

An underwater scene with a fishing net in the background and several fish in the foreground. The water is a deep teal color with light filtering through from the surface, creating a shimmering effect. The net is a fine mesh, and the fish are dark with lighter spots on their sides.

# **FISHERIES** PARTNERSHIPS

**Combating illegal fishing to strengthen  
maritime security and environmental sustainability**

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**F**ishing is the largest extractive use of wildlife in the world. Fisheries products are the world's most widely traded foods, with commerce dominated by the developing countries. Fishing and fisheries-based commerce provide invaluable employment and cash income, create and grow local economies, and generate foreign exchange. In Southeast Asia alone, more than 250 million people rely on fish for at least 20 percent of their average per capita intake of animal protein. In some nations, for example, Cambodia and Indonesia, fish comprise more than 50 percent of dietary animal protein intake. More than 200 million people in Southeast Asia also rely on fisheries for their livelihood and income.

Despite the important role that fisheries play in maintaining the economies, livelihoods and food security of many countries, increasing scientific evidence indicates that marine and coastal ecosystems around the world have been drastically altered during the past 50 years, reducing their productivity, resilience and potential to continue providing societal benefits in the future. Evidence from recent assessments indicate broad reductions in the size and value of fish caught and the destruction of key, high-value fish species, particularly large predatory fish such as sharks and tuna. The decline in larger, predatory fishery catches has resulted in subsequent shifts to fishing for smaller and less-valuable species — a trend known as “fishing down the food web.”

In Southeast Asia, many fisheries have been fished down to only 5 to 15% of their original natural population levels. Overfishing and declining fish populations in Southeast Asia are leading to increased levels of competition and conflict among fishers over remaining stocks, leading to decreased economic and food security, reduced environmental sustainability, and threats to peace and order, recent research reveals.

#### **Overfishing in Southeast Asia**

Illegal, unreported and unregulated (IUU) fishing is one of the largest contributors to overfishing in Southeast Asia. IUU fishing occurs when national or foreign fishers and vessels violate the fishery laws of the relevant state or international treaty obligations, according to the United Nations Food and Agricultural Organization (FAO).

IUU fishing operations are known by law enforcement officials and fisheries managers in Southeast Asia to be associated with supporting insurgency, terrorism and organized maritime crime, particularly piracy, kidnapping and the trafficking of narcotics, humans and small arms.

Types of IUU fishing include the use of unauthorized fishing methods and gears, fishing within prohibited areas or during restricted time periods, conducting unauthorized catch transshipment, and altering catch reporting or falsifying information. A common example of IUU fishing occurs when overfishing and fisheries scarcity require fishers to venture beyond their traditional fishing grounds to meet catch requirements, including in the waters of neighboring countries where they are not licensed to fish. Coupled with other negative impacts from climate change, marine pollution and coastal habitat destruction, IUU fishing can result in the decline of a country's marine populations and biological diversity, including various fish stocks and the marine habitats that they rely upon. Recent studies suggest that a significant proportion of seafood products imported into the U.S. are being illegally caught and/or mislabeled.

In addition to its environmental impacts, IUU fishing is also commonly linked to serious human welfare abuses, including slave labor, and represents a nontraditional threat facing maritime security across Southeast Asia. IUU fishing operations are known by law enforcement officials and fisheries managers in Southeast Asia to be associated with supporting insurgency, terrorism and organized maritime crime, particularly piracy, kidnapping and the trafficking of narcotics, humans and

small arms. Maritime security threats are complex and interconnected, and although they may occur at sea, have large onshore impacts. In regions where there is ineffective governance at sea and insufficient monitoring, control and surveillance (MCS) capacity, these threats can proliferate and lead to maritime insecurity.

### Tracking Catches

Recognizing that IUU fishing is a complex challenge facing the international community, governments and nongovernmental organizations are increasingly looking to multinational initiatives and regional policies that increase information exchange and promote collaborative approaches to combating IUU fishing within specified waters, according to the FAO. Also, large seafood-consuming nations, including the U.S. and European Union (EU) member countries, have developed new seafood import regulations that require the governments and/or private companies of exporting countries to provide verifiable documentation that their seafood products being imported are IUU-free, accurately labeled and involve no forced labor within their supply chain.

More recently, in 2018, the U.S. launched the Seafood Import Monitoring Program, joining the EU in requiring robust import documentation to verify product legality. To meet these requirements,

exporting countries are increasingly using electronic catch documentation and traceability (eCDT) systems to collect real-time, accurate and verifiable information at all points along the seafood supply chain, from point of catch through to landing, processing, transport and export.

The data provided along the supply chain by these eCDT systems can be used by the importing country to follow the verifiable information regarding seafood products “from bait to plate” to detect and deter IUU products. Such eCDT systems are typically a combination of hardware and software used on fishing vessels and on land, at port, in processing facilities, and within transportation systems. With an eCDT system, operators can document relevant information about a seafood product digitally and transmit it in real time to online data exchange services via satellite, cellular or radio frequency communication technologies. When combined with strong port-state control measures to prevent the importation and sale of undocumented fish, the big data generated through eCDT systems can significantly limit the entry of IUU fish into the supply

**A Thai Navy Officer inspects a fishing boat in waters near Samut Sakhon, Thailand. The Thai Navy is using new technology to monitor fishing boats to crack down on illegal fishing and forced labor.**

THE ASSOCIATED PRESS

Workers haul in nets on a fishing boat in Prachuap Khiri Khan, Thailand.

ISTOCK





The objective of MDA is to detect, prevent and mitigate a range of threats, such as piracy, trafficking and other forms of transnational criminal activity, based heavily on collecting, triangulating, fusing, analyzing and acting on information from a variety of sources and systems.

chain, thereby reducing revenues to illegal operators while strengthening market access for producers who are operating legally and traceably.

The U.S. Agency for International Development Oceans and Fisheries Partnership (USAID Oceans) is working to combat IUU fishing and seafood fraud throughout Southeast Asia by partnering with national and local governments, the fishing industry, and other private sector actors, regional organizations and other fishery stakeholders to encourage their adoption of eCDT systems. As of late 2018, project partners had deployed and were testing eCDT systems — including policies, hardware and software — onboard small and large-scale tuna fishing vessels, as well as at landing sites, tuna processing facilities and throughout transportation systems. Throughout 2019, USAID Oceans will support the analysis and decision-making use of eCDT data to help regional fishery managers and government agencies to manage sustainable fish catch levels, improve their understanding of fish stock status and strengthen real-

time MCS of fishing operations at sea, including issues associated with human welfare and transnational crime.

#### **Enhancing Maritime Awareness**

Maritime domain awareness (MDA) is the effective understanding of events, behaviors and dynamics within the maritime domain that have or could have security, safety, economic and/or environmental impact on the associated domain area of responsibility, according to U.S. Department of Homeland Security and International Maritime Organization definitions. A robust MDA capability requires real- or near-real time actionable intelligence triangulated from interagency, regional governments and private sector sources. The objective of MDA is to detect, prevent and mitigate a range of threats, such as piracy, trafficking and other forms of transnational criminal activity, based heavily on collecting, triangulating, fusing, analyzing and acting on information from a variety of sources and systems.

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# A Sea of Threats

The Indo-Pacific houses the world's most productive and biodiverse ecosystems that provide food and income to over 200 million people in the region. Unsustainable fishing practices, however, threaten the region's biodiversity, food security and livelihoods. In recent years, the fisheries sector has garnered attention for its adverse human welfare conditions, which are perpetuated by illegal, unreported and unregulated fishing, limited fish stocks and a lack of uniform standards.

## Unregulated fishing

- Labor abuse/human trafficking
- Few champions for sustainable fishing
- Inconsistent enforcement of regulations

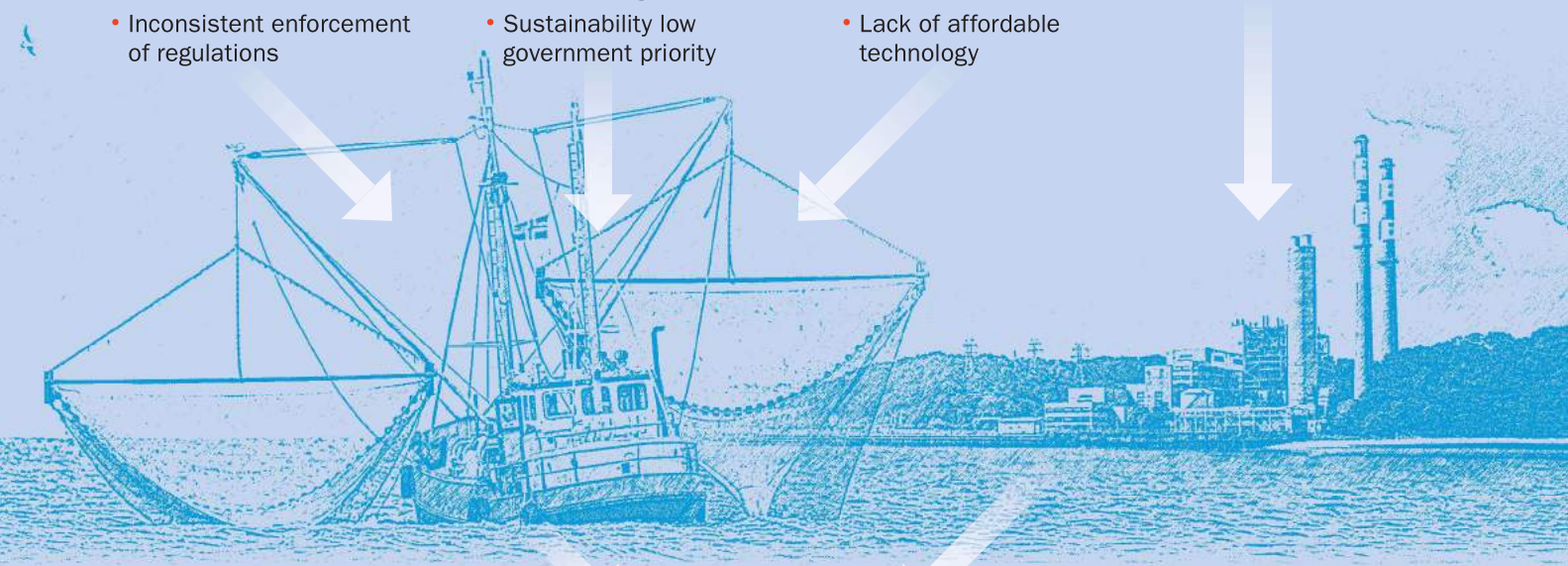
## Illegal fishing

- Limited regional cooperation
- Inadequate national and marine governance
- Sustainability low government priority

## Unreported fishing

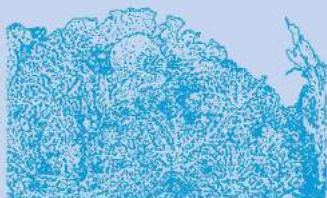
- Increasing demand for cheap fish
- Limited alternative livelihoods
- Lack of affordable technology

## Climate change, destructive development, and marine and land-based pollution

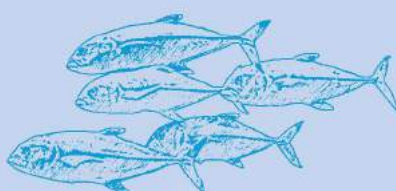


Illegal fishing threatens species and habitats

### Reef and reef-associated species



### Near to offshore pelagic species

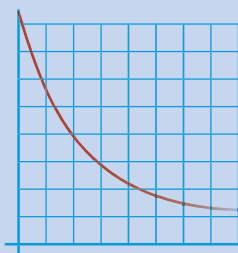


### Soft-bottom coastal species



Sustainability and biodiversity suffers

### Reduced diversity/abundance



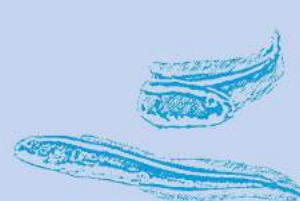
### Habitat degradation



### Changing temperatures and pH levels



### Reduced reproductive capacity



# Catch Documentation and Traceability

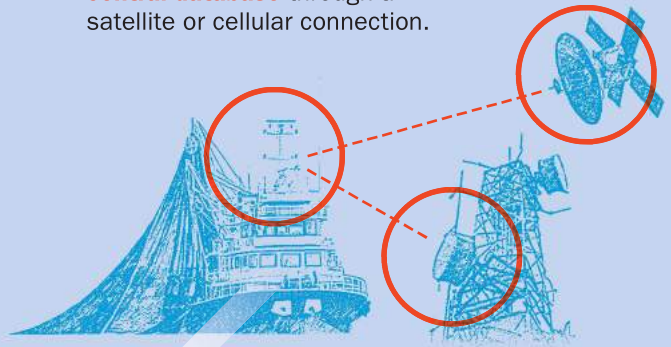
Electronic Catch Documentation and Traceability (eCDT) provides a means for governments and the fishing industry to better regulate fishing, prevent overfishing and enforce against illegal fishing – key drivers of marine biodiversity loss. With eCDT data, governments can strengthen laws and improve management of marine ecosystems.

## TECHNOLOGY

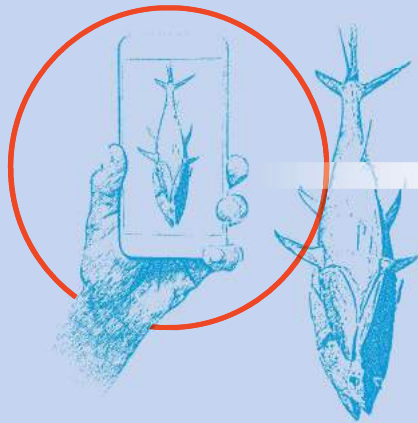
- 1 At sea, small- and large-scale fishers **enter catch data** via custom vessel monitoring devices equipped with data entry dashboards.



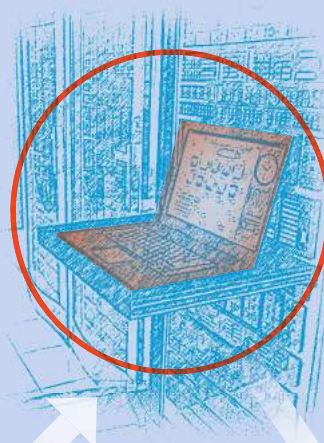
- 2 Information is **uploaded to a central database** through a satellite or cellular connection.



- 3 The vessel and its catch arrive in port or at the local landing site. **Data is captured by buyers/brokers** using custom smartphone or tablet applications.



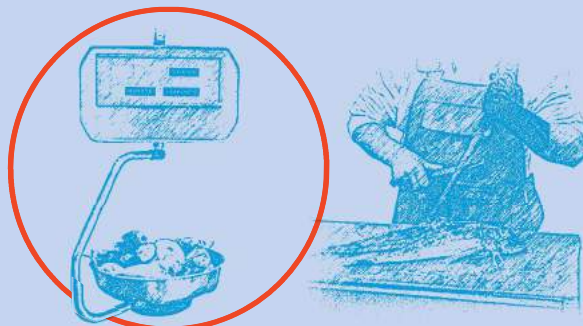
### CENTRAL DATABASE



- 4 The seafood is purchased on-site and either exported immediately or sent to a processor. Its **data travels along with it**.



- 5 The seafood arrives at the processor with its data since catch and is canned, filleted or otherwise transformed for consumption. **Processors capture product data** as it moves through the assembly line.



- 6 Finished and **fully traceable** seafood products are sent to local or international export markets, with **data available** for every step in its journey.



# Philippine program progresses to monitor fishing **digitally**



Fish for sale at the Wet Market in Palawan, Philippines

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

The Philippines is nearing completion of its implementation of a digital seafood traceability system in General Santos City that will eventually be expanded throughout the country.

The Philippine government, through its Bureau of Fisheries and Aquatic Resources (BFAR), designed its electronic catch documentation and traceability (eCDT) system to address illegal, unreported and unregulated fishing through full-chain traceability, from the point of catch to export. The eCDT pilot was launched in September 2017 during the Philippines' 19th National Tuna Congress.

At the point of catch, the BFAR eCDT system will use vessel monitoring systems (VMS) onboard large-scale fishing vessels to capture key data and ensure fish has been caught from a permitted area. Upon landing, data captured by the VMS will be electronically submitted to BFAR, which fishery officers will use to approve fish unloading and validate shipments for processing.

BFAR is working with the U.S. Agency for International Development Oceans and Fisheries Partnership (USAID Oceans) and the South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos region (SOCSKSARGEN) Federation of Fishing and Allied Industries Inc. (SFFAI) to complete all links of the system. Based in Santos City, SFFAI

is a nongovernmental, nonprofit organization established in 1999 as an umbrella organization of seven associations that include over 100 companies involved in fishing, canning, fish processing, aquaculture production and processing, and other related industries.

The eCDT system is being piloted with several fishing and processing companies. To date, the system has traced over 25 metric tons of tuna from these companies, which include Tuna Explorers Inc., Marchael Sea Ventures, Rell and Renn Fishing Inc., Dex Sea Trading, General Tuna Canning Corp., Philippine Cinmic Industrial Corp., and RR Seafood Sphere Inc.

For now, the companies are using the eCDT system in parallel with traditional paper-based documentation systems, with the goal to transition to

entirely electronic documentation once the system is fully functional.

USAID Oceans and SFFAI have held a series of live data testing activities with the fishing companies, canneries and fresh-frozen processors to demonstrate the efficiency of the technology. BFAR programmers and technicians based in Manila are leading the system maintenance and improvement process, further building their capacity in adaptive system design and management.

A leading lesson learned during the ongoing pilot phase is that efficient and consistent communication between stakeholders is crucial in expediting the solutions to recurring issues, facilitating uninterrupted system testing and overcoming any problems in a timely manner.

USAID Oceans has been coordinating between BFAR and SFFAI to facilitate exchanges of feedback and solutions related to the technical challenges encountered through regular meetings and system development workshops. The workshops enabled all partners to address issues encountered during testing, as well as initiate action plans for further implementation of the eCDT system.

USAID Oceans continues to work with its partners across Southeast Asia, including in Indonesia and Thailand, to provide technical guidance and support to improve traceability, sharing experiences from the Philippines' pilot.

Used effectively, MDA can promote economic, social and political security and stability across Southeast Asia and around the world. At recent global conferences, including Our Ocean Conference 2018, maritime security has increasingly come to the forefront of private and public sector interest with large investments backing joint initiatives. Maritime security was one of the areas of action discussed at the conference, with its impact on national economic growth acknowledged and the requirement of sophisticated technological innovation.

Under the USAID Oceans project, nations in Southeast Asia are testing eCDT systems to combat IUU fishing that could also be used to enhance MDA and strengthen national and regional maritime security. Big data generated in real time along all points of the supply chain — from large- and small-scale operations — could be used by national and regional security partners to enhance existing MDA initiatives, including through analysis of information about at-sea position, fishing activities and vessel behavior, as well as legally documented and validated fishing crews. These capabilities also empower responsible large- and small-scale supply chain actors to verify their commitment to responsible, legal fishing practices.

For eCDT data to be used most effectively for MDA, it must be interoperable and able to be easily exchanged across governmental information systems, including those that house port in/out documentation, catch certificates, fishing licenses and vessel registrations, crew manifests, and law enforcement databases. Thus, an eCDT system extends into a range of mission-critical sectors related to maritime security to address drivers of instability, extremism, crime and violence. During 2018, USAID Oceans engaged with the Pacific Environmental Security Forum of the U.S. Indo-Pacific Command and began preliminary discussions relating to how such eCDT data could be demonstrated with national-level security and defense partners to enhance regional MDA.

### Technology Solutions

To combat IUU fishing, eCDT systems in Southeast Asia can generate accurate and verifiable data relating to fishing vessel behavior, operations and position at sea in real time, thereby strengthening existing methods of MCS while enhancing MDA. The Philippines, for

**Police watch as the Indonesian government destroys foreign boats seized for illegally fishing in Indonesian waters.**

REUTERS



example, launched a pilot eCDT program (see sidebar) in September 2017 that is nearing completion. In the future, when such systems become increasingly accepted and used, the capture of multiple types of real-time eCDT data across thousands of operators, such as licensed fishing companies, will generate large data sets. They will require active machine learning with real-time, geospatial visualization tools so the data can be effectively integrated, analyzed and updated to provide accurate, real-time risk analysis to enhance MDA and enable defense and security priorities.

Such machine learning and risk analysis of big eCDT data will become an invaluable tool for security analysts and fisheries managers. Not only will such eCDT systems provide information on the position and behavior of fishing vessels at sea and their crews but also the status of threatened or endangered marine species and valuable fish stocks. Analysis of these big data will allow fishery managers to adaptively limit fishing, restrict bycatch, and enforce the use of prohibited gear types within specified waters. (Bycatch refers to fish and other marine species caught unintentionally while catching target species of target sizes of fish.) Big data generated by these eCDT systems will be used to enhance MDA within the Association of Southeast Asian Nations (ASEAN) member countries. □