The Oceans and Fisheries Partnership (USAID Oceans)

eLogbook Implementation:
Benefits, Industry Perception, and Opportunities

Case Study | February 2020

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

AP2HI	Indonesian Pole & Line and Handline Fisheries Association
CCDS	Catch Certificate Derivative Sheet
CCIS	Catch Certificate Initial Sheet
CDT	Catch documentation and traceability
EU	European Union
FIS	Fisheries Information System
GT	Gross tons
IUU	Illegal, inreported, and unregulated
LoV	Letter of Verification
MDPI	Masyarakat dan Perikanan Indonesia
MMAF	Ministry of Marine Affairs and Fisheries
SIMP	Seafood Import Monitoring Program
USAID Oceans	USAID Oceans and Fisheries Partnership
VMS	Vessel Monitoring Systems

EXECUTIVE SUMMARY

Historically, catch documentation and traceability (CDT) systems in Indonesia's fishing industry have been paper-based. Paper-based CDT systems pose numerous challenges in terms of data accuracy and completeness, analysis, and transparency. To improve its CDT system and increase compliance with fishing regulations, the Indonesian Ministry of Marine Affairs and Fisheries (MMAF) developed an electronic logbook, or "eLogbook," application to digitally capture and compile data within the fisheries supply chain. In October 2019 at the *Our Oceans Conference* in Bali, Indonesia, MMAF publicly committed to launching the eLogbook application in the country's fishing industry. As of May 2019, with support from the USAID Oceans and Fisheries Partnership (USAID Oceans), the eLogbook was employed by approximately 4,900 vessels nationwide.

The launch of eLogbooks in Indonesia represents an important step in the advancement of the country's fisheries data management. As these electronic records replace unreliable paper logbooks, data quality is expected to improve and data collection across the archipelago streamlined. By offering a streamlined, data rich application that captures information that is useful for vessel owners and captains, MMAF will boost the incentives for eLogbook compliance and support increased productivity in the fisheries industry while decreasing illegal, unreported, and unregulated (IUU) fishing incidence. And by simplifying, digitizing, and integrating the catch and export documentation process while simultaneously implementing eLogbooks, both MMAF and industry actors can increase efficiency and refocus their efforts on capturing a greater share of international export markets. If executed well, eLogbook implementation, combined with a digital documentation system, will significantly improve MMAF's data collection while reducing costs for both the government and private sector.

This case study looks at the implementation of eLogbooks in Indonesia, including challenges, limitations, and opportunities. By maximizing industry participation and the positive impacts of eLogbook implementation, MMAF has the opportunity to transform eLogbooks from simply another compliance requirement into a useful business tool.
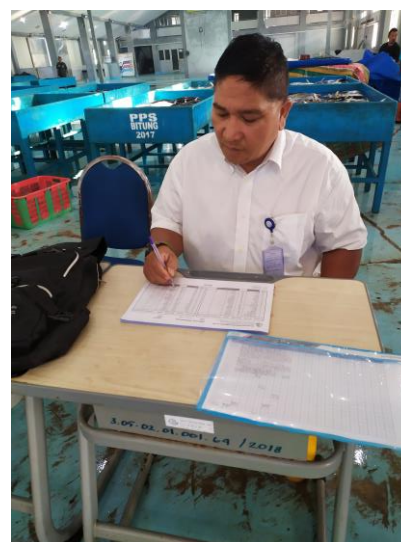
1. INTRODUCTION: eLOGBOOK IMPLEMENTATION AND INDUSTRY PERCEPTION

Catch documentation and traceability (CDT) systems in Indonesia's fishing industry have historically been paper-based. Paper-based CDT systems pose numerous challenges in terms of data accuracy and completeness, analysis, and transparency. To improve its CDT system and increase compliance with fishing regulations, in October 2018, the Indonesian Ministry of Marine Affairs (MMAF) developed and implemented an electronic logbook, or "eLogbook," with support from the USAID Oceans and Fisheries Partnership (USAID Oceans). The application was designed to digitally capture and compile data within the fisheries supply chain and was introduced under a pilot project in November 2018. As of May 2019, the eLogbook application was employed by approximately 4,900 fishing vessels nationwide.[1]

The introduction of eLogbooks in Indonesia presents both opportunities and challenges for the country's fisheries industry and its regulators. These new eLogbooks will replace paper logbooks that have long been in use across the country. Data from the paper logbook system is widely considered to be unreliable. Captains/fishers often complete these analog records after arriving at port even though they are meant to do so while at sea. It has also been reported that traders buying fish regularly fill out paper logbook data rather than the captains/fishers themselves, which further compromises the accuracy of information. This situation, along with weak enforcement, results in incomplete or aggregated logbook data rather than complete documentation, including the correct date, time, location, and estimated tonnage of each catch event.

Example of a paper-based logbook being used to capture data at port. Photo: USAID Oceans/L Bader

By contrast, eLogbooks, which are submitted via a mobile application, must be completed at sea at the time the gear is set and when the harvest is hauled in. If fishers attempt to complete the eLogbook after they have returned to port, their submission will be flagged because of the GPS position, and they will receive a warning from MMAF. When completed at sea, the timing and location of each event is automatically logged by an on-board device, typically a smartphone or tablet. This technology could significantly improve the quality of catch data captured across Indonesian fisheries.

MMAF is the primary beneficiary of eLogbook implementation. Compiling and analyzing data from paper-based fisheries logs across the archipelago is an enormous, time-consuming, and expensive task that has historically caused considerable delays in publishing and understanding Indonesia's fisheries outputs and trends. Not only do eLogbooks allow for more accurate data

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[1] MMAF presentation: "Progress and Planning of Electronic Fishing Log Book in Indonesia." 2019.

collection, they can significantly reduce the time lag and expense associated with collecting information at the fishery level. In turn, improved and timely data collection can contribute to accurate stock assessments and inform management measures such as harvest strategies and harvest control rules.

The secondary benefits of eLogbooks are related to export markets. For example, improved data accuracy could contribute to recognition among foreign buyers that Indonesia's fisheries are well managed and thereby increase their willingness to source from them. In addition, enhanced data as well as the reputational benefits associated with eLogbooks generally reduce the risk of being issued a "yellow card" by the European Union (EU).[2] Finally, better catch data enhances the ability of seafood processors, exporters, and importers to meet international traceability requirements, particularly for the United States and EU. The ability to reliably demonstrate the origin of the fish in their supply chains is vital for companies to receive a catch certificate granting access to EU markets and for complying with the U.S. Seafood Import Monitoring Program (SIMP).

In May and June 2019, on behalf of the USAID Oceans and Fisheries Partnership (USAID Oceans), representatives from Marine Change interviewed industry actors that had been piloting eLogbook since November 2018 to understand the perceived benefits of launching eLogbooks in Indonesia and the shortcomings of implementation to date. Interviewees were industry representatives from eight fishing and fish processing companies based in Bitung. These companies, all members of the Indonesian Pole & Line and Handline Fisheries Association (AP2HI), were selected based on their first-hand experience using eLogbooks (fishing companies) and/or their knowledge of export markets and the associated traceability and documentation requirements (processing and exporting companies). Their location in Bitung makes their feedback particularly useful as the local harbormaster has required eLogbook use for all vessels above 10 gross tons (GT), while nationally the requirement since November 2018 is only for vessels above 30 GT.[3]

As part of this case study, representatives at MMAF and USAID Oceans[4] were also interviewed to further understand the context of eLogbook implementation. In addition, staff from Masyarakat dan Perikanan Indonesia (MDPI), a local non-profit organization that works with small-scale fisheries, were interviewed regarding their experience working with partners that export seafood products to the United States. During the course of interviews with industry, government, and civil society, a number of challenges in the design and launch of the eLogbook were reported.

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[2] A "yellow card" is a designation issued by the EU that identifies a country as not cooperating in the fight against IUU fishing. (Source: http://www.iuuwatch.eu/tag/red-yellow-carding/)
[3] Provincial governments have regulatory authority over vessels below 30 GT while vessels above 30 GT are under national-level jurisdiction.
[4] USAID Oceans supported MMAF to pilot eLogbook in Bitung.

2. INDUSTRY PERCEPTION OF eLOGBOOK IMPLEMENTATION: CHALLENGES AND LIMITATIONS

2.1   Limited Access to eLogbook Data

The most common feedback from users was that eLogbook catch data is no longer available to the user once it has been logged and submitted. Instead, the user simply receives an autogenerated email from MMAF stating that data was received, without any indication of what data was submitted and whether there were any problems or omissions. An additional email is later autogenerated if data issues are identified. Once the data has been reviewed by the harbormaster, the fishing company is issued a paper Letter of Verification (LoV, or Lembar Verifikasi Penyerahan Data eLogbook) that includes the tonnage, species, and date of catch, but does not include GPS coordinates. If a company would like access to its eLogbook data, it must submit a letter to MMAF in Jakarta formally requesting access. These limitations to data access have driven some fishing companies to keep duplicate records—both eLogbooks submitted via the application and paper logbooks kept as a reference for internal bookkeeping and accounting. This creates an additional burden for companies and if resolved could be a driver for increased industry participation, compliance, and incentive to enter timely and accurate data.

Apart from avoiding the burden of filling out their logbooks twice, providing companies access to their digital data would allow fishers, captains, and company owners to easily reference detailed catch trends, which could potentially improve catch efficiency and industry performance. It is simply too cumbersome to undertake such analysis using data from paper logbooks.

2.2   eLogbook Registration Requirements

The barriers to registering to use eLogbook was another barrier for vessel owners. To begin using the eLogbook system, every vessel owner must physically visit the nearest port and register with the harbormaster, locally referred to as a *syahbandar*.[5] For the many vessels operating in remote areas with no nearby port, this severely limits their ability to participate in eLogbook implementation. Online eLogbook registration for vessels already registered/licensed by MMAF would enable greater uptake of the eLogbook.

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[5] For full list of Indonesia's 96 ports, see http://hubla.dephub.go.id/unit/upt/kesyahbandaran-dan-otoritas-pelabuhan.aspx. Based on a MMAF presentation in May 2019, 51 ports are currently eLogbook ready.

2.3   Catch and Export Documentation, >20 GT Vessels

Implementing eLogbooks has not yet eased the process of obtaining catch or export documentation. Under the paper logbook system, users must physically bring a paper logbook to the syahbandar and have it verified, signed, and stamped—even if the data in the paper logbook is incomplete. Once the paper logbook is approved, fishing companies then must obtain a catch certificate for export, a Catch Certificate Initial Sheet (CCIS).[6] The CCIS includes data derived from logbooks, including species, tonnage, date range of the catch, vessel registration information, and the Fisheries Management Area of the catch. It does not include specific location data such as GPS coordinates where the catch was reeled in.

For fish to be processed and exported to countries with traceability requirements, principally the EU, US, and Australia, the processing company must obtain a Catch Certificate Derivative Sheet (CCDS).[7] Securing a copy of the CCDS requires the exporting company to physically visit the syahbandar with a request letter and the CCIS forwarded by the fisher or fishing company. If the fisher or fishing company does not have or does not wish to provide a CCIS then the processor has no way of securing a CCDS and accessing these international markets.

Technically, eLogbooks make it possible to conduct each of these steps online without the need for the fishing company to provide any hard copies to the processor/exporter, but in practice this is not yet the case. Such streamlining would save time and money for both industry and regulators.

A fisher uses an onboard VMS. Photo: USAID Oceans

An additional way to modernize the documentation process for all parties involved would be to algorithmically compare data from vessel monitoring systems (VMS), currently required on vessels above 30 GT, with data from eLogbooks. This process is still reportedly done manually on a case-by-case basis at the syahbandar office, which is slow, costly, and likely leads to mistakes and a lack of oversight.

2.4   Catch and Export Documentation, <20 GT Vessels

For catch originating from vessels below 20 GT, processors must apply for a simplified CCDS to export to countries with traceability requirements. As implied by its name, a simplified CCDS requires less documentation than a standard CCDS; it only requires a receipt of fish purchase, a packing list invoice from the company, and an LoV.

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[6] Ministerial Decree PER.13/MEN/2012.

[7] Only the EU legally requires the CCDS, while Australian companies rather than the government itself reportedly require this document. While the US does not specifically require a CCDS, the documents underlying CCDS data must be available in case of a SIMP audit. Based on industry interviews, there appeared to be some confusion over what export documents are actually required, so in practice the CCDS is used for these export markets.

For the significant number of coastal communities not served by a nearby syahbandar, a government-appointed "Local Competent Authority" must issue a paper LoV, and a trained and certified "Designated Certification Officer" must travel to the landing site to process the CCDS. To receive these reports, a copy of the fisher's license, or proof of vessel registration in the case of small-scale fishers, is required.[8,9]

Most vessels under 20 GT are operated by small-scale fishers who often work in remote areas and do not land their catch at ports but rather on small landing sites across the archipelago. In these areas there are few if any government-appointed representatives who can register vessels, verify landings, process catch documents, or issue health certificates. This serves as a de facto trade barrier and discourages export-focused companies from sourcing from these fishers. A fish processing company that sources yellowfin tuna from small-scale fishers in Maluku reports that its supply chain has been audited by the U.S. National Oceanic and Atmospheric Administration under SIMP and its produce can be exported to the US. However, the company is still unable to acquire an EU catch certificate because local government is unable to send staff to verify the catch.

As with larger vessels, if the catch documentation process were moved online with the assistance of eLogbooks, it would allow small-scale fishers in remote areas improved access to export markets, lower regulatory costs, and improve data collection for the government.

2.5   Limited Systems Integration

In the course of the research, it also became apparent that there is a lack of integration between MMAF's eLogbooks and other electronic data systems used on vessels. In many cases, industry members are beginning to invest in at-sea and on-land traceability technologies that offer operational efficiencies and business management benefits that the eLogbook system cannot offer. For example, eLogbook data captured by a private VMS, such as,[10] cannot feed into MMAF's eLogbook application. Thus, Pointrek users must keep parallel, duplicate eLogbooks. Allowing data entry from other, private sector technology solutions would encourage system participation, adoption, and improved accuracy.

A installs the Pointrek system onboard a vessel. Photo: USAID Oceans/Frengky Sihombing

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[8] What constitutes a "small-scale" fisher differs between government ministries due to conflicting fisheries laws, which variously define small-scale fishers as those who catch fish using vessels up to 5 GT, 7 GT, or 10 GT. The differences of interpretation of what constitutes "small-scale" has made it difficult for these fishers to properly register their vessels.

[9] Health Certificates are also required for consignments shipped to the EU.

[10] Pointrek is a two-way VMS integrated with a mobile and desktop application that allows transmission of text-based messages, electronic logbooks, and real time vessel tracking data via narrowband satellite connection.

Integrating data from other technology solutions into the eLogbook system would also strengthen the technical capabilities of the eLogbook technology, such as connectivity. A significant proportion of Indonesian vessels are out to sea for extended periods, sometimes for months at a time, before returning to port. However, eLogbook systems can only transmit data via land-based mobile phone networks. As a result, eLogbook data is not submitted in a timely manner and for vessels that transship at sea the fish will often arrive at port before the eLogbook data. In this situation paper logbooks must still be used, with all of their associated shortcomings. For vessels that travel for long periods and are equipped with VMS that send and receive data via satellite,[11] eLogbook data could also be sent alongside VMS data.

2.6   eLogbook Application Design

One key challenge reported by captains who have used the eLogbook application since its launch in November 2018 was the difficulty of filling out eLogbook data immediately after the catch had been hauled on board. At the time of catch, they are often performing multiple tasks and maneuvering the vessel. Recording the time and place of each gear setting is relatively simple and not problematic—the difficult and time-consuming task can be the entry of catch and species estimates. Once the catch event is initiated on the app, captains are not clear on how much time they have available to fill in that data and fear a citation from MMAF if they do not complete it within the (unknown) allotted time. They indicated that having a one-hour window after catch would help them complete the data requirements while performing their normal duties.

Captains also reported that distinguishing which species they have caught relative to the species available for input in the application was another issue. The application is in Bahasa Indonesian, but captains usually refer to the species—even common species such as neritic tunas—in their local language and may not know the Bahasa Indonesian name. A picture glossary of different species would ameliorate this issue.

Captains also noted that if a mistake is made, there is no way to revise the data. The only option in the application is "Next." Providing a "Back" button would address this issue.

Finally, the application was built as a one-size-fits-all for all gear types,[12] making it difficult to use and unable to capture all relevant data, such as bait for pole and line vessels. This challenge could be addressed by modifying the input options, so they change depending on a selected gear usage.

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[11] According to Ministerial Decree no 42/PERMEN-KP/2015 any fishing vessel above 30 GT must have VMS, though many of these vessels have only one-way VMS that is unable to transmit eLogbook data.
[12] According to Ministerial Decree no. 48/PERMEN-KP/2014 there are three approved logbook formats based on gear type.

3. eLOGBOOK IMPLEMENTATION OPPORTUNITIES

To maximize industry participation and the positive impact of eLogbook implementation, MMAF has the opportunity to transform eLogbooks from simply another compliance requirement into a useful business tool.

Taiwan is a useful case study to illustrate the opportunity. In October 2015, Taiwan was issued a yellow card by the EU, prompting various reforms by the country's regulators, including the mandatory use of eLogbooks for daily catch reporting. To incentivize industry adoption of eLogbooks onboard vessels—most of which are longliners operating in distant water fisheries in the Pacific Ocean—the Taiwanese government introduced a free smartphone application that allows vessel owners to track the position, heading, and catch of their fleet in real time using two-way VMS data and to analyze historical catch and GPS data. During a research visit to Taiwan related to at-sea technology, multiple vessel owners took out their phones without prompting, opened the application, and described how useful the combined VMS and eLogbook data was for fleet management.

During the interviews with industry representatives in Bitung, the owners of two large fishing companies that use Pointrek separately indicated that the application, which is very similar to the government application used in Taiwan, helps them manage their fishing operations. By analyzing historical catch and position data, vessel owners and captains are able to make better informed decisions regarding precisely which areas to target and when those areas are best targeted. While this data is theoretically available to companies when they use paper logbooks, the datasets are usually so large that it is impractical to perform meaningful analysis without first digitizing the data, which is expensive and time consuming.

The fully integrated digital documentation system—the Fisheries Information System (FIS)—that is currently in place in the Maldives, an archipelagic country with fisheries challenges similar to those in Indonesia, provides another useful case study. Launched in 2016, FIS is a centralized government database for monitoring and managing eLogbooks, catch and effort, fish purchase data, fishing vessels and licensing, and the issuance of catch certificates and export documentation. The system was developed to streamline fisheries data collection, increase export market access, and provide transparency to both regulators and international buyers. Additionally, data from the system meets the regional fisheries management organization's reporting requirements.

Figure 1: Overview of Maldives Fisheries Information System (FIS)

By offering an eLogbook with a streamlined, data rich application that captures information that is useful for vessel owners and captains, MMAF will boost the incentives for eLogbook compliance and support increased productivity in the fisheries industry while decreasing illegal, unreported, and unregulated fishing incidence. And by simplifying, digitizing, and integrating the catch and export documentation process while simultaneously implementing eLogbooks, both MMAF and industry actors can increase efficiency and refocus their efforts on capturing a greater share of international export markets. If executed well, eLogbook implementation, combined with a digital documentation system, will significantly improve MMAF's data collection while reducing costs for both the government and private sector.

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