

The Development of Traceability Systems for Capture Fisheries in Southeast Asia: the eACDS in focus

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Traceability system is one of the most recent trade requirements being put into force in response to the pressing needs expressed by the markets to ensure that fish and fishery products in the supply chain are not derived from IUU fishing activities. It is also being used to facilitate the tracking of the flow of products through the production processes or the supply chain to ensure that these are safe for human consumption. In the Codex Alimentarius Commission, traceability is defined as “the ability to follow the movement of a food through specified stage(s) of production, processing and distribution.” Traceability has therefore been used to compile information regarding the identity, history, and source of a product or of the materials contained within a product, as well as on its destination, or any ingredient contained within it, making traceability system an information management tool. In the fisheries sector, information on traceability is used to ensure food safety which means that the products and materials from which they are made should come from origins that meet food safety conditions. Traceability is also applied for determining the tariffs and quota tariffs, making sure that appropriate rates of duty are applied, and finally, traceability is also meant to warranty that the fish is derived from sustainable sources, *e.g.* from fishing operations and vessels that follow conservation rules.

In the early 2000s, consumers from the European Union (EU) had become concerned with the trade of fish and fishery products produced through illegal, unreported and unregulated (IUU) fishing operations as these constitute one of the most serious threats to the sustainable exploitation of living aquatic resources and jeopardize the very foundation of the common fisheries policy and international efforts to promote better ocean governance. For this reason, the EU adopted the Regulation (EC) No. 1005/2008 establishing a community system to prevent, deter and eliminate IUU fishing, also known as the EU IUU Regulation, which comes with the respective implementing regulations and other legislative tools. The EU IUU Regulation includes a provision on the need for importing countries to develop their respective catch documentation schemes (CDSs) building upon the primary responsibility of the flag States to prevent, deter and eliminate IUU fishing, and constituting a valuable supplement to port State and other measures.

The EU therefore, introduced on 1 January 2010, the Catch Certification Scheme (CCS), whereby fisheries products must be accompanied by Catch Certificate (CC) declaring that the catch had been produced in accordance with applicable laws, regulations, and international conservation and management

measures. While the CDS should be designed to address the concerns on IUU fishing, especially as an important tool to combat IUU fishing, and should be developed from the point of view of Monitoring, Control and Surveillance (MCS) or from trade documentation perspective.

Meanwhile, the EU IUU Regulation is being applied to all trade of marine fishery products, processed or not, originating from third country fishing vessels and exported to the EU by any means of transportation, and also to any catch originating from EU fishing vessels to be exported to third countries, as well as to transshipments and processing operations. Legally, the CCS is meant to record the origin of all marine products arriving the EU market. This implies that EU importers must ensure that all consignments to be imported have validated certificates provided by exporters prior to the importation to the EU. Normally, the Fisheries Authority of the flag country of the vessel is responsible for the issuance of the Catch Certificate.

In 2017, FAO developed the Voluntary Guidelines for Catch Documentation Schemes (VGCDs) which includes the Catch Documentation Schemes (CDSs) for wild capture fish caught for commercial purposes in marine or inland areas, whether processed or not. The Guidelines had been developed recognizing the relevant international laws and other international instruments, *e.g.* the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU). The VGCDs therefore aims to provide assistance to States, regional fisheries management organizations, regional economic integration

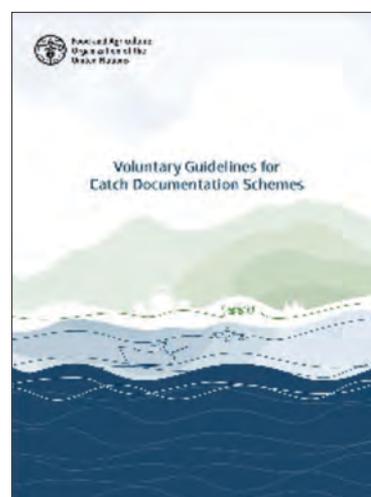


Figure 1. FAO Voluntary Guidelines for Catch Documentation Schemes

organizations, and other intergovernmental organizations, in their efforts towards developing and implementing new CDS or harmonizing or reviewing their existing CDSs.

Benefits of Traceability

A traceability system requires that fisheries companies should record the source, volume, form, and certificate numbers of all products received under a CDS. The same type of records must be kept by operators for all products leaving a company, whether these are meant for international export or as business-to-business transfer/sale of products within the national supply chain. Therefore, a trace is created that indicates the complete information of a batch of products flowing through the supply chain, which could be accessed by authorities for inspection purposes, if necessary. Specifically, the benefits of traceability systems could be seen from three main aspects, *i.e.* ensuring food safety, promoting better process controls, and securing better market niches (**Box 1**). In this connection, it has also become necessary to develop a Catch Documentation and Traceability System (CDT) not only to trace the fish and fishery products in the value chain but also to certify their origin and quality with respect to food safety and sustainability.

Catch Documentation and Traceability Systems in Southeast Asia

The fisheries sector in Southeast Asia is critically important considering its significant role in boosting the people’s social, economic, and livelihood conditions. During the past decades and until now, several ASEAN Member States (AMSs) have been the top ten seafood producing countries exporting to the world seafood market, notwithstanding the challenges in addressing the international fish trade-related issues, *e.g.* IUU

fishing issues, that have significantly impacted the seafood export of the region until the present.

Efforts had therefore been made by SEAFDEC in collaboration with the AMSs, to establish and promote a CDT under the Japanese Trust Fund (JTF)-funded Project “Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products.” Implemented by SEAFDEC/MFRDMD since 2013, the Project had come up with the “ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain” and supported as one of the Project activities, the promotion and implementation of the “ASEAN Catch Documentation Scheme” in the Southeast Asian region.

The development of the ASEAN Catch Documentation Scheme (ACDS) was in response to the request of the AMSs for SEAFDEC to enhance the traceability of fish and fishery products in the Southeast Asian region. SEAFDEC therefore, through technical consultations with its Member Countries, drafted the ACDS concept, which was later on endorsed by



Stakeholders use their mobile devices to scan the QR Codes on fish/fishery products as they check the traceability details of the products throughout the value chain

Box 1. Benefits of applying traceability systems

- Securing food safety

Damages from the impact of food safety failure in terms of illness or death could be minimized if not eliminated, when the distribution of the affected fish and fishery products is curtailed because the trace provides the relevant information. So that when the source of the contamination and the precise affected batch could not be identified, then the food business operator is obliged to withdraw and destroy all batches which could be potentially contaminated. There are numerous cases where food safety failures were discovered in only part of a consignment but the affected part could not be identified, because traceability batch codes were not applied, while testing every unit in a batch is also not feasible. Thus, if the affected products could not be identified and separated, an inspector is obliged to consider any detectable food safety non-compliance as grounds for the batch to be condemned.

- Promoting better process controls

Once correctly implemented, traceability can improve stocks control and reduce out-of-date product losses by allowing efficient operation of first-in-first-out systems, lower inventory levels, quicken the identification of processes and supplier difficulties, and raise the effectiveness of logistics and distribution operations. In addition, operators can collect quantitative data on yields associated with specific batch codes. Over time, by relating yields to independent variables concerning the process conditions, operators can often gain a better understanding of the critical process variables and thus improve the efficiency of their production processes. Improved process control to manage yields can provide significant financial benefit to the operators.

- Securing better market niches

In the longer term, the better food safety management resulting from improved traceability, provides greater guarantees in terms of sustained market access and buyer confidence. Improved customer confidence also helps with branding and improved brand equity. In fact, traceability can be employed as a marketing tool, by providing customers with unique information about the product they are buying and its origins.

the ASEAN during the 25th Meeting of the ASWGF in 2017, and subsequently adopted by the SOM-AMAF Meeting, also in 2017.

The ACDS concept constituted one of the most significant regional initiatives pursued by SEAFDEC with the collaboration of the AMSs for improving the traceability of marine capture fisheries to ensure that the entry of fish and fishery products from IUU fishing activities, into the supply chain is prevented. Based on the ACDS initiative, national CDTs had been developed by the respective AMSs for their fish and fishery products, especially those that are bound for the export market.

Development of the electronic ASEAN Catch Documentation Scheme

In an effort to support and enhance the traceability system for fish and fishery products in the Southeast Asian region, the electronic ASEAN Catch Documentation Scheme (eACDS) was developed by SEAFDEC (Siriraksophon *et al.*, 2017; Saraphaivanich *et al.*, 2019), as an application that links all information and data in the supply chain from point of catch to plates/consumers (Figure 2), taking into consideration the instruction of the SEAFDEC Council of Directors that the ACDS should not create unnecessary burdens, costs, or lengthy processes for the supply chain, especially to the importers and exporters. The eACDS consists of two applications: web-based and mobile applications (Figure 3). First is the “web-based application” which had been designed for: (a) port-out permission and issuance of initial Catch Declaration (CD) to fishing masters, (b) port-in permission including catch weight and species verification and issuance of the CD to fishing masters, (c) issuance of Movement Document (MD), (d) issuance of Statement of Catch (SC), and (e) requirement of Catch Certification (CC) and issuance of CC. The second is the “mobile application” which is for catch reporting at sea and purchasing fish. The eACDS requires several inputs of basic data and information called “Key Data Elements” (KDEs) that include information on: 1) Point of Catch, 2) Buyers/Receivers and Sellers (Broker/Wholesaler), 3) Processors, 4) Exporters and International Shippers, 5) Importers, and 6) End Consumers.

In June 2017, the eACDS was pilot tested in Brunei



Figure 2. Work Flow of the eACDS from point of catch to plates/consumers

Darussalam and a series of consultations and on-site trainings on the use of eACDS ensued with the involvement of relevant stakeholders in collaboration with the Department of Fisheries of Brunei Darussalam to apply, test and improve the applications of the eACDS, especially making the application more user-friendly. This led to the development of the web-based and mobile applications of the improved eACDS, for offline reporting of the catch at sea.

The first version of the electronic system of the ACDS (eACDS-VER.1) was developed by SEAFDEC/TD in collaboration with Brunei Darussalam as the pilot country in 2017. The prototype eACDS covers the management of the Catch Declaration (CD), Movement Document (MD), and issuance of Catch Certification (CC). However, catch reporting at sea became a fundamental problem when mobile devices operated offshore do not have internet signal. As a result, there was no monitoring system on how raw fish materials were used in the processing plants and no vessel tracking functions.

For these reasons, SEAFDEC/TD has improved the eACDS applications in collaboration with the Directorate of Fisheries (D-Fish) of Viet Nam in 2019, based on the existing paper-type Viet Nam Catch Certification for the EU market, and was pilot-tested in Binh Thuan Province, Viet Nam. The eACDS-VER.2 includes the traceability of fish in the value chain and supports the users with its new features added, including mobile apps in both online and offline modes for catch reporting at sea, which is part of the Catch Declaration process.



Figure 3. eACDS applications consist of web-based application and mobile application to cover all relevant stakeholders

The new features in eACDS-VER.2 include: 1) Request for port-out/port-in by vessel owner/fishing master via an online webpage (Figure 4); 2) Bilingual function (English - local language) for both eACDS web-based and eACDS mobile applications (Figure 5); 3) eACDS-catch report application showing the date, start, and end positions of fishing vessels (Figure 6); 4) eACDS-catch report application for transshipment at sea (Figure 7); 5) Dashboard to summarize reports of managers (Figure 8); 6) Mapping of status of a vessel: online and offline (Figure 9); 7) Information

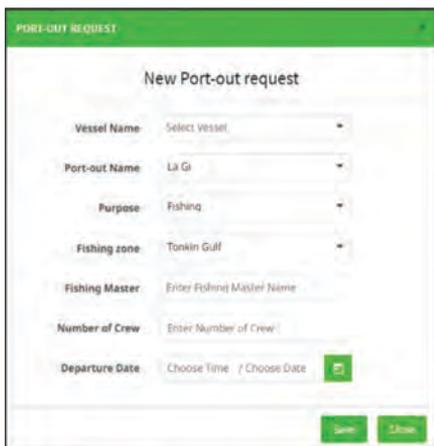


Figure 4. eACDS webpage for requesting port-out



Figure 5. Changing language in eACDS web-based application

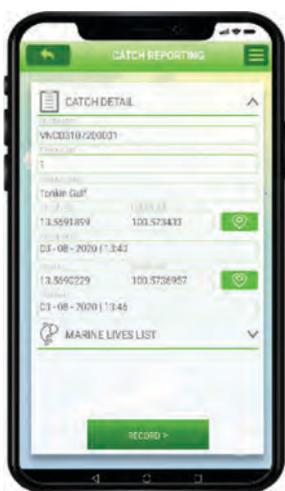


Figure 6. Inputting catch data into eACDS-catch report application

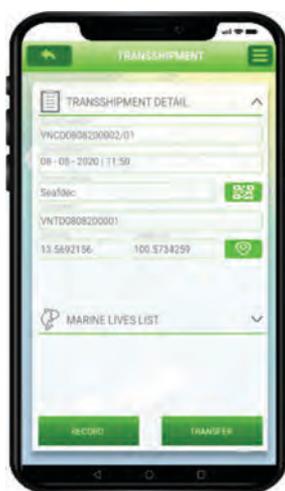


Figure 7. Inputting trans-shipment data into eACDS-catch report application

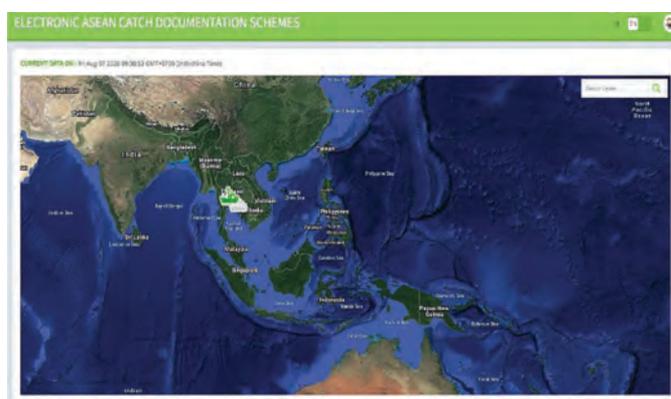


Figure 9. Status of a vessel on map (online and offline)



Figure 8. Dashboard to summarize reports of all certificate including CD, MD, SC and CC

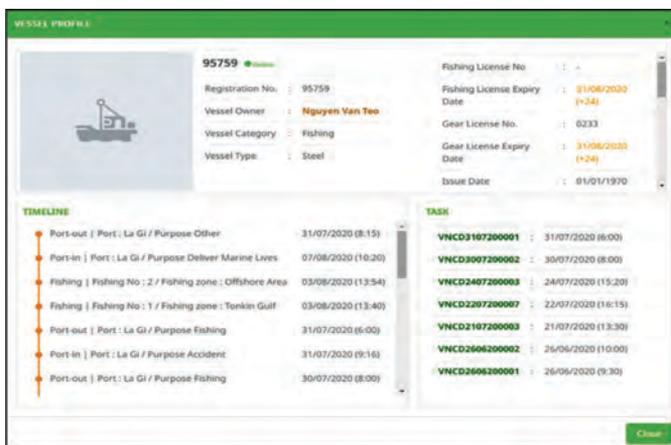


Figure 10. Vessel information and timeline of fishing vessel activities

and timeline of fishing vessel activities (**Figure 10**); 8) Vessel tracking system on eACDS (**Figure 11**); and 9) New application on mobile known as the eACDS-Market Application (**Figure 12**). Also added in the ACDS-VER.2 are other critical functions on traceability, such as the Statement of Catch (SC) for monitoring the use of raw-fish materials in processing plants.

During the succeeding years, the eACDS has also been pilot tested in Myanmar and Malaysia. The promotion and implementation of eACDS in participating AMSS, namely: Brunei Darussalam, Viet Nam, Myanmar, and Malaysia have been carried out in response to the respective countries' requests during the SEAFDEC high level meetings. The progress of implementation of the eACDS in the participating countries as of 2021 is shown in **Box 2**.

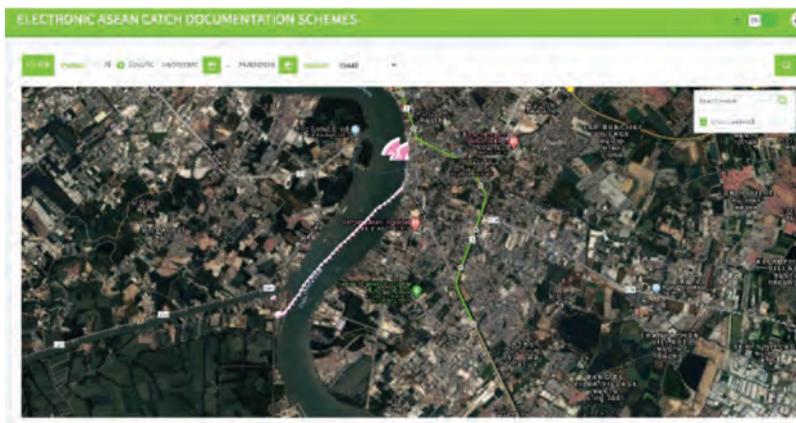


Figure 11. Vessel tracking system on eACDS application



Figure 12. List of sellers shown on eACDS-Market Application

Box 2. Progress of implementation of the eACDS in participating countries (as of 2021)

Brunei Darussalam

Choosing Brunei Darussalam as the first country to pilot test the eACDS in 2016, had an advantage because Brunei Darussalam has only one fishing port, the Muara Fishing Port which is near the offices of the Department of Fisheries, besides, not many fishing vessels had been in operation. The sea areas and fishing grounds are also clearly divided into zones so that vessels can be easily controlled and monitored. With only 3-4 processing companies in the country that purchase the raw materials from their own vessels, the challenge of Brunei Darussalam is to encourage stakeholders to use the eACDS application to issue Catch Certification, and use it for their export of fish and fisheries products even if their export may not be in large quantities. After pilot testing the eACDS in Brunei Darussalam starting in June 2017, series of consultations and on-site trainings on the use of eACDS application for all relevant stakeholders were conducted in collaboration with the Department of Fisheries (DOF) of Brunei Darussalam.

Viet Nam

In responding to the request made by Viet Nam during the 40th Meeting of SEAFDEC Program Committee in November 2017, the eACDS was introduced to relevant stakeholders in Binh Thuan Province, as the first pilot site in Viet Nam. Four sites in Viet Nam have been considered to pilot test the eACDS, namely: Phan Thiet Fishing Port, La Gi Fishing Port, Phu Hai Fishing Port, and Phan Ri Cua Fishing Port. Participated by 50 fishing vessels, the pilot test carried out several activities including discussions on the development and verification of the eACDS application, training on the use of the eACDS application through trials conducted in Binh Thuan Province as the pilot site, in collaboration with the Sub D-Fish.

Myanmar

The Council Director for Myanmar reiterated during the 50th Meeting of the SEAFDEC Council in March 2018 that Myanmar is ready to cooperate with SEAFDEC in strengthening regional cooperation to combat IUU fishing by supporting the implementation of the eACDS at the national level. To follow up on such proposition, the eACDS system was introduced to relevant stakeholders and the Department of Fisheries (DOF) of Myanmar through a discussion on the initial planning and cooperation with DOF of Myanmar for the eACDS implementation. The DOF proposed Yangon as its pilot site with the participation of two private jetties, namely: Ei Phyo Yadanar Jetty, and New Pinle Jetty, and the involvement of more than 50 fishing vessels. Training was conducted on the collection of KDEs, verification of the application to develop the eACDS database, and use of the version of eACDS application.

Malaysia

In 2019, the eACDS system was introduced for all relevant stakeholders and the Department of Fisheries Malaysia, as requested by Malaysia during the 41st Meeting of SEAFDEC Program Committee in November 2018. Two pilot sites in Kelantan and Kuantan were selected as proposed by DOF Malaysia. Initial discussion on planning and cooperation with DOF Malaysia agreed that a baseline survey would be conducted, and training would be organized for the analysis of the data as well as for the collection and verification of KDEs for the eACDS database development, and also on the use of the eACDS application.

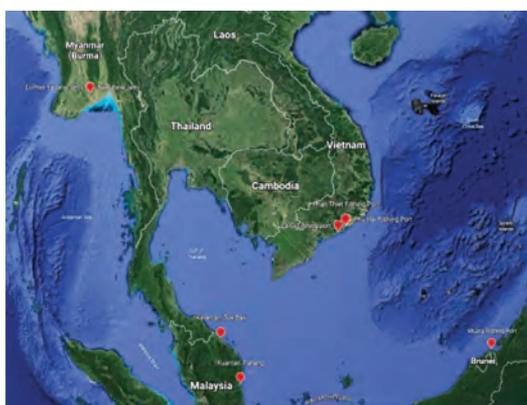


Figure 13. eACDS Project Sites in Brunei Darussalam, Malaysia, Myanmar, and Viet Nam

Development of Other Initiatives on Catch Documentation and Traceability Systems in Southeast Asia

In addition to the eACDS being promoted by SEAFDEC (Figure 13), other initiatives on CDTs have also been promoted in the Southeast Asian region, including the development of an electronic Catch Documentation and Traceability (eCDT) system by the USAID Oceans Project (a five-year collaborative project between SEAFDEC and USAID (2015–2020)). This was carried out through the establishment of a wide range of partnerships in both the public and private sector, including productive partnerships with government ministries, global seafood companies,

Box 3. Development of eCDTs and other technologies in Southeast Asia

Indonesia: had been supporting the development of national systems (*i.e.* e-logbook and Stellina) and three private sector technologies, such as:

- The **Pointrek** two-way communication Vessel Monitoring System (VMS) which was developed for large and medium-scale capture fisheries, is a web-based application at sea that can connect with Inmarsat’s satellite networks to monitor the movement of vessels, including data such as: speed, heading, distance, weather information and two-way communications. Pointrek VMS provides real-time VMS and electronic catch data via a mobile tablet, installed onboard fishing vessels (Figure 14). The system offers person-to-person communication from ship to shore by offering onboard Wi-Fi to connected mobile devices via text message, email, and the conventional SMS technology.
- **Trafiz** was developed as a mobile catch documentation application for small-scale fish suppliers and buyers that provide first data entry point for seafood products originating from small-scale fishers. Trafiz enables data collection at the landing site, allowing users to enter and submit catch data via a mobile device and cellular connectivity. Trafiz also includes value-added user functions that support loan and payment management and other tools that add user value. Trafiz therefore, supports catch reporting, as well as business functionalities that help small-scale fishers manage their business (Figure 15).
- **TraceTales** was developed to enable the processing companies to capture data throughout the processing stage (Figure 16). With the system, processors can quickly and easily compile the information that are essential to comply with the various national and international traceability requirements, thereby ensuring the company’s access to valuable export markets, as well as bring paper-based record keeping online for improved business and resource management.

Philippines: the USAID Oceans Project supported the Philippine Bureau of Fisheries and Aquatic Resources national eCDT system and one private sector to develop a technology known as the “Futuristic Aviation and Maritime Enterprises, INC. (FAME)” for small-scale vessel trackers and monitors that also serves as communication devices, enabling small-scale fishers to participate in the eCDT system and establishing increased communication and safety at sea.

- **FAME** makes use of radio frequency to send and receive information, and its gateways receive the information from transponders and sends to the cloud. Telemetry data can be sent up to 50 km offshore and can be extended farther via mesh technology between the transponders. Even if a vessel/device is out of range, but within range of another vessel equipped with a FAME transponder, the data can still be sent to a gateway. Personal communication, together with telemetry data can also be sent through the FAME transponders. FAME also provides a dashboard through a web and mobile browser-based application, allowing users to see the details of each transponder and other related data in near real-time, anywhere. The dashboard allows users to draw geofencing areas for remote areas or areas to prioritize, as well as generate custom reports with integrated graphs. FAME users can receive notifications (alerts) both to fishers at-sea and users on-shore. Fishers can use their mobile phones with USB On-The-Go (OTG) or Bluetooth to send and receive messages without mobile phone tower connectivity (Figure 17). Their platform is fully customizable and has been modified to incorporate the required Key Data Elements (KDEs).



Figure 14. Pointrek/ Inmarsat Two-Way Communication Vessel Monitoring System (VMS)



Figure 16. TraceTales System

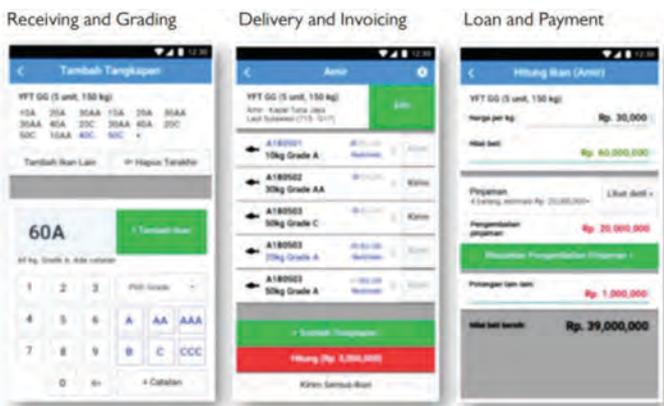


Figure 15. Trafiz (Mobile Application)

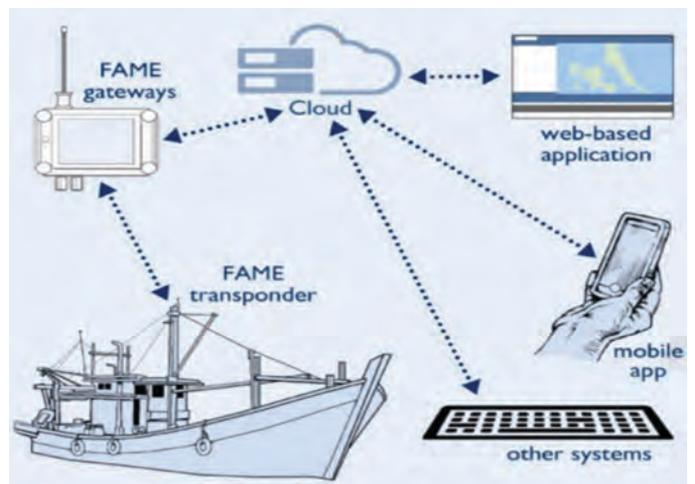


Figure 17. Futuristic Aviation and Maritime Enterprises, Inc. (FAME) Vessel Transponders Work Flow

processors, suppliers, sector associations, non-governmental organizations (NGOs), and academic institutions.

The development of such eCDTs had added to the regional momentum for action on seafood traceability where the industry (suppliers, processors, buyers) had been encouraged to invest in eCDT systems to improve the efficiency of their operations and regulatory compliance. More specifically, the USAID Oceans Project supported the development of national eCDTs and complementary private sector technologies in Southeast Asia, mainly in Indonesia and the Philippines (Box 3).

Issues and Concerns on Southeast Asian Catch Documentation and Traceability Systems

The adoption of catch documentation and traceability systems (CDTs) is a relatively new initiative in fisheries in the Southeast Asian region, and lessons on their implementation

could be learned. During the 2019 Workshop on the Technical Guidance on the Design and Implementation of Electronic Catch Documentation and Traceability Systems in Southeast Asia, issues and concerns were identified by the AMSs that could possibly hinder in their efforts to effectively adopt such CDTs (Box 4). The issues and concerns could be summarized into: inadequate capacity building not only of the human resources but also institutional, especially in IT as the traceability systems require sufficient knowledge in IT to be able to use the applications; limited mainstreaming of the concepts of eACDS or eCDTs in national policies, laws, and regulations; laws and regulations do not generally address the concerns on the need to promote traceability of fish and fishery products at national level; weak cooperation and collaboration among agencies concerned with traceability as well as with the private sector, among others. Efforts should therefore be exerted to address such issues and concerns in order that the benefits of traceability with respect to the sustainable management of the fishery resources could be realized.

Box 4. Issues and concerns on the adoption of the Southeast Asian catch documentation and traceability systems

Box 4. Issues and concerns on the adoption of the Southeast Asian catch documentation and traceability systems	
Brunei Darussalam	<ul style="list-style-type: none"> • Large volume of capture fisheries production is contributed by small-scale fishers (70 %) • Limited human resources and assets for MCS activities • Selectivity of jobs by local youth
Cambodia	<ul style="list-style-type: none"> • Limited market access due to inability to keep up with production and marketing systems of neighboring countries • Insufficient cross-border collaboration among key players • Inadequate cross-border trade regulations and means of implementing the regulations • Limited incentives for the private sector to enter into development of commercial post-harvest facilities • Insufficiency of appropriate financial resources • Absence of port-in port-out system to meet the ASEAN Catch Documentation Scheme (ACDS) requirements • Fisheries Administration being challenged by traders selling fish at sea without transmission of catch records to authorities • High numbers of small-scale fishers
Indonesia	<ul style="list-style-type: none"> • Absence of integrating data from downstream and upstream in a single national data system, to support decision making for fisheries management • Identification of responsible unit to monitor compliance • Accountability towards verification and validation processes
Lao PDR	<ul style="list-style-type: none"> • Absence of any catch documentation or traceability system • Recording of information includes only the amount of sale at landing sites • Fishing ports consist mainly of small local landing sites along the Mekong River, reservoirs and lakes • Fisheries sector is characterized by 95 % small-scale fishing activities • Inadequacy of necessary resources • Inadequate capacity building programs for staff
Malaysia	<ul style="list-style-type: none"> • Only 6 states implement Catch Certificate - Penang, Perak, Selangor, Johor, Pahang, and Sabah • Need for additional resources (manpower, financial) necessary for monitoring, auditing, and verification • Need for training of new officers and conduct of refresher courses for existing officers • Key Data Elements are collected more than once through different forms managed by different agencies with very limited scope for data sharing, resulting in lack of proper consolidation and organization of these KDEs under one eCDTs platform • Current approach to CDT is very compartmentalized within government and should be streamlined • CDT is not yet officially mandated or streamlined under any policy, across fisheries in Malaysia
Myanmar	<ul style="list-style-type: none"> • Fisheries sector is characterized by predominantly vessel type(s) for offshore fisheries (trawlers) • Catch documentation and traceability system is largely paper-based • Low interest of policy makers and decision makers in the fisheries sector • Insufficient technical capacity and financial resources • Inadequate post-harvest facilities

Box 4. Issues and concerns on the adoption of the Southeast Asian catch documentation and traceability systems (Cont'd)

Philippines
<ul style="list-style-type: none"> • Lack of appreciation of CDT as a mechanism for sustainable fisheries development • Need to harmonize CDT systems of trading partners in the development of IT system for CDT in the Philippines • Catch documentation is mainly paper-based and primarily for business dealing purposes • Non-uniform methodology for data capture, storage, and sharing; differences in terminology used by different players along the chain; and differences in the types of data captured and transmitted by different players along the chain • Restrictive policies and unsupportive governance • Subscription or adherence to several standards dictated by international markets and other international and non-regulatory standards which have their own lists of certification requirements • Compliance with regulations and certification requirements are considered labor and resource intensive • Inactions on the part of the government agencies tasked with regulating food systems hamper the maturation of technologies and standards necessary for achieving whole-chain traceability • Lack of buy-in and commitment to implement an electronic CDT system by both small- and large-scale sector stakeholders • Limited awareness of the CDT system brought about by the diversity of nature and technology (e.g., computers, smartphones) and multiplicity of fishing gear and target species of the small-scale fisheries sector • Limited capacity to pay for increased CDT, particularly in the case of small-scale fishers • Inadequacy of needed skills and human capacity • Absence of trust among companies to participate in the implementation of CDT system which they believed could result to data breach
Singapore
<ul style="list-style-type: none"> • Limited domestic fishing grounds • Extensive species and sources of seafood imports • No commercial fishing
Thailand
<ul style="list-style-type: none"> • Ability and willingness to adopt technology that is not compulsory, depend on the personalities and progressiveness of boat captains and owners • Fisheries regulations of Thailand including VMS requirements have been changing frequently in recent years causing mistrust in the government • Insufficient technical capacity and interest of fishers on the technology (as suggested by the following findings during the pilot testing of the Hi-Chat application and e-logbook technology), e.g. the use of e-logbook technology, for some older captains who are resistant to change and end up designating the filling of the e-logbook to a crewmember, although most boat captains use the Hi-Chat application, so that the problem is more on users' interest rather than technical capability • Companies are wary of authorities getting data for the eCDT, implying the need for bridging over through incentives, demonstrating the benefits, and so on • Need improvements in terms of the number of KDEs collected by the e-logbook system, as additional data points are necessary for the system to be compatible with the CDT system in use by the Department of Fisheries of Thailand, and with other international standards—including USAID Oceans' recommended point of production KDEs • Needs value proposition analysis based on the evaluation of efficiencies and benefits • Unclear cost-sharing structure
Viet Nam
<ul style="list-style-type: none"> • Fisheries sector is characterized by small-scale fishing (71 % small vessels) • Low awareness of fishers on IT • Limited application of IT for the CDT • Country's catch documentation system is mainly paper-based up to the point of the processors • Low awareness of the need for CDT on the part of fishers and limited application of IT for CDT

Way Forward

Among the major benefits of traceability include the prevention of damages to human health due to food safety concerns, in terms of illness or death, as the distribution of the contaminated products is avoided. Furthermore, if the source of the problem and the precise batches of contaminated products could not be identified, then the food business operator concerned will be obliged to withdraw and destroy all batches which could have been potentially affected. Promotion of traceability which provides the tool to address the aforesaid issues, should therefore be enhanced.

Moreover, traceability can improve stock control and reduce out-of-date product losses, lower inventory levels, quicken the identification of process and supplier difficulties, and raise the effectiveness of logistics and distribution operations. In the longer term, better food safety management resulting from improved traceability, provides greater guarantee in terms of sustained market access and buyer confidence. Improved customer confidence also helps with branding and improved brand equity. In this regard, traceability should be promoted as a marketing tool, by providing customers with unique information about the products they are buying and their origin. This also implies the need for the AMSs to consider the development and improvement of their traceability systems that could complement those of the importing

countries not only in commercial/large-scale fisheries but also by exploring appropriate approaches for the small-scale fisheries in coastal and inland waters through the use of new technologies that support traceability processes and systems. This would enhance the intra- and inter- regional trading of fish and fishery products. More specifically at the regional level, AMSs should harmonize the catch documentation scheme importer's requirements (paper-based and electronic), including IT Catch.

Furthermore, the AMSs should move toward ensuring compatibility and linking of data in the future for the traceability processes and systems. This would necessitate the development of new projects or additional activities for the existing relevant projects being implemented in the Southeast Asian region.

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