficiency by reviewing how previously collected data were used, and revise data activities to reduce collection of unused data.
- Data needs change as the project matures and data collection is not only a baseline process but should be part of all phases of a project.
- Create a central database and dashboard for the project teams and stakeholders' data access and use.
- Technology and mobile data collection applications can be useful tools for project teams but require agreement from project partners and working with experts to review if appropriate for project objectives.
- Regularly communicating results, including summary results or tracking data collection progress, can be a useful source of motivation during field surveys.
- Undertake training of fishers and local stakeholders to collect and analyze data to facilitate continuation of activities even after the project has ended.



6 Evaluation & Adapting



OVERVIEW

Phase 6 is when the project team, communities and stakeholders pause and reflect to review project activities, identify reasons for success and areas of weakness to plan future improvement. Effective community-based co-management depends on productive relationships among communities and other fishery stakeholders. It is crucial to address areas of conflict to increase understanding and to develop trust.

It is also important to evaluate whether fishery governance and management activities are achieving objectives for fish, the fishers and fishery stakeholders. Positive results should be reviewed to understand the enabling conditions, especially because the success of management activities is not guaranteed in the future as fisheries and their context change over time. Understanding causal drivers is important information for future adaptive management decisions. Reviewing the lack of success is also important for future decision-making.

The adaptive management review process should include honest reflections on how the overall project is being executed, taking into consideration any tension and negative reflections by the project team, communities and stakeholders. Aspects to review include how well groups contribute to the project process and how well they follow through with their responsibilities. This process should be done with an open mindset with the goal of identifying the most important actions needed for stakeholders to meet their responsibilities.

An exciting aspect of this phase is the potential to consider new options in the next management cycle because of the changes to a fishery from past project activities. Ideally, trust among project teams, communities and Interested Parties is strengthening. Training and experience will also increase capacities for more responsibilities or different roles in governance and management activities. Evaluating progress and learning opportunities through data analysis will lead to a greater understanding of the fishery.

BACKGROUND

Community-based co-management is usually a long process and success depends on project teams, communities and stakeholders learning from past activities to improve future activities.

OUTCOME

Improved future iterations of the management cycle and activities by evaluating past activities and adapting the next set actions.

OUTPUT

A critical and honest assessment from the project team, communities and stakeholders of what and why activities went right or wrong and documented steps for the next iteration of the management cycle that builds on the review of the recently completed cycle.

EXPERTISE

Social scientist, gender experts, anthropologists, economists, fisheries, fish and freshwater ecologists and conservationists



Steps

1 ***Undertake proper data handling and analysis to ensure data metrics and indicators are used to evaluate the progress towards governance and management objectives and other needs identified in Phase 5.***

2 ***Hold pause and reflect sessions with the project team, communities, key stakeholders and subject-matter experts. Planning these sessions should account for appropriate timing, who to involve and a supportive and enabling environment. The sessions should be supported by data and be open to discussions, reviewing topics like:***

- Progress towards governance and management objectives.
- Areas of weakness or unsatisfactory progress.
- Dissatisfaction or desired improvements in decision-making process or implementation of project activities.
- Conflict(s) in project team, communities or stakeholders.
- Contribution of fisheries to nutrition, livelihood or other non-explicit project objectives.
- Required training or capacity building needs.
- Any new knowledge learned by individuals and groups.
- Other points as requested by the project team, communities and Interested Parties.

3 ***Produce and share a report of the pause and reflect sessions to all project partners and stakeholders for transparency and record-keeping.***

4 ***Conduct an initial review of potential considerations and actions for each phase of the next iterative management cycle and document considerations for future phases. Notes can include but are not limited to:***

- Revisit assumptions in the project teams in their understanding of the fishery (Phase 2) and the theory-of-change for governance and management plans (Phase 3).
- Identify unresolved or emerging problems, threats and opportunities affecting the overall fishery or progress towards project objectives.
- Underscore new knowledge or feedback informing planning, decision-making or execution of phases and activities.
- Define new and/or revised assumptions and evaluate potential limitations in the understanding of the fishery and project activities.
- Incorporate priority areas for potential capacity strengthening or new equipment.

5 ***Work on an action plan for the next adaptive management cycle that builds on the problems, threats, new understanding and opportunities identified in this management cycle and distribute to all project team members, communities and stakeholders*** *(see Table 5)*.

TABLE 5

Example sections of an action plan for the next management cycle.

SELECTIONS	DESCRIPTION
Participation & Transparency	Ensure all actors can participate and all processes are transparent and accessible for everyone. Make additional effort to include marginalized and vulnerable actors.
Timeline & Milestones	Create a timeline with realistic milestones to guide the plan development.
Appropriateness & Feasibility	Assess if current project team members are appropriate and if management and governance objectives and activities are feasible or if they need revising (e.g., emerging threats from factors outside of the actors' control).
Resources	Identify resources, funding or expertise needed in the next cycle
Barriers	Evaluate potential barriers or resistance to proposed changes in the next cycle and find solutions where possible.
Accountability	Agree on roles and assign responsibilities to ensure proposed changes to the next cycle are implemented.



Fisherman, Napo River, Kiwcha Nation, Ecuador. *(Ana Guzmán León)*



Fish from Lake Gomé in Gabon. *(Roshni Lodhia)*

HINTS & TIPS

- Consider the most appropriate format for communicating results to community and stakeholder (e.g., stories, photos, video). If the community has been involved in data collection, this can be more impactful.
- Be aware of group and individual power dynamics and cultural norms influencing discussions.
- Take care in curating a safe space for discussions to promote honest communication, including establishing enabling conditions for pause and reflect sessions such as fostering awareness across team, scheduling in advance, and clearly identifying responsibilities, funding and resources.
- Before each pause and reflect session, make sure the project team spends sufficient time in pre-session work to assemble the needed information and results (from data collected and analyzed using plans developed in Phase 5).
- Stakeholders will have different abilities and insights in interpreting and evaluating activities.
- Evaluate overall progress using both data and feedback from communities and stakeholders.
- Discussions and feedback are invaluable sources of information to contextualize results and inform next steps.
- Document and archive discussions and any new understanding of the fishery and assumptions.
- Some challenge(s) may be outside project scope and stakeholder influence, requiring a decision to either disregard those challenges or expand project scope or stakeholder involvement.

FUTURE ADAPTIVE MANAGEMENT CYCLES

- Improve integration between analysis with data collection process for faster communication to stakeholders (e.g., dashboard, quarterly reports).
- Overcome blind spots and improve evaluation and reflection process according to previous cycles success and failures.
- Increase the frequency of opportunities for evaluation and feedback during a single cycle for faster reactions and adaptative decisions.
- Curate a repository for the activities and their effectiveness and limitations for future reference.

Iterative Cycles & Transitioning to an Exit Strategy



The long-term success of community-based co-management will require project teams to repeat the cycle's sequential phases, which will re-align management with continuously changing community and stakeholder circumstances that occur as a response to dynamics within and external to the fishery. A community's interests and objectives for the conservation of aquatic systems, whether it be for food, livelihood, cultural use or conservation, change over time. Moreover, changing opportunities, like the creation of new governance structures or fishery management and monitoring activities, and increased trust among communities and stakeholders, mean future iterations will operate in drastically different contexts. Each iteration should build on the successes of the past as well as address previous challenges or limitations. Project teams should go through each sequential phase of the next adaptive cycle to address all opportunities.

Project teams should approach iterations along two-time scales:

- **In the short-term (i.e., early iterative cycles):** project teams should aim to strengthen the processes and outputs of the individual phases and the links among them. In these early cycles, communities, governments and other project stakeholders are learning how the fishery is responding to co-management actions and can use this information to update the system. Everyone's needs to be aware that progress, including stabilized / increasing fish populations or a community's catch, is rarely linear and some results will take time to realize.
- **In the long term (i.e., late iterative cycles):** project teams should plan for a longer-term aim of transferring ownership of project activities and outputs to the fishing communities and stakeholders for enduring legacy. A well-functioning community-based co-management system, where communities and stakeholders have the capacity, authority and tenure to make evidence-based adaptive management, should continue to contribute to local conservation and sustainable use interests even after formal projects end.

To achieve long-term success, project teams must develop a transition strategy identifying the needs at this longer time scale. The ideal transition for project teams or facilitator (e.g., TNC) would be an exit, where neither funding nor technical support is needed for the community to be successful long-term in meeting their effective fisheries management and conservation goals. In some cases, long-term support at a low level may be needed for success in meeting more ambitious community goals, especially when there is a conservation component.

In all cases, trainings and the gradual transfer of governance and management activities (e.g., negotiation, data collection and analyses) will strengthen communities and stakeholders to continue to undertake, adapt and lead activities after a project ends. For example, formalization of tenure rights and community-based governance structures, like multi-stakeholder platforms, provide long-term mechanisms to empower community governance and management of fisheries. Project teams should plan for an exit that the community-based co-management activities are sustainable and there is little or no input from external resources.



Belen Fishmarket, Brazil. *(Ana Guzmán León)*

POTENTIAL DIRECTIONS FOR INTERESTED PARTIES OVER THE ITERATIONS:

Project leads (e.g., TNC) will not be in a particular project site forever. From the start of the project, building in a transition plan - ideally exit plan - is both sound fisheries management and responsible program management. A transition or exit plan:

- Includes reasonable community and government expectations that are defined in both short and long timeframes.
- Avoids perverse incentives that could lead to management collapse upon transition/exit.
- Recognizes that government funding streams for inland fisheries management in most, if not all, of the developing world are unlikely to cover needed investments. Private sector and/or local NGO involvement should be realistically involved.

Government will inevitably play a critical role in program transition or exit:

- Use creative approaches to ease the transition including training, secondment, and policy/advocacy support for their own financial and organizational sustainability.
- Advance policies and supporting services that promote community involvement in governance and management, including appropriate rights and tenure for communities.
- Be patient with timelines, as change can be gradual, and communicate successes to support scaling to new locations.

Communities are the ones that will suffer most from rapid or poorly thought-out exit plans. In these situations, unsustainable investment could be worse than no investment at all. Over time, plans should be made to:

- Elevate involvement with governance and management activities, including undertaking training to participate and/or lead activities.

Local partner NGOs, ideally locally based, may be the best placed long-term enablers of community-based co-management activities and should be invested in accordingly.

To meet the challenges of freshwater ecosystems and use, community-based co-management of inland fisheries needs to continue beyond the life of a project, possibly into perpetuity. New challenges and threats, including environment, climate change and changing community, government or other stakeholder interests, are inevitable. As such, the governance process, management plans and roles and responsibilities will need to evolve. However, new knowledge and capabilities developed through the process can inspire new innovative solutions.

Crucially, community-based co-management of inland fisheries is a human endeavor and represents a governance as well as a fisheries management challenge. The relationships among groups developed through the process are key to ensuring each iteration continues to build and support successful collaboration and deliver socially and environmentally responsible management.

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