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Biodiversity Case Example

INTEGRATING FOOD SECURITY AND WILD FISHERIES CONSERVATION IN USAID PROGRAMMING

ILLUSTRATIVE SITUATION MODEL AND RESULTS CHAIN

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DISCLAIMER

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Front Cover: Women fishing in the Terai region of Nepal. The USAID Paani program will enhance Nepal's ability to manage water resources for multiple uses and users through climate change adaptation and the conservation of freshwater biodiversity. Photo credit: Olaf Zerbock for USAID.
Back Cover: Fried fish, sorted according to size and quality, are for sale in a market in Davao City, Philippines. Photo credit: Mark Walter, Nathan Associates Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF BOXES

ACRONYMS & ABBREVIATIONS

BFS	Bureau for Food Security
E3	Bureau for Economic Growth, Education, and Environment
EAFM	Ecosystems Approach to Fisheries Management
ECOFISH	Ecosystems Improved for Sustainable Fisheries
FAB	Office of Forestry and Biodiversity
FAO	Food and Agriculture Organization of the United Nations
IR	Intermediate Result
U.S.	United States
USAID	United States Agency for International Development

I. INTRODUCTION

Working together across development sectors can lead to faster, more effective change. To enhance effectiveness, the United States Agency for International Development (USAID) increasingly promotes intentional integration of different development sectors, activities, and funding streams within Agency programming, including biodiversity conservation and food security. One goal of the USAID Biodiversity Policy (2014) is to "integrate biodiversity as an essential component of human development." The Biodiversity Policy specifically identifies opportunities for integration with key sectors, including food security, climate adaptation, health, democracy and governance, and economic growth.

The United States (U.S.) Government Global Food Security Strategy (2017–2021) promotes a comprehensive, multi-sectoral approach to global food security, resilience, and nutrition – with special attention to small-scale producers, including farmers, fishers, pastoralists, and foresters. The Global Food Security Strategy "aims to break silos, integrating programming across sectors and agencies for maximum impact and effective stewardship of [U.S.] taxpayer dollars," and recognizes that "improved climate risk, land, marine, and other natural resource management" is cross-cutting and foundational to all areas of food security. A strategic objective of USAID's Multi-Sectoral Nutrition Strategy (2014–2025) is "increased multi-sectoral programming and coordination for improved nutrition outcomes." The Multi-Sectoral Nutrition Strategy calls on USAID to promote both nutrition-specific and nutrition-sensitive[1] strategic approaches[2] across multiple sectors.

Integrating food security and wild fisheries management is imperative to achieving USAID's development objectives. Fishing is the largest extractive use of animal biodiversity in the world, providing food, nutrition, livelihoods, and national revenues to many developing countries.[3] However, more than 10% of the world's human population is at risk of malnutrition as fish populations decline due to inadequate attention and management.[4] Supporting countries to improve the governance and sustainable management of their wild fisheries will support their path to self-reliance and resilience.[5]

The purpose of this illustrative case example is to demonstrate how two tools – situation models and results chains – can help USAID design teams incorporate adaptive management approaches into activities that effectively integrate food security, nutrition, and sustainable management of wild or capture fisheries.[6] The technical content and design processes described in this example come from literature on fisheries management and on-the-ground experiences and lessons learned by USAID's Bureau for Economic Growth, Education, and Environment/Office of Forestry and Biodiversity (E3/FAB) and Measuring Impact[7] in providing direct technical assistance to USAID missions in activity design. Although this content is grounded in real-world experiences, the example has been generalized for teaching purposes. In actuality, the design process would be linked to a mission's country strategy and project and would represent a more complete range of key drivers, focal interests, ecosystem services,[8] and intended outcomes within the context and scope of the activity.

[1] Interventions that address underlying conditions of undernutrition, related behaviors, and the broader enabling environment are defined as nutrition-sensitive; whereas interventions that address immediate conditions for optimal nutrition (e.g., adequate dietary intake and low disease burden) and related behaviors are defined as nutrition-specific.
[2] A strategic approach is a set of actions with a common focus that work together to achieve a series of results in a results chain.
[3] WorldFish Center. 2002. Fish: an issue for everyone – a concept paper for Fish for All. Penang, Malaysia.
[4] Golden, C.D. et al., "Nutrition: Fall in Fish Catch Threatens Human Health," Nature 534, no. 7607 (2016): 317-320. doi:10.1038/534317a.
[5] USAID's mission is to lead the U.S. Government's international development and disaster assistance through partnerships and investments that save lives, reduce poverty, strengthen democratic governance and help people emerge from humanitarian crises and progress beyond assistance.
[6] Wild fisheries, sometimes called capture fisheries, refers to all kinds of harvesting of naturally occurring living resources in both marine and freshwater environments. In contrast, aquaculture is the farming of aquatic organisms, including interventions in the rearing process to enhance production.
[7] Measuring Impact is a six-year (2013–2018) mechanism managed by USAID E3/FAB to provide support to develop and apply best practices in program design, monitoring, evaluation, and learning to missions that implement the USAID Program Cycle with biodiversity funds.
[8] An ecosystem service is a service that functioning ecosystems, species, and habitats provide and that can benefit people (e.g., water filtration, wild food for consumption, or recreational opportunities).

A fisher dries his catch in the sun in the Philippines. Improving the management of fishing practices and conserving critical fish habitats can enhance the natural productivity of the fish resources, leading to improved benefits for people and nature. Photo credit: Joel Policarpio for USAID/Philippines.

USAID's Biodiversity Code requires that design teams programming biodiversity funds use a theory of change to clarify how they expect the proposed strategic approach(es) to generate positive, systemic change in the problem(s) identified, based upon evidence and experience. A results chain is a type of logic model that graphically depicts a program's theory of change. According to the USAID Program Cycle Operational Policy, a logic model is required for all projects and highly recommended for activities.[9] The situation model and results chain tools used in this illustrative case example are described in detail in three USAID Biodiversity How-To Guides: 1) Developing Situation Models in USAID Biodiversity Programming; 2) Using Results Chains to Depict Theories of Change in USAID Biodiversity Programming; and 3) Defining Outcomes and Indicators in Monitoring, Evaluation, and Learning in USAID Biodiversity Programming.

[9] See USAID Program Cycle How-To Note: Developing a Project Logic Model (and its Associated Theory of Change). Results chains are the logic models of choice to depict theories of change in biodiversity conservation programming.

II. BACKGROUND

The contribution of biodiversity to food security and improved nutrition is well established.[10] Healthy and functioning natural systems play an important role in food production through goods and services such as wild fish production, pollination, water storage, drought and flood mitigation, pest control, and climate regulation.[11] Biodiversity also supports improved nutrition by providing micronutrients and enhancing dietary diversity.[12] Wild fisheries contribute to food security directly, as fish are an important source of animal protein and nutrients to more than 2.6 billion people in developing countries.[13] Fisheries and aquaculture also contribute to food security indirectly by assuring livelihoods for 10 to 12% of the world's population, with more than 90% of those employed in the wild fisheries sector working in small-scale operations in developing countries.[14] Fish are the world's most widely traded food products; the net export value of fish from developing countries is greater than that of rice, sugar, and coffee combined.[15] Women serve as an important link in the fisheries value chain – a 2010 study of wild fisheries in nine fish producing countries found that 46% of those engaged in pre- and post-harvesting activities were women,[16] and nine out of ten people engaged in secondary activities such as fish processing are women.[17]

Despite their global significance, wild fisheries are at risk of decline, decreased productivity, and collapse due to inadequate management and policies.[18] This degradation of wild fisheries – and the ecosystems that support them – can impact food security and sustainable development outcomes, imperiling a country's journey to self-reliance. The proportion of dietary protein that comes from fish is extremely high in many countries, such as Ghana (63%), Sierra Leone (63%), Senegal (47%), Bangladesh (56%), and Indonesia (54%).[19,20] The World Bank estimates that poor management of global marine fisheries represents an annual loss of $83 billion globally – with the greatest need for reform in Africa and Asia where fish stocks are most severely overexploited.[21] However, as the examples in Box 1 demonstrate, with better management and fishing practices, fisheries declines can be reversed and fish populations increased substantially, yielding greater catches and profitability.

An important tool for improving degraded fish stocks is an ecosystem-based approach to fisheries management.[22] While the traditional management approach for fisheries is to focus on one species in isolation, ecosystem-based fisheries management considers the health and productivity of broader ecosystem elements. This modern approach restores and enhances fish productivity through practices such as conserving critical fish habitat necessary for growing fish populations, using appropriate fishing gear, and protecting small juveniles and large reproductive individuals. Importantly, an ecosystem-based approach to fisheries management can enhance food security and encourage a self-sustaining solution to hunger and poverty.

[10] USAID. 2016. Fishing for Food Security: The Importance of Wild Fisheries for Food Security and Nutrition.
[11] Powell, B et al. 2015. "Improving diets with wild and cultivated biodiversity from across the landscape." Food Security 7 (3): 535-554.
[12] Ibid.
[13] USAID. 2016. Fishing for Food Security: The Importance of Wild Fisheries for Food Security and Nutrition.
[14] The Food and Agriculture Organization of the United Nations (FAO). 2014. The State of World Fisheries and Aquaculture: Contributing to Food Security and Nutrition for All. Rome.
[15] FAO. 2016. The State of World Fisheries and Aquaculture: Contributing to Food Security and Nutrition for All. Rome.
[16] WorldFish Center. 2010. Gender and fisheries: Do women support, complement or subsidize men's small-scale fishing activities? Panang, Malaysia.
[17] FAO. 2014. The State of World Fisheries and Aquaculture: Contributing to Food Security and Nutrition for All. Rome.
[18] USAID. 2016. Fishing for Food Security: The Importance of Wild Fisheries for Food Security and Nutrition.
[19] Thilsted, S.H. et al., "Sustaining healthy diets: The role of capture fisheries and aquaculture for improving nutrition in the post-2015 era." Food Policy 61 (2016): 126-131. doi:10.1016/j.foodpol.2016.02.005
[20] USAID. 2016. Fishing for Food Security: The Importance of Wild Fisheries for Food Security and Nutrition.
[21] World Bank. 2017. The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries. Washington, D.C.
[22] USAID. 2017. Mainstreaming Ecosystems Approach to Fisheries Management (EAFM) Program: EAFM Planning and Implementation Process. ECOFISH.

Fish is a primary source of essential nutrients for pregnant mothers and children such as DHA, an omega-3 fatty acid that is critical for early brain development. Photo credit: FAO.

Box 1: Ecosystem-Based Approach to Fisheries Management

USAID missions have increasingly identified opportunities to integrate biodiversity conservation and food security in programming, including applying an ecosystem-based approach to fisheries management. For example, the Management of Aquatic Ecosystems through Community Husbandry (MACH) program supported a community-led approach to revive fisheries in three degraded wetlands in Bangladesh. Between 1999 and 2007, fish catches in MACH villages rose by 140% (a reflection of healthier fish stocks), consumption of fish per person a day went up from 32 to 48 grams, and average daily household incomes increased 33%.[23] Similarly, the Ecosystems Improved for Sustainable Fisheries (ECOFISH) activity focused on improving fisheries management and strengthening local fisheries governance in the Philippines. From 2012 to 2017, ECOFISH helped improve the management of more than 1.8 million hectares (7,000 square miles) of municipal marine waters in the project sites, achieving a 24% increase in fish biomass and 12% increase in employment or better employment, while ensuring that benefits from fishing were equitably shared by the resource users.[24] In both examples, implementing good, participatory governance for fisheries management in combination with ecosystem-based approaches led to positive outcomes in both food security and biodiversity conservation.

[23] World Resources Institute, United Nations Development Programme, United Nations Environment Programme, and World Bank. 2008. Roots of Resilience – Growing the Wealth of the Poor. Washington, D.C.
[24] USAID. 2017. ECOFISH Project Synopsis.

III. ILLUSTRATIVE SITUATION MODEL TO DEPICT THE PROBLEM ANALYSIS

In this USAID case example, the design team conducts a context or problem analysis using the situation model tool as a first step in planning the integrated food security and biodiversity conservation activity. A situation model is a diagram that represents relationships between key factors identified through the context or problem analysis that are expected to impact specific focal interests, in this case biodiversity and food security focal interests. A good situation model should link these focal interests to their direct threats,[25] the drivers behind these threats,[26] and the related stakeholders. A good situation model is also grounded in what is known about the system from experience and scientific evidence.[27] The team will use the situation model to first understand the dynamics of the problem, and then identify key intervention points where their activity can have the most strategic and effective influence. This section provides a narrative description of the design team's situation model (See Figure 1 on page 10) and key lessons based on their understanding of the status of wild fish populations and the reasons for those declines.

Description

The overall activity purpose of the case example is to provide food security, nutrition, and livelihoods to coastal and inland communities through the conservation, sustainable use, and management of critical marine and coastal resources. As part of their context or problem analysis, the design team is interested in the relationship between the health of coastal biodiversity focal interests and food security focal interests (lime green and brown ovals in Figure 1 on page 10, respectively). The team focuses the geographic scope of the activity on the country's *coastal regions*,[28] although this approach could also be applied to freshwater fisheries. Within this scope, the biodiversity focal interests are (1) *wild fisheries* and (2) *critical fish habitat*. If critical fish habitats (e.g., coral reefs, mangrove forests, and estuaries) are healthy, then they can support resilient and productive fish populations, as well as protect human communities from extreme weather events, storm surges, and other natural disasters. Likewise, intact wild fisheries also enhance the resilience and natural productivity of fish populations. Together, these ecosystem services contribute to seven of the nine intermediate results (IRs) within the U.S. Government Global Food Security Strategy (IRs 1–7). The direct threats[29] and drivers (pink and orange boxes in Figure 1 on page 10, respectively) reflect the most important conservation challenges facing coastal ecosystems in this example, as well as the food security challenges for coastal and inland human populations.

In order to achieve the activity purpose, it is assumed that the activity must ultimately contribute to a reduction in the direct threats: (1) *unsustainable and destructive fishing by small-scale producers/fishers* and (2) *unsustainable and destructive fishing by large-scale industrial fishers*. If these threats can be reduced, it is expected that the increased viability of the marine biodiversity will contribute to improved benefits or ecosystem services. These benefits, in turn, will also result in better coastal food security interests for both coastal and inland communities in the geographic zone of interest.

The direct threats are driven by: (1) *insufficient incentives for sustainable fishing practices* and (2) *inadequate use of ecosystem-based practices that can grow fisheries and enhance resilience. Ineffective management of fisheries* (See Box 2), especially *open, unmanaged access to fishing grounds and lack of zoning*, drives these insufficient incentives and inadequate use of ecosystem-based practices. Similar to secure land tenure for farmers, secure tenure for fishers is a major incentive and driver of good environmental stewardship.[30] In addition, the lack of *secure fishing zones for exclusive use by small-scale fishers* contributes to the *insufficient incentives for sustainable fishing practices* by small-scale producers. Without exclusive-use fishing zones, *small-scale fishers cannot compete with large-scale fishers and processors for resources and market share*, which results in further food insecurity and non-inclusive development.

[25] A direct threat is a human action or unsustainable use that immediately degrades one or more biodiversity focal interests.
[26] A driver is a constraint, opportunity, or other important variable that positively or negatively influences direct threats.
[27] Best practice for using the best available evidence when developing a problem analysis is outlined in USAID. 2018. Evidence in Action: Using and Generating Evidence About Effectiveness in Biodiversity Programming.
[28] Italics are used to denote text that appears verbatim in Figure 1 or Figure 2.
[29] For more information on defining, ranking, and prioritizing threats please refer to Supplemental Guide 2: Rating Direct Threats in USAID Biodiversity Programming.
[30] USAID. 2018. Marine Tenure and Small-Scale Fisheries – A Priority for Development Programming.

Box 2: Ineffective Management of Fisheries

In this example, ineffective management of fisheries includes:

- *Management practices that reduce the natural productivity and resiliency of fish populations* (i.e., a focus on single species management rather than ecosystem-based management)
- *Weak enforcement of fishing regulations*
- *Open, unmanaged access to fishing grounds and lack of zoning*
- *Weak fishing and processing associations characterized by limited participation in decision-making processes* (i.e., a lack of co-management whereby fishers and government managers collaborate to develop and implement management plans)
- *Inadequate capacity, financing, and extension services for sustainable fish market systems*
- *Limited attention to small-scale fishers, processors, and women*

Ineffective management of fisheries is driven by *inadequate financial resources* (i.e., *insufficient capital investments [public and private]* and *insufficient government budget allocations*) and weak governance. Weak governance in this context includes: inadequate representation of small-scale fishers/producers leading to *non-inclusive development, inappropriate subsidies that distort market systems* (e.g., fuel subsidies), *inadequate institutional arrangements for ecosystem-based fishing* and participatory decision-making, and insecure tenure and open access to fishing grounds and fish resources.

These governance and financial systems are weakened by inadequate policies for nutrition-sensitive fishing and trade, sustainable fishing and processing, and securing tenure. *Increasing demand for seafood and feed*, coupled with *low demand by public, stakeholders, and businesses for sustainable and equitable management of fisheries* are key drivers of such inadequate policies. Low demand for sustainable management is a result of ecosystem services being undervalued by public and political systems. However, a potential opportunity for addressing the low demand for ecosystem-based and equitable fisheries management lies in leveraging the burgeoning international demand for legally and sustainably harvested fish that can act to pull the system towards sustainability and inclusion. Such opportunities include U.S. and European Union import requirements for legally harvested fish, and the growing demand by seafood companies for sustainably-sourced products and by consumers for certified sustainable and/or Fair Trade products.

After the design team conducts their problem analysis, they use their completed situation model to identify possible strategic approaches that could influence key intervention points. Based on the potential for impact and feasibility of implementation, the team prioritizes five strategic approaches[31] (yellow hexagons in Figure 1 on page 10) to include in their activity:

- *Increase domestic demand for sustainably managed and profitable fisheries*
- *Strengthen policy and governance framework for sustainable, inclusive, and nutrition-sensitive fishing*
- *Promote secure tenure for fishing grounds*
- *Build capacity for participatory, ecosystem-based fisheries management*
- *Strengthen inclusive and sustainable market systems*

[31] For more information on prioritizing strategic approaches see Supplemental Guide 3: Prioritizing and Selecting Strategic Approaches in USAID Biodiversity Programming.

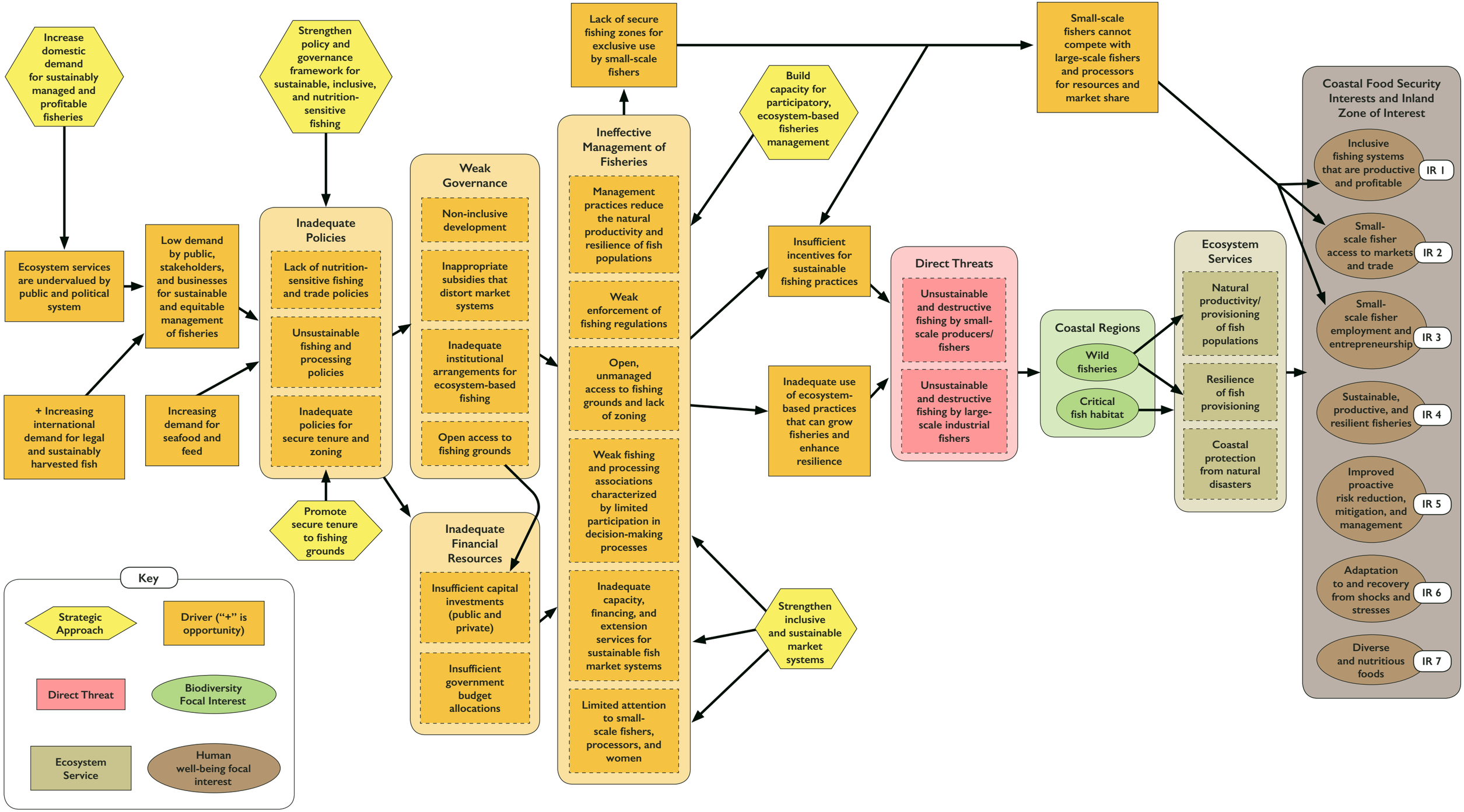

Figure 1. Illustrative integrated biodiversity and fisheries situation model with strategic approaches

A fisherman mends his nets in Ghana's Cape Coast. Photo credit: Brian Conklin for USAID.

Key Lessons

The following lessons for future integrated programming are derived from previous experience managing fisheries in a variety of contexts, consulted literature, and the process of developing a situation model:

- **Open access to common fish resources is a key driver of resource degradation and unsustainable fishing:** Lack of secure access and tenure rights (by communities and/or individuals) to resources is identified as a clear hindrance to sustainable and productive fisheries, enhanced stewardship, and public and private capital investments. Secure tenure in fisheries management can take a variety of forms – from tenure or access rights to fish resources or fishing grounds for fishing communities, fishing associations, or government units, to individual access or use rights.[32] Operationalization and promotion of secure tenure can also take several forms, from collaborative mapping of resources and building upon existing customary user rights, to developing community-level, written tenure agreements or statutory agreements for registration and licensing, coupled with local or national policing.
- **Opportunities for market-based approaches exist and can be used to promote more efficient and sustainable fishing and processing practices:** Market demand for legal and sustainably harvested fish is identified as an opportunity driver in the situation model, and potential entry point for conservation. Market-based approaches, specifically when linked to international or regional demands for sustainable and legal fish, can be used to promote more efficient and sustainable fishing and processing practices thus providing more benefits to fishing communities and incentives for better management. However, care must be taken as increased links to markets that do not demand sustainable and legally sourced fish can drive over-exploitation.[34]
- **Taking a systems approach can help teams identify causal relationships and critical intervention/leverage points:** Using the situation model tool helps teams to understand and articulate the causal relationship between nature (ecosystem health), wealth (economic benefits), and power (inclusive governance arrangements), and illustrate the role and importance of a systems approach to improved biodiversity and food security goals.

[32] USAID. 2017. Looking to the sea to support development objectives: A primer for USAID staff and partners. Tenure and Global Climate Change Program.
[33] Ibid.
[34] Peterson, H.C. and K. Fronc. 2007. "Fishing for consumers: Market-driven factors affecting the sustainability of the fish and seafood supply chain." In Globalization: Effects on Fisheries Resources (pp. 424-452). Cambridge University Press.

IV. ILLUSTRATIVE RESULTS CHAINS TO DEPICT THE THEORY OF CHANGE

In this case example, the design team uses results chains to graphically depict their theory of change for each strategic approach. To do this, the team first converts the drivers and threats they intend to influence through a single strategic approach into a series of initial expected results, which proposes a solution pathway to the problem (i.e., a preliminary theory of change). The team then uses the best available evidence[35] to discuss and clarify the cause-and-effect logic of this solution pathway and then includes additional expected results and assumed relationships. The product of this process[36] is a results chain, which illustrates the causal relationships between a strategic approach and the desired outcomes for biodiversity conservation and human development. This section provides a narrative description and key lessons of one of the team's results chains (See Figure 2 on page 14).[37]

Description

One of the first results (blue boxes in Figure 2 on page 14) in the team's results chain for the strategic approach *build capacity for participatory ecosystem-based fisheries management* is that *key opinion leaders, champions, and entrepreneurs are identified and lead stakeholders to develop a shared vision* for fisheries in the country. This involves understanding what stakeholders value and their goal for the fishing sector (e.g., revenue generation from the export of fish or securing the livelihoods of small-scale fishers). Similarly, there needs to be increased recognition of the economic benefits, such as market access or reliable buyers, that can be derived from more sustainably managed fisheries, thus driving stakeholder demand for better fisheries capacity and management. For example, both the European Union and the U.S. require seafood imports to be certified as legally sourced, and third-party certification systems exist for sustainably harvested fish.

The complementary strategic approach (See Box 3 below) *strengthen policy and governance framework for sustainable, inclusive, and nutrition-sensitive fishing* is aimed at strengthening the role of civil society as agents of change – especially through increased participation and social cohesion – to allow for more impactful capacity building efforts around fisheries management. In addition to establishing a strong constituency for sustainable fisheries management, this complementary strategic approach will further enable capacity building efforts.

Box 3: Depicting Complementary Strategic Approaches

In practice, a design team would develop separate results chains for all strategic approaches they prioritize. The results chain in this example focuses on the strategic approach *build capacity for participatory ecosystem-based fisheries management.* Three other complementary strategic approaches of *increase domestic demand for sustainably managed and profitable fisheries; strengthen policy and governance framework for sustainable, inclusive, and nutrition-sensitive fishing*; and *promote secure tenure to fishing grounds* and their relationship to the focal strategic approach are also depicted.[38] These three complementary strategic approaches work in combination with the focal strategic approach to address the drivers of ineffective management of fisheries. The fifth strategic approach, *strengthen inclusive and sustainable market systems*, is not included because it does not relate as strongly to the results chain on page 14.

[35] Best practice for using the best available evidence when developing a theory of change is outlined in USAID. 2018. Evidence in Action: Using and Generating Evidence About Effectiveness in Biodiversity Programming.
[36] For more information on how to use a situation model to draft an initial results chain, please see Steps 6-8 in How-To Guide 2: Using Results Chains to Depict Theories of Change in USAID Biodiversity Programming.
[37] In practice, all five strategic approaches prioritized and included in the situation model on page 10 would have results chains developed for them. For brevity and simplicity for teaching purposes, this case example highlights the results chain of just one of the strategic approaches.
[38] The complementary approach boxes on page 14 are only represented by yellow hexagons, not their entire results chains, which in this case are left off of the diagram for simplicity. When illustrating complementary strategic approaches, the green font label distinguishes them from the strategic approach that is the focus of the full results chain.

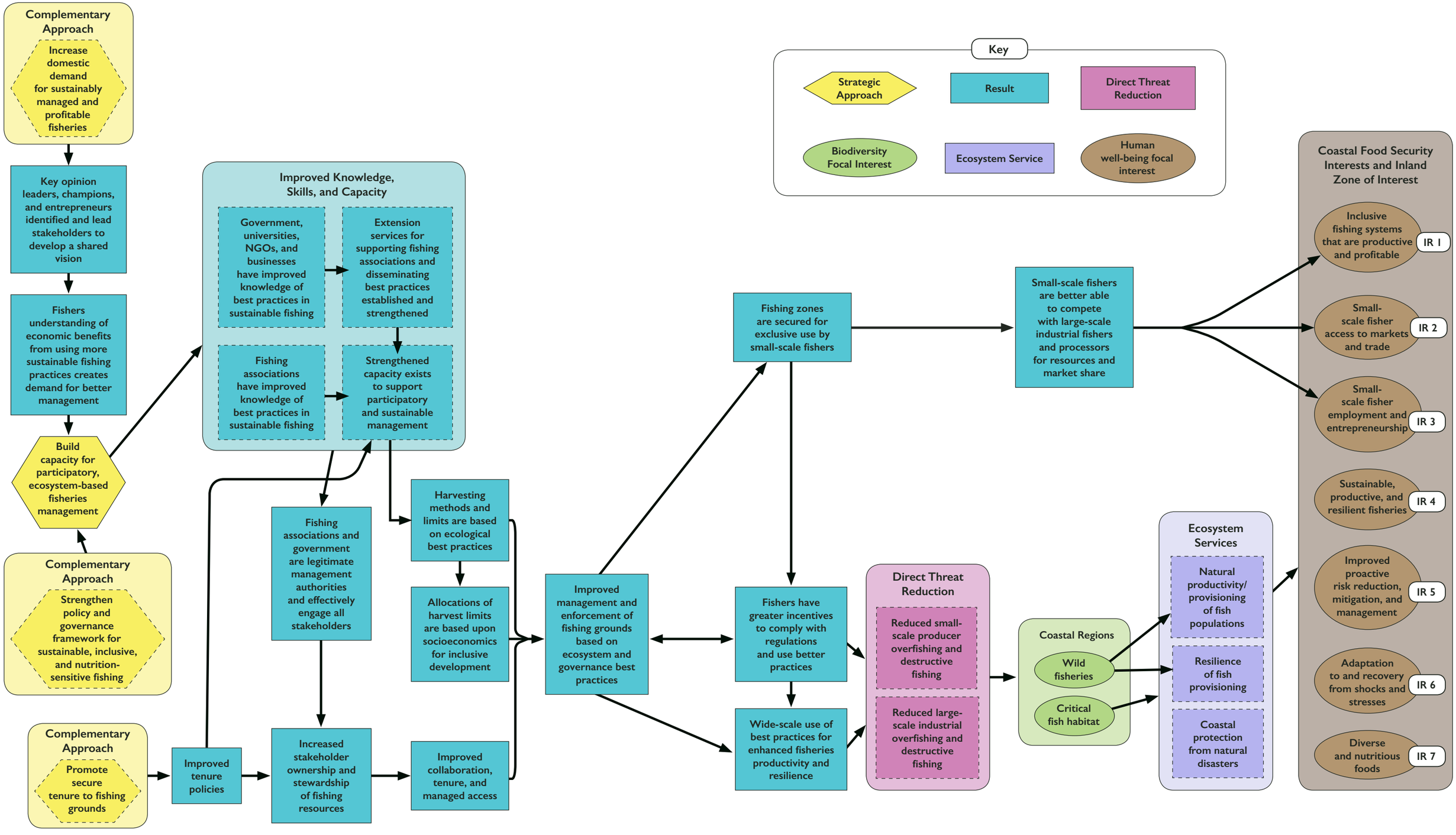

Figure 2. Illustrative integrated biodiversity and fisheries results chain

The first set of expected outcomes stemming from building capacity for participatory, ecosystem-based fisheries management is *improved knowledge, skills, and capacity.* Improved knowledge of best practices in sustainable fishing among all levels of government, universities, other non-governmental organizations, and fishers should allow for the establishment and strengthening of extension services for supporting fishing associations and disseminating best practices. This in turn, will result in strengthened overall capacity for both participatory and sustainable management.

Secure tenure is a necessary component of strengthening the ability of government and fishing associations to manage fisheries sustainably but will not result from this individual strategic approach. Here, the design team identifies a complementary strategic approach that will be foundational to further support government and fishing association capacity through better tenure policies.

If fishing associations and governments have improved *knowledge, skills, and capacity* for sustainable fishing and understand the roles and responsibilities under participatory management, then they will serve as legitimate management authorities and thus be able to effectively engage all stakeholders (including women, processors, and small-scale fishers). This, along with *improved tenure policies*, should result in *increased stakeholder ownership and stewardship of fishing resources*, which then leads to *improved collaboration, tenure, and managed access* to fishing grounds. When fishers realize the economic benefits from sustainable fishing practices and have the capacity and authority for participatory co-management, then fishers and managers are more likely to establish harvest control rules, methods, and limits that are based on ecological best practices. This is a critical first step to allocating harvest limits for more inclusive distribution to small-scale fishers. *Improved stakeholder collaboration, tenure, and managed access*, in tandem with harvest methods and limits that are based on ecological best practices and are allocated for inclusive development, should result in more effective management and enforcement in designated fishing grounds.

If, as a result of better management and enforcement of fishing grounds, *fishing zones are secured for exclusive use by small-scale fishers*, then this should enable small-scale fishers to compete with large-scale, industrial fishers and processors for resources and market share. As a direct co-benefit[39] to communities, alongside benefits to biodiversity, this greater ability of small-scale fishers to compete for resources and market share is expected to directly contribute to three of the seven food security interests: *inclusive fishing systems that are productive and profitable, small-scale fisher access to markets and trade,* and *small-scale fisher employment and entrepreneurship.*

Improved management and enforcement of fishing grounds, including restricting access to legitimate uses, also provides fishers with greater incentives to comply with regulations and use better practices, thus increasing stewardship, which contributes to the *wide-scale use of best practices for enhanced fisheries productivity and resilience*. Increased fisher compliance with ecosystem-based regulations and best practices should reduce the prevalence of large- and small-scale overfishing and destructive fishing practices (pink direct threat reduction box in Figure 2 on page 14), ultimately resulting in positive impacts to fish populations, biodiversity, and food security interests. Additionally, all seven of the listed coastal food security interests (IRs 1-7), will benefit from the ecosystem services derived from healthier fisheries and fish habitats (purple ecosystem services box in Figure 2 on page 14).

[39] Co-benefits is a term used in the USAID Biodiversity Policy to describe the results of actions that are designed to achieve biodiversity conservation ends but undeniably produce clear social benefits as well (e.g., actions that build capacity for stronger governance structures can benefit both natural resource management and community cohesion and function).

Key Lessons

The following lessons for promoting an ecosystem-based approach to fisheries management are derived from the team's experiences with similar efforts, consulted literature, and the process of developing the example results chain:

- **Collaborative management and stronger fishing associations can promote participatory and transparent decision-making over common resources.** Collaborative management, in which fishers and government participate in the development of management plans and share management responsibility, can increase resource stewardship, improve compliance and enforcement, and promote good governance and stability – all necessary requirements for sustainable fishing.
- **Sequencing actions actions and expected results is important for achieving desired outcomes.** Articulating a theory of change for an ecosystem-based approach to fisheries management illuminates the critical importance of appropriate sequencing or alignment of actions and expected results (e.g., appropriate policies that enable marine tenure and access, establishing ecologically-based harvest control rules and levels before investing in market measures that could drive over-exploitation, and generating the political will to effectively enable capacity building and market measures).
- **An integrated theory of change can help explore and articulate the links between biodiversity conservation and human well-being focal interests, such as food security.** This begins with identifying those ecosystem services provided by healthy biodiversity (e.g., food security and nutrition, resilient livelihoods, coastal protection, and resilience to impacts of climate change). Design teams can then use the results chain to help identify additional development outcomes or co-benefits that may arise through conservation actions, such as greater community cohesion or increased rule of law.
- **In selecting strategic approaches, teams should consider opportunities that address threats to both biodiversity and food security interests.** Although only one strategic approach is highlighted in this example, in reality, teams would use multiple approaches that may overlap and interact with each other. Strategic approaches should be selected based on an assessment of their potential impact and feasibility, and any additional criteria identified by the team. This includes considering strategic approaches that are intentionally integrated, addressing threats to both biodiversity and food security interests, either directly or through ecosystem services provided by biodiversity conservation.

Fishmonger in Ghana preparing fish for smoking. Credit: Glenn G. Page, SustainaMetrix for USAID

V. ADDITIONAL KEY LESSONS

Some additional, more general lessons derived from using this integrated planning approach include:

- **Draw on the expertise of team members from both sectors to make the model more useful.** The most important lesson for developing an integrated situation model and results chain is to build an interdisciplinary team that allows individuals to expand their thinking beyond sectoral perspectives. Ideally, design team members from the biodiversity sector, food security sector, and other relevant sectors are present together so that opportunities for integrated approaches can be discovered and developed collaboratively. This allows for the development of comprehensive models that capture the full spectrum of focal interests, threats, and driving factors from involved sectors.
- **Use common language and tools to help an integrated team work together better.** This entails using language that draws on the strategies and policies of all included sectors (e.g., this case example references both the U.S. Government Global Food Security Strategy and USAID's Biodiversity Policy). Another important lesson is eliminating or defining jargon (for example, although the term co-management is largely understood in the conservation sector, this case example limits the use of this term since it is not widely used in the food security sector). Teams should also be open to using a broader range of analyses and tools to inform a program's models (e.g., political economy analysis, market analysis, gender analysis).
- **Teams need to determine what level of detail is useful and manageable for their audience and purpose.** In some cases, design teams might choose to have an intricate and complicated internal situation model or results chain and also produce a simplified summary diagram for sharing outside the team. Group boxes can also help with simplifying display while still maintaining some nuance.
- **Even with a strong interdisciplinary team, there will be information gaps and uncertainties.** To the extent possible, sound evidence should support all aspects of developing the situation model, prioritizing strategic approaches, and articulating the theory of change.[40] Teams should make note of what additional evidence is needed, which should inform the development of activity monitoring, evaluation, and learning requirements. Noted evidence gaps also serve to focus assessments and other research initiatives on clear information needs. For example, an activity design team that lacks complete understanding of the key local and national-level political influencers of a given area may choose to commission (or design) a political economy analysis that would focus on this topic and would generate evidence to inform the activity's stakeholder targeting and engagement efforts.
- **Together, graphic displays and narrative descriptions can help teams articulate, review, and communicate their theory of change.** Ideally, situation models and results chains should be accompanied by a narrative that gives further details on the context or problem analysis (for situation models) and the rationale, assumptions, and evidence underlying the strategic approach (for results chains). In writing the narrative, teams will often unearth additional weak linkages and/or evidence gaps that warrant further refinement of the graphic model.
- **Ensure that the proposed activity meets the main objectives of each sector and follows a country-led approach that supports its journey to self-reliance.** This conscientious and thoughtful approach to activity design will be more successful in achieving outcomes in both sectors and will better serve a host country in its journey to self-reliance, stability, and resilience.

[40] USAID. 2018. Evidence in Action: Using and Generating Evidence About Effectiveness in Biodiversity Programming.

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