LEARNING SITE EXPERIENCES AND LESSONS LEARNED

BITUNG, INDONESIA | THE USAID OCEANS AND FISHERIES PARTNERSHIP

THE USAID OCEANS AND FISHERIES PARTNERSHIP (USAID OCEANS) set out in 2015 to strengthen regional cooperation to combat illegal, unreported, and unregulated (IUU) fishing and conserve marine biodiversity in the Asia-Pacific region. The five-year program—a partnership between the U.S. Agency for International Development (USAID), the Southeast Asian Fisheries Development Center (SEAFDEC), and the Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF)—has worked to establish and advance electronic catch documentation and traceability (eCDT) systems, improve sustainable fisheries management using an Ecosystem Approach to Fisheries Management (EAFM), address human welfare aspects of the seafood sector, and develop public-private partnerships in support of these efforts. In 2016, USAID Oceans and the Indonesian Ministry of Marine Affairs and Fisheries (MMAF) established Bitung in North Sulawesi as a program learning site to locally test solutions for national impact and regional learning.

BITUNG, INDONESIA was selected as a program learning site in 2016, and since has been a training ground to:

- develop and test cutting-edge seafood traceability systems,

- implement sustainable fisheries management plans,

- empower women and promote gender equity in the seafood supply chain, and

- bring together government and industry enhance seafood traceability.

IMPACTS

Figure 1. USAID Oceans overall project achievements

COMBATING IUU FISHING IN INDONESIA

Bitung, Indonesia is situated at the point where National Fisheries Management Areas (WPP) 715 and 716 meet. The waters of the Sulu-Sulawesi Marine Ecoregion that surround Bitung are so globally significant that during the past two decades they have become a high priority for global conservation and sustainable development efforts.

Over 60 fish species are landed at Bitung Fishing Port, yet tuna comprise the majority of fish landed. Of the catch landed in Bitung in 2015, approximately 81% were tuna species. Globally, Indonesia is as the sixth largest tuna exporting country by value, and Bitung is one of the main tuna fishing ports and processing centers in the country.

From 2014 to 2015, total fish product landed at Bitung Oceanic Fishing port decreased from 122,704 ton to approximately 36,000 tons. The drop in landings is the result of regulations that aim to eliminate illegal and harmful fishing practices. IUU fishing practices and overfishing pose serious threats to the region's biodiversity and increase uncertainty regarding catch and fishing efforts and stocks. This uncertainty results in difficulties formulating and implementing fisheries management plans. Foreign fishing vessels also operate WPP 716, increasing the difficulty of enforcing regulations requiring action on a regional and international level.
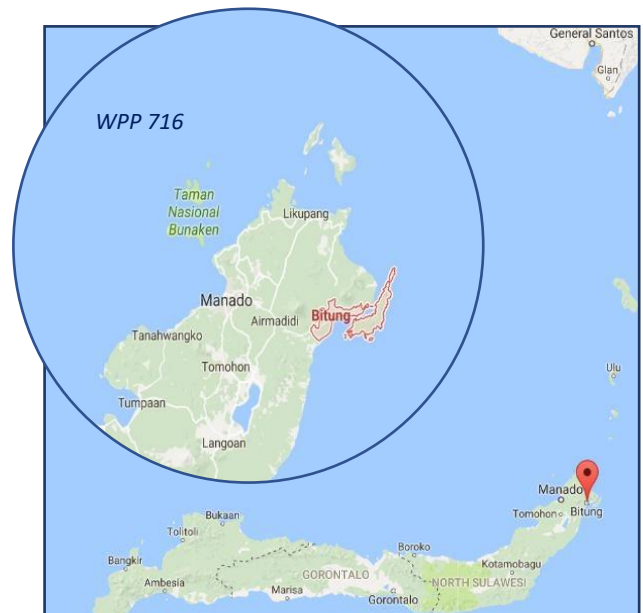
USAID Oceans interventions in Bitung focused on three main intervention areas: 1) ensuring tuna vessels comply with fisheries laws and regulations, 2) enhancing fisheries management plans to sustain fishery resources and optimize socioeconomic benefits, and 3) increasing regional collaboration to establish coordinated efforts in fisheries management, regulatory design, and enforcement approaches.

When USAID Oceans was launched in 2015, catch documentation and traceability (CDT) systems in Bitung, Indonesia were exclusively paper-based. Thus, establishing eCDT systems for Bitung fisheries that could be scaled-up throughout Indonesia was an essential component of USAID Oceans' work in the learning site. In addition to being an industry standard and increasingly, a market requirement, eCDT systems are more effective for recording and tracking essential information at harvest and throughout the supply chain than paper-based systems. In turn, data from eCDT systems is an important resource for fisheries management decision-making.

PROGRAM APPROACH AND IMPLEMENTATION PHASES

The USAID Oceans program approach and phases of implementation are grounded in three assumptions (Box 1). These assumptions focus on the benefits of adopting eCDT systems for fishers, the use of eCDT data to improve fisheries management, and the need for regional capacity and cooperation to expand and sustain CDT as a tool for implementing an ecosystem approach to fisheries management (EAFM).

USAID Oceans was implemented in **five phases** over five years (Figure 1). In its first two years, USAID Oceans focused on developing regional and national coordination mechanisms and partnerships **(Phase 1)** to take stock of ongoing efforts and gain a common understanding of assumptions on which the program's approach would be based. In **Phase 2,** USAID Oceans conducted research and analysis to explore exciting eCDT technologies; identify key data requirements for fisheries management, human welfare, and gender equity; and assess the status of fisheries management systems in which these technologies would be embedded.

> **Box 1. USAID Oceans Program Assumptions**
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> **Assumption 1.** If the eCDT system is robust, meets stakeholders' needs, and provides an economic incentive to fishers through the increased demand for and value of traceable fishery products, then the system will be adopted by the private sector and supported by government agencies throughout the region.
>
> **Assumption 2.** If fisheries managers use eCDT systems with other tools (including an ecosystem approach to fisheries management and promoting safe, legal, and equitable labor practices) to inform fisheries management plans and regulatory regimes, then local and national fisheries governance will be strengthened.
>
> **Assumption 3.** If regional capacity and cooperation is built to support EAFM and CDT, then more institutions and countries in the region will endorse and sustain their use.

During **Phase 3,** USAID Oceans supported the design and implementation of eCDT technologies along the supply chain and engaged with local "First Movers" to test the technologies. System design and stakeholder engagement activities were conducted hand-in-hand with private and government partners. Starting with small-scale, site-based pilots that focused on a specific port, supply chain, and fishery was essential for designing a system that could meet the needs of and provide benefits to both private and government stakeholders. Prior to USAID Oceans, the Indonesian Ministry of Marine Affairs and Fisheries (MMAF) had existing plans to develop eCDT systems. In Phase 3, USAID

Oceans was able to catalyze development and provide momentum through technical assistance, training, and providing equipment needed to bring existing plans to reality.

In last two years of the project, eCDT technologies were procured, tested, and evaluated in learning sites in partnership with local, national, and regional private- and public-sector partners **(Phase 4)**. In the final phase, **Phase 5,** USAID supported additional public-private partnerships to facilitate eCDT system scale up, assist technology providers to expand their user base, and introduce eCDT to new provinces beyond Bitung. Program partners played a leading role in scaling and expanding eCDT systems to other sites and countries in the region.

> **Box 2. Government and Private Sector Technologies Supported by USAID Oceans**
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> - **eLogbook:** mobile catch documentation application designed by MMAF
> - **STELINA:** MMAF's National Fish Traceability and Stock System; a downstream, government-hosted traceability system
> - **Pointrek:** satellite-based catch documentation and vessel monitoring system with two-way communication, for medium- and large-scale vessels
> - **Trafiz:** mobile application for small-scale buyers, brokers, and middlepersons to record seafood traceability data at the point of landing
> - **TraceTales:** electronic production inventory system for seafood processors

While the project used a phased approach, implementation and expansion of eCDT systems was not a strictly linear process. The process required returning to prior phases to build new partnerships, conduct additional research, and adjust implementation. In particular, the design and testing phases often required USAID Oceans to conducted additional research to fully understand issues or gaps that were identified in design and testing. Coordination, partnerships, and capacity building were cross-cutting activities that supported each phase of implementation.
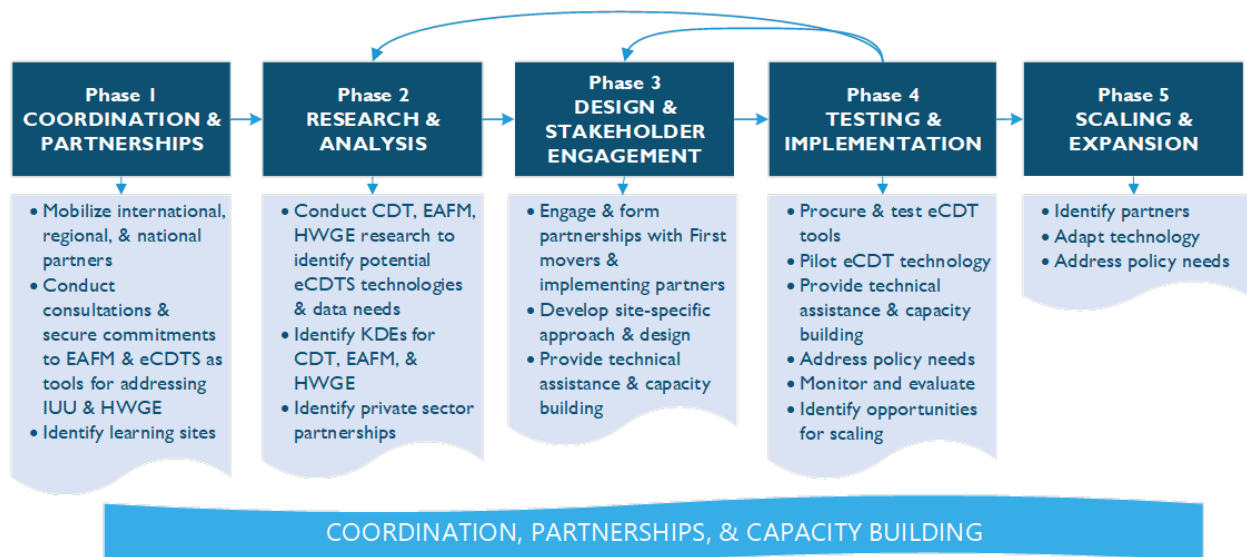
EAFM – Ecosystem Approach to Fisheries Management
eCDTS – Electronic Catch Documentation and Traceability Systems
IUU – Illegal, Unreported, and Unregulated Fishing
HWGE – Human Welfare and Gender Equity

Figure 2. USAID Oceans' phased implementation approach

LESSONS LEARNED

Cross Cutting

While economic benefits of eCDT were important for fishing companies, other benefits emerged as equally important to stakeholders along the supply chain, such as increased operational efficiency, two-way communication, maritime security, and safety at sea. Companies that worked at all nodes of the seafood supply chain—fishing, processing, and export—experienced benefits from advanced knowledge of their expected catch to inform staffing and processing. Processors were able to communicate with fishing vessels to get updates on fish catch, schedules, and resupply needs. The cost savings to business operations were an essential benefit as manual, paper-based documentation was replaced by electronic systems. In addition to the economic and management benefits for companies, small-scale fishers using eCDT technologies identified two-way communication and safety sea features as the main benefits to them and their families.

eCDT data for fisheries management needs to be aligned with stock assessment methodologies and management needs. The use of eCDT system data in stock assessment and fisheries management remains untested. If length-based stock assessments are used, the current eCDT system does not provide a data field for port validators or fish enumerators to capture the length of the fish caught; the current system only allows entry of either the number or weight of the catch. More testing, standardization, and quality control are needed to support the use of eCDT for fisheries science. Additional research and analysis and pilot studies are also needed to understand how data from the eCDT system can be used in fisheries management. Moreover, fisheries management plans must incorporate actions to promote gender equity and good labor practices. Many current plans do not include these elements despite clear increased awareness of and interest in these issues as a result of USAID Oceans training and capacity building efforts.

Regional coordination is essential to national and site-level eCDT system design and implementation as it supports identifying eCDT system needs and capacities that are regionally relevant, while locally customized, resulting in customized systems that work within regional and international landscapes. Under USAID Oceans, coordination among international and regional organizations and national government entities provided an understanding of existing systems, capabilities, and gaps and bolstered national and site-level activities with regional and international expertise. USAID Oceans and partners were able to establish a common understanding of the benefits of an eCDT systems at regional and national scales, which provided a foundation for communicating those benefits to partners and stakeholders. USAID Oceans established a regional technical advisory group as a platform to share ongoing efforts and issues and develop guidance and technical resources that support design and adoption of national and regional eCDT systems and to improve fisheries management beyond the life of the project. Consultations, meetings, and workshops conducted throughout the life of the project resulted in enduring relationships among partners, creating a support network that can be utilized after the program's close.

Phase One – Coordination and Partnerships

National and site-level technical working groups need to be established early and meet regularly to address issues that emerge from eCDT system design and testing. In the Indonesia learning site, coordination between national and site-level stakeholders was limited. Regular information exchange among national- and site-level technical working groups would have better ensured that issues that arise throughout testing were clearly understood and addressed. The use of SMS applications, such as WhatsApp, can be particularly useful in communicating small issues as they emerge and sharing possible solutions. In addition, while USAID Oceans had a regional multi-sectoral project team, composed of a coordinator, technology expert, fisheries advisor, and communications

specialist, a similar site-level team would be better able to identify and respond to issues that arise at all phases of the project.

Public-private partnerships help build trust needed between government agencies and the fishing industry to work toward a sustainable industry and sustainable fisheries management. Agreements between the government and fishing companies provide the foundation for coordination needed to design and test eCDT systems. Agreements on the roles and responsibilities of government and private sector entities should be clearly articulated, especially regarding data confidentiality, data access, and integration between privately owned and government systems. By working together to address eCDT system needs, USAID Oceans' government and private sector partners gained a greater appreciation of the challenges and opportunities to support both a sustainable industry and sustainable management of the fisheries. Public-private partnerships helped balance the government's need for data to support fisheries management with the industry's need for data for improved business management. Fishing associations played a vital role in these partnerships as they have an in-depth understanding of their members' needs and can assist in bringing them together when key decisions are needed.

Phase Two - Research and Analysis

Careful research and analysis are needed to identify the minimum data requirements that allow eCDT systems to serve multiple needs (export, seafood safety, fisheries management, human welfare, and gender) without overburdening government and other stakeholders**.** USAID Oceans worked with large-, medium-, and small-scale fishers, buyers, processors, and exporters to understand how technology was currently being used to trace fish products and identify areas for improvement. Value chain analyses, rapid appraisals of fisheries management systems, gender analyses, and labor studies all contributed to eCDT system design and were used to identify opportunities to improve fisheries management and integrate gender equity and human welfare interventions. Through regional technical working group meetings and workshops with a broad range of stakeholders, issues and data needs related to fisheries management, human welfare, and gender were identified and integrated as key data elements (KDEs) captured in the eCDT system. These findings were shared through multisector stakeholder meetings and captured in seminal documents that were used to inform the design and implementation of eCDT systems.

Fishing associations were instrumental in supporting research and analysis, identifying First Movers, facilitating partnerships, and supporting step-by-step implementation. Fishing associations can serve as a one-stop-shop for identifying issues, needs, and capacity of their members. In USAID Oceans' work in Indonesia, the Indonesian Pole & Line and Handline Fisheries Association (AP2HI) played a vital role in the government-private sector partnership as they have an in-depth understanding of their members' needs and can assist in convening members when key decisions need to be made. These associations can assist in identifying First Movers and conducting a robust due diligence process that is essential for identifying issues before engaging with them.

Phase Three - Design and Stakeholder Engagement

A "one-size-fits-all" approach to eCDT system design is ineffective given the diverse points of entry to the supply chain and the wide range of capabilities of the industry. USAID Oceans provided strategic support to catalyze design, testing, and capacity building of the national eCDT systems, eLogbook and STELINA, while supporting the development of other technologies such as Pointrek, Trafiz, and TraceTales that addressed private sector capabilities and needs. The ongoing challenge, which USAID Oceans and partners are currently working to address, is establishing interoperability between and streamlining private and government systems. While First

Movers have adopted private sector eCDT technologies, some still must enter the same data into the government's eLogbook as the government is not yet accepting data from external eCDT tools.

Collaboration between national and local government is to design an eCDT system that benefits provincial fisheries licensing and management. Provincial governments, which issue licenses for small- and medium-scale fishers (vessels less than 30 GT), were not regularly engaged in the design of the eLogbook or STELINA. In Indonesia provincial governments must also submit a request to MMAF to access the data captured in the system. The Bitung Port Authority requires certain documentation, including data entered in the eLogbook, for vessels leaving and entering the port, which is then sent directly to MMAF in Jakarta. Local academic institutions, such as Sam Ratulangi University, are interested in analyzing data captured in eCDT systems and supporting the provincial fisheries management efforts but access to the data must be made in writing to MMAF. Removing barriers to accessing data is challenging due to data protection and ownership concerns. However, removing these barriers and increasing data transparency and sharing among national and local as well as government and non-government entities would improve fisheries licensing processes and enable eCDT data to be used to inform fisheries management practice.

Phase Four – Testing and Implementation

First Movers play a key role in demonstrating technologies and communicating benefits to other stakeholders. USAID Oceans provided training, technical assistance, and equipment for First Movers testing both government and private technologies. In turn, First Movers were critical to piloting eCDT technologies and systems and providing honest feedback and solutions for improvement. For example, feedback from First Mover partners testing Pointrek showed that data entry by a vessel captain required a cultural shift, additional training, and periodic data validation to insure quality control; and that integration of Pointrek data with the MMAF's eLogbook is still needed to eliminate the double data entry. Moreover, before the pilots began, tangible benefits could not be easily defined and demonstrated early on to stakeholders. Once First Movers could test the system, these benefits became evident. For example, partners testing TraceTales revealed that the technology requires fewer staff, provides data on market values, and increases buyers' confidence in the product. First Movers testing early versions of STELINA indicated that the technology will save time, improve data accuracy, and support documentation required for export once the system is electronic and linked to the eLogbook.

Testing is a critical phase requiring time and frequent interaction with stakeholders to reveal and resolve with technology and data capture, accessibility, and use. Both large and small problems will emerge through testing. Regular contact with First Movers is essential not only for identifying and addressing these problems but for minimizing frustration on the part of the user. Close communication with large-scale fishers revealed that long periods of time at sea without real time data transfer hinders an iterative testing process. USAID Oceans also learned that technology designed for and tested by small-scale fishers must consider literacy limitations and systemic problems in the supply chain, such as the role of middle buyers and brokers who finance small-scale fisher to purchase supplies before going to sea. Concerns over data confidentiality was another key issue identified during testing, particularly for data entered into the MMAF eLogbook and STELINA, which belongs to the national government. First Movers wanted to know what protocols the government had in place to protect their data.

Phase Five – Scaling and Expansion

Small pilots provide tangible benefits that can support eCDT system scaling. Stakeholder understanding and appreciation of the benefits and viability of eCDT has vastly improved since the start of USAID Oceans. Small pilots conducted under the program provided tangible benefits that can be socialized beyond the learning site. USAID Oceans' national partners are now considering

national rollout of program-supported eCDT systems. Additionally, USAID Oceans partner, MDPI, is expanding implementation of TraceTales to multiple Indonesia-based processing plants beyond the Bitung learning site. Fishing associations are instrumental in advocating for adoption of new technology and should use First Movers to communicate to their members. Local partners supporting small-scale pilots also play a leading role in scaling and expanding eCDT systems to other sites and countries in the region. A thorough review and evaluation of the eCDT systems being adopted in the learning site should be completed to resolve outstanding issues such as system integration and data confidentiality before expanding to new areas.

Building capacity among women is vital despite limitations to women's participation. While USAID Oceans' interventions, trainings, and events were open to women, their participation, particularly in trainings and technology development, was often limited due to cultural norms. For example, in some instances, women may not be allowed to attend a training unless accompanied by a trusted male leader. These limitations must be considered and adjusted to when planning activities. Because USAID Oceans recognized social, familial, and economic limitations women face during research and planning stages, the program was able to conduct capacity building activities for partners and stakeholders to help them incorporate gender considerations in their work. These types of focused gender activities are necessary to identify ways increase women's participation in and benefit from program activities.

RECOMMENDATIONS AND NEXT STEPS

Continued technology development and scaling. While over 400 vessels are now using eLogbook in Bitung, use of the system is far from universal. As vessels less than 30GT are licensed by the provincial government, MMAF and the Province of Manado should develop a joint plan to expand eLogbook adoption to all fishers in the province. MMAF can support to the LGU by sharing data and building capacity to analyze and use the data to manage vessels licensed by the provincial government. In addition, MMAF would benefit from continued partnerships with nongovernmental organizations such as MDPI and AP2HI to support ongoing eCDT system development and expansion.

In addition to being scaled geographically, eCDT technologies have the potential to be scaled beyond the tuna industry. USAID Oceans partners are encouraged to explore opportunities to introduce these technologies to enhance traceability and sustainable management practices for additional species (e.g., sharks and rays), gear types, etc. as well as for freshwater fisheries throughout Indonesia and the region.

Integration and interoperability. As new eCDT systems, technologies, and needs continue to emerge, it would help for Indonesia to develop a *Technology Evaluation and Integration Protocol*. This protocol would include criteria for the review, evaluation, and integration of emerging technologies. A multisector eCDT technical advisory group, chaired by the MMAF with members from nongovernmental organizations, fishing associations, and private sector, should meet regularly (e.g., semi-annually) to review the status of eCDT system implementation, identify and address issues as they arise, and stay current on eCDT technologies. This advisory group would be able to leverage USAID Oceans' work fostering public-private sector collaboration to address IUU fishing and improve fisheries management.

Fisheries science and management. The use of eCDT data for fisheries management in Indonesia remains untested. MMAF should engage scientists and managers from government and academe to explore ways eCDT data can be used for stock assessments, including length-based stock assessments. It would be valuable at this early stage of eLogbook rollout to make sure that data collected will support these assessments. Moreover, a data sharing agreement is needed between MMAF, the Provincial Fisheries Management Office, and local academic institutions such as

Universitas Sam Ratulangi to support use of eCDT data for fisheries management. Future programs should provide more training and capacity building at the provincial level to support the use of these data for fisheries science and management.

Policies and Regulations. While MMAF policies require use of eCDT systems for all vessels greater than 30 GT, vessels less than 30 GT are managed at the provincial level. Because of this decentralized management structure for smaller vessels, additional policy efforts should focus on increasing participation from and building the capacity of provincial governments to adopt eCDT systems and regulations, including developing supporting management and financing systems.

Gender Equity. Building capacity among women is vital, particularly given current cultural limitations to women's participation in capacity building activities. Understanding social, familial, and economic limitations women face and building the capacity of partners and stakeholders to incorporate gender considerations in their work is necessary to ensure women benefit from program interventions. Legal instruments to promote gender equity and women's empowerment in fisheries management, developed with USAID Oceans' support, are in various stages of development and submission to relevant authorities (local, national, regional). Further guidance and monitoring and evaluation are needed to ensure that these legal instruments are properly implemented and that gender equity is a standard consideration in fisheries management.

USAID Oceans has taken strides in developing eCDT systems, improving sustainable fisheries management, advancing human welfare and gender equity in the fishing industry, and establishing essential public-private sector partnerships in Bitung and throughout Indonesia. But there is still work to be done. The program looks to regional and site-level partners to carry USAID Oceans' initiatives into the future and to continue to advance eCDT and EAFM efforts in Southeast Asia beyond the life of the project.

USAID OCEANS REGIONAL, NATIONAL, AND LOCAL PARTNERS

International and Regional Partners

Southeast Asia Fisheries Development Center (SEAFDEC)

Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF)

Global Food Traceability Center (GFTC)

Seafood Watch

Future of Fish

International Pole and Line Federation (IPNLF)

United States Agency for International Development (USAID)

US Department of the Interior (DOI)

NOAA

Government

Ministry of Marine Affairs and Fisheries (MMAF)

Bitung Port Authority, MMAF

Bitung Fish Quarantine, MMAF

Provincial Government Fisheries Management Office

Local Non-Governmental Partners

Indonesian Pole & Line and Handline Fisheries Association (AP2HI)

Yayasan Masyarakat dan Perikanan Indonesia (MDPI)

UNSRAT

Private Sector First Movers

Marine Change

Nutrindo

BOGI

Anova

SIG-Asia

Selected fish buyers

Technology Partners

PT Sisfo

Altermyth

MDPI

AVAILABLE RESOURCES

Explore USAID Oceans' training, technology, and research tools, which provide guidance for implementing fisheries development solutions that support sustainable fisheries, consider new technological advancements, and enhance the human aspects of fisheries. Key resources, available in multiple languages, are listed below. To view and download USAID Oceans full set of resources, visit http://bit.ly/OceansResources

Project Overview Materials

Program Overview Video – Learn how USAID Oceans and its supported technology solutions are working to strengthen regional cooperation to combat IUU fishing, promote sustainable fisheries, and conserve marine biodiversity in the Asia-Pacific region. This video provides an overview of what eCDT technology is and the benefits it can bring to a range of partners—from local fishers to international consumers. bit.ly/Oceansoverview

Fisheries Catch Documentation and Traceability in Southeast Asia primers – "CDT 101" provides a conceptual overview of USAID Oceans' approach to eCDT, exploring Southeast Asia's fisheries, technology, and partner landscape. "CDT 201" provides a deeper, more technical look at the program's technical approach and outlines specifications used for system design, testing, and implementation. bit.ly/cdtprimers

Data Requirements for Catch Documentation and Traceability in Southeast Asia – This guide presents a framework for critical tracking events (CTEs) and key data elements (KDEs) recommended to be captured using eCDT systems, including those recommended for enhanced human welfare. It includes a glossary of terms, definitions, and intended uses of all relevant and required KDEs within a traceable, wild-caught seafood supply chain. bit.ly/oceanskdeguide

Technology Solutions for Electronic Catch Documentation and Traceability booklet – This booklet provides an overview of USAID Oceans-developed and supported technology tools for electronic catch documentation and traceability. These tools establish connectivity in remote and at-sea areas, provide a mechanism for data collection and transmission through the entire supply chain, and provide value-added user benefits, such as communication, safety, and business tools. http://bit.ly/eCDTbooklet

Gender training videos – Video 1 introduces viewers to the important role that women play in the seafood supply chain—from preparing boats for sea to managing seafood sales. Video II provides a more in-depth look at gender research, including the importance of conducting gender research to inform fisheries management and important tools for conducting this research. These videos are developed to be used in trainings for fisheries managers at all levels as well as program implementors working in fisheries. *[LINKS FORTHCOMING]*

Learning site posters – Download USAID Oceans' series of posters that communicate key behaviors and practices needed for sustainable fisheries. The four posters cover illegal, unreported, and unregulated (IUU) fishing; safe and fare workplaces; catch documentation and traceability; and catch handling. Available in multiple languages. http://bit.ly/siteposters

Assessing Fisheries in a New Era: Extended Guidance for Rapid Appraisals of Fisheries Management Systems and Technical Annexes provide new and extended guidance on appraising fisheries management systems that make use of new technology advancements and acknowledge the human and gender-related aspects of fisheries. Download the RAFMS guide here: http://bit.ly/RAFMSguide, and the technical annexes here: http://bit.ly/RAFMSannex

Gender Research in Fisheries and Aquaculture: A Training Handbook can be used to build team's understanding of gender equity, its importance in development, and practical tools and research methodologies that can be used to obtain valuable information about the human dynamics of fisheries. http://bit.ly/gender-research

Transformational Fisheries Development: Simplified Steps for Public Sector and Industry Engagement provides step-by-step guidance for identifying, evaluating, and implementing partnerships between the public and private sector to greatly enhance eCDT and other fisheries development ventures. http://bit.ly/PPP-guide

To access these resources and more, visit *www.seafdec-oceanspartnership.org* or contact *info@oceans-partnership.org*.