

1. INTRODUCTION

Overview

This is the final report on the activities performed by the United States National Oceanic and Atmospheric Administration (NOAA) from 2012 to 2016, through a partnership agreement with the United States Agency for International Development (USAID) Timor-Leste Mission to support the Government of Timor-Leste, particularly the Ministry of Agriculture and Fisheries (MAF). Based on consultative discussions among USAID, MAF, and NOAA, these activities provide essential baseline fisheries and marine resource information to inform marine ecosystem-based fisheries management in the nearshore waters of Timor-Leste. These efforts were funded primarily by the USAID Timor-Leste Mission, with significant in-kind contributions and support from NOAA, as part of the 5-year partnership between NOAA and USAID.

Background

The Coral Triangle has the highest marine biological diversity in the world. Coral reefs and fisheries in this region encompass the tropical waters of Malaysia, Indonesia, the Philippines, Papua New Guinea, the Solomon Islands, and Timor-Leste (Figure 1). One in three people in the Coral Triangle region depend upon coral reefs for subsistence and livelihood. With expanding populations and development, increased global food demands, and extensive poverty, the coral reefs and fisheries in this region are both highly valued and severely threatened by numerous stressors, including overfishing/gleaning, destructive fishing, land-based pollution, climate change, ocean acidification, and other effects from human activities and natural events. In these developing coastal and island nations, managing and conserving coral reef ecosystems for future generations links inextricably to provision of food, enhanced resilience to climate change, and capacity for alternative livelihoods.

The need to sustainably manage and protect coral reefs and their associated resources across the Coral Triangle was highlighted as a priority by President Yudhoyono of Indonesia in 2007. In 2009, the six countries of the Coral Triangle, including Timor-Leste, established a multi-national ocean governance partnership called the *Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security* (CTI-CFF) to work toward improved management of marine and coastal resources throughout the region. The six countries of the CTI-CFF adopted a Regional Plan of Action with five overarching goals:

1. Priority seascapes designated and effectively managed
2. Ecosystem approach to fisheries management (EAFM) and other marine resources fully applied
3. Marine protected areas (MPAs) established and effectively managed
4. Climate change adaptation measures achieved
5. Threatened species status improving

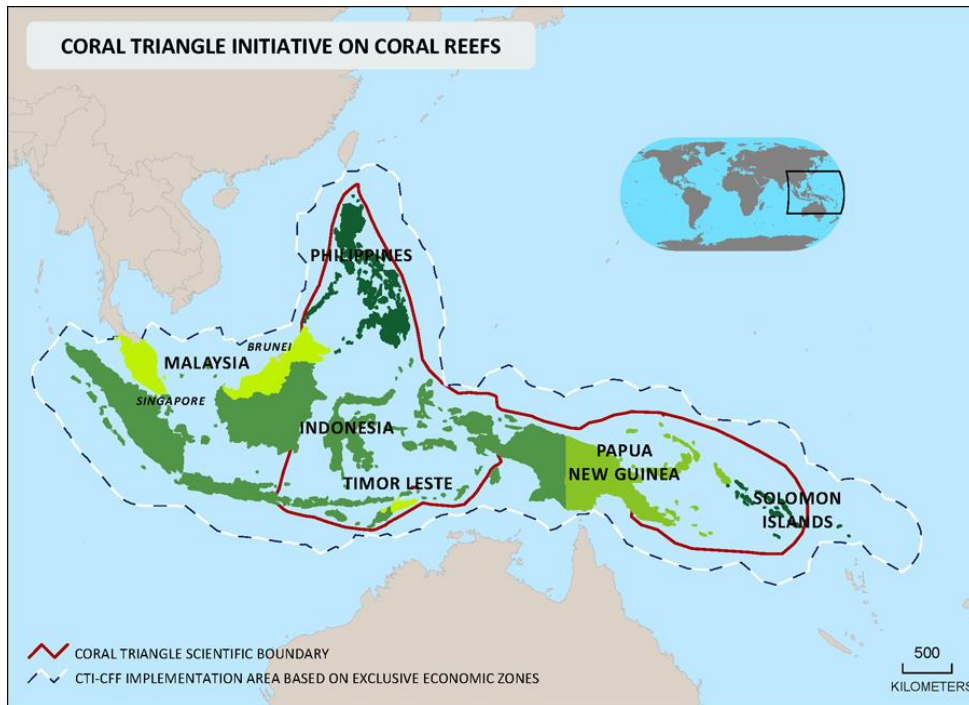


Figure 1. Map of the six countries of the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security. Dashed line shows implementation area, based on Exclusive Economic Zones (Flanders Marine Institute 2016). Solid line shows scientific boundary of the Coral Triangle (Veron et al. 2009). Image courtesy of Coral Triangle Secretariat.

The United States committed substantial resources through the Department of State and the USAID Regional Development Mission for Asia (RDMA) and formed the United States Coral Triangle Initiative (USCTI) designed to assist the six countries achieve the ambitious and forward-thinking goals of the CTI-CFF. In executing USCTI, USAID established a Program Integrator for management and administration of the overall effort, a consortium of international non-governmental environmental organizations called the Coral Triangle Support Partnership (CTSP) consisting of the World Wildlife Fund, The Nature Conservancy, and Conservation International who can provide on-the-ground implementation support, and NOAA who provides world-class government-to-government technical expertise in NOAA’s mission of science, service, and stewardship of the nation’s coastal and ocean resources.

In 2011, Dr. Rusty Brainard of the NOAA Pacific Islands Fisheries Science Center’s Coral Reef Ecosystem Program (NOAA-CREP) became NOAA’s technical lead for the CTI-CFF Goal 2 which promotes an ecosystem approach to fisheries management (EAFM) across the six Coral Triangle countries. As a result, NOAA began working closely with the colleagues at USAID-RDMA, CTSP, the Program Integrator, and the primary fisheries agencies in each of the six countries. NOAA’s objective was providing both technical assistance and capacity building toward the application of an EAFM and science supporting an EAFM leading to growth, conservation, and sustainability for food security, livelihoods, biodiversity, economic development, and threatened species.

Timor-Leste

As one of the six Coral Triangle countries working toward implementation of an EAFM, Timor-Leste's food security, human health and well-being, and facility for adapting to climate change depend in part upon its capacity for management and conservation of its coastal and nearshore marine resources. Based on initial successes with the USCTI regional efforts, environment officer Peter Cloutier of USAID Timor-Leste reached out to the NOAA CTI Program Manager Dr. Janna Shackeroff and Dr. Brainard in May 2011 to initiate the establishment of a bi-lateral partnership which would provide technical assistance in support of an EAFM and improved ocean stewardship for the people of Timor-Leste. In August 2011, the USAID Timor-Leste Mission Director, Rick Scott, hosted Drs. Shackeroff and Brainard through a series of consultative meetings with the Government of Timor-Leste's Ministry of Agriculture and Fisheries (MAF) in which they discussed and developed a draft partnership agreement and work plan to best enhance the capacity of the Government of Timor-Leste and local communities in management and conservation of nearshore fisheries and ecosystems along with the goods and services they provide to the Timorese people.

During those discussions, both MAF and USAID Timor-Leste requested that NOAA focus initially on filling significant information gaps regarding their coastal and marine ecosystems prior to moving toward training-focused activities aimed at building capacity in utilizing the information provided by NOAA. Both USAID Timor-Leste and MAF officials stated that MAF staff was overwhelmed by numerous, well-intended training activities that left many staff with insufficient time to perform their job functions. Accordingly, MAF prioritized their request to USAID Timor-Leste for NOAA's technical assistance primarily in obtaining baseline scientific data for the nearshore marine ecosystems around Timor-Leste as an essential first phase of the partnership, followed by capacity building in data collection and utilization in the later phases of the partnership. Specifically, they requested technical assistance from NOAA focused on addressing the following questions:

1. Where are Timor-Leste's nearshore marine resources?
2. What are Timor-Leste's nearshore resources and how do coastal people and communities rely upon these resources?
3. How are the coastal and fisheries resources changing over time?
4. What are the threats to the nearshore resources that are causing these changes?
5. What approaches are needed to help manage and conserve the nearshore resources towards ensuring food security, livelihoods, and adaptation to climate change over the long-term?

Though neither USAID nor NOAA could firmly commit to a long-term agreement, both NOAA and USAID Timor-Leste acknowledged that addressing and resolving any of these prioritized needs would require sustained engagement by NOAA. Shorter-term efforts would likely compromise success through inefficient use of USAID's resources and NOAA's institutional and personnel engagement.

As a result of those early discussions, numerous email exchanges, and conference calls over the following months, USAID Timor-Leste and NOAA developed and agreed upon a 5-year work plan whereby USAID Timor-Leste would provide funding support to NOAA (subject to Congressional

appropriations and mission priorities) for technical assistance and capacity building in baseline assessments and monitoring of the nearshore marine ecosystems to help managers apply scientific information toward decision-making that supports coastal and fisheries management using an EAFM. The following activities were proposed, initially agreed upon, and most were implemented to address these five key questions over the next five years, though some modifications to the work plan did occur over time as USAID Timor-Leste's programmatic requirements shifted away from the marine sector.

1. Where are Timor-Leste's nearshore marine resources?

Activity: Satellite mapping of nearshore habitats

For effective management of their resources, managers must know where the different habitats and their resources are located. Since marine and fisheries resources are not uniformly distributed along coastlines, habitat maps which delineate coral reefs, seagrass beds, mangroves, and other habitats are foundational in establishing ecosystem baselines and informing coastal resource management decisions. Timor-Leste was missing two important pieces of data in its nearshore ecosystem maps: depth and key features of benthic habitats. NOAA-CREP acquired and processed high-resolution, WorldView-2 satellite imagery along much of the coastline of Timor-Leste to derive estimated depths and benthic features. The resulting maps can now be used as foundational layers which can support resource management decision-making (e.g., restricted fishing areas, marine spatial planning, coastal development and permitting, etc.), designing scientific survey efforts, and ecosystem modeling. Depth and habitat information are also useful in scoping and defining fisheries management units and developing EAFM plans well into the future.

See Chapter 2. *Satellite Mapping of Nearshore Habitats* for further details on this activity.

2. What are Timor-Leste's nearshore resources and how do coastal people and communities rely upon these resources?

Activity A: Coral reef ecosystem assessments

Knowing the status of nearshore fisheries and marine resources (including their location, quantity, and condition) is critical information for effectively managing coastal and nearshore ecosystems and protecting food security in a changing climate. NOAA conducted surveys of reef fish and their habitats along the entire north coast of Timor-Leste.

See Chapter 3. *Coral Reef Ecosystem Assessments* for further details on this activity.

Activity B: Building socioeconomic monitoring capacity and establishing a baseline assessment of Timorese reliance upon nearshore ecosystems and vulnerability to climate change

Due to changes in personnel (therefore expertise available) within NOAA's Coral Reef Conservation Program (CRCP) and a steep increase in costs associated with carrying out marine resource assessment activities along the south shore of Timor-Leste (a concern brought up with initial work planning), this

activity was canceled and USAID agreed that associated funding should be transferred to the marine resource field assessments and spatial data framework.

3. How are resources changing over time? and 4. What are the threats to the nearshore resources?

Activity A: Establishing a baseline for climate change

Climate change and ocean acidification pose significant threats to nearshore marine resources, biodiversity, and the ecosystem goods and services they provide to coastal communities, such as food security, livelihoods, and coastal protection. The potential impacts of these threats are poorly understood. At the request of the Timor-Leste government's request for assistance, NOAA deployed a suite of relatively low-budget climate assessment instruments in shallow-water reef areas around Timor-Leste, using standardized methods established for use across the U.S. Pacific Islands and elsewhere in the Coral Triangle. These data establish a baseline for future monitoring activities of several climate change-related parameters in the nearshore ecosystem. These data also build capacity by improving understanding of the cascading impacts of climate change and ocean acidification on the nearshore ecosystems and resources.

See Chapter 4. *Establishing Ecological Baselines for Climate Change* for further details on this activity.

Activity B: Building biophysical and socioeconomic monitoring capacity

This activity, which was planned for the later phases of the partnership, was canceled by USAID Timor-Leste Mission in late 2013 as the capacity building components of the later phases were not included in their new 5-year strategic plan. A portion of the associated funding was transferred to assist with the marine resource field assessments and spatial data framework project.

5. What approaches (and/or tools) are needed to help manage and conserve the nearshore resources towards ensuring food security, livelihoods, and adaptation to climate change over the long term?

Activity A: Building management capacity by developing a spatial data framework

NOAA supported the government of Timor-Leste by providing guidance and technical assistance to MAF in the development of a spatial data framework for integrating the new basemaps and baseline datasets. This will help managers determine what resources need managing, where those resources are located, where baseline data have been collected, and the types of data collected all together in a visual format for planning and decision-making.

See Chapter 5. *Developing a Spatial Data Framework* for further details on this activity.

Activity B: Building capacity in ecosystem-based management of Timor-Leste's nearshore ecosystems and ecosystem services they provide

During the early phases of the effort, NOAA led a workshop with leaders from fisheries and other sectors in which the benefits of applying data layers to an EAFM for planning and implementation was

introduced. In the final phase of the effort, NOAA transitioned to capacity building for conducting science pertinent to ecosystem-based management. This was done by working with local partners on the methods associated with the assessment efforts and further engaging communities during each in-country activity.

For the final year of the effort, the focus was on capacity building to institutionalize knowledge and on training capabilities in core areas applicable to nearshore marine ecosystem assessments that apply to management. However, NOAA was notified by USAID Timor-Leste that changes to the initial work plan needed to be made to phase out NOAA work in the country. In developing the work plan revisions, NOAA carefully incorporated the knowledge and experiences acquired over the first two years of working in Timor-Leste (i.e., reality checks). As agreed upon with USAID, the revised work plan was based on a local in-country partner's ability to assist with on-the-ground coordination and communication with Timor-Leste government agencies and key stakeholders.

In the revised work plan, the capacity building efforts planned primarily for the final phase of the project were canceled. While the formal capacity building efforts were eliminated, NOAA included workshops during the final phase on using the data and information in both the short-term and in the long-term which could, in turn, be applied toward more effective management of coastal and fisheries resources in the face of climate and ocean changes.

Final workshops were planned for 2015 and 2017 in an effort made by NOAA to deliver the data and spatial framework in a meaningful way, the most helpful to Timor-Leste given these changes. As a result, a Geographic Information System (GIS) workshop was held in 2015 with the AL-GIS team. At this point, NOAA introduced the spatial data framework that allows MAF to convert the raw data collected into a useable format for decision makers strengthening the relationship between the data managers and those tasked with management decisions. In 2017, a workshop is planned with USAID and MAF to deliver the final data and report and socialize the information with MAF partners and stakeholders.

See Appendix A. *Capacity Building and Community Engagement* for further details on these activities.