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The background image shows a traditional wooden fishing boat with a complex rigging system, including masts and ropes. The boat is painted in light green and red. The name "Ma. Chelita Lopez 2" is visible on the side. The boat is on a body of water with mountains in the background under a cloudy sky. A large blue circular graphic is overlaid on the left side of the image, containing the title text.

# Sub-Regional Scaling

*OF AN ECOSYSTEM  
APPROACH TO FISHERIES  
MANAGEMENT*

The USAID Oceans and Fisheries  
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*Cover Photo: A fishing vessel in USAID Oceans' General Santos City, Philippines learning site. USAID Oceans/Farid Maruf*

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## ACRONYMS AND ABBREVIATIONS

ADB	Asia Development Bank
ASEAN	Association of Southeast Asian Nations
BFAR	Bureau of Fisheries and Aquatic Resources
CCRF	Code of Conduct for Responsible Fisheries
CT	Coral Triangle
CTI-CFF	Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security
EAFM	Ecosystem Approach to Fisheries Management
EBM	Ecosystem-based Management
ECP	Ecoregion Conservation Plan
EEZ	Exclusive Economic Zones
FAO	United Nations Food and Agriculture Organization
FMA	Fisheries Management Area
FMU	Fisheries management Unit
GEF	Global Environmental Fund
ICM	Integrated Coastal Management
IMU	Integrated Management Unit
IUU	Illegal, Unreported and Unregulated (fishing)
LME	Large Marine Ecosystem
MCS	Monitoring, Control and Surveillance
MMAF	Ministry of Marine Affairs and Fisheries
MPA	Marine Protected Area
NOAA	[U.S.] National Oceanic and Atmospheric Administration
RPOA	Regional Plan of Action
SDG	Sustainable Development Goal
SEAFDEC	Southeast Asian Fisheries Development Center
SFMP	Sustainable Fisheries Management Plan
SSME	Sulu-Sulawesi Marine Ecoregion
SSS	Sulu-Sulawesi Seas
UNEP	United Nations Environment Programme
UNCLOS	United Nations Convention on the Law of the Sea
USAID	United States Agency for International Development
USAID Oceans	USAID Oceans and Fisheries Partnership Activity
WWF	World Wildlife Fund

# EXECUTIVE SUMMARY

The establishment of appropriate fisheries management mechanisms is vital to ensure sustainable fisheries resources and achieving long-term food security in the Southeast Asian region. An Ecosystem Approach to Fisheries Management (EAFM) provides a broader framework for management of marine resources to achieve sustainable development goals through improved ecological well-being (e.g., habitat protection and restoration, pollution reduction and waste management, sustainable harvesting of fishery resources) and human well-being (e.g., food security, sustainable livelihoods, equitably distributed wealth). Applying an EAFM is considered the preferred option and best practice by most countries and regional organizations in Southeast Asia for the long-term sustainability of fisheries and the ecosystem services provided to society (e.g., food security, livelihoods, economic security, coastal protection, human health and well-being).

Adopting EAFM as a new management approach or an evolution of an existing approach requires an expanded scope of fisheries management over other conventional management approaches. A sub-regional EAFM plan can complement local, national, and regional fisheries management priorities, and can help to catalyze action at all levels that may not otherwise occur. A sub-region, in the context of planning, is defined as a space that is smaller than a region but larger than a local authority, such as a nation, and is usually based on location.

This technical paper provides an overview of how a sub-regional EAFM plan can be developed and scaled to include regional organizations, countries, local governments, and stakeholders. The paper was developed by the USAID Oceans and Fisheries Partnership (USAID Oceans), a five-year regional program working in partnership with the Southeast Asian Fisheries Development Center (SEAFDEC) to combat illegal, unreported, and unregulated fishing, and conserve marine biodiversity in Southeast Asia, and in doing so developed a sub-regional Ecosystem Approach to Fisheries Management (EAFM) plan for the Sulu-Sulawesi Seascape (SSS). The SSS can be considered a sub-region of Southeast Asia. In addition to the importance that the SSS sub-region serves for fisheries production, food security, and economic development in the region, it is also a globally significant priority area for biodiversity conservation. The sub-region is considered the epicenter of global marine biodiversity, with the highest number of coral reef, marine fish, seagrass, and mangroves species in the world. The deterioration of environmental conditions in the SSS indicates that the resource extraction has exceeded the natural capacity of this marine ecosystem for recovery, and its shared boundaries, ecosystem dynamics and resources, as well as transboundary environmental issues (including human migration) justify a taking a sub-regional approach to conserve the SSS.

This paper uses the Sulu-Sulawesi Sub-Regional Plan as a case study and aims to lay a foundation for sustainability and replication of fisheries management initiatives in the Southeast Asia region. It illustrates how fisheries management plans can be developed to be scaled up to support and link to relevant international, regional, and other sub-regional fisheries management plans, environmental initiatives, as well as scaled down to support and link to relevant national, provincial/state, and local fisheries management plans.

# I. BACKGROUND AND CONTEXT

## I.1 BACKGROUND

Southeast Asia, including the Coral Triangle, is home to some of the world's most biologically diverse, economically productive, and vulnerable marine areas. The region faces increasing human population growth, natural resource exploitation pressures, and growing threats from pollution, habitat alteration, degradation, and climate change. Coastal communities are heavily dependent on marine fisheries for food and livelihood, however, a range of forces, such as weak governance, socioeconomic conditions, and ecosystem change is compounding the already complex challenges of overfishing and overcapacity facing Southeast Asian fisheries and these forces (Pomeroy, 2013).

The establishment of appropriate fisheries management mechanisms is vital to mitigate these stressors, ensure sustainable fisheries resources, and achieve long-term food security in the region. Currently, policies, legal, and regulatory frameworks that support fisheries management are generally based on increased concerns about decreasing and/or overexploited fish stocks. However, there is a need to enhance national fisheries management frameworks in the region through the incorporation of innovative management approaches for sustainable fisheries such as the Ecosystem Approach to Fisheries Management (EAFM).

An EAFM focuses equally on the ecological and human well-being or welfare aspects of fisheries. It also provides a broader framework for management of marine resources to achieve the Sustainable Development Goals (SDGs) through improved ecological well-being (e.g., habitat protection and restoration, pollution reduction and waste management, sustainable harvesting of fishery resources) and human well-being (e.g., food security, sustainable livelihoods, equitably distributed wealth). Transitioning towards an ecosystem approach requires that the scale of what is being managed be broadened—spatially and temporally—and more attention be given to governing across scales. One of the greatest shortfalls of conventional fisheries management—indeed, conventional environmental management—is the mismatch of scales of governance to the scales of the managed system. Identifying appropriate spatial, temporal, and governance scales is perhaps one of the most important aspects of transitioning to EAFM, as well as recognizing that marine resources are often mobile, transboundary resources that can benefit from a wider, multi-national scope of management.

Drawing on USAID Oceans' experience in developing a sub-regional EAFM plan for the Sulu-Sulawesi Seascape, this document: (i) outlines and compares the various scales where EAFM can be applied, including at the sub-regional level; (ii) discusses the complementary and catalytic role of a sub-regional EAFM plan in supporting national and regional fisheries management priorities; (iii) presents a case study of the process and lessons learned in undertaking a sub-regional EAFM initiative in Southeast Asia; and (iv) discusses how a sub-regional EAFM plan can be designed at scale to empower and catalyze actions between regional fisheries management organizations, countries, local governments, and fishers/private sector.

## I.2 DEFINING AN ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

In 2003, the United Nations Food and Agriculture Organization (FAO) defined an EAFM as “an approach to fisheries management and development that strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries” (FAO, 2003). The principles and guidelines in the FAO Code of Conduct for Responsible Fisheries support an EAFM and state that: “The purpose of the ecosystem approach to fisheries is to plan, develop, and manage fisheries in a manner that addresses the multiple needs and desires of societies without jeopardizing the options for future generations to benefit from the full range of goods and services provided by marine ecosystems” (FAO, 2003).

The increased understanding of the interactions among different components of marine ecosystems such as fish, people, habitats, and climate has led to a growing recognition of the need to manage fisheries in the context of their supporting ecosystems. Under an EAFM, a fishery is not simply “fish in the sea and people in boats,” but also covers the broader marine environment and natural components, such as coral reefs, mangroves, and the environment, as well as human activities, such as fishing, coastal development and tourism. It focuses on sustainable management of fisheries and their provisioning of food and livelihoods for humans, as a sectoral component of the more holistic Ecosystem-based Management (EBM), which also involves management of other non-fisheries sectors, such as coastal development and land-use, shipping, and transportation. As a systems approach, EAFM binds integrated coastal management and ecosystem-level perspectives grounded on the principles of collaborative and adaptive approaches.

EAFM is a means to implement sustainable development concepts into fisheries by addressing both human and ecological well-being. It merges two related but potentially converging paradigms; the first is ecosystem management that focuses on protecting and conserving ecosystem structure and functions by managing the biophysical components of ecosystem, and the second is fisheries management that focuses on providing food and income/livelihoods for humans by managing fisheries activities (FAO, 2003). There are various entry points for EAFM as a process. EAFM initiatives can be undertaken at many levels and by different stakeholder groups: (i) a single community or a group of communities wishing to improve the inshore fisheries’ management; (ii) a government deciding to adopt EAFM in its policy; or (iii) a regional body wanting to develop high-level management of shared stocks at a sub-regional or Large Marine Ecosystem (LME) scale. A nested structure for fisheries management can be set up to include fairly large-scale regional seas (e.g., the Coral Triangle or Sulu-Sulawesi Seascape), for which integrated management plans would be developed by a regional advisory council and serve as the basis for centralized decision-making. These large regions could be subdivided into high seas and national Exclusive Economic zones (EEZs), and, if appropriate, more locally e.g., where local governments could serve as the basis for devolved management. For example, a nested system can be developed using existing LMEs as a natural boundary where projects are orientated to meet shared objectives and help to form the necessary linkages between the region as a whole and its local stakeholders.

### 1.3 CONTEXTUALIZING EAFM IN SOUTHEAST ASIA’S POLICY

The development of EAFM has its roots in international fisheries management efforts. In 1995, the FAO adopted the Code of Conduct for Responsible Fisheries (CCRF) to foster application of the new approaches to fisheries management embracing conservation and environmental, as well as social and economic considerations. The CCRF established the principles and standards applicable to the conservation, management and development of all fisheries. Associated technical guidelines were also developed relatively to precautionary approach to fisheries, fishing operations and integration of fisheries into coastal area management. Indicators for sustainable development of marine capture fisheries were later developed.

The CCRF was later regionalized in Asia through regional guidelines specific for capture fisheries (Southeast Asian Fisheries Development Center (SEAFDEC), 2003). In 2011, the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 was adopted by ASEAN-SEAFDEC senior officials to guide the programs, projects, and activities for the implementation of the Resolution in the Southeast Asian region (SEAFDEC, 2011). Under the chapter on fisheries management, the EAFM was adopted.

EAFM is, in effect, a means of implementing many of the provisions of the FAO Code of Conduct for Responsible Fisheries and provides a way to achieve sustainable development in a fisheries context. The principles pertaining to EAFM are not new and can be traced back from the 1972 World Conference on Human Environment; the United Convention on the Law of the Sea adopted in 1982 (Articles 61, 192 & 193); the 1992 United Nations Conference on Environment and Development (UNCED) and its Agenda 21; the 1992 Convention on Biological Diversity; the Code of Conduct for Responsible Fisheries (CCRF) (FAO,

1995); and the 2001 Reykjavik Declaration. The Report of the World Summit of Sustainable Development in 2002 (UN, 2002) also stated an agreement to develop and facilitate the use of EAFM. Furthermore, the Delegation of Nations to the World Summit on Sustainable Development in 2012 had expressed their commitment to effectively apply an ecosystem approach in the management of activities with an impact on the marine environment (UN, 2012).

EAFM is considered a preferred option for fisheries management and best practice by most countries and regional organizations in Southeast Asia for the long-term sustainability of fisheries and the ecosystem services provided to society (e.g., food security, livelihoods, economic security, coastal protection, human health and well-being). The shift to an EAFM from conventional fisheries management requires thoughtful consideration. One of the primary issues in adopting EAFM is the inclusion of an expanded scope of EAFM over conventional approaches; specifically, a broader scale in management.

Each of the ten ASEAN member countries is at a different stage in EAFM implementation (Pomeroy et al., 2015; USAID Oceans and Fisheries Partnership, 2017). While none of the countries has a specific law on an EAFM, all of them have laws and policies to support the EAFM principles, a number of them have developed relevant training programs and are implementing an EAFM but in an incremental manner through various projects and programs, often with technical assistance and support from external agencies or organizations. Under the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF), the six Coral Triangle countries (CT6) adopted a Regional Plan of Action (RPOA) with five overarching goals: (i) strengthening management of seascapes; (ii) applying an ecosystem approach to fisheries management (EAFM); (iii) developing and strengthening management of marine protected areas; (iv) implementing climate change adaptation measures; and (v) protecting threatened marine species (CTI-CFF, 2009). Under the Second Sustainable Development Goal (SDG 2), Target 1 emphasizes upon “strong legislative, policy and regulatory frameworks in place for achieving an EAFM”. The RPOA specifically states: “At the national and regional levels, a strong legislative, policy, and regulatory framework is in place for achieving an EAFM, designed to plan, develop and manage fisheries in a manner that addresses the multiple needs and desires of societies, without jeopardizing the options for the future generations to benefit from the full range of goods and services provided by marine ecosystems. An EAFM is a key approach toward addressing common transboundary policy and regulatory concerns, such as (i) over-fishing of shared pelagic fish stocks; (ii) illegal cross-border fishing by small-scale fishers (stimulated by depletion of local coastal fisheries), commercial-scale fishing operations, and transshipment; (iii) overcapacity; and (iv) by-catch of protected and endangered species.”

At the 48th Meeting of the SEAFDEC Council, April 2016 in Nha Trang, Vietnam, SEAFDEC was encouraged to use the sub-regional approach as a platform to enable countries to discuss and address fisheries management in transboundary areas and in combating IUU fishing. Several fisheries management units covering transboundary areas among countries in Southeast Asia were identified including the: (i) Sulu-Sulawesi Seascape (Malaysia, Indonesia and the Philippines); (ii) Gulf of Thailand (Malaysia – Thailand; Cambodia – Vietnam; including South China Sea (with Brunei Darussalam, Indonesia, Philippines, Singapore); and (iii) Andaman Sea (Indonesia, Malaysia, Myanmar, Thailand). An example of how this has been implemented in Southeast Asia is detailed in Section 2.3.

## 2. SCALING THE ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

### 2.1 UNDERSTANDING SCALING AND ITS ROLE

“Scaling up” or “scaling down” refers to the transferability of concepts, methods and approaches, and organizational structures from one level to another in the dimensions of space, time, and governance; for instance, “scaling up” or “scaling down” from other management arrangements such as community-based management to a sub-regional ecosystem scale. It is crucial to identify the appropriate scales of marine ecosystem for fisheries management purposes. Scales where EAFM can be applied (depending upon the management goals and objectives including political, governance, ecosystem, fishery, and human) include from:

- Single-species management to management of multi-species assemblages;
- Managing fish with home ranges limited to sites within country boundaries to transboundary/straddling stock fisheries;
- Focusing on isolated drivers of change to considering broader environmental and human impacts;
- Design of individual protected areas to planning networks of protected areas;
- Conservation of a fragment of habitat to comprehensive spatial management;
- A larger national fisheries-management area down to a smaller-scale Integrated Management Unit (IMU);
- A single local government to multiple local governments surrounding an ecosystem, i.e., bay or gulf; or
- One national government to several national governments in a region.

Chua (2006) states that scaling up in Integrated Coastal Management (ICM) refers to three different contexts: (i) geographical expansion, (ii) functional expansion, and (iii) temporal considerations. The same contexts hold true for scaling up to an EAFM. Geographically, a management area could scale up from a single small coastal community operating in a nearshore area to include a broader geographic dimension, for instance, an enclosed bay shared by several villages or municipalities/districts, a long strip of coastal area that transcends several provinces or a marine seascape. Scaling up functionally takes into consideration new program interventions e.g., if the current intervention relates largely to enforcement, functional expansion could incorporate new interventions such as conserving or expanding livelihoods and/or increasing educational opportunities. It could also involve integration of fisheries management into broader administrative programs of local, municipal, and provincial/state government agencies or departments. Temporally, scaling up could shift from focusing solely on near-term issues like annual catch limits to considering long-term climate change and ocean acidification in the management process.

The initial scale for an EAFM may vary significantly depending on the geographic area, governance structures, socio-economic conditions, and the current priority issues. In general, starting at smaller spatial and governance scales (in terms of stakeholders, issues, and jurisdiction) may increase the likelihood of initial success, which can then be expanded. It is often easier to scale up once initial activities have been successful and become sustained at demonstration sites. Scaling up may be undertaken to encompass more stakeholder groups, manage a larger jurisdiction or IMU, and/or address new issues or a greater range of issues. In scaling up, a new EAFM plan and agreements may generally need to be developed or existing plans modified. If there is a spatial expansion of the IMU, further data collection and analyses will likely be required. New stakeholder groups and organizations may have to be organized and coordinated with existing ones. Moreover, additional funding may be required, which may also lead to new opportunities to broaden the funding base and potentially increase inefficiencies as communities leverage capabilities and resources for the common good. Additional legal support may also be needed if the new scale concerns multiple political jurisdictions.

Scaling may be constrained by a number of factors including funding, resources, legal authorities, management structures, and voluntary bases of participation. To identify and better understand potential constraints, the following considerations should be made effectively to scale the EAFM plan. First, it is important to understand whether and how social, economic and institutional factors in implementing the EAFM plan vary depending on the scale of the fishery e.g., local, national, regional (involving two or more countries), and at a broader international scale, such as those covering several sub-regions or even continents. Second, the various potential fisheries management challenges must be addressed; human (social, economic and institutional) scales can be different from that of the resource, or of the harvesting activity and there can be differences in the scales that are appropriate to deal with each component of a fishery – fish stocks, fishers, gear, science, enforcement, policy, etc.

Lastly, management of a given fishery may have to be undertaken at multiple scales. This may involve “scaling up” and/or “scaling down.” For example, if fisheries management (and an EAFM) is already implemented at a broad geographical scale (e.g., state, province or nation), it may need to be scaled “down” to a local level. Similarly, if local-level or community-based management is in place within local ecosystems, it may need to be “scaled up,” while allowing for spatial heterogeneity and differing human and institutional arrangements. These situations may imply a need for ‘cross-scale linkages.’ For example, an institutional arrangement may be needed to help coordinate across boundaries in situations where local or decentralized approaches to management are needed to account for local conditions but the fish stocks range over larger geographical areas. This could be the case for a fishery of a highly migratory stock, such as tuna, where biological aspects must be considered on a large, multinational scale, while national or sub-national scale may best fit fishers and management system needs (i.e., local management of fleets).

## 2.2 SCALING EAFM AT THE SUB-REGIONAL LEVEL TO CATALYZE ACTION

A sub-region, in the context of planning, is defined as a space that is smaller than a region but larger than a local authority, such as a nation, and is usually based on location. For instance, the Sulu-Sulawesi Seas can be considered as a sub-region in Southeast Asia. A sub-regional EAFM plan can complement local, national, and regional fisheries management priorities and can help to catalyze action at all levels that may otherwise not occur. A sub-regional approach can support the development of joint or coordinated management plans for fisheries and habitat management, management and control of fishing effort, and strengthening of the cooperation on Monitoring, Control and Surveillance (MCS) to verify and certify the legal status of the fisheries, thereby reducing levels of IUU Fishing (Torell, 2017). Table 1 illustrates some of the benefits and costs or challenges of scaling an EAFM at the sub-regional level.

**Table 1. Benefits and Costs or Challenges of Scaling an EAFM at a Sub-Regional Level**

<b>Benefits</b>	<b>Costs/Challenges</b>
Enables management of a broader ecosystem (spatial and temporal, e.g. longer timeframes accommodating climate change) and social systems relevant to fisheries	Requires higher levels of cooperation, coordination, and participation across governments, sectors (e.g. coastal, climate, development), and jurisdictional boundaries as well as the public
Supports in the establishment of a fisheries management framework that allows for multiple objectives - fisheries, ecosystem, and socioeconomic goods and services	Could involve a development of a new policy and legal framework
Improved coordination, consultation, planning, and implementation of management within and across regional, national, provincial, and local levels with overlapping responsibilities for managing activities that impact transboundary fisheries and marine ecosystems	Demands a more diverse data and information to support decision-making across sectors and stakeholders
Greater recognition of ecological and social system-wide connections and effects that different components of the	Higher costs of management due to additional data and information; increased coordination, planning, and consultative decision-making; and staff

ecosystem can have on each other over a broader geography	
Enables fisheries management within broader multi-sectoral approaches - such as Ecosystem-based Management (EBM) and Integrated Coastal Management (ICM) – dealing with goals from all sectors such as fisheries, mining, shipping, tourism, coastal development, agriculture, and forestry	New stakeholder groups and organizations will have to be organized and coordinated with existing groups.
Facilitates initiations of frameworks to recognize and reduce potential or existing conflicts that impact or are impacted by fisheries and to accommodate multiple uses	Demands a wider scope in MCS and enforcement
Creates connection between regional and national planning and policy goals and practical implementation through local government units.	Effectiveness of plan is dependent upon national political and economic priorities
Enables determination of multiple spatial and temporal scales reflecting the natural hierarchy of the ecosystem	Effective planning requires harmonized workplans and budgets across multiple governments.
Enhances capacity building through shared knowledge and skills	Requires an establishment of a lead organization to oversee coordination and integration
Improved transboundary management decision-making and problem-solving that are matched to the spatial and temporal scale of the ecosystem	Countries must be able and willing to share information

Harmonizing EAFM among multiple levels is an important prerequisite for catalyzing fisheries management actions successfully across multiple scales of governance and management. Linkages between and among the various scales are critical, particularly among governance scales ranging from individual communities to districts to provinces to national governments. National planning and policy goals are often disconnected, as are practical goals and implementation through decentralized local government units, management of nearshore and offshore fisheries, and how different agencies deal with commercial fisheries versus artisanal/subsistence fisheries. One of the challenges in sub-regional EAFM planning is to establish methods to assess and ensure that the actions of the coastal and fisheries institutions at each level of government are harmonized and are consistent with agreed EAFM goals and policies. Similarly, at a regional level disconnects may occur between or across all of the participating nations in the region, regardless of whether or not they share transboundary fish stocks or have abutting EEZs.

Harmonization across scales calls for consistent approaches between national and local government, reinforcing the importance of a legally authorized, inclusive framework that allows for effective harmonization of policy and operational objectives. By matching management decisions to the spatial scale of the ecosystem, to the programs for monitoring all desired ecosystem attributes, and to relevant management authorities, ecosystem objectives are much more likely to be successfully achieved.

Several conditions are necessary to address the challenges of EAFM scaling at the sub-regional level and support effective plan design and implementation:

- Coordination mechanisms must exist across levels of government (regional, national, and local), as well as across different ministries, to incorporate data and information sharing, planning, and local implementation support. Mechanisms should also involve large-scale areas, such as a seascape, across Fisheries Management Unit (FMU) boundaries, and across Marine Protected Area (MPA) networks.
- A specific, lead regional and national government agency should be designated to oversee and encourage coordination and integration between agencies and departments at all levels.
- A clear set of outcome-based objectives must be approved by decision makers and officials.
- A supportive EAFM policy framework should be established, including harmonized national and local legislations and policies that integrate climate change adaptation, ecosystem approach to fisheries, and biodiversity conservation.
- Harmonized work plans and budgets must be established to support integration across levels of government.

- Stakeholder involvement must be encouraged in all aspects of the management system.
- Capacity building must be conducted at regional, national, local government, and community levels to support the application of EAFM (in the areas of integrated planning and management, standardization and cascading across the country, and on-the-ground EAFM application).
- Regular collection of data and information must be conducted and shared by supporting agencies, with active support exercised for site-level EAFM implementation.

Many issues threatening marine ecosystems are typically beyond the mandate of fisheries agencies, thus EAFM governance requires coordination and cooperation between government agencies, data and information sharing, support for local implementation, and work plan and budget harmonization. In addition, support should be provided to scale up best management practices and innovations such as efforts to align resource management actions with national policies and among neighboring countries that share fish stocks. Moreover, an EAFM should be integrated with other sectoral and environmental management approaches—such as Integrated Coastal Management (ICM) and Integrated Watershed Management (IWM)—that address terrestrial and terrestrial/marine management.

### 3. A CASE STUDY ON SCALING FOR A SUB-REGIONAL EAFM APPROACH: THE SULU-SULAWESI SEASCAPE

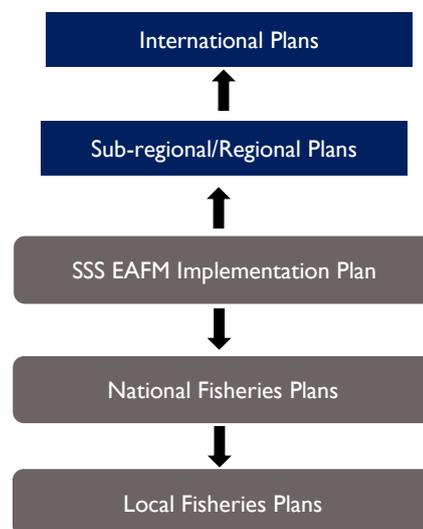
#### 3.1 THE SULU-SULAWESI SEASCAPE

The Sulu-Sulawesi Seascape (SSS) can be used as an example of how sub-regional EAFM plans can be designed, developed, and implemented to be scaled up to support and link to relevant international, regional, and other sub-regional fisheries management plans and environmental initiatives and scaled down to support and link to relevant national, provincial/state, and local fisheries management plans (Figure 1). The SSS sub-regional EAFM plan is an entirely voluntary agreement, with all proposed management actions ‘offered’ (i.e., contributed) and ‘maintained’ at the discretion of each participating nation.

**Figure 1. Map and the geophysical boundary of the SSS**



**Figure 2. SSS Sub-regional EAFM Planning Approach Linked at Different Scales**



From a biophysical and fisheries perspective, Southeast Asia is a region within the wider Indo-Pacific Ocean. Within this region, four Large Marine Ecosystems (LMEs) have been identified – the Gulf of Thailand, South China Sea, Sulu-Celebes Sea (or Sulu Sulawesi Seascape (SSS)), and the Indonesian Sea. LMEs are relatively large areas of ocean space of approximately 200,000 square kilometers (77,220 square miles) or greater, adjacent to the continents in coastal waters where primary productivity is generally higher than in open ocean areas (NOAA, 2018). The physical extent of the LME and its boundaries are based on four linked ecological criteria: (i) bathymetry; (ii) hydrography; (iii) productivity, and (iv) trophic relationships.

In the Southeast Asian region, six transboundary marine and inland sub-regional areas are of vital importance to the region's socio-economic make-up because of their unique social, ecological, and economic characteristics (Torell, 2017). These include the Gulf of Thailand, Andaman Sea, (Northern) South China Sea/Tonkin Gulf, SSS, Arafura-Timor Seas, and Mekong River Basin.

The SSS sub-region (Figure 2) is one component of the wider Indo-Pacific Ocean Region (also known as the Coral Triangle Region) within Southeast Asia, geographically defined as the waters encompassed by the Sulu-Sulawesi Marine Ecoregion (SSME). The sub-region covers a marine area of over 900,000 square kilometers (347,490 square miles) and is bounded among three nations: Indonesia, Malaysia, and the Philippines (ADB, 2011; DeVantier, Alcala, and Wilkinson, 2004). The SSS sub-region has been referred to as the Sulu-Celebes Sea Large Marine Ecosystem (Heileman, 2009; TWAP, 2005), and since 2009, as the Sulu-Sulawesi "Seascape". The Seascape is one of the priority seascapes recognized by the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) Seascape working group.

Previous geographic definitions of the SSS sub-region, including both the SSME (ADB, 2011; DeVantier, Alcala, and Wilkinson 2004) and the Sulu-Sulawesi Seascape (CTI-CFF et al., 2015), have been justified based on the results of the UNEP Global International Waters Assessment, which identify the sub-regions' boundaries based off of the geophysical delineation of the island drainage basins that flow into the Sulu and Celebes Seas (UNEP, 2005). These boundaries include catchment/watershed topography from Northern Luzon, the Visayan Islands in the North and Northeast, down along the Diuata mountain range of Eastern Mindanao Island in the East, through to Northern Sulawesi in the South (UNEP, 2005). The area is also bounded by East Kalimantan (Indonesia) and Eastern Sabah (Malaysia) in the southwestern part of the sub-region, and Palawan Island in the northwest (UNEP, 2005). All boundaries exclude catchments and rivers that feed into the South China Sea or Pacific Ocean (UNEP, 2005). These geophysical boundaries well overlap with the WWF SSME definition and boundaries (Spalding et al. 2007; WWF, 2009).

The Global Environmental Fund (GEF) has identified the Large Marine Ecosystem (LME) approach as an engine for achieving SDG 14 (GEF LME: LEARN, 2017). It specifically cited that the areas to be addressed for the Sulu-Celebes LME are: strengthening law enforcement through cooperation and exchange of information among marine law enforcers (trans-border); and improving bilateral or multilateral coordination to combat IUU fishing. The Sustainable Development Strategy for Seas of East Asia (SDS-SEA) has sustainable fisheries as a major component among its strategies, objectives and action programs.

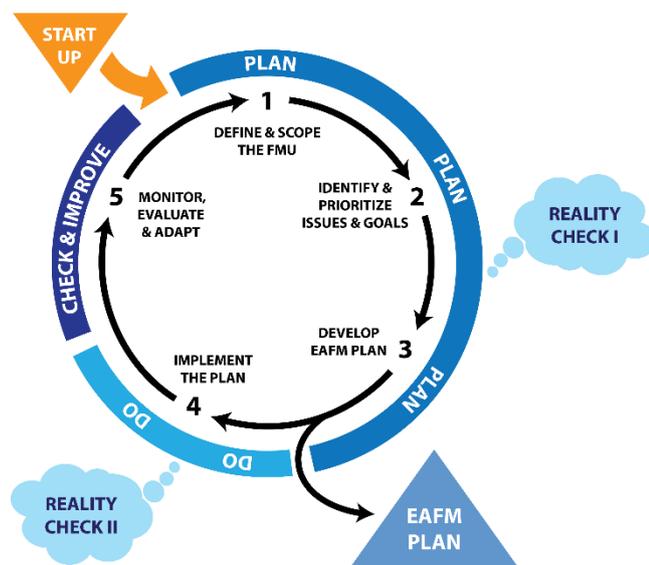
Some regional plans, including international treaties and agreements, do not strictly focus on fisheries and reflect other elements or concerns from other sectors, such as integrated coastal management, biodiversity conservation, and environmental management. Relevant international agreements include the 2009 FAO Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and the 1995 FAO Code of Conduct for Responsible Fisheries (CCRF). Other international agreements referencing fisheries management along with other cross-cutting themes include: the 1992 Convention on Biological Diversity; the 1992 Action Agenda for Sustainable Development (Earth Summit); the 1982 United Nations Convention on the Law of the Sea (UNCLOS); and the 1973 CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the Washington Convention). The Fourteenth United Nations' 2015 Sustainable Development Goals (SDGs), Life below Water (Conserve and sustainably use the oceans, seas and marine resources), also addresses concerns relating to fisheries management.

In addition to the importance that the SSS serves for fisheries production, food security, and economic development in the region, it is also a globally significant priority area for biodiversity conservation. The SSS sub-region is the epicenter of global marine biodiversity, with the highest number of coral reef, marine fish, seagrass, and mangroves species in the world (CTI-CFF Regional Secretariat 2016). The sub-region is characterized by a tropical climate and complex and wide-ranging biophysical characteristics and oceanography that contribute to its exceptionally abundant marine biodiversity (Miclait, Ingles, and Dumaup, 2006; CTI-CFF Regional Secretariat, 2009). The deterioration of environmental conditions in the ecoregion indicates that the resource extraction has exceeded the natural capacity of this marine ecosystem for recovery (CTI-CFF Regional Secretariat, 2016). Shared boundaries, ecosystem dynamics and resources, as well as transboundary environmental issues (including human migration) justify a sub-regional approach to conserving the SSS (Miclait, Ingles, and Dumaup, 2006; CTI-CFF Regional Secretariat, 2009).

### 3.2 DEVELOPING A SUB-REGIONAL EAFM PLAN FOR THE SSS

The development of an EAFM plan for the SSS sub-region commenced in 2015, led by the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) and supported through a number of implementing partners. It utilized a five-step process developed under the U.S. Coral Triangle Initiative (Pomeroy et al., 2013) (Figure 3). An initial vision and draft set of goals and objectives were conceived out of the “EAFM Implementation Planning Meeting” convened by CTI-CFF and National Oceanic and Atmospheric Administration (NOAA) in Manado, Indonesia in 2015. During the workshop, participants revisited the results of the Transboundary Diagnostic Analysis (Sulu-Sulawesi Marine Ecoregion Tri-National Committee, 2013), prioritized and agreed on the key issues. They defined the Fisheries Management Units (FMU), established a common vision for the SSS, and agreed upon the main issues and threats in the region. As documented in the workshop report that followed (CTI-CFF et al., 2015), a second, follow-on workshop to review and refine the outputs of this initial workshop was proposed as an important next step.

Figure 3. The Five Steps of EAFM Plan Development



In August 2017, USAID Oceans and its partner, SEAFDEC, held the “Southeast Asia Fisheries Management Planning Workshop: Taking the Sub-Regional Approach,” workshop in Bangkok, Thailand to revitalize the planning process in an effort to strengthen fisheries management in Southeast Asia through a sub-regional and ecosystem approach. During the workshop, attendees developed and proposed sub-regional EAFM plans for three sub-regions across Southeast Asia: the SSS; the South China Sea (including the Gulf of Thailand); and the Andaman Sea. The workshop served as an opportunity to review, refine, and amend the outputs generated from the 2015 workshop in support of developing a SSS sub-regional EAFM plan. A number of sub-regional objectives and proposed management actions were also developed at the 2017 workshop.

Managing fisheries at an ecosystem scale requires that all stakeholders established and agree upon the area that is to be covered, the FMU. Through FMUs, fisheries may be managed at various nested scales, with co-management arrangements in each of the FMUs. At each scale and each FMU, management plans are developed with reference and governance arrangements to link it both ‘up’ and ‘down.’ Using the Sulu-Sulawesi Seascape (SSS) sub-region as an example of a FMU, a structure was developed to link or scale the

sub-region plans “up” to international agreements and “down” to local fisheries management units. The Seascape’s boundary functions as the regional FMU of the SSS Sub-regional EAFM Plan. In characterizing the FMU, it is important to include an explanation of how (delineation) and why (justification for the delineated area) the boundaries of the proposed sub-regional EAFM planning area were generated.

**Updated Vision for the SSS Sub-region:**

“By 2035, the Sulu-Sulawesi Seascape is ecologically healthy and delivers ecosystem services that provide equitable socio-economic and cultural benefits through generations, by collaborative and sustainable fisheries management across all political and cultural boundaries.”

At the 2017 workshop, a common vision was agreed upon, and participants also identified a number of reasons for supporting marine biodiversity conservation within the SSS sub-region (Table 2). ‘Food security’ and ‘sustainable fisheries’ were considered the most important reasons, followed secondarily by both ‘human benefit/well-being’ and ‘economic security’, while ‘to recover/restore depleted marine/fishery resources’ and the region’s ‘intrinsic, unique value’ were viewed as a less critical priority for the group.

**Table 2. Summary of Consensus Points on the Primary Threats and Issues, Root Causes, and Rationale for Conserving Marine Biodiversity within the SSS Sub-region from the Southeast Asia Fisheries Management Planning Workshop, 2017**

<i>Top threats and issues</i>	<i>Primary root causes</i>	<i>Rationale for conserving marine biodiversity</i>
<b>Overfishing</b>	Poverty	Food security
<b>IUU fishing</b>	Weak governance	Sustainable fisheries
<b>Destructive fishing</b>	High demand	Human benefit (supports human well-being)
<b>Habitat destruction</b>	Poor management	Economic security, livelihoods
<b>Pollution</b>	Income needs	Restore depleted marine resources
<b>Declining stocks</b>	Climate change	Intrinsic, unique value of region
<b>Transboundary crime</b>	Lack of monitoring, enforcement	Protect the food web (trophic levels)
<b>Tourism</b>	Lack of data or information	Cultural relationship, traditional knowledge

The sub-regional plan calls for an immediate (near-term) focus on five species of high-value and economically-important transboundary small pelagic fisheries, and a longer-term focus on seven target species of high-value and economically-important transboundary large pelagic and neritic tuna fisheries, as well as six target species of coral reef-associated transboundary fish species within the SSS sub-region.

The plan was developed around the following sub-regional goals, based in the three pillars of an EAFM:

I. Ecological Well-being:

“Improved long-term health of living marine resources and their habitats through responsible regional fisheries management for optimal benefits to our communities.”

There are two proposed phases for this regional fisheries management goal:

- An initial phase (in the immediate/near-term, from 2018-2023) focused on a specified set of small pelagic fisheries shared among all three nations within the sub-region; and

- A later phase (in the mid-term, from 2023-2030) with a broader/expanded focus encompassing transboundary large pelagic (including neritic tuna) and coral reef fisheries across the sub-region.
2. Human Well-being:
 

“Resilient, self-reliant, and empowered communities who benefit from inclusive, just, responsible, and economically- and socially-equitable fisheries management.”
  3. Good Governance
 

“Improved governance and transboundary fishery policy capacity through a coordinated regional framework that is effectively implemented through a participatory, responsive, transparent, and adaptive process.”

Throughout 2017 and 2018, USAID Oceans continued to design and develop the plan. The draft was formally endorsed by the CTI-CFF EAFM Technical Working Group and Senior Officials Meeting (SOM-13) in November 2017, with review, finalization, and adoption of the plan integrated into the EAFM TWG 2018 Workplan. A third workshop was held in July 2018 to finalize the plan in partnership with the CTI-CFF Seascope Working Group, GIZ and partners. In July 2018, a two-day workshop was held in the Philippines to finalize of the draft SSS sub-regional EAFM plan in preparation for its formal adoption in December 2018 and future implementation. The workshop re-convened attendees from the earlier 2015 and 2017 workshops and was co-organized by USAID Oceans, CTI-CFF, GIZ, and delegates from Indonesia, Malaysia and the Philippines. Following, USAID Oceans continued to socialize the draft plan in the region for proposed Plan adoption in late 2018.

### 3.3 “LINKING” THE SUB-REGIONAL PLAN

The SSS sub-regional plan was designed to scale up to link to the interests and activities of several existing regional fisheries organizations such as SEAFDEC, CTI-CFF, the Illegal, Unregulated, and Unreported Regional Plan of Action (RPOA-IUU), and other relevant legal and policy instruments. At the regional level, the SSS sub-regional EAFM plan is linked ‘upward’ to the CTI Regional Plan of Action – Goal 2 – Target 1: Strong legislative, policy and regulatory frameworks in place for achieving an EAFM and Southeast Asia’s regional implementation of the FAO CCRF (SEAFDEC, 2003). Other regional plans include the 2007 Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region (RPOA-IUU) and the Conservation and Management Measures of the Western and Central Pacific Fisheries Commission.

The SSS sub-regional EAFM plan also supports existing, related management efforts also focused at the sub-regional level; for example: The Ecoregion Conservation Plan (ECP) for the Sulu-Sulawesi Marine Ecoregion (SSME, 2003); the SSME Regional Strategic Action Program (GEF/UNDP/UNOPS, 2013); and the Comprehensive Action Plan for SSME (ADB, 2011).

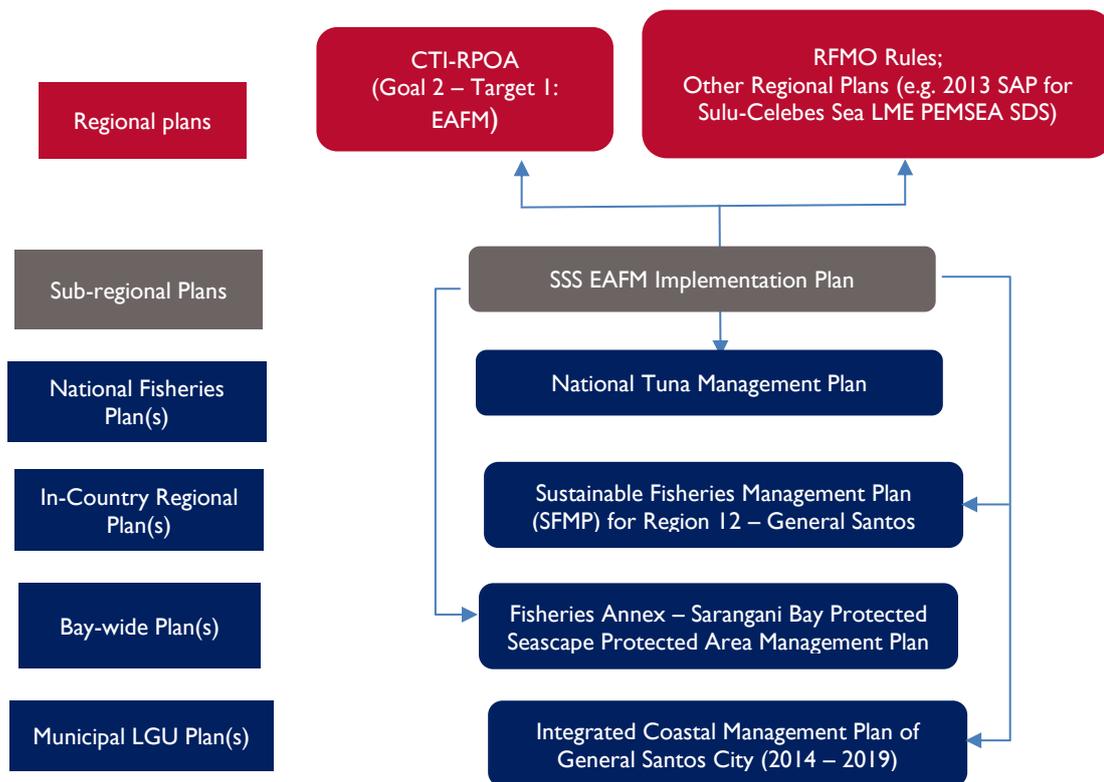
Developed through the ECP, all three plans are based on the same three long-terms goals:

1. A marine ecoregion that remains globally unique and a center of diversity with vibrant ecological integrity, including all species assemblages, communities, habitats, and ecological processes.
2. A highly productive ecoregion that sustainably and equitably provides for the socioeconomic and cultural needs of the human communities dependent on it.
3. An ecoregion where biodiversity and productivity are sustained through the generations by participatory and collaborative management across all political and cultural boundaries.

The plan’s “nested” approach and linkages can be seen through the Philippines, where the sub-regional plan aligns with national and local planning initiatives (Figure 4). Figure 4 shows how the SSS sub-regional EAFM

plan links ‘downward’ to relevant national, provincial, and local fisheries management plan. In the Philippines, the SSS sub-regional EAFM plan may link ‘downward’ to and support national, provincial, and local fisheries management efforts, such as the 2015 Comprehensive National Fisheries Industry Development Plan (CNFIDP) and the National Tuna Management Plan (NTMP). At a local level, for example in the Southern Philippines, the SSS sub-regional EAFM plan links to and supports projects and programs of the Sustainable Fisheries Management Plan (SFMP) of Region 12, the Integrated Coastal Management Plan for General Santos City, and the Fisheries Annex of the Sarangani Bay Protected Seascape Protected Area Management Plan (2014-2019). Similarly, in Indonesia, the SSS sub-regional EAFM plan should support and be linked to the National Tuna Fisheries Management Plan, as well as provincial fisheries planning and local fisheries management efforts at a community level within WPP 716.

**Figure 4. Linkages of SSS Sub-Regional EAFM Plan with Regional, National, and Site-based Fisheries Plans in the Philippines**



### 3.4 PLAN GOVERNANCE AND COORDINATION

In the case of the SSS, the sub-regional EAFM plan will be implemented by three governments (and their fisheries authorities). This requires coordination and cooperation among each nation at different levels and across multiple sectors, such as across the ministries or institutions with management authority over fish, coasts, and climate—as well as associated sectors like mining, energy, agriculture, and tourism, among others. For the SSS, the primary agencies at the national level within the SSS sub-region are the Indonesia Ministry of Maritime Affairs and Fisheries (MMAF), the Malaysia Department of Fisheries, and the Philippines Bureau of Fisheries and Aquatic Resources (BFAR).

It is recommended that a voluntary coordinating governance mechanism be established at the sub-regional level to support coordination and coordination. In the case of the SSS, an existing regional fisheries organization, such as CTI-CFF, SEAFFDEC, or the Tri-National Committee for the Sulu-Sulawesi Marine Ecoregion (Miclaf, Ingles and Dumaup, 2006) and the SSME Sub-committee on Sustainable Fisheries (ADB, 2011), were envisioned to serve in this role. Under the proposed SSS EAFM plan, a Sulu-Sulawesi Seascape

sub-regional coordinating mechanism was proposed, to be comprised of the CTI-CFF EAFM working group and the National Coordinating Committees in Indonesia, Malaysia, and the Philippines.

## 4. CONCLUSIONS

Transitioning toward an EAFM will involve broadening the scale of what is being managed—spatially and temporally—and more attention to governing across scales. One of the greatest shortfalls of conventional fisheries management is the mismatch of scales of governance to the scales of the system managed. As such, identifying appropriate spatial, temporal, and governance scales is perhaps one of the most important aspects of transitioning to an EAFM. Scale factors into a plethora of management decisions, for example in determining boundaries (e.g., the relevant fish stocks and habitats to manage); determining the multiple spatial and temporal scales reflecting the natural hierarchy of the ecosystem (e.g., from large marine ecosystems such as the Sulu-Sulawesi Seascape to small estuaries such as San Miguel Bay in the Philippines); and in establishing climate change adaptation measures (e.g., counting on uncertainties). In almost all situations, regardless of the degree of management centralization, EAFM-implementing institutions will need to consider mechanisms to scale up and scale down management decision-making within and across the community, municipality, district, province, national, and regional levels.

Torell (2017) states that strengthened sub-regional cooperation with development of joint or coordinated fisheries management plans needs to be promoted, including research and studies on the social, ecological, and economic importance of fisheries and aquatic resources utilization. This would enhance the understanding and raise awareness on the significance of national and regional fish and fishery products as sources of domestic food security, employment opportunities for millions of people and profits for export industries. Improved and coordinated management and environmental protection is also a prerequisite for sustainability.

**For more information** on the design, development, and adoption process of the SSS Sub-regional EAFM plan, visit [www.seafdec-oceanspartnership.org](http://www.seafdec-oceanspartnership.org).

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