Fishery Systems Mapping Tool User Guide

Beta version – August 2018

EDF
ENVIRONMENTAL
DEFENSE FUND®

TOOL DEVELOPERS

Leah Fine and Alexis N. Rife

VERSION

This tool is being released as a beta version that will be updated as we receive feedback from fishery practitioners. The beta designation is a recognition of the value of stakeholder input, which we know will make this tool even more successful in supporting sustainable fisheries management around the world. We invite you to share your feedback on the Sustainable Fisheries Toolkit website.

TOOL COMPONENTS

User guide
Excel tool

Any views expressed in this tool and associated materials are those of the authors and do not necessarily represent those of the contributors or their organizations. Any errors are those of the authors. This tool and any supporting materials are decision-support tools and results should be interpreted as such. Neither EDF, nor the authors, take responsibility for any outcomes that result from the use of this tool.

Fine, L. and Rife, A. (2018). *Fishery Systems Mapping Tool*. Environmental Defense Fund.

TABLE OF CONTENTS

BACKGROUND

Most fisheries have many activities that contribute to their functioning, including science, regulation, and enforcement; however, the groups or individuals responsible for carrying out these functions and the relationships between them may vary depending on local conditions. Identifying these stakeholders and their roles within a fishery system can provide context and inform strategies for implementing sustainable fisheries management.

The Fishery Systems Mapping Tool helps define the functional roles of stakeholders in a fishery system, clarify the interactions between each group and compare their influence and interest in improving fisheries management. Use of this tool can help build knowledge of a fishery system and identify gaps in capacity, challenges, potential partners and strategic opportunities for improved fisheries management.

Intended Audiences

The Fishery Systems Mapping Tool is designed for use by fishery managers, non-governmental organizations (NGOs) and other practitioners to understand the landscape of a fishery system. The Tool can be completed through desk-based research rather than through field work, using white papers, scientific literature, internet searches and expert advice as references. Additionally, it can be used within a group setting to arrive at a common understanding of a fishery.

When to Use This Tool

The Fishery Systems Mapping Tool can be used at various scales and stages of the fisheries management process. The Tool can be used relatively early in the fishery reform process, to understand the stakeholders present in the system and gain insight and context that can inform strategic opportunities for fishery reform projects. For example, the Tool can help fishery practitioners collect information prior to beginning work in a fishery system, such as during the Strategic Scoping phase. However, the Tool can also be applied to smaller regions, individual fisheries or specific sites to better understand the dynamics within a fishery and it can be applied when interacting with fishery stakeholders, such as during the Assessment & Engagement phase. See the Sustainable Fisheries Toolkit website for more information on the phases of a fishery reform process.

Limitations

This systems map template is designed to be broadly applicable to a range of geographic locations, fishery types and governance scenarios, and to provide a consistent framework to guide identification of fisheries stakeholders and their roles within a system. However, there is a tradeoff between this consistency and the level of detail necessary to understand a given region. As mentioned previously, many parts of the system are not comprehensively represented by this tool, and will require further analysis for a specific site or fishery. In addition, the range of relationships between stakeholders and the processes that drive change in a system are not fully represented.

Given these limitations, this template should be used as one part of the larger diagnostics process, and additional tools should be used to map the supply chain, the regulatory process, the political economy and stakeholder interactions at the finer scale of a fishery or site.

Finally, it will be challenging to identify all relevant stakeholders on an initial use of this template, especially in groups where many entities may be playing that role, like Conservation or Sellers. The map resulting from this process should not be considered static, and can be altered and added to as a better working knowledge of a country or region develops.

INSTRUCTIONS

Getting started

This User Guide is designed to walk you through the Fishery Systems Mapping Tool, step-by-step. The Tool is a Microsoft Excel workbook divided into multiple tables: (1) Overview, (2) Instructions, (3) Group Definitions, (4) Systems Map, (5) Power Map, (6) Relationships, and (7) Interpretation. You will fill out information in these tabs sequentially by completing the steps below. To begin, **open the Fishery Systems Mapping Tool Excel file**.

Step 1: Define scope

The first step is to clearly define the scope of the system you want to analyze. You may want to include all marine fisheries in a given country or large region, but if the country or region you are working in is particularly complex and heterogeneous (for example, the European Union or the United States), narrowing the scope of the analysis will be helpful. You may also choose an alternate entry point or method of defining the scope of analysis. For example, you might select only those fisheries managed by a certain regulatory agency, or only those that a specific group of fishermen target.

You should also define the point in time you are analyzing, particularly if fisheries management in a country is changing quickly. It may be useful to update this analysis to understand how the system and stakeholder opinions change over time.

Finally, you should clarify your goals for working in this system. For example, are you interested in understanding stakeholder attitudes towards a particular management option? These might include a form of secure fishing rights like IQs, ITQs, or TURFs, but may also include other goals like MPAs, improved catch monitoring, science-based management, etc.

Once you have decided the scope of the system you want to analyze, click on the Group Definitions tab and enter the information in cell C3 (or click on the hyperlink provided on the Instructions tab). *Example: Geographic location, fishery, point in time, management option(s)*

Step 2: Identify entities

On the Group Definitions tab, the next step is to identify the “Entities or Institutions” that play a role in each functional group. To do this, read the Functional Group Definition (Column E) for

each Functional Group (Column D), for example Fisheries Resources. You can also find this information in the Group Definitions section of this User Guide.

a. For each Functional Group, **fill in the groups or stakeholders that play that role in the Entities and Institutions column** (Column F). To help fill in the boxes, you may want to read reports, journal articles, online resources or consult with experts familiar with the region. Good places to start include FAO Fishery Country Profiles, OECD fisheries reports and MIT's Observatory of Economic Complexity. If no stakeholders or groups fill a particular role, write "none." It may be difficult to create an exhaustive list of all the stakeholders who fill these roles; if necessary, generalize or list the most important stakeholders.
b. **Add additional notes and considerations** in the Notes column (in some cases, the Functional Group Defintions specify additional information it may be helpful to note).
c. **Include particularly helpful references** in the Sources column (Column N).

Once you have completed filling all the Entities and Institutions, and added any applicable Notes and Sources, proceed to Step 3.

Step 3: Scoring

In the Group Definitions tab, you can also **assign a score for Adequacy, Influence and Interest/Alignment for each group and the Cohesion within that group.** These scores are best determined by someone with a deep familiarity with the system, and an internal working group or discussion may be a good way to make sure the scores are representing the system well. However, they are still inherently subjective and may change over time. Review scoring for each category below:

- **Adequacy** indicates the success of the entities within a given group in fulfilling that functional role—for example, how successfully the entities in the catch monitoring group are at gathering information about landings and discards. Adequacy scores are on a five-point scale, ranging from low adequacy to high adequacy. Low scores indicate inadequacy/need for capacity building and high scores indicate that the entities in a group are successfully fulfilling that role.
- **Influence** indicates the power and access that a given group has to create changes in fisheries management and regulations. Influence scores range from not influential to extremely influential, with higher scores indicating greater influence. Scores of very or extremely influential indicate that that stakeholder group has the potential to be a significant driving force behind changes in management, while scores of not or slightly influential indicate that they may not be able to incite change independently.
- **Interest/Alignment** indicates how receptive to and engaged stakeholders are to secure fishing rights. Interest/Alignments scores range from strongly opposed to strongly supportive, If the group is evenly split on its alignment with secure fishing rights—for example, if half of industrial fishermen support secure fishing rights, but half oppose it—assign a score of neutral and give that group a low score for cohesion.
- **Cohesion** indicates the level of agreement within that group about their interest in secure fishing rights. Scores range from low to high cohesion, with a low score indicating

low cohesion and a high degree of disagreement within the group, while a high score indicates that most entities in that group share a similar perspective.

In all cases, it is more important to accurately represent the *relative* scores of each stakeholder compared to others in that region than the *absolute* scores. It may not be appropriate or possible to assign scores to each group (for example, it does not make sense to assign scores to the fishery resource or to laws and regulations). If that is the case, leave the scores blank. You should also leave the scores blank if no entities are listed for a particular group or if you have insufficient information to estimate a score.

Step 4: System map

Completing the Group Definitions worksheet (Steps 1-3) automatically populates the System Map with information you have entered about the fishery system. For example, as you fill in the Entities and Institutions column of the Group Definitions tab, the names of those entities and institutions will automatically be transferred to the System Map tab. This system map helps visualize the stakeholders within the system and the interactions between them.

Some functional groups are clumped together in boxes—in particular, the supply chain, community, fishermen, and regulators. These boxes indicate that the groups within them have particularly close and complex relationships that may require further analysis during the Assessment and Engagement phase.

The arrows define relationships between the groups. Some interactions are already defined by the arrows included in the map based on interactions typically observed in a fishery system. In the System Map **black arrows indicate an exchange of information, green arrows indicate a financial transaction, blue arrows indicate resource use or impact, red arrows indicate a regulatory relationship and purple arrows indicate political influence**. The bolder arrows indicate the relationships of particular importance that are examined in greater detail in the Relationships section (see Section G, below). Optionally, you may choose to modify these arrows in other ways to best represent the system you are mapping. Possibilities include:

- You can add or remove arrows to this map (go to Insert→Shapes) to best represent the interactions between stakeholders present in this system.
- The width of the arrows can also indicate the strength or effectiveness of the relationship between stakeholders. As a default, the arrows are set to a 4½ point width; these can be changed to 2¼ point to indicate a weak relationship or to 6 point to indicate a particularly strong relationship. For example, if fishermen communicate with regulators, but have very little influence over their decisionmaking, you might change the width of the black arrow between fishermen and regulators to 2¼. To change the width of the arrows, click on an arrow, then go to Format→Shape Outline→Weight.
- The pattern of the arrows can also be changed to a dotted line to indicate notable conflicts between groups. To change the pattern of the arrows, click on an arrow, then go to Format→Shape Outline→Dashes.

To export the map as a PDF, go to File→Print and choose the PDF option as your printer. Change the page orientation to Landscape and select Fit Page on One Sheet, then hit Print. Printing on larger paper may be necessary to make the text large enough to read easily.

Step 5: Power map

When you fill in the Influence and Interest/Alignment scores on the Group Definitions tab, the functional groups will automatically appear on the plot in the Power Map tab. The four quadrants of this plot are labelled with potential approaches for engaging with stakeholders falling within that area:

- Groups with both high influence and high interest in fisheries reform may be suitable **potential partners** in efforts to improve fisheries management.
- Groups with high interest in fisheries reform but relatively low influence may be strong candidates for continued **communication and/or capacity-building** efforts, to strengthentheir continued participation and engagement with the process.
- Groups with high influence but low alignment with fisheries reform goals should be **engaged with and potentially motivated** to support changes in management.
- Groups with low alignment and low influence should be **observed**, but are not probable partners.

Groups may **fall on the vertical axis of the plot** if they are indifferent to secure fishing rights, or if there is disagreement within the group. Groups on the vertical axis that have a low score for cohesion may require further analysis to determine which entities within that group may make good partners and which may require other approaches.

If two groups appear in the same place on the grid, the data labels may overlap and be difficult to read; you can move the labels manually. Once you have manually adjusted any difficult to read labels, continue to Step 6.

Step 6: Relationships

The Relationships worksheet identifies 11 key relationships between functional groups. These relationships were identified through a review of the fisheries management literature and by drawing on experience implementing fisheries reform. They include interactions between:

- Fishermen and Legislators/Regulators
- Science and Regulators
- Enforcement and Fishermen
- Fishermen and Science
- Lenders, Investors and Aid Providers and Science
- Conservation and Fishermen
- Community and Fishermen
- Fishermen and other Fishermen
- Fishermen and Fisher Organizations
- Supply Chain and Fishermen

- Fishermen and Other Resource Users

In the Relationships worksheet, each of these key relationships is separated into two directions—from the first party to the second party and vice versa. For each direction of each relationship, the user is asked to define:

- The **Nature of the Relationship**—in particular, how cooperative or confrontational the relationship is. Options include Conflict, Some Animosity, Neutral, Cooperation, or Alliance.
- The **Effectiveness** of the relationship. Effectiveness scores range from very ineffective to very effective. A relationship identified as particularly confrontational in the previous category is not necessarily effective; for example, there could be conflict between enforcement actors and fishermen, but the relationship could still result in effective enforcement of fishing regulations. Similarly, an alliance does not necessarily indicate that the relationship is fulfilling its functions effectively.

Guiding questions are provided for each direction of each relationship to help the user evaluate these characteristics. The worksheet also indicates what is being transferred between the two parties in each case (information, political influence, regulatory authority, money, etc.). Please note that scores do not change any of the other sheet and this analysis is for a deeper analysis of these key relationships.

The list of key relationships is not exhaustive, but represents those that are often critical to the success of fisheries management initiatives. If additional relationships are particularly important in the study area, the user can add and evaluate these relationships in the blank rows provided.

Step 7: Interpretation

This Tool serves as a good first step towards understanding how fisheries in a given country or region work, and will provide useful background and context moving into strategy development and site selection. The resulting system map can be used as a reference throughout the diagnostics process to highlight who plays certain roles within a system, the regulatory, financial and communications processes at work and the relationships between the various functional groups.

This tool can also provide insight into three areas useful for strategy development.

- First, it can help identify **opportunities and potential partners** for fishery improvement. Groups appearing in the upper right quadrant of the Power Map may be key stakeholders in the system and particularly good partners. For example, stakeholders in the Other Resource Beneficiaries and Support Service Providers groups benefit from healthy marine resources, and so may be interested in working towards sustainable fisheries management. Stakeholders in many of the community groups, including Influential Leaders and Conservation, and many of the fisher groups may also play a critical role.

- Second, it can point out potential **challenges** to improved fishery management. Excessive IUU fishing or Illicit Marine Activities may threaten the successful implementation of sustainable management practices. Groups in the upper left quadrant of the Power Map, potentially including political leadership or influential leaders that are not favorable to conservation or fisheries reform, may provide additional challenges.
- Finally, the systems map can locate institutional **gaps** in the fishery system or marginalized stakeholders that may be a **target for capacity building**. For example, if the Stock Assessments or Enforcement categories indicate limited or no stakeholders engaged in these activities, building capacity in these areas may be a priority for the strategy in that country. Similarly, a lack of Financial Accountability or Lenders and Investors suggests an opportunity to improve fishermen' access to capital. Groups appearing in the lower right quadrant of the Power Map are interested in supporting positive changes in fisheries management but have less influence in enacting those changes, so they may be good targets for developing opportunities to engage with the fisheries management process.

As you are completing the template, record your observations and insights in these areas in the orange boxes in the Interpretation worksheet. Questions to guide interpretation of results are included in the worksheet. There is also an opportunity to note other insights or questions resulting from this analysis that may require a deeper dive.

NEXT STEPS

Additional systems mapping

While this tool is designed to provide more information about the current state of a fishery, it may also be used to map out hypothetical management scenarios or an idealized version of what a system might look like if sustainable fisheries management can be successfully implemented. Comparing ideal and existing scenarios may help inform engagement strategies.

This analysis may also be repeated or updated to understand how the system changes over time. The Alignment and Influence scores are likely to respond to engagement efforts, and the Adequacy scores and the roles of stakeholders within the system may shift as a result of capacity building and changes in management.

Systems mapping may also be used as a method of stakeholder engagement. The results of this analysis can serve as a communications tool regarding the current state of the system.

Capacity assessment

This systems mapping exercise is a necessary first step in identifying system gaps and developing a plan to strengthen capacity within and throughout the system. Capacity strengthening, however, can and should happen at various levels: individual, organizational, network and system.

The individuals within a system, such as individual fishermen, policy makers, government officials, fishery management leaders and technical experts, may need additional tools and resources, knowledge and skills, or incentives and consequences to perform their roles more effectively in the system.

The organizations within a given system, such as non-governmental organization (NGO) partners, fishery management organizations, scientific institutions and government institutions or ministries, may need organizational strengthening in areas such as financial management, service delivery, or administration to perform more effectively in the system. The systems map can help you identify priority organizations for further capacity analysis.

Networks in the system, such as fishery associations or cooperatives, the seafood industry, associations of NGO partners, or business coalitions, can also represent opportunities for strengthened capacity by improving the flow of information and resources as well as increasing the collaboration, coordination and communication within networks.

Finally, capacity should be assessed for the system itself, which in addition to individuals, organizations and networks, includes other factors such as the policy and legal framework, environmental factors, fisheries resources and the linkages between various components of the system. While this map begins to address these system-level capacity gaps, additional resources on the subject can complement this Tool.

Other Sustainable Fisheries Toolkit resources

Additional tools can also provide more detail about portions of the system at a finer scale. For example, the Fisheries Policy & Governance Analysis Tool can help diagnose the strength of fisheries policies and regulations. For a complete list of tools that may help you conduct a more detailed analysis of elements of your fishery system, please visit the Sustainable Fisheries Toolkit website.

APPENDIX I: ADDITIONAL RESOURCES

Relationships

The Relationships tab of the Fishery Systems Mapping Tool examines critical flows (such as information, political influence, money and goods, etc.) between functional groups. Research for this tab came from peer-reviewed literature and EDF's experiences with fishery reform. To explore more about these relationships, see the resources below. Note: if the relationship is examined in the Relationships tab, the row number of the Relationships tab has been indicated.

Fishermen→Regulators (row 5)

- Cinti, A., Shaw, W., Cudney-Bueno, R., & Rojo, M. (2010). The unintended consequences of formal fisheries policies: social disparities and resource overuse in a major fishing community in the Gulf of California, Mexico. *Marine policy*, *34*(2), 328-339.
- Ainsworth, C.H., Morzaria-Luna, H., Kaplan, I.C., Levin, P.S., Fulton, E.A., Cudney-Bueno, R., et al. (2012). Effective ecosystem-based management must encourage regulatory compliance: A Gulf of California case study. *Marine Policy*, *36*(6), pp.1275-1283.
- Cinti, A., Shaw, W. and Torre, J. (2010). Insights from the users to improve fisheries performance: fishermen' knowledge and attitudes on fisheries policies in Bahía de Kino, Gulf of California, Mexico. *Marine Policy* 34(6), 1322-1334.
- Jentoft, Svein, Thijs C. van Son and Maiken Bjørkan. (2007). Marine protected areas: a governance system analysis." Human Ecology 35(5), 611-622.
- Bennett, E., Neiland, A., Anang, E., Bannerman, P., Rahman, A.A., Huq, S., et al. (2001). Towards a better understanding of conflict management in tropical fisheries: evidence from Ghana, Bangladesh and the Caribbean. *Marine Policy*, *25*(5), pp.365-376.

Regulators→Fishermen (row 5)

- Ainsworth, C.H., Morzaria-Luna, H., Kaplan, I.C., Levin, P.S., Fulton, E.A., Cudney-Bueno, R., et al. (2012). Effective ecosystem-based management must encourage regulatory compliance: A Gulf of California case study. *Marine Policy*, *36*(6), pp.1275-1283.
- Cinti, A., Shaw, W. and Torre, J. (2010). Insights from the users to improve fisheries performance: fishermen' knowledge and attitudes on fisheries policies in Bahía de Kino, Gulf of California, Mexico. *Marine Policy* 34(6), 1322-1334.
- Jentoft, S., van Son, T. and Bjørkan, M. (2007). Marine protected areas: a governance system analysis. *Human Ecology* 35(5), 611-622.
- Hernandez, A., and Kempton, W. (2003). Changes in fisheries management in Mexico: effects of increasing scientific input and public participation. *Ocean & Coastal Management* 46(6), 507-526.

Science→Regulators/regulations (row 6)

- Hernandez, Alvaro and Willett Kempton. (2003). Changes in fisheries management in Mexico: effects of increasing scientific input and public participation. *Ocean & Coastal Management* 46(6), 507-526.

Enforcement →Fishermen (row 7)

- Cinti, A., Shaw, W., Cudney-Bueno, R., & Rojo, M. (2010). The unintended consequences of formal fisheries policies: social disparities and resource overuse in a major fishing community in the Gulf of California, Mexico. *Marine policy*, *34*(2), 328-339.
- Ainsworth, C.H., Morzaria-Luna, H., Kaplan, I.C., Levin, P.S., Fulton, E.A., Cudney-Bueno, R., et al. (2012). Effective ecosystem-based management must encourage regulatory compliance: A Gulf of California case study. *Marine Policy*, *36*(6), pp.1275-1283.
- Cinti, A., Shaw, W. and Torre, J. (2010). Insights from the users to improve fisheries performance: fishermen' knowledge and attitudes on fisheries policies in Bahía de Kino, Gulf of California, Mexico. *Marine Policy* 34(6), 1322-1334.
- Basurto, X. and Mateja Nenadovic. (2012). A systematic approach to studying fisheries governance. *Global Policy* 3(2), 222-230.
- Hernandez, A. and Kempton, W. (2003). Changes in fisheries management in Mexico: effects of increasing scientific input and public participation. *Ocean & Coastal Management* 46(6), 507-526.
- Bennett, E., Neiland, A., Anang, E., Bannerman, P., Rahman, A.A., Huq, S., et al. (2001). Towards a better understanding of conflict management in tropical fisheries: evidence from Ghana, Bangladesh and the Caribbean. *Marine Policy*, *25*(5), pp.365-376.

Intra-fisher relationships

- Basurto, X. and Nenadovic, M. (2012). A systematic approach to studying fisheries governance. *Global Policy* 3(2), 222-230.
- Bennett, E., Neiland, A., Anang, E., Bannerman, P., Rahman, A.A., Huq, S., et al. (2001). Towards a better understanding of conflict management in tropical fisheries: evidence from Ghana, Bangladesh and the Caribbean. *Marine Policy*, *25*(5), pp.365-376.

Science→Fishermen (row 8)

- Cudney-Bueno, R., Bourillón, L., Sáenz-Arroyo, A., Torre-Cosío, J., Turk-Boyer, P., & Shaw, W. W. (2009). Governance and effects of marine reserves in the Gulf of California, Mexico. *Ocean & Coastal Management*, *52*(3-4), 207-218.
- Cudney-Bueno, R. and Basurto, X.. (2009). Lack of cross-scale linkages reduces robustness of community-based fisheries management. *PloS one* 4(7), e6253.

Fishermen→Science (row 8)

- Jentoft, S., van Son, T. and Bjørkan, M. (2007). Marine protected areas: a governance system analysis. *Human Ecology* 35(5), 611-622.

- Johnson, T. and van Densen, W. (2007). Benefits and organization of cooperative research for fisheries management. *ICES Journal of Marine Science: Journal du Conseil* 64(4), 834-840.

Supply Chain→Fishermen (row 14)

- Kaiser, Michel J. and Edwards-Jones, G. (2006). The role of ecolabeling in fisheries management and conservation. *Conservation Biology* 20(2), 392-398.
- Charlotte, T. (2009). 10 Fisheries Supply Chain Issues for Developing Countries. *From Hook to Plate: The State of Marine Fisheries*, 129.
- Bennett, E., Neiland, A., Anang, E., Bannerman, P., Rahman, A.A., Huq, S., et al. (2001). Towards a better understanding of conflict management in tropical fisheries: evidence from Ghana, Bangladesh and the Caribbean. *Marine Policy*, *25*(5), pp.365-376.

Fishermen→Other Resource Users (row 15)

- Bennett, E., Neiland, A., Anang, E., Bannerman, P., Rahman, A.A., Huq, S., et al. (2001). Towards a better understanding of conflict management in tropical fisheries: evidence from Ghana, Bangladesh and the Caribbean. *Marine Policy*, *25*(5), pp.365-376.

Political Economy and Institutional Analysis

Below are resources that you can use to assist with institutional analyses.

- Fritz, V., Levy, B., and Ort, R.. (2014). Problem-Driven Political Economy Analysis: The World Bank's Experience. Directions in Development. Washington, DC: World Bank.
- Imperial, M. T. (1999). Institutional analysis and ecosystem-based management: the institutional analysis and development framework. *Environmental management*, *24*(4), 449-465.
- Mcloughlin, C. (2014). Political Economy Analysis: Topic Guide (2nd Ed.) Birmingham, UK: GSDRC, University of Birmingham. Retrieved from: http://www.gsdrc.org/wp-content/uploads/2015/07/PEA.pdf
- Melim-McLeod, C. UNDP Institutional and Context Analysis Guidance Note. Retrieved from: http://www.undp.org/content/undp/en/home/librarypage/democratic-governance/oslo_governance_centre/Institutional_and_Context_Analysis_Guidance_Note.html
- Poole, A. (2011). How-to notes: Political economy assessments at sector and project levels. *Washington DC: The World B*ank. Retrieved from: http://www. gsdrc. org/docs/open/PE1.pdf
- Weible, C. M. (2007). An advocacy coalition framework approach to stakeholder analysis: Understanding the political context of California marine protected area policy. *Journal of public administration research and theory*, *17*(1), 95-117.
- UNDP-UNEP Poverty Environmental Initiative. (2009). Draft Institutional Analysis Report for PEI Botswana. Retrieved from: https://www.unpei.org/sites/default/files/e_library_documents/botswana-InstitutionalAnalysisReportPEI%20Botswana.pdf

APPENDIX II: GROUP DEFINITIONS

A. Resources

A.1 Fisheries Resources

Living marine resources harvested by fishermen. Depending on the scale of analysis, these may be defined either as broad types of targeted resources or as specific species or species complexes.
Examples: reef fish, groundfish, green urchin

A.2 Habitats and Ecosystems

The coastal and marine habitats and ecosystems that support healthy fisheries. Again, depending on the scale of analysis, these may be defined broadly or as specific habitat areas or types.
Examples: mangroves, coral reefs, high seas

A.3 Species of Concern

Species other than those harvested by fishermen that are threatened by fisheries activities, a concern for fisheries managers, or of particular ecological importance to fished species. This may include species that were once fished but can no longer be landed due to their poor biological condition.
Examples: vaquita, loggerhead sea turtles, forage fish, Atlantic salmon

B. Fishermen

B.1 Small-Scale Fishermen

Fishermen using relatively small vessels and gear, and sometimes fishing nearer to shore on shorter trips or with lower levels of technology and investment.
Examples: New England's small dayboat fishermen; Belizean finfish fishermen

B.2 Industrial Fishermen

Fishermen using relatively large vessels and gear. They often take longer fishing trips farther from shore and catch more fish on a single trip when compared to small-scale fishermen, fish with higher tech gear and greater levels of investment, and may be associated with commercial companies.
Examples: large Alaskan pollock trawlers, South African deep-sea hake trawlers

B.3 Subsistence Fishermen

Fishermen whose catch is primarily consumed by the fishermen themselves and their families. Generally, subsistence fishermen fish near to shore with relatively low tech fishing methods. Subsistence fishermen often depend on fish as an important source of food, and may sell small amounts of their catch as a source of income.
Examples: Alaskan subsistence fishermen, Filipino coastal subsistence fishermen

B.4 Indigenous Fishermen
Fishermen belonging to ethnic groups native to the region. It is helpful to note whether or not indigenous fishermen are subject to a different set of fishing regulations than other fishermen, depending on the existence of reserved indigenous fishing rights or treaties.
Examples: Australian aboriginal fishermen, Pacific Northwest tribal fishermen

B.5 Recreational Fishermen
Fishermen who catch fish for sport and personal use, rather than sale or subsistence.
Examples: Gulf of Mexico recreational red snapper fishermen, Cuban recreational billfishermen

B.6 IUU Fishermen
Fishermen violating laws and regulations, not reporting their fishing activities or catch to the appropriate authorities, or fishing outside of regulatory oversight by fishing without nationality or in unregulated areas.
Examples: Chilean loco fishermen outside TURF areas; foreign fishermen in Indonesia's EEZ

B.7 Fishing Organizations
Any organizations composed mostly of fishermen that participate in fisheries regulation and harvest and represent fishermen's interests, including sectors, cooperatives, associations, and other groups. These organizations may be the entities to which regulations apply—for example, territorial use rights may be granted to a cooperative rather than to individual fishermen—or they may participate in fishery management less directly.
Examples: New England groundfish sectors, Mexico's fishermen's cooperatives

C. Other Marine Resource Users
C.1 Other Resource Beneficiaries
Groups, individuals, or industries other than fishermen who interact with the fishery resource and marine ecosystems and benefit from the health and stability of these resources. Often, these groups will use the resource in a non-extractive manner, but some extractive uses - like certain types of aquaculture that are dependent on a healthy ecosystem - may also fall into this category. It is helpful to note which type of resource use is occurring.
Examples: scuba divers, tourist industry

C.2 Other Resource Impacters
Groups, individuals, or industries whose actions affect the fishery resource, but do not benefit directly from its health and stability. Often, these groups will be engaged in activities that can cause direct harm to fish or indirect harm to fish stocks through habitat loss or alteration. These activities may include both extractive uses of marine environments like mining and non-extractive uses like shipping, as well as onshore activities like agriculture that affect coastal environments.
Examples: oil drilling operations, shrimp aquaculture in mangroves

C.3 Illicit Marine Activities

Illegal uses of the marine ecosystem other than IUU fishing, which may have an impact on fishermen or management.
Examples: coyotes, drug smuggling, human trafficking

C.4 Environmental Threats
Environmental factors or changes that influence the health of fish populations. While these threats may be directly caused by humans, the causes are outside the analyzed system or indirect enough that they will likely not be a primary focus of fisheries reform.
Examples: climate change, excessive predation, ocean acidification

D. Legislators and Regulators

D.1 Political Leadership
The decision-makers with oversight of the system as a whole and the authority to develop policies about how resources are managed on a large scale. If working on a national scale, this will likely be the head of state.
Examples: Obama administration; presidents of the European Union institutions

D.2 Legislators
Those who make laws guiding how fisheries are managed, but are not responsible for developing or enforcing the regulations to implement these laws. This category may include international, national, and/or smaller-scale lawmaking bodies, depending on the scale and context of the observed system.
Examples: Myanmar Assembly of the Union; Massachusetts legislature; United Nations Conference on the Law of the Sea

D.3 International Regulators
Those who write rules and regulations regarding how fishing is conducted at an international level; for example, Regional Fishery Management Organizations and various United Nations agencies.
Examples: International Commission for the Conservation of Atlantic Tunas, Canada–USA Steering Committee, United Nations Food and Agriculture Organization

D.4 National Regulators
Those who write rules and regulations regarding how fishing is conducted at the national level. Generally, this will include government agencies.
Examples: National Oceanic and Atmospheric Administration, Cuba's Ministerio de la Industria Alimentaria

D.5 Regional/Local Regulators
Those who write rules and regulations regarding how fishing is conducted at the local or regional level, or for a specific fishery. May include government agencies, fishing organizations, or other groups involved in co-management. Third-party sustainability certifications may play a de facto regulatory role in certified fisheries by requiring that certain standards be met to ensure certification. In some cases, community groups or the general public may also serve local regulators through social expectations.

Examples (high governance): South Atlantic Fishery Management Council, TURF cooperatives, Belize Fisheries Department
Examples (low governance): community members or organizations

E. Legislation and Regulation

E.1 Laws and Policies

The large-scale principles and national, international, or regional statutes that guide how resources are managed and how regulations to implement these management practices are developed and enforced. Policies may be formal, written plans or the informal objectives of political leadership.
Examples: NMFS Ecosystem-Based Fishery Management Policy, EU Common Fisheries Policy, Myanmar Fisheries Law

E.2 Regulations

The rules and mechanisms that implement laws, policies, and societal expectations regarding resource management at international, national, or local scales. These may be formal rules or societal expectations. Define regulations at a broad level - you should note if there are fishery management plans, no-take zones, catch limits, permit requirements, or input controls, but do not need to comprehensively list the specific rules (gear restrictions, number of days at sea, etc.).
Examples (high governance): Fishery Management Plans, TACs, marine protected areas, limited entry permits, input controls
Examples (low governance): social pressure to fish in specific areas, taboos

F. Finance

F.1 Lenders and Investors

Groups, organizations, or individuals that provide loans or other forms of capital and investment to fishermen or other components of the fishery system and expect to receive a return on their investment. May include NGOs, international organizations, investors, banks, processors, or other components of the supply chain. It is helpful to note if lending practices are predatory or cause excessive burdens on fishermen.
Examples (high governance): California Fisheries Fund, government loan funds, bank loans
Examples (low governance): loan agreements with processors

F.2 Aid Providers

Groups, organizations, or individuals that provide grants or aid to fishermen or other components of the fishery system, including monitoring and research efforts. Often, this aid may need to be used for specific projects and may come with requirements for specific management methods, conservation practices, research, reporting and accountability, or other activities. However, grants and aid do not need to be paid back, and aid providers do not expect any direct financial returns.
Examples: USAID, federal disaster funding, philanthropic organizations

F.3 Financial Accountability
External parties who audit the operational and financial actions of fishermen and fishing organizations and enforce appropriate behavior to ensure compliance with regulations, protect against fraud, and increase confidence for granters and investors.
Examples: IRS, private auditors, government auditors, local law enforcement

G. Community
G.1 Education and Communication
Those who communicate regulations, community actions, and conservation efforts to fishermen and fishing organizations to promote compliance with regulations and encourage best practices, and who facilitate communication between fishermen, other stakeholders, and regulators. Successful education and communication may play a large role in resolving conflicts between fisher groups and between regulators and fishermen.
Examples: industry or community leaders, government officials, NGOs, media

G.2 Influential Change Agents
Influencers within the community who play a role in organizing community members, fostering conversations and participation in management, and guiding public opinion. Organizations that advocate for the interests of the fishing industry but that do not directly participate in fisheries harvest or regulation may be included here. For the most part, these will be groups, although some particularly important individuals may also be included; influential individuals can be more comprehensively identified at the site level.
Examples: fishing industry leaders, journalists, religious leaders, local politicians, unions

G.3 Community Development
Groups, agencies, institutions, or individuals who support the development of collective community action to reach common goals and services that benefit the community as a whole. Limit this category to groups that have some connection to fishing or fisher communities, or that could potentially help address a gap in capacity (for example, groups that could help build financial literacy among fishermen).
Examples: community development corporations, NGOs

G.4 Conservation
Groups, agencies, institutions, or individuals who encourage conservation and sustainability in the use of fisheries resources by communication with fishermen, fisher organizations, regulators, political leaders, and/or components of the supply chain. Note if there are large differences in philosophy or approach between different conservation organizations.
Examples: EDF, sustainability certifications, international/local NGOs, community members

G.5 Support Service Providers
Groups, individuals, or industries providing services to fishermen. These providers receive financial benefit from the fishing industry, but not directly from the sale of fish (in other words, they are not part of the seafood supply chain).
Examples: ice companies, bait shops, gear manufacturers, mechanics, port managers

H. Supply Chain

H.1 Seafood Inspection and Quality Control

Organizations or agencies who inspect the quality of seafood. Inspections may be conducted to ensure food safety, protect against seafood fraud, comply with regulations, and provide access to export markets.
Examples: US FDA, Canadian Food Inspection Agency

H.2 Marketing

Organizations, certifications, or individuals who market seafood to domestic or international buyers and consumers, emphasizing its quality, sustainability, or other characteristics to increase the price received by one or more components of the supply chain.
Examples: state or regional seafood marketing associations, Marine Stewardship Council, Fair Trade, Gulf Wild, Maine Lobster Marketing Collaborative

H.3 Primary Buyers, Processors, and Exporters

Those who initially purchase seafood from fishermen, process seafood into value-added products, and/or export seafood to foreign markets. Generally, though not always, this will take place in the country where the fish is landed. If possible, note if prices offered to fishermen are competitive or fixed, and if fishermen have exclusive relationships with any buyers or companies.
Examples: individually owned trucks that sell to processors, local processing plants, StarKist in American Samoa

H.4 Importers, Wholesalers, and Distributors

Those who import, sell, and/or distribute bulk quantities of seafood to retailers and vendors. Secondary processing may be conducted by some entities in this category.
Examples: US Foods, Trident, Fulton Fish Market

H.5 Retailers and Vendors

This category includes grocery stores, restaurants, and institutional dining. Those in this group sell directly to consumers, but some may be vertically integrated and operate their own processing and distribution networks.
Examples: Whole Foods, Kroger, Red Lobster

H.6 Consumers

The end consumers of seafood products, whether local, domestic, or international.
Examples: tourists, local coastal residents, EU consumers, used as bait

I. Monitoring and Enforcement

I.1 Catch Monitoring

Those who measure and monitor fisheries catch on an ongoing basis. Monitoring may be conducted by the fishermen themselves or an external group like at-sea or dockside monitors. Is possible, note whether monitoring includes the collection of biological information like the sex,

length, and age of the catch and whether it accounts for discards.
Examples (high governance): North Pacific Observer Program; electronic monitoring
Examples (low governance): self-reported catch measurements by fishermen, market/auction records

I.2 Enforcement
Those responsible for ensuring that fishermen cooperate with international, national, and regional laws and regulations. In some cases, this category may include government enforcement agencies like a Coast Guard; in the absence of formal enforcement capacity, it may include informal mechanisms like community or individual actions.
Examples (high governance): NOAA Office of Law Enforcement, Philippines Fishery Law Enforcement Officers
Examples (low governance): social disapproval, community group sanctions

J. Science
J.1 Stock Assessments
Groups, agencies, institutions, or individuals who carry out stock assessments to determine the status of fisheries resources and guide regulatory actions. Stock assessments may have varying levels of formality, scientific guidance, and peer review.
Examples (high governance): European Commission Scientific, Technical and Economic Committee for Fisheries, NOAA Fisheries Science Centers, consultants
Examples (low governance): FIHSE assessments conducted by fishery managers or fishermen, local ecological knowledge

J.2 Social Science
Groups, agencies, institutions, or individuals who carry out social science research related to fisheries and fishing communities, including economics, sociology, and political science.
Examples (high governance): NEFSC Social Sciences Branch, academic institutions/universities
Examples (low governance): fisher organizations, community groups

J.3 Fisheries Data Collection
Groups, agencies, institutions, or individuals who gather data about the status of fisheries resources. This may include both fisheries-dependent (catch, CPUE) and fisheries-independent (survey) data.
Examples (high governance): National Marine Fisheries Service, academic institutions/universities
Examples (low governance): fisher organizations

J.4 Ecosystem Research
Groups, agencies, institutions, or individuals who carry out research on the functions and status of marine habitats and ecosystems to help understand the status of fisheries resources and guide regulatory actions. This research may help identify important habitat areas, understand marine food webs, define fish life cycles, etc.

Examples (high governance): NOAA Fisheries Science Centers, universities and other research institutions
Examples (low governance): fishermen, local ecological knowledge, universities and other research institutions

J.5 Fishing R&D
Groups, agencies, institutions, or individuals who fund and/or carry out research on new fishing gears or technologies and support innovation in fishing practices.
Examples: Australia's Fisheries Research and Development Corporation, fishermen and fisher organizations, universities and other research institutions, NFWF Fisheries Innovation Fund

K. Judicial Process

K.1 Judiciary
Judicial processes, mechanisms, or procedures encompass the enforcement of regulations and laws, the prosecution of violators and the systems available for users and stakeholders to take legal recourse to ensure authorities are fulfilling their responsibilities. *Examples: US Supreme Court, European Court of Justice, civil and criminal courts*