TECHNOLOGY IMPACTS

Business Benefits of Electronic Catch Documentation and Traceability (eCDT) Technologies
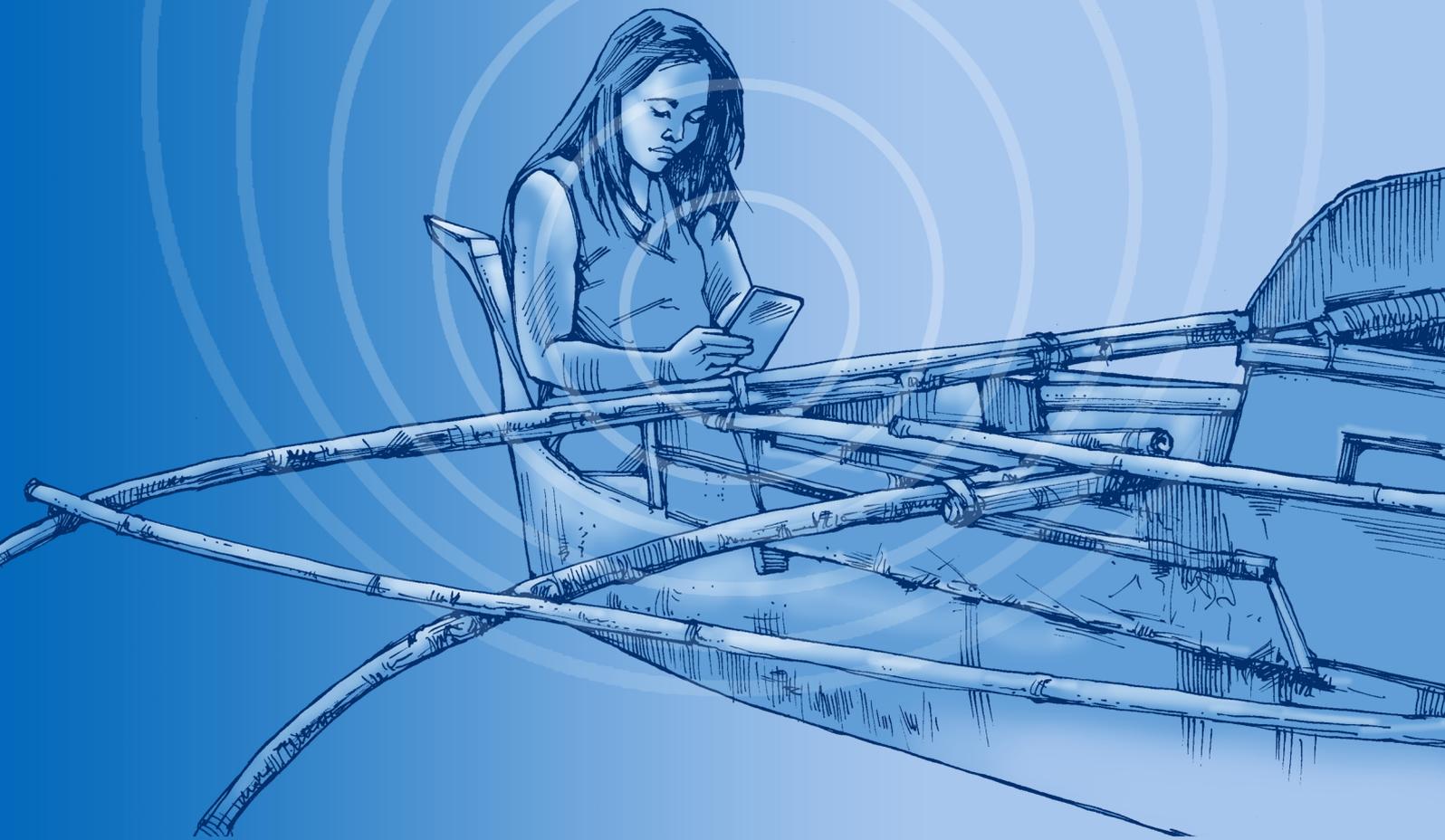
THE USAID OCEANS AND FISHERIES PARTNERSHIP

ABOUT THE USAID OCEANS AND FISHERIES PARTNERSHIP

The USAID Oceans and Fisheries Partnership (USAID Oceans) is a five-year activity that works to strengthen regional cooperation to combat illegal, unreported, and unregulated fishing, promote sustainable fishing, and conserve marine biodiversity in the Asia-Pacific region. USAID Oceans is 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) that works with public and private sector partners across the Asia-Pacific to develop and implement electronic catch documentation and traceability systems, improve sustainable fisheries management using an ecosystem approach to fisheries management, address human welfare and gender equity concerns, and develop public-private partnerships in support of these efforts.

For more information, visit *www.seafdec-oceanspartnership.org* or contact *info@oceans-partnership.org*.

ABOUT THIS GUIDE

The USAID Oceans and Fisheries Partnership (USAID Oceans) has supported the development and implementation of transparent and financially sustainable electronic catch documentation and traceability (eCDT) systems that bolster members of the public and private sectors' abilities to combat illegal, unreported, and unregulated (IUU) fishing practices, manage fisheries more sustainably, and eliminate human rights and labor abuses—including those that result from gender inequality.

Since the program's launch in 2015, the benefits of seafood traceability technologies have continued to gain attention, with eCDT becoming an industry standard and a growing market requirement. However, many members of the public and private sectors remain cautious regarding the costs of implementation and are interested in research on the benefits and efficiencies that can be gained from the systems.

USAID Oceans has worked closely with public and private sector stakeholders to identify, design, and develop suitable tools that establish connectivity in remote and at-sea areas; provide mechanisms for data collection and transmission through the entire supply chain; and offer value-added user benefits, such as communication, safety, and business tools. Following USAID Oceans' years of eCDT design and development, and partnerships with members of the public and private sectors across Southeast Asia to implement and pilot a range of traceability technologies, the program has worked with its partners to document the real-world benefits they have realized from using eCDT technology. This guide presents impact studies from each node of the seafood supply chain, exploring the various applications of eCDT technologies, benefits realized, and recommendations for further enhancements.

USAID Oceans has collaborated with fellow USAID program, the Seafood Alliance for Legality and Traceability (SALT), to share these impact studies with members of the global community interested in learning more about how traceability technologies can be implemented to offer a range of benefit to businesses, members of the supply chain, and supporting government partners.

Photo: Philippines Bureau of Fisheries and Aquatic Resources

FOREWORD

Seafood is one of the most globally-traded foods, often originating thousands of miles from where it ends up on a dinner plate. Because of this complex trade system, determining whether a product was harvested sustainably and responsibly can be difficult, and sometimes impossible, with historically limited ways to track products and their movements. Without effectively recording and tracking essential information at harvest and throughout the chain of custody, supply chains can be vulnerable to products that originate from illegal, unreported, and unregulated (IUU) fishing.

To combat IUU fishing and improve supply chain transparency, many governments and the private sector are implementing eCDT technologies that, when bridged together, can form effective local, national, and regional traceability systems. These technology solutions can exist in many different forms, depending on where it is needed along the supply chain. For instance, to digitally capture harvest information, some eCDT systems couple electronic logbooks in the form of mobile applications with data collected from vessel monitoring systems.

Full-chain traceability entails the continuous capture and sharing of digital information from the point at which the fish leaves the water until it ends up with a consumer—in other words, from "bait to plate." The digital information linked to the seafood at each step in the supply chain establishes a record of the product's entire journey, in turn, providing valuable information to fisheries managers, business owners, and individuals working along the supply chain.

Photo: USAID Oceans/Farid Maruf

Full-chain, electronic traceability can yield direct benefits for businesses. Users have experienced returns from their investment, including eased compliance with import and export regulations and expanded international market access. It can also improve recordkeeping, expedite the transfer of essential information, and pinpoint operational inefficiencies. However, such potential economic gains are not the sole benefits of eCDT; there are overarching social benefits as well.

Human rights abuses are often closely tied with IUU fishing practices, such as forcing laborers to toil in dangerous environments or enslaving migrant workers. In addition to putting human lives in danger, the risk of sourcing products potentially harvested by unethical or illegal fishing practices can limit business' export market prospects, threaten its brand reputation, and jeopardize its sustainability claims. These eCDT technologies can also increase safety and connectivity aboard fishing vessels, providing a "lifeline" for fishers who are out on the water for long periods of time with no means of communicating with those onshore. Equipped with the communication and weather tracking features that come with many eCDT technologies, fishers can communicate with family on land and assess sea conditions. Connection with loved ones while at sea increases safety standards, morale on board, and worker well-being and retention.

This series of impact studies documents the economic and social benefits experienced firsthand by companies that piloted eCDT technologies in partnership with USAID Oceans. The experiences presented here are not unique to Southeast Asia—many can be applied to other regions, fisheries, and businesses. While the studies presented reflect eCDT tools used in the seafood supply chain, with modifications they can easily be used to suit freshwater and aquaculture applications.

This foreword has been provided courtesy of SALT, a five-year USAID initiative that seeks to widely share stories of how eCDT is transforming businesses and countries. By showcasing the lessons within this series, it is our hope that others will see the economic, ecological, and social merits of investing in full-chain, electronic traceability systems. It is only by sharing lessons, such as benefits gained and obstacles conquered, that we can collectively work together to move the field of traceability forward.

The Seafood Alliance for Legality and Traceability (SALT) is a global alliance for collaboration and learning that promotes legal and sustainable fisheries through improved transparency in seafood supply chains.

TRACEABILITY FOR: ENHANCED COMMUNICATION AND SAFETY

In the Philippines, USAID Oceans partnered with a range of supply chain actors to establish fully traceable tuna products, benefitting actors in Southeast Asia, as well as markets and consumers in the United States. This impact study presents the benefits of "bait-to-plate" electronic traceability technology that enables small-scale traceability, ensuring that the full range of supply chain actors—not just large-scale, commercial operations—are able to contribute to and benefit from traceability advances.

In 2018, USAID Oceans formed a partnership with Philippines-based technology provider, FAME, to develop traceability technology for small-scale fisheries in General Santos City, Philippines. To support implementation, the program partnered with the Philippine's Bureau of Fisheries and Aquatic Resources (BFAR); local industry association, the SOCSKSARGEN Federation of Fishing and Allied Industries, Inc. (SFFAII); and the Alliance of Tuna Handliners (ATH).

> **FUTURISTIC AVIATION AND MARITIME ENTERPRISES, INC. (FAME)** is a private, Philippines-based company that develops transponders to solve tracking and monitoring issues in the aviation and maritime industries. FAME's small-scale vessel trackers have been developed to also serve as communication devices, enabling small-scale fishers to capture and tag their fish with point-of-catch traceability data and enjoy ship-to-shore communication that offers safety at-sea.

The Technology

Vessel Monitoring Systems (VMS) and other traceability technologies have primarily been deployed on large fishing vessels as an enforcement and monitoring tool. Unavailability of practical, cost-effective, and durable technology has prevented small-scale fishers from participating in traceability systems and ultimately from accessing higher-value markets that require traceability data. FAME's transponders fill this market gap by providing low-cost, durable, and value-added small-scale vessel transponders that track vessel location, capture traceability data, and provide safety and communication features.

Photos: USAID Oceans/Farid Maruf

FAME transponders use radio frequency to send and receive information through gateways, which receive information from the transponders and send it to the cloud. Data can be transmitted up to 50 km offshore, or even further when multiple transponders (i.e., transponders on other boats) are in range and bridged together. FAME data is accessible through a web and mobile browser-based dashboard application that allows users to see details of each transponder and related data in near real-time.

Benefits

FAME technology has resulted in numerous benefits for small-scale fisheries, including:

- **Hassle-free traceability data capture** – FAME technology lets small-scale fishers focus on catching fish and getting it back to shore, instead of spending time keying in traceability data in rough conditions at-sea. FAME transponders are near-field communication (NFC) reader and writer-enabled, allowing fishers to tap NFC cards to tag fish with catch time, location, and other basic details that are pre-loaded into each transponder. When the vessels land at port, the NFC cards are read by those receiving the fish, cleared, and given back to the fisher to be reused.

- **Increased safety at sea** – Transponders are equipped with a 24/7 vessel tracking and emergency alert system that provides fishers with peace of mind and allows permitted users on shore to track their journey. With the technology, emergency response services can be provided to fishers when needed.

- **Ship-to-shore connectivity** – Transponders create a Wi-Fi network that can be accessed by smart phones for basic data and messaging needs. With these capabilities, fishers can stay in touch with loved ones and business partners on shore, which is essential for single-income homes planning finances and logistics around returns from sea.

- **Enhanced market access and ability to comply with national and international market requirements** – FAME has enabled small-scale fishers, as well as companies with small-scale vessels, to meet national and international record-keeping requirements, opening up doors to higher-value markets that demand traceability data. Coupled with financial and business management trainings, fishers and their family members as business partners are able to identify new opportunities for income and savings.

- **Maritime security** – FAME has garnered attention from national and international government agencies for its ability to locate small-scale fishing vessels, which often make up the majority of nations' fleets.

"For many years…I never know when my husband will return from his fishing trips. All I can do is wait and pray for his safe return. Now, I can track his location and know exactly when he'll return." – Mylene Bibat, Partner of Small-Scale Fisher, Philippines

Photos: USAID Oceans

Recommendations - USAID Oceans' government, industry, and technology partners have recommended continuing to pursue the following improvements to advance and expand the use of eCDT technology:

Creating long-term funding mechanisms – While eCDT technology is becoming more affordable, the price of hardware and connectivity/airtime charges can still be significant, especially to small-scale fishers. Identifying long-term funding partners that also benefit from the technology is imperative to its continued use and success.

Continued technology development – FAME continues to work to identify technology enhancements, such as transponder wind turbines to power the devices and make the technology as energy-efficient, user-friendly, and durable as possible.

User incentives and support – Partners recognize the need to provide incentives to system users, and continue to work on identifying additional user incentives, as well as providing 24/7 system support for troubleshooting and outages.

Photos: USAID Oceans/Melinda Donnelly

TRACEABILITY FOR: INCREASED MARKET OPPPORTUNITIES

Nutrindo Fresfood Internasional (Nutrindo) is a tuna fishing and processing company that joined USAID Oceans' network of partners in 2017 to establish full-chain traceability for tuna products harvested in Southeast Asia. This requires seafood's journey to be documented from its point of catch to its final point of sale to consumers. To establish full-chain traceability, partnerships are required throughout the seafood supply chain, from the fishers who are the first to touch the fish to those that process and export them. USAID Oceans, together with its partner and grantee, Yayasan Masyarakat dan Perikanan Indonesia (MDPI), recruited small- and large-scale industry partners—like Nutrindo—in USAID Oceans' learning site in Bitung, Indonesia to test "bait-to-plate" seafood traceability technology.

Nutrindo was established in 2002 in Bitung, North Sulawesi, Indonesia, and processes several types of tuna products, from fresh sashimi tuna, called "saku" to ultra-frozen sashimi tuna. Saku is processed and packed as a-ready-to-eat sashimi product, sold daily at international super markets, including in the United States and Japan. The company supports one-by-one caught tuna fishing—the most sustainable method of fishing.

The Technology

In addition to catching its own tuna, Nutrindo collects and purchases tuna from small-scale fishers to supplement the product that the company catches itself using sustainable, small-scale methods. In June 2018, Nutrindo began using Pointrek VMS technology. Unlike traditional VMS technology that typically only provides one-way data exchange and location tracking, Pointrek was customized through USAID Oceans' support to also enable at-sea seafood traceability data capture and transmission, as well as two-way ship-to-shore communication. With the technology, Nutrindo is now able to communicate with and track its fleet, reduce manual data entry and communications, and comply with national and international regulations. To trace the tuna it sources from small-scale fishers and the fish suppliers who act as a broker between the fishers and the company, Nutrindo also uses Trafiz, a mobile application that enables mobile entry of traceability data that can be shared with Nutrindo for seamless data transfer.

"eCDT technology has helped us improve our efficiency, reporting accuracy, and at the same time ensures every fisherman is practicing legal, reported, and regulated fishing activities. We strongly recommend this technology to others and hope that with continued expansion the technology will continue to become more affordable for use by all." – Tedy Harmoko, Plant Manager, Nutrindo

Benefits

In addition to the communication and safety benefits described above, Nutrindo has seen business benefits since implementing the *Pointrek* and *Trafiz* traceability tools, including:

- **Increased communication for fleet and plant management –** Two-way, real-time communication has resulted in a host of benefits for fleet managers, captains, and crew. Previously, communication was only available via radio on days with clear weather. Now, through messaging and vessel-tracking functions, it is easy to track ship position, catch results, and routing plans. The on-board VMS system also offers optional add-on monitoring features for fishing, navigation, fleet management, and safety, such as temperature sensors, fuel consumption monitors, closed-circuit TV, and SOS alert systems.

- **Reduced staff reporting time –** Paperwork has been reduced with real-time electronic reporting. Previously, catch information was relayed by radio, manually recorded, and then typed into a messaging application to inform company staff. Time spent by fleet managers to get in touch with the vessel and record and relay information has now been eliminated.

- **Enhanced ability to manage and record raw materials received from small-scale fishers –** From 2017 to 2018, the amount of tuna sourced from Nutrindo's small-scale fisheries suppliers increased by 20 percent over that sourced from its own vessels—a trend that Nutrindo expects to continue. *Trafiz* enables Nutrindo to receive traceability data direct from its suppliers, allowing continued compliance with market traceability requirements while reducing the burden of data-entry. *Trafiz* captures more information than previously possible through manual entry, such as departure, catch and landing area, vessel name, total quantity of catch, and personal fisher data.

- **Increased ease in complying with national and international market requirements –** The eCDT tools have improved compliance and reduced the time required to meet record-keeping requirements, eliminating the need to make in-person visits to authority offices to file paperwork. *Pointrek* has allowed Nutrindo to send reports online, saving at least one day of staff time and resources, reducing data recording negligence and errors.

- **Enhanced captain and crew experience –** As a result of using these technologies, captains and crews have reported increased comfort in knowing they can communicate to shore, less paperwork, and improved route planning as they can easily check their position, predict time of arrival, and prepare those receiving their catch on land.

> **Recommendations -** Nutrindo recommends public and private sector actors to advance and expand the use of eCDT technology continue to pursue the following improvements:
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> **Continued reduction of technology costs and creation of financing mechanisms -** While eCDT technology is becoming more affordable, the price of hardware and connectivity/airtime charges can still be significant.
>
> **Continued public and private sector eCDT integration -** Nutrindo hopes governments will accept data from private sector eCDT tools to eliminate technology duplication, such as vessels installed with both government-mandated VMS technology and other traceability devices used to collect data for company use.

- **Reduced operational costs –** With improved fleet management and weather information, Nutrindo has been able to make data-driven decisions on when vessels will set sail, which has reduced unproductive vessel trips due to bad weather and led to cost savings resulting from efficient use of staff time. This has saved the company as much as seven to ten million Indonesian Rupiahs (approximately $500-900) per vessel per trip cancelled due to bad weather. Vessels larger than three gigatons can cost even more to send to sea.

TRACEABILITY FOR: IMPROVED OPERATIONAL EFFICIENCIES

In 2018, Anova Food, LLC. joined USAID Oceans' network of partners. Similar to Nutrindo, Anova partnered with USAID Oceans to establish full-chain traceability for tuna products harvested in Southeast Asia that are imported into the United States by documenting the seafood's journey from its point of catch to its point of sale.

Anova sources its seafood from an Indonesia-based tuna processor, Blue Ocean Grace International (BOGI). In February 2018, BOGI began using *TraceTales*, a traceability application that allows processors to electronically track their inventory as it moves through the processing factory—from receiving, to filleting, to packaging, to freezing and shipping. *TraceTales,* developed by the non-profit Yayasan Masyarakat dan Perikanan Indonesia (MDPI), enabled BOGI to convert their old, paper-based recording system to a fully digital, computer-based system that enables electronic data capture, storage, and management.

ANOVA FOOD, LLC. is a top, sushi-quality tuna company in North America that leads the industry in the global sourcing of wild caught and sustainably harvested tuna. Annually, Anova imports over 12 million pounds of frozen tuna products to the United States for sale by retailers, including the country's second largest food service company. Anova sources its seafood from several countries in the Western and Central Pacific Ocean, with 40 percent harvested from the rich waters of Indonesia. Anova has a core commitment to social and environmental responsibility and works to deliver sustainable seafood to ensure a healthy supply of fish for future generations.

The Technology

TraceTales can be accessed simultaneously by multiple workstations throughout the processing floor and management offices, allowing data entry from receiving, cutting, trimming, packing, loading, and shipping. Through touchscreen monitors, users can enter data quickly and accurately while they are conducting processing activities. Digital scales connected to the system feed the data directly to the system, avoiding input errors. The system also provides print labels for each packaged box with product information that can be used to trace the product through processing.

From the data entered throughout the processing stages, the system creates summary data reports, including graphical data analysis to support efficient decision making. *TraceTales* also allows users to export data to Excel for further analysis. With the system, data entry errors are reduced, the need for paper-based filing is eliminated, and traceability, inventory management, real-time data analysis, and electronic data sharing are improved.

Benefits

As a seafood importer, Anova has seen numerous benefits to its business since its supplier, BOGI, began using the USAID Oceans-supported *TraceTales* traceability application:

● **Increased assurance in meeting import requirements.** The European Union and other countries around the world have established reporting requirements to prevent IUU seafood products from entering their markets, such as the United States Seafood Import Monitoring Program (SIMP), launched in 2018. *TraceTales* enables Anova's suppliers, such as BOGI, to efficiently record its products and create

reports that meet SIMP requirements. In turn, Anova is assured that the products they are importing, supplied from small-scale fisheries, meet requirements and will not be turned away.

- **Greater ability to meet customer requirements.** As customer demand for traceable seafood products steadily increases, *TraceTales* has helped Anova establish credibility with its customers that its products are sourced legally, responsibly, and are properly labeled. In 2018, the volume of filets produced by BOGI increased by 45 percent. Demand for fully traceable tuna products will continue to grow as more and more customers require the level of traceability afforded by new technology.

- **Enhanced efficiency and business intelligence.** *TraceTales* has markedly increased the pace and accuracy of data capture, inventory reconciliation and business calculations. The system has reduced errors in data received from BOGI through reduced human error that was inherent to the old, paper-based system. Anova also now uses less time in production, receiving and packaging.

For seafood processing company, BOGI, *TraceTales* has digitized its entire documentation process and the company has experienced:

- **Increased accuracy and efficiency in operations and data management.** TraceTales can be accessed simultaneously by multiple workstations where users can enter data quickly and accurately in time with the processing activity, with reduced human error.

- **Reduced product recalls and waste**. With the system, the source of recalled products can be easily pinpointed as specific boxes can be traced through printed labels, resulting in a fewer product rejections and less waste.

- **Increased capacity for data analysis and business decision making.** *TraceTales* allows users to manage production, inventory, and transaction data from each stage of processing. Yield analyses can also be conducted, not only in the processing plants, but also with the brokers who supply the fish to identify where there is room for improvement along the supply chain.

- **Reduced operational costs.** Eliminating paper-based data collection has allowed BOGI to reduce the number of staff needed to manually capture and record information. These staff have been promoted to other roles in the company and have led to increased human and financial resources available to processors.

"*Thanks to the traceability technologies funded and developed by USAID Oceans, we have experienced benefits at both Anova's supply chain levels. We are now able to create timely reports that comply with importing regulations, we meet increasing customer demands for product traceability and can create accurate inventory reports that enhance our business.*"
Blane Olson, Managing Director, Anova Technical Services, LLC.

Recommendations - Anova recommends that businesses interested in implementing traceability systems:

Clearly define the scope of traceability system needs by identifying its purpose, relevant stakeholders, information and data to be captured, and required capabilities.

Allow for flexibility in the system so it may be customized for use in different processing plants.

Conduct pilots at a small scale to assess and evaluate system capabilities.

Build strong relationships, work closely with suppliers, and train staff and relevant suppliers.

Communicate frequently with customers on current traceability practices and commitments.

TRACEABILITY FOR: COMMUNICATION AND CREW CONNECTIVITY

In March 2017, USAID Oceans and Thai Union launched a partnership to advance traceability, further the development of regional data standards, and explore the human benefits of traceability technology. In the same year, the partners launched a pilot program to test the usability and scalability of eCDT technology for at-sea data collection and improved crew communications. The pilot was conducted in cooperation with the Thailand Department of Fisheries, Mars Petcare, and technology partners Inmarsat and Xsense, with USAID Oceans as a technical advisor. Thai Union implemented the pilot on four vessels between May and December 2017 in Ranong and Pattani, Thailand.

> **Thai Union Group PCL.** was founded in 1977 and since has grown into an international business with a large global portfolio of popular consumer brands that serve the United States, Asia and Europe. In 2016, Thai Union announced a U.S. $90 million strategy to ensure that a minimum of 75 percent of its branded tuna is sustainably sourced (i.e., from environmentally and socially responsible sources) by 2020 in order to ultimately achieve 100 percent tuna traceability. In 2017, the company also committed to the Tuna 2020 Traceability Declaration, which supports the United Nations' 14th Sustainable Development Goal on marine conservation.

The Technology

Inmarsat Fleet One Technology　　**eLogbook**　　**Xsense Hi-Chat Application**

The pilot employed Inmarsat's Fleet One VMS technology with two-way communication, an electronic logbook (eLogbook), and a mobile phone application developed by Xsense. At sea, the Inmarsat Fleet One technology enabled the vessel captain and crew to capture and transmit key traceability data elements through broadband connectivity and the eLogbook application. The eLogbook, used onboard through a tablet, allowed real-time reporting of catch data that could be transferred to Thai Union's existing, internal traceability systems that capture data throughout the supply chain. The mobile crew communication application, called Hi-Chat, enabled ship-to-shore crew communication so that workers at sea could communicate with family members and emergency personnel.

Benefits

During the pilot, Thai Union and its staff realized benefits from the eCDT technology—both for business and improved employment conditions. These included:

- **Streamlined business operations with quicker sales and higher product quality –** Vessel owners recognized the market and business advantages of being an early adopter of technology. The Fleet One system improved operational efficiency and facilitated ship-to-shore communication, helping to speed up logistics and improve the quality of fish as it was delivered and sold faster.

- **Enhanced crew communication and morale –** The Hi-Chat application received positive feedback from its users and was seen to improve crew morale. The technology provided the crew with peace of mind that they could report incidents and connect with their relatives or partners on land, a direct benefit to Thai Union's goal to improve industry standards by enhancing transparency and monitoring of crew conditions.

"We've been able to talk by phone at any time since the new technology has been installed. We have continuous communication, and I can say that it's very convenient. I like to ask him to take good care of himself." - Hla Hla Myo, partner of a Thai Union fisher.

Photos: Thai Union

- **Simplified data collection –** The eLogbook interface and design were easy to use and facilitated quick and accurate catch data collection. It endured the at-sea conditions better than paper-based documentation.

A full report on the pilot program is available at bit.ly/2TpFRHA.

Recommendations - Based on the pilot, Thai Union and USAID Oceans recommend the following:

Establish interoperability with other systems (e.g., the government eCDT system). Due to the limited scope of the pilot, the eLogbook data was not connected to the Department of Fisheries and the Port-In-Port-Out center that monitors daily operations of fishing vessels. Connectivity and interoperability between these systems would create seamless and full electronic reporting.

Improve Fleet One technology connectivity. During the pilot, the Fleet One system was challenged by connectivity issues and shortages of purchased airtime for users/crews. The system's connectivity, permissions, and funding should be enhanced for wider scale roll-out.

Manage costs. Hardware and airtime can be costly for vessel owners, captains, and crews and requires effective cost management. For example, fairly distributing quotas and credit for each crew member while using data-demanding applications, such as Hi-Chat, and cost-sharing between captains and crews on mobile/internet services. The government or private corporations could provide incentives or financial support.

Align systems to national and international reporting requirements. Technology adopters are encouraged to closely review all national and international reporting requirements to ensure their eCDT tools are capable of capturing all required elements.

Scale the system to include a larger number of vessels, in particular those currently without satellite connections, to better evaluate the added benefit of two-way satellite communication. Future pilots could involve other relevant governmental units or stakeholders, such as the Department of Labor, to have further discussions around human welfare.

TRACEABILITY FOR: EMPOWERED AND CONNECTED SUSTAINABLE SUPPLIERS

Robust eCDT systems that meet international requirements and satisfy growing customer demands necessitate that seafood traceability data be captured from the point of catch. However, the point of catch is part of the seafood supply chain that has historically been the most complicated to capture data from—particularly within small-scale fisheries. Fishers are often without network connectivity, work around harsh environmental conditions, and have a limited amount of time onboard to manage recordkeeping.

To address these unique needs and challenges, USAID Oceans introduced *Trafiz* to bring seafood traceability to the pockets of seafood suppliers in even the most remote locations. With *Trafiz*, first buyers and fish suppliers are the first to collect and submit traceability data, in lieu of at-sea data entry tools more suitable for medium- and large-scale vessels, such as the *Pointrek* system.

ALTERMYTH is a software development company based in Jakarta and founded in 2003. Altermyth works on projects across Southeast Asia to develop software applications and in 2018 began collaborating with USAID Oceans to develop the mobile seafood traceability application, *Trafiz*. Since the application's launch, Altermyth has been sharing *Trafiz* with interested public, private, and non-governmental organization users across the region who are interested in using and customizing the open-source software to meet their fisheries' needs.

The Technology

Designed for small-scale suppliers and buyers, *Trafiz* provides a first data entry point for seafood products originating from small-scale fishers. The app enables data collection at the landing site, allowing users to enter and submit catch data via a mobile device and cellular connectivity. As soon as the seafood reaches the shore, key data is captured and logged in the app—including species, fisher name, location of catch, weight, and more. Data is electronically stored and can also be quickly printed out for product tagging using small, Bluetooth-enabled printers.

Trafiz supports catch reporting, as well as value-added business functionalities that help small-scale fishers manage their businesses. It includes features that help users track outstanding loans awaiting repayment, payments received, and monthly revenues and profits.

Photos: USAID Oceans/Melinda Donnelly

Benefits

Small-scale fish suppliers in North Sulawesi, Indonesia that have been using the technology since 2018 shared several of the benefits they've experienced thanks to the technology, including:

- **Improved market access and premium pricing –** The ability to electronically capture and transmit traceability data as soon as the seafood is landed has enabled small-scale buyers and suppliers to continue doing business with processors with high international traceability standards. These processors, like Nutrindo, offer higher buying prices than domestic buyers and international processors that don't specialize in premium products.

- **Added-value business management tools –** Although many suppliers keep meticulous records, often in well-kept paper notebooks, the paper-based system makes it difficult to track running profits, revenues, and liabilities. *Trafiz* provides at-a-glance reports that enable users to see their data and learn more about their business' trends so they can begin to maximize their operations.

- **Support for inventory management and buyer demand –** When connected to processor systems, *Trafiz* enables buyers and processors to see available inventory and product pipelines. In remote islands, ice storage is limited and can make it challenging for buyers to manage inventory and pipeline. With greater data access, processors can know what stock is available and more easily collect it from buyers.

- **Flexibility for on- and off-line environments –** *Trafiz* allows users to enter data, even when not connected to a cellular or WiFi network. This means suppliers can still enter data, provide receipts to fishers, and carry out required business transactions while offline. When back online, data syncs immediately to the cloud server.

As of 2020, a community, open-source version of Trafiz will be available on www.GutHub.com.

Recommendations - USAID Oceans, Altermyth, and users have recommended that the following improvements continue to be pursued to advance and expand the use of mobile traceability tools, like *Trafiz*.

Continued exploration of *Trafiz* as a financial resource – With limited documented financial records, members of the small-scale supply chain are often challenged to apply for loans and funding. *Trafiz's* user records could be further developed and used to provide financial records, credibility, and credit "ratings." USAID INVEST is currently supporting development and technology partners to address this by working to enhance Trafiz with additional finance-related data fields and financial management features.

Continued development for use in multi-tiered supply chains – Although currently *Trafiz* only supports use by one tier of suppliers and the buyer/processors they are selling to, often supply chains can have several tiers of middlemen. Further development would enable multiple tiers to enter data, tracking each step of the products' journey.

Development of a compensation scheme for data providers – USAID Oceans is currently working to explore compensation models to reward fishers for supplying data (via the sale of their fish), such as top-up mobile data credits transferred from the supplier to the fisher.