

MARKET ACCEPTANCE BASED ON COMPLIANCE WITH EUROPEAN UNION REGULATIONS: TRACEABILITY STUDY FOR THE TUNA AND TUNA-LIKE SPECIES PROCESSING INDUSTRY IN INDONESIA

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ABSTRACT

This study aimed to suggest improvements in the traceability practices for Indonesian tuna and tuna-like species products to comply with regulation (EU) 2023/2842 (the amendment of Fisheries Control Regulation) and to emphasise the transformation of paper-based catch certificates to a complete digital system by mapping the current traceability. The impact of regulation (EU) 2023/2842 on non-EU countries was reviewed in this study. An Icelandic traceability scheme based on the General Food Law Regulation (EC) No. 178/2002 was observed and compared to the Indonesian scheme to identify the gap. The results show that the current supply chain of tuna and tuna-like species in Indonesia meets the legal requirements for traceability in the EU, referring to Council Regulation (EC) No 1005/2008. It has also met the standards of food safety in the EU by implementing Council Regulation (EEC) No. 315/93 and the hygienic requirements related to sanitary and phytosanitary (SPS) conditions and microbiological criteria of the final product. The Icelandic traceability system shows that the vertical integration of information technology managed by the Directorate of Fisheries facilitates the effective transfer of fish traceability information from vessels to processing plants. This study compares the traceability systems in Indonesia and Iceland and suggests improvements for the current situation in Indonesia in transferring information on fish batches as raw materials from a paper-based (delivery note/purchasing note) system to an electronic system in the processing plant to address the amendment of the Fisheries Control Regulation. This study also suggests that adopting a Global Returnable Asset Identifier (GRAI) for the insulated box or the built-in hatch in a boat for one-day tuna fishing will facilitate tracking and make transferring information from GRAI to Global Trade Item Number (GTIN) more accessible.

Keywords: Traceability systems, tuna supply chain, EU fisheries regulations, digital catch certification, Indonesia – Iceland comparison.

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1 INTRODUCTION

1.1 Background

European Union (EU) countries import tuna and tuna-like species to fulfil domestic needs for retail purposes or further processing by processing companies. In 2022, tuna accounted for 10% of the total volume and value of fish imported into the EU, with a 1% increase in volume and a 29% increase in value compared to 2021 (EC, 2024c). Skipjack tuna accounted for 53% of the imported volume and 49% of the imported value, followed by yellowfin tuna, which accounted for 32% of the volume and value (EC, 2024c).

The average Indonesian skipjack tuna and tuna production of 500 thousand tons and 337 thousand tons, respectively (MMAF, 2024), contributed to an average export value of US\$ 88,34 million to the EU between 2018 and 2022 (ITC, 2024). The products were manufactured from approximately 55 tuna processing plants out of 178 fish processing plants that received approval from the EU (EC, 2024a). Most of the tuna landed from vessels with a maximum size of 30 gross tons (GT) (20 m length), equipped with handline and pole-and-line fishing gear, are considered small-to medium-scale fisheries. Fishing boats of < 5 GT for one-day fishing contribute to 7,67%, and boats of 5 – 30 GT contribute to 66,08% of the total fishing vessels (11.104 units) (MMAF, 2020).

The European Union (EU) has established Regulation (EU) 2023/2842 to amend Regulation (EC) No. 1224/2009 (Fisheries Control Regulation). The amendment will ensure a more harmonised fisheries control system and better preserve marine resources by transitioning to a complete digital traceability system and modern data management methods. The regulation was enacted on 9 January 2024 and will enter into force on 10 January 2026 for fresh and frozen fish and 10 January 2029 for prepared and preserved fish (canned products) (EU, 2024). To achieve full digital traceability, the new rules now mean operators must retain information across the supply chain, from the sea to the plate. The new rule includes everything from the first sale to the retail stage of fisheries and aquaculture products. According to the EU announcement, full digital traceability for fish and fish derivatives is intended to reinforce food safety, ensure fairer competition, and combat Illegal, Unreported, and Unregulated fishing (IUU fishing).

The European Commission (EC) establishes import conditions for fishery products and shellfish (bivalve molluscs) that are equal for EU member and non-EU countries. This condition aims to provide safe food to EU citizens by implementing the principle of quality management and process-oriented controls throughout the food chain, from the fishing vessel or aquaculture farm to the consumer's table (EC, 2024b). Indonesia's tropical climate and temperatures can accelerate protein degradation and histamine formation faster. Implementing a cold chain system for each catch batch is necessary to maintain fish quality and as a first step to avoid border rejection in EU countries.

The processing sector needs to be integrated with the European Article Number (EAN) to implement a traceability system for selling fishery products in the European market. The

International Article Number (EAN) is a standard describing a barcode symbology and numbering system used in global trade to identify a specific retail product type in a specific packaging configuration from a specific manufacturer (ECoC, 2024). The EAN coding system provides product traceability by presenting the flow of information between trading partners during the supply chain. Compared to the non-coding movement of goods, the EAN coding system reduces expenses in the warehouse and during the logistics process through data interoperability. The EAN's role in traceability is to track fish products from the manufacturer to the retail point of sale.

Digital traceability in the amendment of the Fisheries Control Regulation will significantly impact Indonesia's tuna and tuna-like species capture fishery, as small—to medium-scale fisheries are dominant. Before the amended regulation is applied, the transformation from paper-based to digital must be carried out along the supply chain. The transitional provisions will leave sufficient time for the EU's fishing authorities and other relevant stakeholders to adapt to the new requirements.

1.2 Rationale

The project is relevant for developing the fisheries sector in Indonesia by reshaping the traceability approaches for exporting tuna and tuna-like species products from their origin to the consumers in EU countries, as the amendment of the Fisheries Control Regulations will come into force.

Ensuring traceability through appropriate labelling to present information about the origin of the fish and the series of processes in manufacturing and delivering final products to consumers is essential to comply with the regulation.

This project will be used to suggest the most effective traceability scheme, particularly for tuna and tuna-like species products, responding to Regulation (EU) 2023/2842 (the amendment of Fisheries Control Regulation) to ensure that export products from Indonesia are compliant and accepted by the EU market.

1.3 Objectives

This study aims to:

1. Present an overview of Regulation (EU) 2023/2842 (the amendment of Fisheries Control Regulation).
2. Map current traceability of tuna and tuna-like species products in Indonesia.
3. Suggest changes in the traceability practices for Indonesian tuna and tuna-like species products to comply with new regulations.

2 LITERATURE REVIEW

2.1 Traceability

2.1.1 Definition of traceability

Traceability, as defined in ISO 8402 (1994), is the ability to trace the history, application, or location of an entity using recorded identifications (ISO, 1994). In ISO 9000 and ISO 22005, the definition of traceability is slightly less specific, as the ability to trace the history, application, or location of that which is under consideration (ISO, 2007).

The Codex *Alimentarius* Commission explained *traceability* as the capability to follow the movement of food through specific stages of production, processing and distribution (FAO, 2017). Regarding the definition provided, traceability in the fish processing industry in terms of quality is an information system that tracks the condition of products, starting from the origin of the fish and ingredients to the destination of the product. This includes materials contained within a product that meet food and safety standards.

Regulation (EC) No. 178/2002, laying down the general principles and requirements of food law, defines traceability as the ability to trace and follow a food, feed, food-producing animal, or substance intended to be or expected to be incorporated into a food or feed, through all stages of production, processing, and distribution (EC, 2002).

Academic perspectives contribute to a thorough explanation of traceability based on the research conducted. (Moe 1998) defined traceability as tracking a product batch and its history through the whole or part of a production chain from harvest through transport, storage, processing, distribution, and sales. (Olsen & Borit, 2013) defined traceability as the capability to access information related to things to be considered throughout their life cycle using recorded identification. Another definition of traceability is given by Millard et al. (2015), who state that traceability is the ability to follow the movement of a food product and its constituents up and down the food chain to prevent unsafe foods from reaching consumers.

2.1.2 The importance of traceability

The number of costly food scandals which received wide media attention worldwide has been the main driver of improving product traceability (Olsen & Borit, 2013). Some consumer studies have reported that consumers' need for access to additional product information, such as catch and environment, is increasing (Viðarsson et al., 2015). There is also a need for transparent information on sustainability due to the high dependence of seafood imports to EU countries to obtain sustainability status of seafood products and whether they are free from Illegal, Unreported, and Unregulated (IUU) fishing, where someone is fishing without a licence or quota, authorised by relevant authorities (Sotelo et al., 2023).

2.1.3 Types of traceability

Two categories of traceability are commonly discussed under the same heading. Internal traceability refers to the traceability of a product within a company, whereas external traceability refers to product information through all links in a supply chain (chain traceability) (Moe, 1998). Various systems can be used to implement traceability within a processing plant

or along a supply chain, each with its own benefits and disadvantages. Common traceability systems are paper-based, computer-based, bar code-based, and radio frequency identification (Marshall, 2004). Tracking is the ability to follow the downstream path of a product along the supply chain, while tracing refers to the ability to determine the origin and characteristics of a particular product, obtained by referring to records held upstream in the supply chain (Bechini et al., 2008)

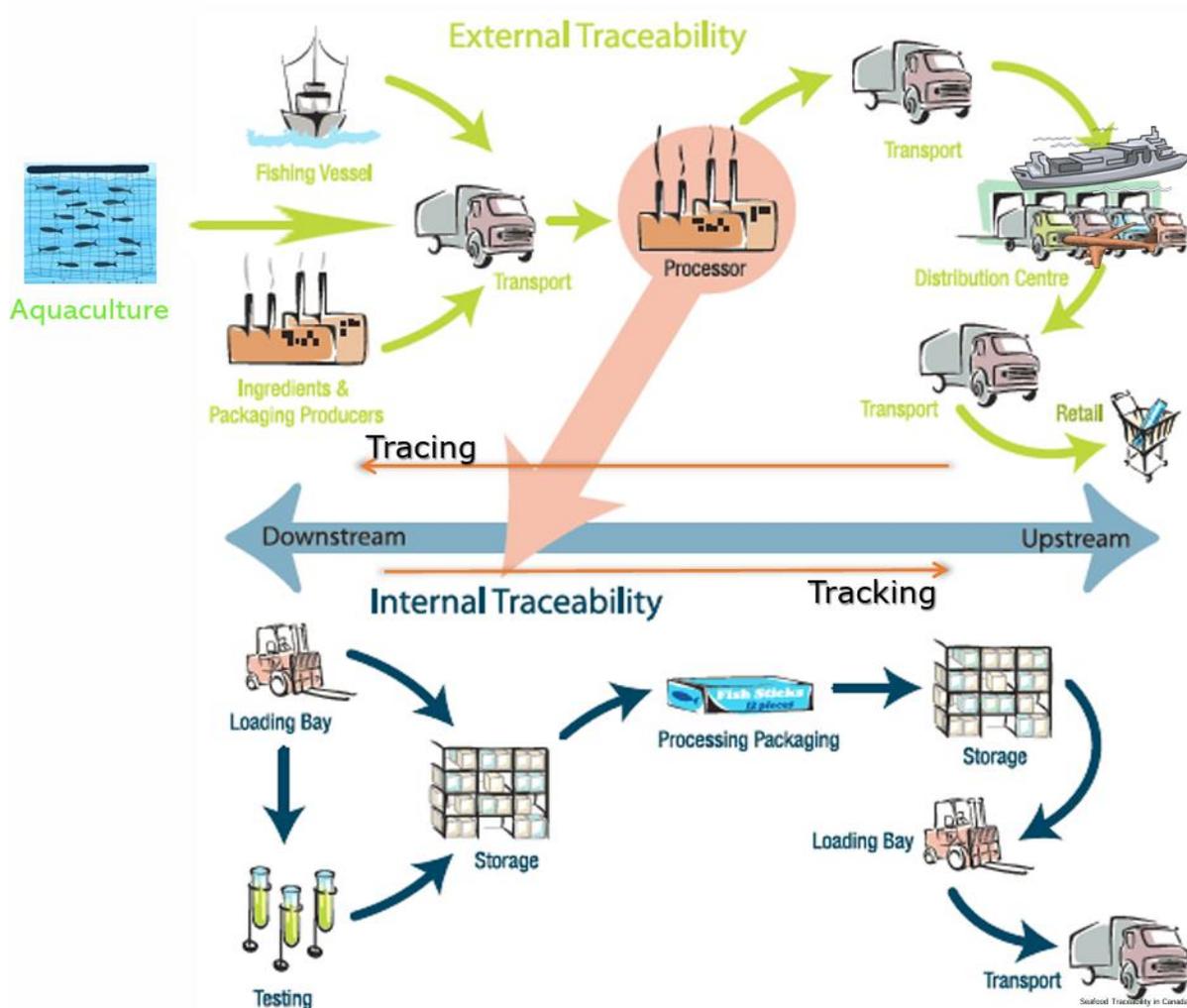


Figure 1 Internal and external traceability (Magera & Beaton, 2009)

2.1.4 Challenges

Increasing local and global demands for regulations regarding environmental concerns, aquaculture and trawler fisheries sector, and IUU fishing are prerequisites for a healthy planet, and communities are leaving uncertainty for sustainability and a high number of different certification schemes (Olsen & Borit, 2013). The complexity of modern global value chains and the development of traceability systems mean that interoperability between systems in the entire chain is essential to seamlessly exchange and interpret key data elements across all critical tracking events in the supply chain (Bhatt et al., 2016). The complexity and diversity of

seafood supply chains mean that implementing traceability systems remains a significant challenge for the industry.

2.1.5 Benefits of Traceability

Traceability is used for things that are measurable and bring connection to a very disconnected chain. Traceability can be utilised to gain other benefits, such as increased internal control or supply chain communication, by implementing finer granularity levels for traceable units, rather than only fulfilling legal requirements (Olsen et al., 2012). Documentation in the fish supply chain can be disseminated to fulfil legislative requirements (e.g. food safety; IUU fishing) or for the benefits of the company. Traceability allows us to understand where things come from and then take action in the places that are most required in the supply chain. Labelling helps to track back to the source, where it came from, and can assess sustainability to promote healthy fisheries and aquaculture (Asche et al., 2018).

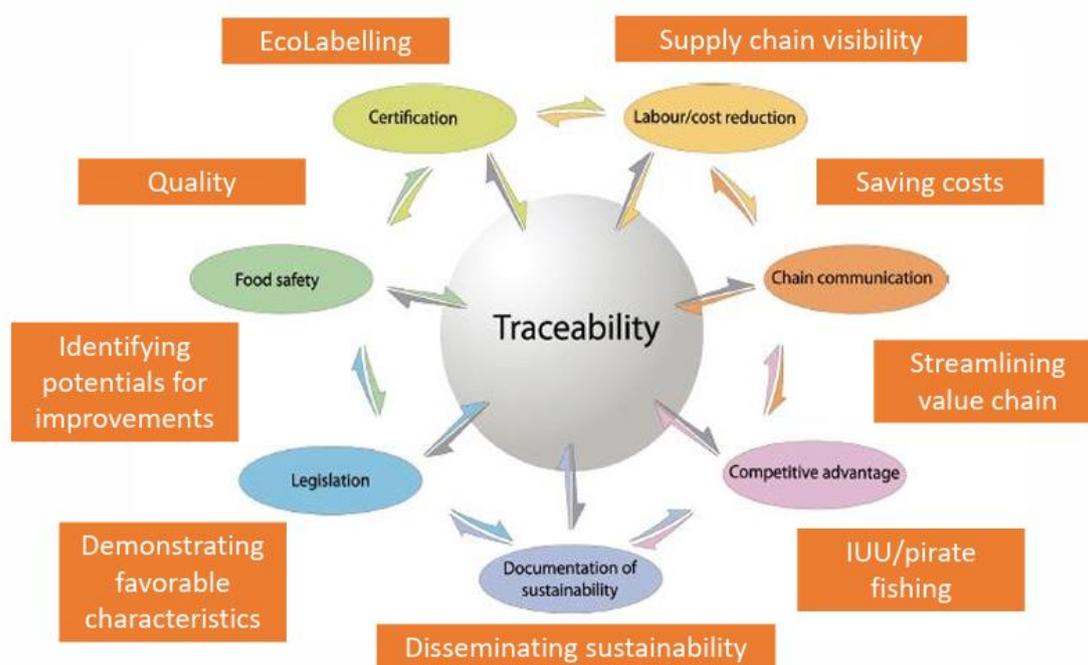


Figure 2 Legal requirements and additional benefits of traceability (Olsen et al., 2012).

2.1.6 Supply chain vs value chain

2.1.6.1 Supply chain

The supply chain is a system involving organisations, people, activities, information, and resources in the planning, movement, or storage of a product or service and transforming natural resources, materials, and components into a finished product to be delivered to the end customer (Myerson, 2015). The supply chain is suitable for commodities and commodity markets, where the goal is to reduce costs, increase margins, and increase market share. Supply chain management focuses on efficiency, market access, and increased distribution (Fearne et al. 2012).

2.1.6.2 Value chain

Value chains apply to differentiated products and market segments. The value chain goals are to add value and segment the market with differentiated products to increase profitability at all

stages, emphasising quality, service, and agility, with distribution determined by consumer demand instead of capacity utilisation (Fearne et al., 2012).

2.2 Regulations on traceability

2.2.1 Regulation (EU) 2023/2842 (amendment of The Fisheries Control Regulation)

The amendment of the Fisheries Control Regulation mentioned that the traceability system should be built based on the existing rules of traceability as set in the General Food Law Regulation (Article 18 of Regulation (EC) No. 178/2002). Traceability is the capability to trace and follow a food, feed, food-producing animal, or substance considered to be or expected to be incorporated into a food or feed through all the production, processing, and distribution stages. Food or feed placed on the market or likely to be placed on the market shall be adequately labelled to facilitate its traceability through relevant documentation or information according to the relevant requirements of more specific provisions. Operators should keep a specific set of information on fishery and aquaculture products on record, make it available to competent authorities upon request, and transfer it to the operator to whom the fishery and aquaculture products are supplied. Article 18 states the general principles of traceability in the food chain in the EU. Traceability must be established at all stages of food production. Traceability should be “one up” and “one down” in the supply chain. All food or feed placed on the market should be adequately labelled or identified to facilitate traceability—provisions for applying traceability requirements to specific sectors.

2.2.2 Batch

The amendment of the Fisheries Control Regulation defines a *lot* as a batch of fishery or aquaculture products. A batch acts as a control tool to improve the marketing of fishery and aquaculture products. The rules for placing these products into lots and merging and splitting lots should be clarified and updated.

2.2.3 Catch certificate - IUU Regulation (EC) 1005/2008

European Union member states should be able to check the validity of the catch certificates accompanying the consignment of the imported products and be entitled to refuse importation if the conditions concerning the catch certificate are not met.

The catch certificate shall contain the following information:

1. Name/fishing company details.
2. Fishing vessel details (name, flag, call sign, IMO/Lloyd’s number, fishing licence number, telephone number/email address).
3. Description of product (Type of processing authorised on board, species, product code, catch area and date, and weight).
4. References of applicable conservation and management resources.
5. Name of the master of the fishing vessel.
6. Declaration of transshipment at sea.
7. Transshipment authorisation within a port area.
8. Name and address of the exporter.
9. Flag state authority validation.
10. Transport details.
11. Import declaration.
12. Import control authorities.

2.3 Standard in traceability

2.3.1 *The GS1 Numbering System*

GS1 administers a global numbering system for the identification and description of items. The concept of the GS1 128 symbology is to code a set of data elements frequently used in trade and logistics (e.g. net weight, production date, etc.) and explain the meaning of the data elements by using a prefix called an application identifier (AI) (Storøy et al., 2013). The GS1 128 symbology provides adequate predefined data elements to enable unique trade and logistics unit identification. The codes and number series generated by the GS1 system are designed to avoid the accidental reuse of number scans printed in various machine-readable formats, including barcodes.

The GS1 symbology provides a trade item number identifying a variant of Trade Units named the Global Trade Item Number (GTIN). Most global trading standards refer to GTIN codes, including at the point of sale to the consumer. GS1 defines the batch number as an internal number for a production batch. A traceability system needs to keep track of both batches and trade units, and the common term for “the unit that we want to trace” or “the unit that we record information on in our traceability system” is Traceable Resource Unit (TRU) (Kim et al., 1995). Batches are internal in processing plant, whereas trade items are exchanged between trading partners in the supply chain. Traceable units are raw materials and products that are uniquely identifiable and traceable (Tracefood, 2011). It is common practice to allocate a batch number to all produced units with similar properties (e.g. origin/farm area, time of arrival, supplier, etc.) and/or produced within a certain time (e.g. one hour, a shift, one day, one week, etc.).

The family of GTIN barcode data structures (GS1, 2016) includes:

1. GTIN-12 (UPC-A) is a 12-digit number primarily used in North America.
2. GTIN-8 (EAN/UCC-8) is an 8-digit number for small packages where EAN-13 is too large. This number is predominantly used outside North America.
3. GTIN-13 (EAN/UCC-13), a 13-digit number used predominantly outside North America.
4. GTIN-14 (EAN/UCC-14 or ITF-14) is a 14-digit number that identifies trade items at various packaging levels.

2.3.2 *European Article Numbering Uniform Code Council (EAN.UCC) System*

EAN.UCC is a global language of business administered by Global Standards 1 (GS1), which provides standards for identifying, tracking, and tracing products, services, and locations, such as barcodes (ECoC, 2024). Special equipment, such as label printing, scanning technology, computer hardware, and software, is essential for data capture (GS1, 2014). EAN.UCC identification numbers are unique and international, which is essential for product traceability.

EAN.UCC barcodes are suitable for the retail point-of-sale (POS) because they are designed for the high-volume scanning environment. The EAN.UCC system has three components for performing product traceability (RMSCC, 2011):

1. Standard numbering structures for the identification of goods, services, shipments, assets, and locations
2. Data carriers represent identification numbers in a machine-readable format.

3. E-messaging standards to transmit the captured data between the trading parties.

The structure of EAN.UCC 13 consists of four parts:

1. The number system (54) consists of two or three digits that depict the code assigned to each country.
2. The manufacturer code (10000) consists of five digits that represent the manufacturer and is issued by a country's standards authority.
3. The manufacturer assigns a product code (12345) to the product.
4. The check digit (9) is an additional digit used to verify the barcode to ensure that it has been correctly scanned.



Figure 3 Structure of EAN 13 Barcode (GS1, 2021)

2.4 Requirements to access international market

2.4.1 Standards and guidelines

Standards contribute to harmonising the technical requirements that must be met in the market, as they can simultaneously act as market entry barriers (Gari, 2016). International trade requirements must be established to facilitate trade between countries by providing common reference points to reduce transaction costs. The agreements for Sanitary and Phytosanitary (SPS) measures and Technical Barriers to Trade become guidance among the WTO's member countries, aiming to increase transparency and protect the interests of consumers and trading partners from hidden protectionism through unnecessary technical requirements (WTO, 2024). SPS and TBT are set up based on international standards-setting bodies such as Codex Alimentarius, OIE (Animal Health), and IPPC (Plant Protection) (Andre, 2018).

2.4.2 Trade Regulations

Commonly, a country delegates the control of food safety to its competent authority to ensure that exporting farms, vessels, and processors produce safe food under regulations (FAO, 2003). When the laws of the exporting and importing countries are harmonised, the possibility of rejection is minimal.

According to the EU food law and hygiene package (food safety and labelling) (EC, 2002), business operators have the following obligations:

1. To withdraw or recall the products.
2. Notify the national competent authorities to monitor whether the appropriate measures have been taken or require that additional measures be taken to reduce or eliminate food safety risks.

Regulation (EC) No. 1005/2008 is the legal basis for identifying IUU fishing and applies to all fishing vessels. It aims to ensure the full traceability of all marine fishery products traded with the EU and establishes a community system to prevent, deter, and eliminate IUU fishing. Regulation (EC) No. 1010/2009 implements Regulation (EC) No. 1005/2008 by establishing a Catch Certificate.

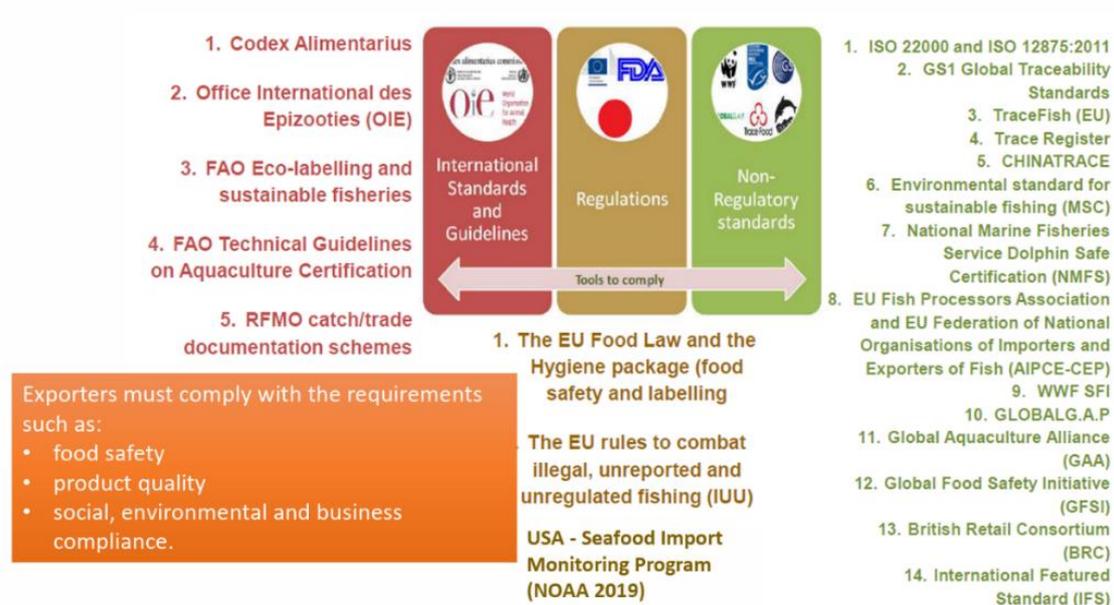


Figure 4 Requirements to access international market (Andre, 2018 with Gunnlaugson additions)

2.4.3 Non regulatory standards

Non-governmental organisations also play a role in issuing fisheries product industry certifications. Non-regulatory standards are widely adopted and provide access to substantial market segments in some European countries. The development of non-regulatory standards is not aimed to be directly attributable to legislative changes; it is more about brand protection and consumer confidence (Humphrey, 2012).

3 METHODOLOGY

3.1 Case study selection

Supply chains for tuna and tuna-like species will be chosen for this study based on their importance to Indonesia and European Union countries. In 2022, the export value of frozen fillet tuna from Indonesia was US\$ 79.06 million from the EU total import of US\$ 533.61 million; the export value of canned tuna was US\$ 6.75 million from a total import of US\$ 3.78 billion (ITC, 2024).

3.2 Structured interviews with stakeholders

Structured interviews with stakeholders will be conducted to identify the challenges and opportunities for improving traceability in Indonesia's tuna and tuna-like species. Participants will be asked to review the operation of the supply chain they represent and the requirements for traceability across the supply chain. The participants will then be asked about the supply chain of tuna and tuna-like species for export purposes and its traceability performance from their perspective. The traceability performance was assessed as follows:

1. How does the supply chain meet the legal requirements for traceability in the EU?
2. How far back or forward is the information traced in the supply chain?
3. Are the different information technology systems used in the supply chain interoperable?
4. Can tuna products be tracked from the consumer to the source?

Participants will be purposively selected from the supply chain. Six stakeholders across the supply chains representing a capture fisheries organisation, a sustainable fishing organisation, tuna and tuna-like species processing plants in Indonesia (two units), a forwarder/shipping line, and competent authority will be interviewed online.

3.3. Desktop study

A desk study will be conducted to observe the following:

- Trade products based on Harmonized System Code
- Quality and safety-related regulations.
- Catch certificate IUU Regulation (EC) 1005/2008
 - What data are collected on board the vessels?
 - What data goes to the processing plant from the vessel, where the lot starts to set up fishing or processing.
- Data collection in the processing plant, where the production lot is established.
- Coding system for labelling in processing plants.
- Data labelling on the products and production batches
- Data supplied with the shipment to EU countries.
- The impact of the Fisheries Control Regulation amendment for non-EU countries
- Traceability system in Icelandic fish auction and processing plant

4 RESULTS

4.1 Overview of the regulation (EU) 2023/2842 (the amendment of Fisheries Control Regulation) for non-EU countries

4.1.1 A fully digital transmission of traceability information

The enactment of the amendment of the Fisheries Control Regulation from 9 January 2024 means that EU countries will no longer request printed certificates when the entry into force date is 10 January 2026 for fresh and frozen fish and 10 January 2029 for prepared and preserved fish (canned products). The amendment of fisheries control regulations aims to enable authorities in EU countries to tackle illegal fishing and provide consumers with better information on the origin of imported fishery products more effectively by implementing a complete digital traceability system. This amendment is still based on the general food law Regulation (EC) No. 178/2002 for food safety purposes, which means that fishery and aquaculture products originating from EU and non-EU countries are subject to the same rules.

Based on the amendment of the Fisheries Control Regulation, an illustration of a fully digitised and paperless workflow management system for catch certification (CATCH) is presented in *Figure 5*. The new system for submitting catch certificates and related documents accompanying fishery products to be imported into the EU simplifies and speeds up administrative procedures by facilitating the exchange of data, information, and documents between all involved trading parties and control authorities. The system also offers the possibility of generating, validating, and submitting catch certificates and related documents from third-country operators and authorities. CATCH allows operators and authorities in non-EU countries to create, validate, and transfer catch certificates and related documents online. In this transformation, CATCH is still managed by the Directorate-General for Maritime Affairs and Fisheries (DG MARE), which implements the European Commission's policies to promote ocean governance at the international level.

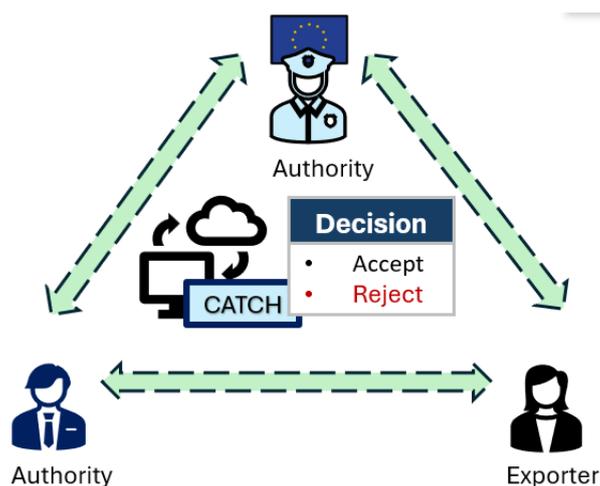


Figure 5 Illustration of a fully digitised and paperless workflow management system for catch certification (CATCH) according to the amendment of Fisheries Control Regulation impact for non-EU countries.

CATCH will be integrated into the Trade Control and Expert System – New Technology (TRACES NT), an online platform to reduce the impact of disease outbreaks and fight against food fraud from imported products, managed by the Directorate-General for Health and Safety (illustration given in *Figure 6*). TRACES NT enables the trace and tracking of the movement of animals, animal products, food, and feed of non-animal origin, and plants along the chain into the EU. TRACES NT aims to promote cooperation and collaboration between competent authorities and traders and their competent authorities. TRACES NT sends notifications to the involved parties regarding the decision of consignment, where each party has access to relevant documents. Therefore, TRACES makes it possible to detect fake certificates quickly and efficiently.

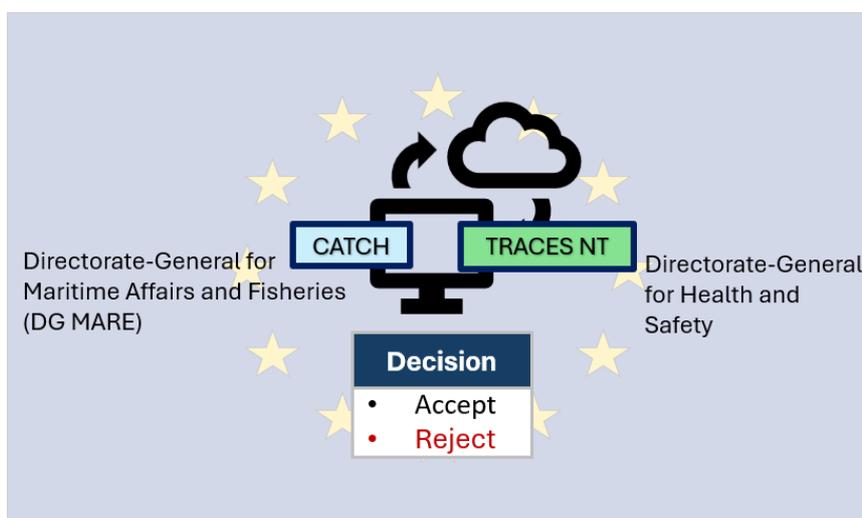


Figure 6 An illustration of integration of CATCH into TRACES NT based on TRACES NT modules and features.

4.1.2 Traceability information for imported products

The Fisheries Control Regulation amendment states that operators are responsible for putting fishery and aquaculture products into lots/batches before placing them on the market. The definition of a lot/batch of fishery products references Council Regulation (EC) No 1005/2008, single species of the same product presentation from the same relevant geographical area, and the same fishing vessel or group of fishing vessels. In this regulation, a lot is created to ensure traceability and shall be traceable at all production, processing, and distribution stages, from catching or harvesting to the retail stage.

The mandatory traceability information for imported products in the amendment of the Fisheries Control Regulation includes a reference to the catch certificate numbers submitted by Council Regulation (EC) No. 1005/2008. The amendment also mentions that operators at the production, processing, and distribution stages shall ensure that the information for lots of fishery products is kept on record and made available digitally to the operator to whom the fishery product is supplied and, upon request, to the competent authorities.

4.2 Tuna and tuna-like species supply chain in Indonesia for EU market

Based on the information gathered during the structured interviews with the stakeholders (APPENDIX 1), the typical supply chain of Indonesian tuna and tuna-like species for the EU market commonly produces frozen tuna loin and canned tuna (

Figure 7). The tuna is caught by one-day fishing with pole and line or handline fishing gear from boats sized up to 30 GT, which is certified as sustainable by a sustainable fishing organisation operating in Indonesia. Freshly caught tuna is kept at chill temperatures in a built-in hatch on boats or an insulated box sized 150 × 90 cm. One catch of tuna from one boat in a day is considered a batch of tuna. After landing, chilled tuna from the boat's hatch is transferred to an insulated box with ice inside a pickup truck, which takes less than 30 minutes to reach the processing plant. Chilled tuna inside an insulated box from the boat without a built-in hatch is also transported to the processing plant with pickup trucks to be further processed into frozen tuna loins. A slightly different process occurs at a canning factory, where canned tuna is made from frozen tuna or skipjack tuna, and a supply from one supplier in one shipment is considered one batch. The finished tuna products are then picked up by the forwarder service and transported to the harbour for export, mainly to Spain, the Netherlands, and Italy.

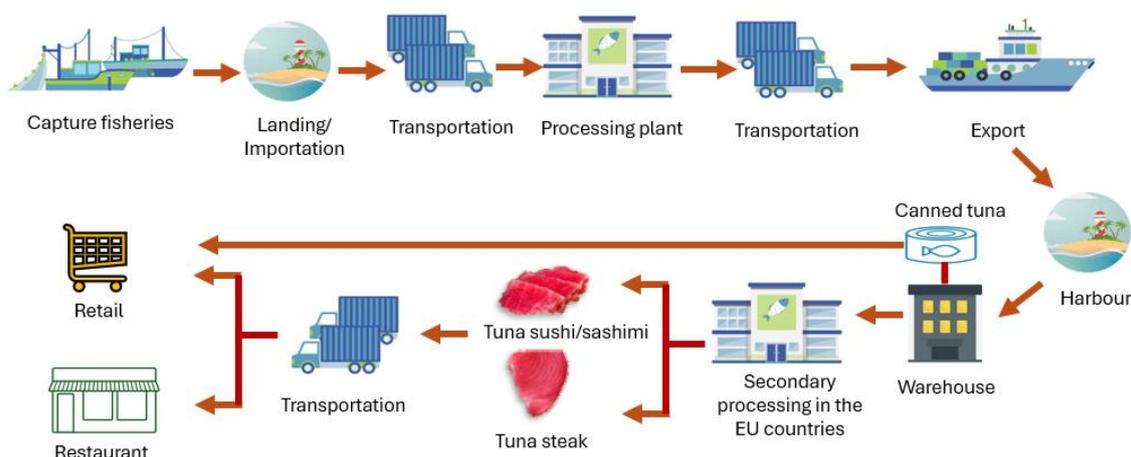


Figure 7 Illustration of typical supply chain of tuna and tuna-like species from Indonesia in the EU countries.

When they arrive in EU countries, the tuna products are transported to warehouses. The canned tuna is transported to retailers, while the frozen tuna loin undergoes secondary processing to be processed into sashimi/sushi-grade tuna and tuna steaks and transported to retail and restaurants.

4.3 Tuna and tuna-like species processing

A value chain occurs within the processing plant, where tuna and tuna-like species are processed into tuna products that comply with food safety standards. In both the frozen tuna processing plant and the canning company, the system combines handwritten or paper-based systems for fish as raw materials with electronic systems in internal company processes to

generate labels containing traceability information printed on the product's packaging in the form of a barcode or a quick response (QR) code printed on the product labels to trace the origin of the fish.

4.3.1 *Frozen tuna*

Fresh tuna is mainly obtained from the fishing boats of the processing plant and contracted boats. A batch is a tuna per catch by fishing gear, handline, or pole and line, treated as a single unit. *Figure 8* shows the material flow in the frozen tuna processing plant. The captain or the fisherman that delivered fresh tuna were interviewed for this study using the pole and line or handline method, and they were sized up to 30 gross tons. There is no onboard system for recording catch information and communicating it directly to Indonesian authorities to generate a catch certificate, which is required to fulfil the requirement to export fish products to EU countries. The applicant (vessel owner/captain/fishing master/representative) must submit a scanned document of ID, fishing licence (SIPI), proof of ship arrival report (STBLKK), and a catch landing verification report through an online application. Based on the verified documents and e-logbook data in different applications received by the authority, a paper-based catch certificate will be generated. The catch certificates issued by the Indonesian authority are based on Council Regulation (EC) No 1005/2008. The information in the catch certificate transferred to the product label includes the name of the species and the geographical area where the catches were taken, based on the FAO's major fishing areas (APPENDIX 2).

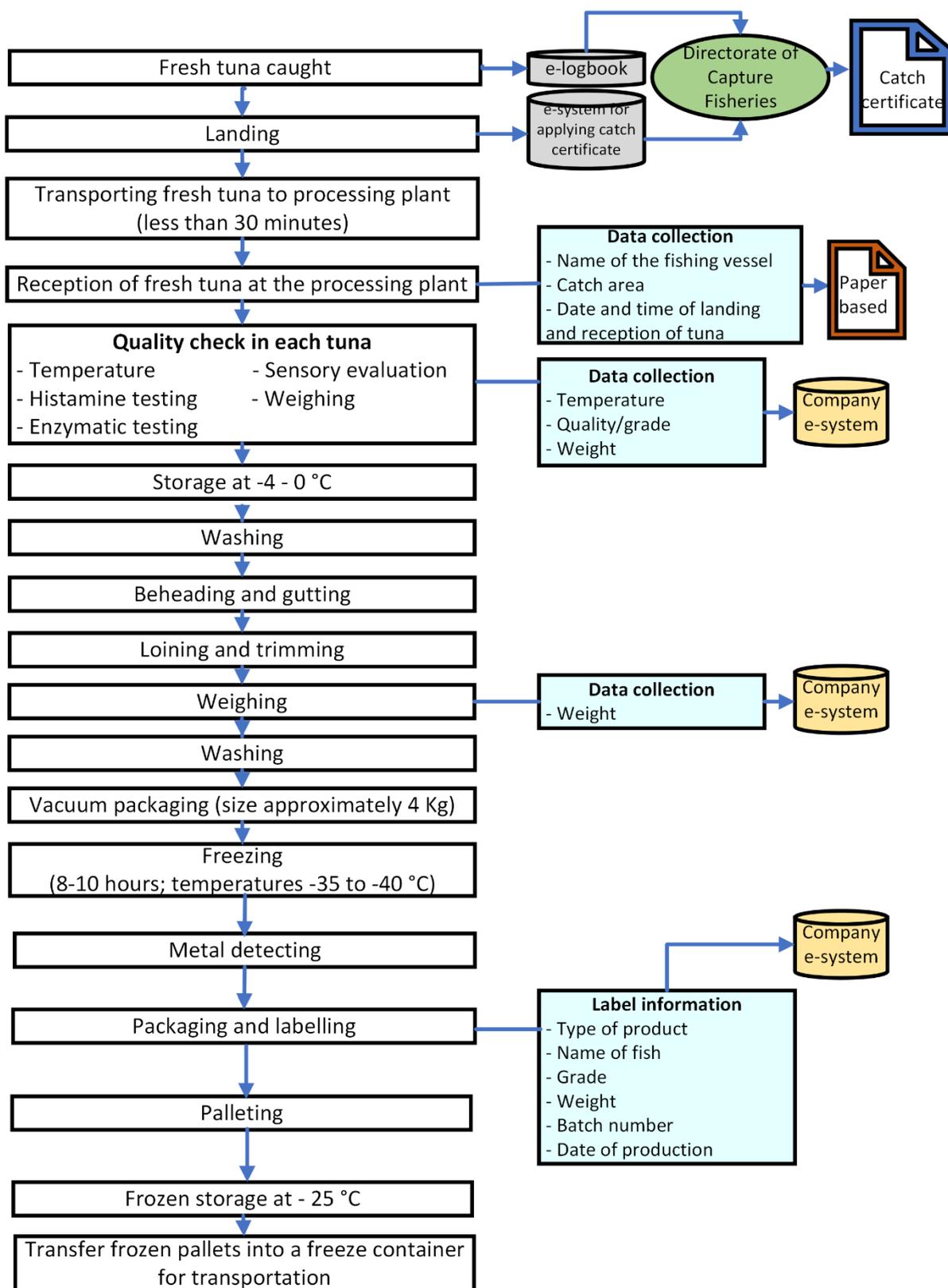


Figure 8 Flow chart of frozen tuna loin processing.

4.3.2 Canned tuna

Frozen tuna is mainly obtained from other companies/suppliers and imported products. A batch is a group of fish from one supplier, and it has uniform quality characteristics produced, processed, or gathered, and treated as a single unit or handled together.

In the context of IUU fishing, information transferred to the product label consists of the name of the species and the geographical area in which the catches were taken, based on FAO major fishing areas, which were obtained from the suppliers. *Figure 9* shows the information and material flows at the canned tuna processing plant.

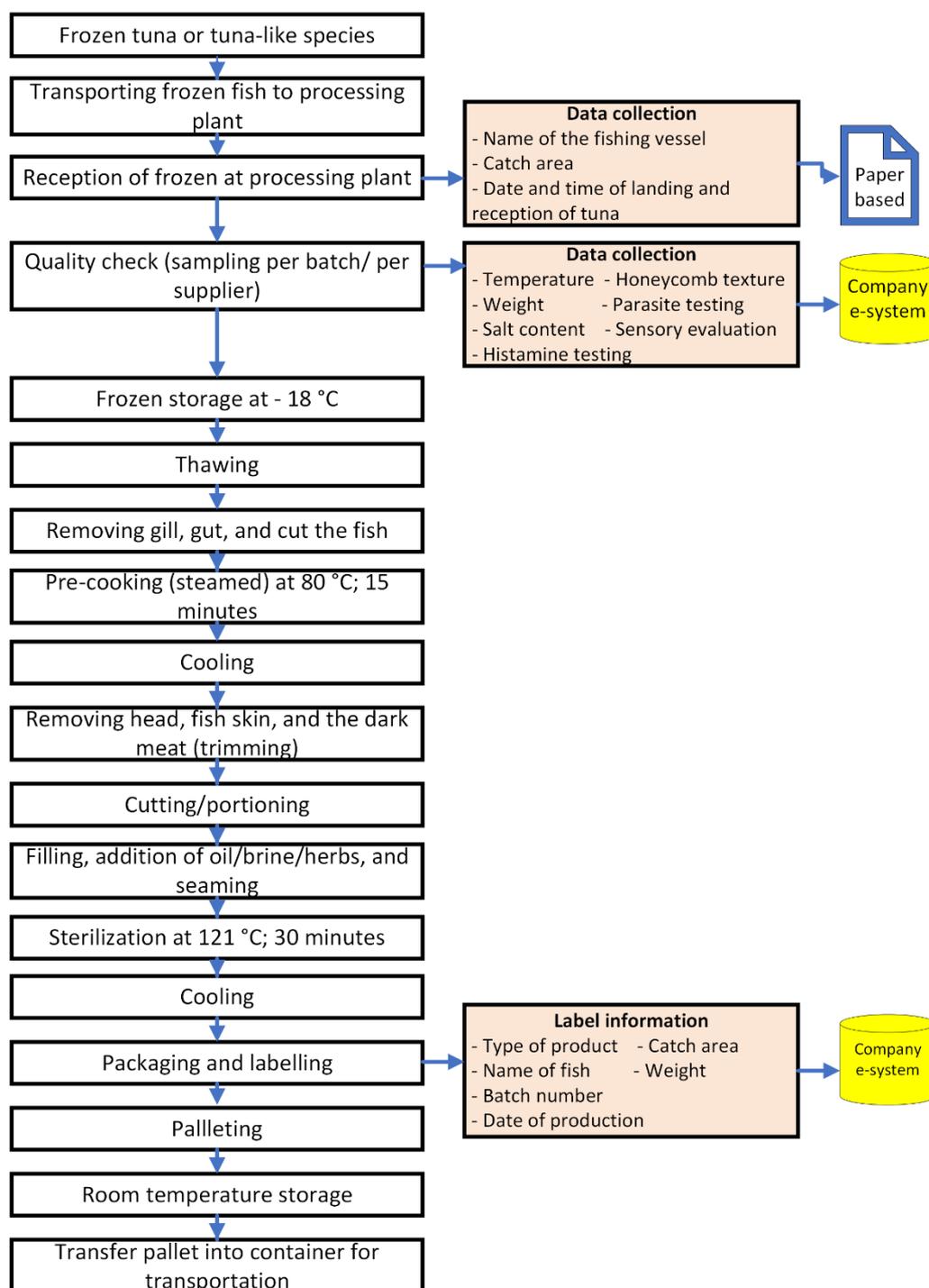


Figure 9 Flowchart depicting canned tuna processing.

4.4 Traceability performances

4.4.1 Legal requirements for traceability

The supply chain of tuna and tuna-like species in Indonesia meets the EU's legal requirements for traceability. In the context of IUU fishing, the current catch certification is accepted by EU countries and is considered Council Regulation (EC) No 1005/2008. Information on species name, ocean area, shipping number, airway bill number, container number, vessel name, and flag is available in the catch certificate. Information on product quality is obtained from factory testing based on food safety standards for EU countries. In producing tuna products intended for human consumption, the processing plant implements Council Regulation (EEC) No 315/93 as a standard for setting the limits for non-microbiological substances in fish, such as various heavy metals, dioxins and dioxin-like compounds, and polycyclic aromatic hydrocarbons. The processing plant also implements hygienic requirements related to sanitary and phytosanitary (SPS) conditions and microbiological criteria for the final products.

4.4.2 Current back and forward information tracked in the supply chain

4.4.2.1 Frozen tuna loin

Current tuna catches and landings are reported using a combination of e-logbooks and paper-based logbooks, which is in line with EU and Indonesian regulations. However, the traceability system in Indonesia remains a challenge for amending the Fisheries Control Regulation. The information entered into the e-logbook or logbook from the boat sent to the government server has not yet been vertically integrated.

In the current system, both logbooks could facilitate tracing back the fish to the boats by gathering information such as the name of the fishing vessel or boat, fishing areas, species, weight, and landing date. In the processing plant, a worker will handwrite or manually type the information on fishing areas, date of landing, and date of reception (figure given in APPENDIX 3 (manual tagging)). The processor assigns the manual tag to the internal electronic system and other information to create labels for the end products. Although the system does not have vertical integration, the relationship between the supply chain nodes is well established, noting that the current system is inefficient.

The batches for retail purposes in the products are made based on the relevant minimum traceability information, such as the product name and product batch code (*Figure 10*).

Case No. AA.2303.0366 FT

FROZEN YELLOWFIN TUNA LOIN
(*Thunnus albacares*)

Grade	Size	Net Weight (Kg)	Pieces
AA	5 - up lbs	29.61	7

Internal Lot Code
410TON23074.9.3.FT-2

Batch code

Packing Box
Case 30 Kg



Expiry Date
2025-03-15

Production Date
2023-03-15
Origin Indonesia

Processed by

PT. Karta Samudra
Jl. Sultan Hasanudin
Kompleks Pelabuhan Perikanan Nusantara
Ambon-Maluku-Indonesia

Figure 10 Batch number for frozen tuna loin (the information also included in the QR code)

4.4.2.2 Canned tuna

Forward traceability for canned tuna products starts with tracking a batch of frozen tuna from a supplier, which includes information on fishing areas and the date of production (paper-based) to the canning company. The processor assigns the information to the company's electronic system and other information to create labels for the end products. Tracing back product information can be done by checking the batches for withdrawal based on relevant minimum traceability information, such as the product name and batch code.



Figure 11 Product information on canned tuna packaging.

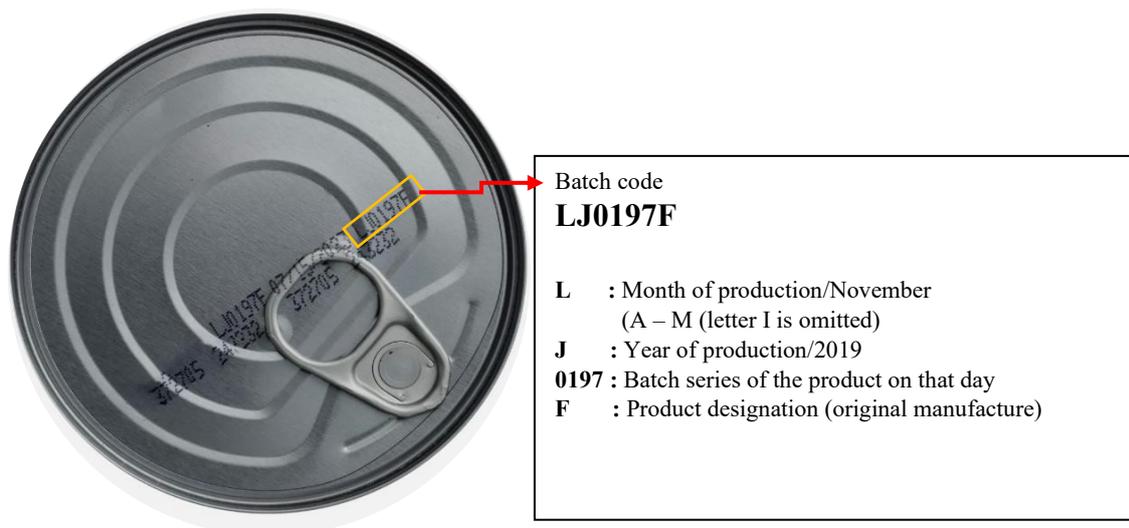


Figure 12 Batch number on the lid of canned tuna

Traceability in tuna products' "best practice" seems to be dominated by voluntary or market demand and consumer demand for third-party labelling. However, third-party or non-regulatory standards are based on top-down regulations and aim for brand protection and consumer confidence.

4.4.2.3 Back and forward traceability according to shipment perspective

Tracking forward can be done by tracking the shipment from the processing plant to the importer at the destination country from the bill of lading (B/L), which involves information on the shipper, consignee, carrier, name of the vessel or aircraft, port of landing/port of discharge, and description of goods. However, this forward tracking only facilitates the needs of the sender and consignee. The B/L does not address the traceability mentioned in the amendment of the Fisheries Control Regulation.

4.4.3 Interoperability of the system used in the supply chain.

There are still instances of paper-based data collection for traceability purposes (from the catch to the processing plant). The paper-based notes of fresh catch (batch) for frozen products and the purchasing notes of frozen tuna (batch) for canned products are not interoperable with the processing plant's electronic internal system. The processor later assigns paper-based batch codes to all internal documentation throughout the production process. Owing to the combination of different recording systems, interoperability is lacking.

The information technology system in the shipping line works independently and is not affiliated with the food company; therefore, it is not interoperable with the processing plant system. However, the processing plant can track the shipment by entering the airway bill number on the shipping line website.

4.4.4 *Tracking tuna from sources to the consumer*

Consumers can trace the information of the products on the packaging (*Figure 10* and **Error! Reference source not found.**) and gather information about the fish (species name), how it was caught (gear types), where it was caught (fishing area), and where it was manufactured. Consumers can also trace whether the products were obtained from responsible fishing practices through the ecolabel logo on the product packaging. The EAN.UCC 13 mentioned on the label is not provided for the consumer; it is provided to transfer clear information to parties in the supply chain. A barcode scanner is required to read the information and transmit it to a computer.

4.5 Traceability system in Iceland

Iceland's traceability system refers to the general food law Regulation (EC) No. 178/2002, which applies to the single market based on the agreement on the European Economic Area. Information records on the origin of fish in Iceland are obtained from fishing vessels to processing plants and are electronically integrated by the Directorate of Fisheries. The company obtains data from fishing vessels containing information on fishing areas, species, and size to ensure better traceability of the products. The information is fed from a secure central server to a shared database accessible by the Directorate of Fisheries for management/enforcement purposes and the Marine and Freshwater Research Institute (MFRI) for scientific purposes.

4.5.1 *Traceability system implemented in fish auction*

Icelandic fish auctions have evolved since the first fish auction in 1987. The auctions were held onsite until 1993, when the transactions were held online. Fish sold in the auction market are typically obtained from small boats. The boats sell the daily catch to Fiskmarkaður Íslands hf. (FMIS)/fish market before unloading through an Internet-based auction system administered by a central auctioning system operated by the Icelandic Fish Market's Data Center. After landing, the fish is sorted into size categories, weighed, and iced again. There is no sampling of quality checking for the freshness of the fish, including the biochemical and microbial content. The freshness of the fish depends mainly on the ice. The auction also does not regularly check the temperature of the fish. The fish are placed in isolated tubs and registered on the correct weighing form. A receipt is printed for each buyer, specifying the stack number, boat name, price, and quantity.

After the auction, the fish are ready to be picked up by the buyers' transporter and are usually forwarded on the same day they are caught. At delivery, the number of fish tubs in the stack is filled out manually on the receipt. A copy of the receipt is enclosed with the product to the buyer, while the FMIS keeps the original. This note provides information on the origin of the fish and includes its number or reference to a purchase order number or buy number. These numbers can be used as unique identifiers to trace products. Fish auctions are maintained in all records for at least two years.

4.5.2 *Traceability system implemented in fish processor*

The Icelandic fish industry is vertically integrated, and processors own fishing vessels. First, orders are made from Icelandic processors for fishing vessels, considering the quota status.

Furthermore, the processors send orders to the vessels for how much fish of each main species, where to catch (fishing area), and when (and sometimes where) to land. The Hafsyn system from Trackwell is utilised to record catch information. The catch information and the industry's vertical integration provide processors with real-time access to all catch data.

In the Icelandic system, fish from fishing vessels are transferred to the processing plant in tubs as fish containers tagged with a Global Returnable Asset Identifier (GRAI) code, including the fishing date, to be processed into final products. The Global Trade Item Number (GTIN) is tagged in the packing stage, followed by tagging the pallet containing boxes of products with another GRAI. Pallets are stored before the products are transferred to truck containers for distribution.

Fresh fish processed on land mostly use the Wise system from Wisedynamics (WiseFish from Maritech), the Innova system from Marel, and the SAP system, which manages data on processing, inventory control, lot tracking, logistics, and marketing. After processing, the fish products are labelled with the processing date.

5 DISCUSSION

In the present study, the amendment of Fisheries Control Regulation (EU) 2023/2842 will shift the business process of delivering paper-based catch certificates and documents related to quality through mail or by emailing scanned documents from Indonesian exporters to importers in EU countries to be further delivered to the competent authorities. The integration of CATCH into TRACES to facilitate the new regulation will simplify the process by transforming the old system into an online system through cooperation and collaboration between competent authorities, traders, and their competent authorities. TRACES is less time-consuming and capable of quickly detecting fake certificates as the involved parties must verify them. TRACES will prevent the rejection of products from non-EU countries by sending notifications regarding consignment decisions.

The traceability system in Indonesia for frozen tuna loin and canned tuna has adopted the Global Trade Item Number (GTIN) to trace the products to their source (manufacturer) and facilitate food recall decision-making in the retail industry for potentially harmful products. Tracing back to the source of fish as raw materials could still be done by the existing manual tagging system, where the company is responsible for obtaining the information necessary from its suppliers and providing the information to the consumers. This transfer of information meets the minimum legal requirements of the EU. However, exchanging data from a paper-based system (delivery note/purchasing note) into the company's electronic system is inefficient because it must be entered per batch of fish, and there is a chance of incorrect writing or typing errors. The processing plant must ensure that all information required to identify its supplier and product identification code is obtained, as the company has many suppliers and customers, each likely to require the information in different formats. The electronic transfer of information in an agreed-upon format would significantly improve efficiency.

Effective systems are in place to ensure catch traceability in Iceland. The detailed fishing area information available for each fishing trip means that the catch may be traced directly from

when it was caught through subsequent processing, export, and delivery to the final market. Information relating to the catch's provenance is communicated to the Directorate of Fishery website and directly to processing plants. The current Indonesian e-logbook in the mobile app is reliable for small- and medium-scale fisheries, particularly for those who operate small boats. The information sent by the fishermen through the mobile application to the government server, even though it has yet to be vertically integrated, has fulfilled the requirements set out in the amendment of the Fisheries Control Regulation for the origin of fish information.

6 CONCLUSION

In conclusion, this study highlights several important points regarding traceability in the Indonesian tuna sector.

1. The transformation from a paper-based catch certificate into an electronic system mandated in the amendment of Fisheries Control Regulation (EU) 2023/2842 aims to tackle IUU fishing and effectively provide valid and verified information on the origin of the products from the involved parties.
2. The current supply chain of tuna and tuna-like species in Indonesia has met the legal requirements for traceability in the EU, as referred to in Council Regulation (EC) No 1005/2008, and has met the standards of food safety in the EU by implementing Council Regulation (EEC) No 315/93 which sets limits for non-microbiological substances in fish (heavy metals, dioxin and dioxin-like compounds, and polycyclic aromatic hydrocarbons) and hygienic requirements related to sanitary and phytosanitary (SPS) conditions and microbiological criteria of the final product.
3. The current traceability system in Indonesia needs to be transformed to transfer information on fish batches as raw materials from paper-based (delivery note/purchasing note) to an electronic system in the processing plant to comply with the amendment of Fisheries Control Regulation.
4. The adoption of GTIN on the labels of tuna products and batch numbers facilitates tracing back information if a food recall action is needed in retail.
5. A practical and integrated information technology managed by the government can be built to transfer information on fish traceability from fishing vessels to processing plants based on a study of Iceland's traceability system.

7 RECOMMENDATIONS

Recommendations are provided to improve the traceability practices of Indonesian tuna and tuna-like species products to comply with the new regulations.

1. Vertical integration of data from fishing vessels (e-logbook) to processing companies through a secured server managed by the Indonesian government could improve information exchange and replace paper-based notes to collect information on the origin of tuna and its legality in accordance with what is regulated by the Catch Certificate - IUU Regulation (EC) 1005/2008. See Figure 13.

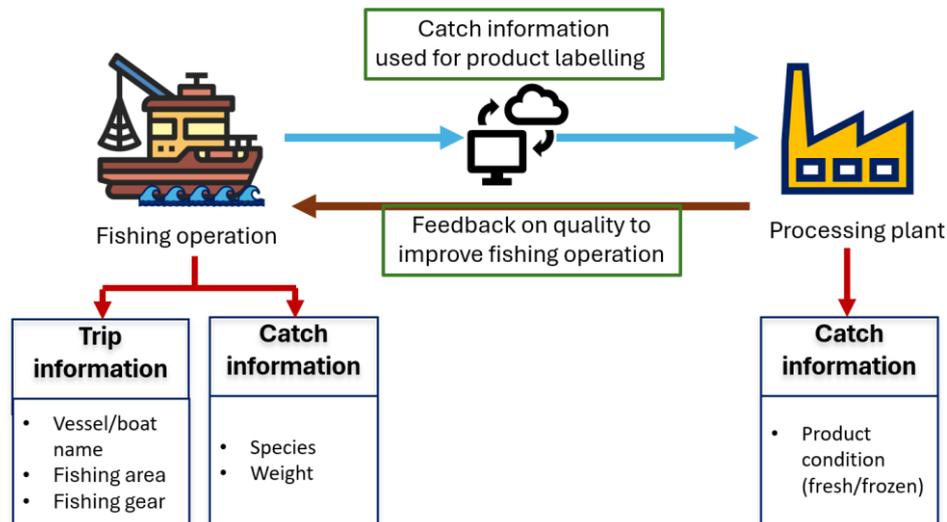


Figure 13 Suggested information exchange.

2. Implementing the Global Returnable Asset Identifier (GRAI) in either a barcode or encoded in an electronic product code (EPC) enabled Radio Frequency Identification (RFID) tag for the built-in hatch in boats or the insulated box as a returnable asset for one-day tuna fishing will facilitate tracking and management and make transferring information from GRAI to GTIN easier.

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APPENDICES

Appendix 1. Traceability performances

Traceability performance	Respondents	Responses
Does the supply chain meet legal requirements for traceability in the EU?	Capture fisheries organisation	Yes, current catch certification is accepted by the EU countries
	Sustainable fishing organisation	Yes, information of species name (common name and latin name), ocean area, type of fishing gear are available
	Frozen tuna processing plant	Yes, species names and ocean areas are available and obtained from catch certificates. Information on product quality is obtained from factory testing based on the standard of food safety for EU countries
	Canned tuna processing plant	Yes, information of species name and ocean area are available and obtained from catch certificate. Information on product quality is obtained from factory testing based on the standard of food safety for EU countries
	Forwarder/shipping line	Yes, information on shipping number, airway bill number, container number, vessel name and flag are available
	Competent authority	<ul style="list-style-type: none"> • In the context of IUU fishing, the current catch certification is accepted by EU countries and is considered Council Regulation (EC) No 1005/2008. • Council Regulation (EEC) No 315/93 (limits of non-microbiology contaminant) • Health control of fishery products intended for human consumption
How far back or forward is information tracked in the supply chain?	Capture fisheries organisation	One landing is one fishing batch traced back to the vessel and landing date (fishing gear: pole and line and handline).
	Sustainable fishing organisation	Forward tracking could be done from the fishing area to the processing plant, involving the name of the species, type of gear,

Traceability performance	Respondents	Responses
		and geographical range of the fishing operation.
	Frozen tuna processing plant	Forward traceability involves tracking a batch of tuna (one catch as one batch) from the fishing areas (paper-based) to the processing plant and importer in the destination country. Backward traceability can be performed in a vice versa manner.
	Canned tuna processing plant	Forward traceability involves tracking a batch of frozen tuna from a supplier, including information on fishing areas (paper-based) to the processing plant and importer at the destination country. Backward traceability can be performed in a vice versa manner.
	Forwarder/shipping line	Tracking could be done by Bill of Landing (B/L), which involves information on the shipper, consignee, carrier, name of vessel or aircraft, port of landing/port of discharge, and description of goods.
	Competent authority	Tracking could be done by gathering information from actors in the supply chain.
Are the different information technology systems used in the supply chain interoperable?	Capture fisheries organisation	Instances of paper-based data collection for traceability purposes still exist.
	Sustainable fishing organisation	The client of the sustainable fishing organisation claims the status of a "Well Managed and Sustainable Fishery" by printing the Ecolabel logo on the product package (lack of interoperability).
	Frozen tuna processing plant	The paper-based notes of catch(batch) and catch certificates are not interoperable with the processing plant's internal system.
	Canned tuna processing plant	The purchase order of frozen tuna (batch) and catch certificates are not interoperable with the

Traceability performance	Respondents	Responses
		processing plant's internal system.
	Forwarder/shipping line	The information technology system in the shipping line is not interoperable with the processing plant system.
	Competent authority	<ol style="list-style-type: none"> 1. There are still instances of paper-based data collection for traceability purposes (from catch to receiving at processing plant) 2. Additionally, there is a lack of interoperability between nodes in the supply chain. 3. Batch codes are assigned by processors and appear on all internal documents throughout the production process.
Can a tuna product be tracked from source through to the consumer?	Capture fisheries organisation	Tuna as raw material can only be tracked to the receiving of the processing plant.
	Sustainable fishing organisation	Consumer know the products obtained from responsible fishing practices through the ecolabel logo in the product packaging
	Frozen tuna processing plant	The product can be tracked from source to importer in the destination country.
	Canned tuna processing pant	The product can be tracked from source to importer in the destination country.
	Forwarder/shipping line	The product can only be tracked from the shipper to the consignee.
	Competent authority	Tuna products can be tracked from source to export destination countries through valid information submitted to government institutions.

Appendix 2. Indonesia catch certificate

First document of catch certificate for boat sized > 20 GT

Document number/Nomor Dokumen		Validating Authority/Otoritas Pemvalidasi	
1. <i>Name/ Nama</i>		<i>Address/ Alamat</i>	
		<i>Telephone Number and Fax / Nomor Telpon dan Fax</i>	
2. <i>Fishing Vessel Name/ Nama Kapal</i>		<i>Flag-Home Port and Registration Number/ Benders Pelabuhan asal dan Nomor Registrasi</i>	<i>Call sign / Kode panggil Kapal</i>
			<i>IMO/Lloyd's number (if issued) / Nomor IMO/Lloyd (jika ada)</i>
<i>Fishing licence No-Valid to/ Nomor Ijin Penangkapan-Berlaku sampai dengan</i>		<i>Inmarsat No / Nomor Inmarsat</i>	
		<i>Fax No / No Fax</i>	
		<i>Telephone No / Nomor Telepon</i>	
		<i>E-mail address (if issued/ Alamat Email (jika ada)</i>	
3. <i>Description of Product/ Deskripsi produk</i>		<i>Type of processing authorized on board/ Tipe cara pengolahan yang diijinkan di atas kapal</i>	4. <i>References of applicable conservation and management measures/ Referensi dari tindakan pengelolaan dan konservasi yang diterapkan</i>
<i>Species/Spesies ikan</i>	<i>Product code/ Kode pr</i>	<i>Catch area(s) and dates/ Area dan tanggal penangkapan</i>	

<i>Estimated live weight (Kg)/ Estimasi berat hidup (Kg)</i>	<i>Estimated weight to be landed (Kg)/ Estimasi berat yang didaratkan (Kg)</i>	<i>Verified weight landed (kg) where appropriate/ Verifikasi berat ikan yang didaratkan (Kg)</i>	
5. Name of Master Fishing Vessel – Signature-Seal/ Nama Nakhoda Kapal – Tanda tangan - Stempel :			
<i>6. Declaration of transhipment at sea/ Name of Master of fishing vessel/ Deklarasi transhipmen di laut/ Nama nakhoda kapal penangkapan</i>	<i>Signature and Date/ Tanggal dan tanda tangan</i>	<i>Transhipment date/area /position/ Tanggal transhipmen/ area/Posisi</i>	<i>Estimated weight (kg)/ Estimasi berat (Kg)</i>
<i>Master of receiving vessel/ Nama Nakhoda kapal penerima</i>	<i>Signature/ Tanda tangan</i>	<i>Vessel name/ Nama kapal</i>	
		<i>Call sign/ Kode panggil</i>	
		<i>IMO/Lloyd's number (if issued)/ Nomor IMO/Lloyd (jika ada)</i>	
7. Transhipment Authorisation within a port area/ Otoritas transhipmen pada area pelabuhan perikanan			
<i>Name/ Nama</i>	<i>Authority/ Otoritas</i>	<i>Signature/ Tanda tangan</i>	<i>Address/ Alamat</i>
<i>Telephone/ Telp</i>	<i>Port of Landing / Pelabuhan tempat pendaratan</i>	<i>Date of Landing/ Tanggal pendaratan</i>	<i>Seal (Stamp) / Cap Stempel</i>

8. Name and address of Exporter/ Nama dan alamat Eksporir		Signature / Tanda tangan	Date/ Tanggal	Seal (Stamp) / Cap Stempel	
9. Flag State Authority Validation/ Otoritas validasi bendera negara :					
Name/Title/ Nama/ Jabatan		Signature/ Tanda tangan	Date/ Tanggal	Seal (stamp)/ Cap Stempel	
10. Transport detail (see appendix)/ Detail pengangkutan (lihat lampiran)					
11. Importer declaration/ Deklarasi Importir					
Name and Address of Importer/ Nama dan alamat Importir		Signature/ Tanda tangan	Date/ Tanggal	Seal/ Stempel	Product CN code/ Kode Produk CN
Documents under Articles 14 (1) (2) of Regulation (EC) No 1005/2008/ Dokumen yang sesuai dengan artikel 14 (1) (2) dari regulasi (EC) No. 1005/2008			References/ Referensi		
12. Import control-authority/ Otoritas pengendalian impor		Piece/ Tempat	Importation authorised (*)/ Impor diperbolehkan (*)	Importation suspended (*)/ Impor ditahan (*)	Verification requested - date/ Verifikasi yang diminta-tanggal
Coastwise declaration (if issued)/ Deklarasi Bea Cukai (Jika dikeluarkan)		Number/ Nomor	Date/ Tanggal	Piece/ Tempat	
(*) Tick as appropriate/ Beri tanda jika sesuai					

Appendix of Transport detail / Lampiran detail pengangkutan	
1. Country of Exportation Port/air harbor/other place of departure Negara pengekaport Pelabuhan/bandara/tempat	2. Exporter Signature/Keterangan Eksportir
Vessel name and Flag /Nama kapal dan bendera	Container Number/Nomor Kontainer
Flight number/airway bill number Nomor penerbangan	Name/Nama
Truck Nationality and register number/ Nomor Kendaraan darat pengangkut	Address/Alamat
Railway number /Nomor kereta api	List Attached/Daftar Lampiran
Other transport document / Dokumen transport lainnya	Signature/Tanda tangan

Second document of catch certificate for boat sized > 20 GT

Document number/Nomor Dokumen		Validating Authority/Otoritas Pemvalidasi	
1. Name>Nama	Address/Aalamat	Telephone Number and Fax / Nomor Telpon dan Fax	
2. Fishing Vessel Name>Nama Kapal	Flag-Home Port and Registration Number/ Bendera Pelabuhan asal dan Nomor Registrasi	Call sign / Kode panggil Kapal	
		IMO/Lloyd's number (If Issued) / Nomor IMO/Lloyd (Jika ada)	
Fishing licence No-Valid to/ Nomor Ijin Penangkapan-Berlaku sampai dengan	Immarsat No / Nomor Immarsat		
	Fax No / No Fax		
	Telephone No / Nomor Telepon		
	E-mail address (If Issued/ Alamat Email (Jika ada)		
3. Description of Product/ Deskripsi produk	Type of processing authorized on board/ Tipe cara pengolahan yang diijinkan di atas kapal	4. References of applicable conservation and management measures/ Referensi dari tindakan pengelolaan dan konservasi yang diterapkan	
Species/Spesies Ikan	Product code/ Kode produk	Catch area(s) and dates/ Area dan tanggal penangkapan	

Estimated live weight (Kg)/ Estimasi berat hidup (Kg)	Estimated weight to be landed (Kg)/ Estimasi berat yang didaratkan (Kg)	Verified weight landed (kg) where appropriate/ Verifikasi berat ikan yang didaratkan (Kg)	
5. Name of Master Fishing Vessel – Signature-Seal/ Nama Nakhoda Kapal – Tanda tangan - Stempel :			
6. Declaration of transhipment at sea/ Name of Master of fishing vessel/ Deklarasi transhipmen di laut/ Nama nakhoda kapal penangkapan	Signature and Date/ Tanggal dan tanda tangan	Transhipment date/area /position/ Tanggal transhipmen/ area/Posisi	Estimated weight (kg)/ Estimasi berat (Kg)
Master of receiving vessel/ Nama Nakhoda kapal penerima	Signature/ Tanda tangan	Vessel name/ Nama kapal	
		Call sign/ Kode panggil	
		IMO/Lloyd's number (if issued)/ Nomor IMO/Lloyd (jika ada)	
7. Transhipment Authorisation within a port area/ Otorisasi transhipmen pada area pelabuhan perikanan			
Name/ Nama	Authority/ Otoritas	Signature/ Tanda tangan	Address/Alamat
Telephone/Telp	Port of Landing / Pelabuhan tempat pendaratan	Date of Landing/ Tanggal pendaratan	Seal (Stamp) /Cap Stempel

8. Name and address of Exporter/ Nama dan alamat Eksporir				
<i>Signature/ Tanda tangan</i>		<i>Date/ Tanggal</i>		<i>Seal (Stamp) / Cap Stempel</i>
9. Flag State Authority Validation/ Otoritas validasi bendera negara :				
<i>Name/Title/ Nama/ Jabatan</i>		<i>Signature/ Tanda tangan</i>		<i>Date/ Tanggal</i>
10. Transport detail (see appendix/ Detail pengangkutan (lihat lampiran)				
11. Importer declaration/ Deklarasi Importir				
<i>Name and Address of Importer/ Nama dan alamat importir</i>		<i>Signature/ Tanda tangan</i>	<i>Date/ Tanggal</i>	<i>Seal/ Stempel</i>
<i>Documents under Articles 14 (1) (2) of Regulation (EC) No 1005/2008/ Dokumen yang sesuai dengan artikel 14 (1) (2) dari peraturan (EC) No. 1005/2008</i>			<i>References/ Referensi</i>	
12. Import control-authority/ Otoritas pengendalian impor	<i>Place/ Tempat</i>	<i>Importation authorised (*)/ impor diperbolehkan (*)</i>	<i>Importation suspended (*)/ impor ditahan (*)</i>	<i>Verification requested - date/ Verifikasi yang diminta-tanggal</i>
<i>Customs declaration (if issued)/ Deklarasi Bea Cukai (jika dikeluarkan)</i>		<i>Number/ Nomor</i>	<i>Date/ Tanggal</i>	<i>Place/ Tempat</i>
<i>(*) Tick as appropriate/ Beri tanda jika sesuai</i>				

Appendix of Transport detail / Lampiran detail pengangkutan	
1. Country of Exportation Port/air harbor/other place of departure Negara pengekaport Pelabuhan/bandara/tempat	2. Exporter Signature / Keterangan Eksporir
Vessel name and Flag / Nama kapal dan benders	Container Number / Nomor Kontainer
	Nama/ Nama
Flight number/airway bill number Nomor penerbangan	Address/ Alamat
Truck Nationality and register number/ Nomor Kendaraan darat pengangkut	List Attached/ Daftar Lampiran
Railway number / Nomor kereta api	
Other transport document / Dokumen transport lainnya	
	Signature/ Tanda tangan

Catch certificate for boat sized < 20 GT


REPUBLIC OF INDONESIA
CATCH CERTIFICATE
SIMPLIFIED

LEMBAR TURUNAN / DERIVATIVE SHEET

Document number/ Nomor Dokumen	Validating Authority (name, address, telp, fax) / Ditugas Pemvalidasi (nama, alamat, telp, fax)	
1. Description of product/ Deskripsi produk	2. Reference of applicable conservation and management measures/ Referensi dari tindakan pengelolaan dan konservasi yang diterapkan	
Species/ Spesies	Product code/ Kode produk	Verified weight landed (kg) / Verifikasi berat ikan yang dideraskan (kg)

3. List of vessels who have provided catches and the quantities by each vessel (name, registration number, etc. annexed):
Daftar kapal penangkap ikan dan jumlah ikan yang ditangkap tiap kapal penangkap ikan (nama, no. registrasi, dll terlampir):

4. Name, address, tel and fax of exporter/ Nama, alamat, tel dan fax eksportir	Signature/ Tanda tangan	Date/ Tanggal	Seal (Stamp)/ Cap Stempel

5. Flag State authority validation/ Validasi otoritas bendera negara

Name/Title/ Nama/ Jabatan	Signature/ Tanda tangan	Date/ Tanggal	Seal (stamp)/ Cap Stempel

6. Transport detail (see appendix/ Detail pengangkutan (lihat lampiran)

7. Importer declaration/ Deklarasi Importir

Name and Address of Importer/ Nama dan alamat Importir	Signature/ Tanda tangan	Date/ Tanggal	Seal/ Stempel	Product CI code/ Kode Produk CI

8. Import control authority / Otoritas pengendalian impor

Piece / Tempel	Importation authorized (*) / Impor diperbolehkan (*)	Importation suspended (*) / Impor ditahan (*)	Verification requested - date / Verifikasi yang diminta-tanggal

9. Consignment declaration (if issued/ Deklarasi Bea Cukai (jika diterbitkan)

Number/ Nomor	Date/ Tanggal	Piece/ Tempel

(*) Tick as appropriate/ Beri tanda jika sesuai

Transport detail appendix /Lampiran detail pengangkutan	
1. Country of Exportation /Port of embarkation /place of departure Negara pengeksport Pelabuhan/bandera/tempat	2. Exporter Signature/Keterangan Eksportir
Vessel name and Flag / Nama kapal dan bendera	Container Number/Nomor Kontainer
	Name/Name
Flight number/airway bill number Nomor penerbangan	Address / Alamat
Truck Nationality and register number/ Nomor Kendaraan darat pengangkut	List Attached / Daftar Lampiran
Railway number /Nomor kereta api	Signature / Tanda tangan
Other transport document / Dokumen transport lainnya	

Appendix 3: Tuna manual tagging per fish per day



Appendix 4: A box of Skipjack ready to be manually tagged

