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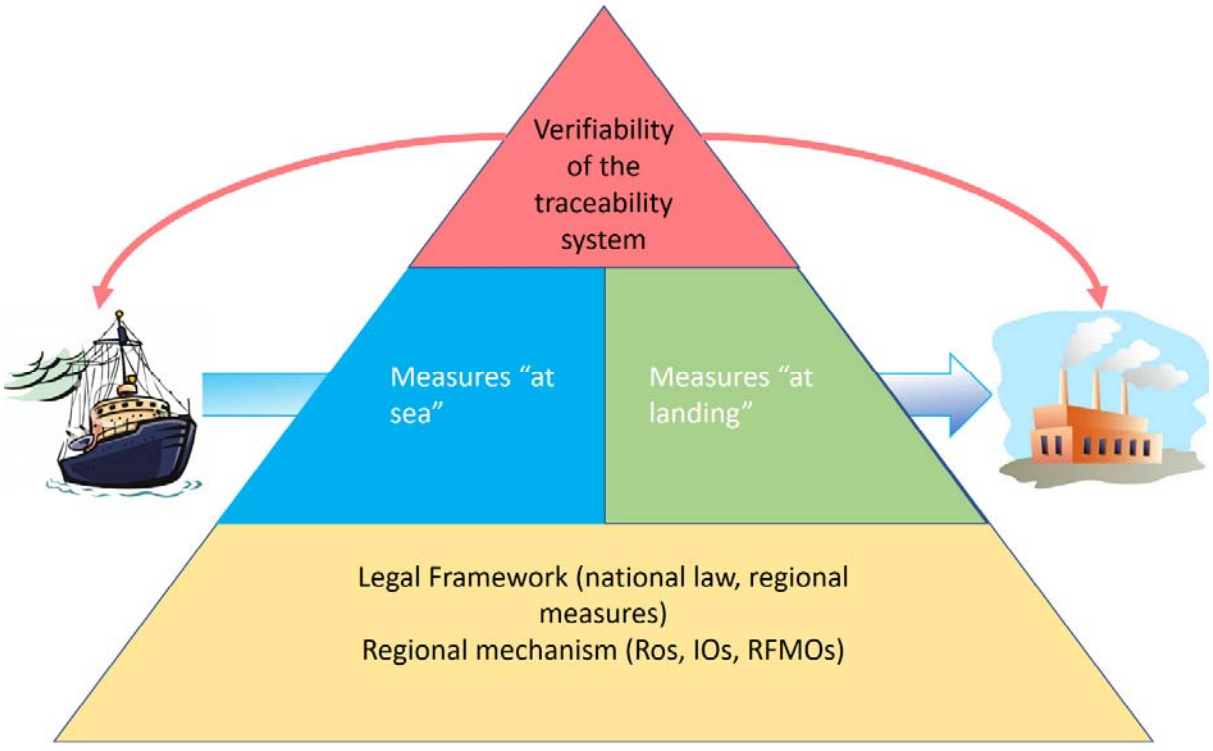
GOOD PRACTICE GUIDELINES (GPG) ON NATIONAL SEAFOOD TRACEABILITY SYSTEMS



Cover image:
Proposed components of good practices in seafood traceability systems. © V. André

GOOD PRACTICE GUIDELINES (GPG) ON NATIONAL SEAFOOD TRACEABILITY SYSTEMS

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PREPARATION OF THIS DOCUMENT

These documented good practices and resulting guidelines were developed by expert consultant Mr Vincent André, under the supervision of Ms Victoria Chomo, Senior Fisheries and Aquaculture Officer, FAO and Ms Nada Bougouss, Consultant, FAO. The guidelines were developed at the request of the FAO Member Countries who participated in a regional workshop entitled, "National and regional good practices in seafood traceability systems to combat IUU fishing in Asia", which took place in Kochi, India, in March 2016, and was funded by CITES and FAO. The documented good practices in Asia and the guidelines can be used for self-assessment by relevant stakeholders and Member Countries, and will constitute a valuable training tool for future FAO regional workshops on traceability systems to combat IUU fishing. The documentation and publication of the good practices was made possible thanks to support from the Global Environmental Fund (GEF) and under the umbrella of FAO Strategic Objective 5, which aims to help developing countries build resilience in seafood value chains in the face of natural disasters and climate-induced changes that affect their aquatic resources, community livelihoods and food security.

FAO. 2018.
Good Practice Guidelines (GPG) on National Seafood Traceability Systems by Vincent André.
Fisheries and Aquaculture Circular No. 1150. Rome, Italy.

ABSTRACT

There is little doubt that IUU fishing has a negative impact on the economic, social and ecological attributes of fisheries and this affects food security. Specifically, illegal, unreported and unregulated (IUU) fishing has contributed to a reduction in food supply, losses of livelihood and state revenue, diminishing fish stocks, and damaging ecosystems, with the most devastating effects felt in developing countries by virtue of their greater vulnerability. These illegal activities form a complex web – from illegal fishing to illegal trade, and persistent catching from unsustainably fished stocks – with the overall objective of making a high profit from illegally caught fish. Members of the FAO Committee on Fisheries have agreed on the need for good practice guidelines for national fishery authorities to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing through the effective implementation of flag state responsibilities. The guidelines are wide-ranging and address the purpose and principles, as well as the scope of application, performance assessment criteria and cooperation between states. They are expected to provide a valuable tool to strengthen the compliance of flag states in terms of their international duties and obligations regarding the flagging and control of fishing vessels.

CONTENTS

Preparation of this document iii
Abbreviations and acronyms vi
Definitions of some technical terms used in the circular vii

1. Introduction 1
2. Objective Framework 5
3. Methodology 6
4. Analysis and selected good practices 7
4.1 Regulatory framework for IUU 7
4.2 Measures at sea 11
4.3 Measures on landing 16
4.4 Verifiability 20
5. Conclusion 22
6. References 23

ABBREVIATIONS AND ACRONYMS

AIS	Automatic Identification System
AMAF	ASEAN Ministerial Meeting on Agriculture and Forestry
ASEAN	Association of Southeast Asian Nations
CDS	catch documentation scheme
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EAF	Ecosystem Approach to Fisheries
EEZs	exclusive economic zones
ETA	estimated time of arrival
ETD	estimated time of departure
EU	European Union (Member Organization)
FAO	Food and Agriculture Organization of the United Nations
FONC	flag of non-compliance
GEF	Global Environmental Fund
GPGs	good practice guidelines
GS1	Global Standards One
INFOFISH	Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asian and Pacific Region
INTERPOL	International Police Organization
IUU	illegal, unreported and unregulated fishing
MCS	monitoring, control and surveillance
NGO	non-governmental organization
PSMA	Port State Measures Agreement
RFBs	regional fishery body
RFMOs	regional fisheries management organizations
SUBIS	Fisheries Information System (Turkey)
UVI	unique vessel identifier
VMS	vessel monitoring system

DEFINITIONS OF SOME TECHNICAL TERMS USED IN THE DOCUMENT

Catch documentation scheme (CDS): a system that tracks and traces fish from the point of capture to unloading, and throughout the supply chain. A CDS records and certifies information that identifies the origin of the fish caught and ensures that they were harvested in a manner consistent with the relevant national, regional and international conservation and management measures. The objective of the CDS is to combat IUU fishing by limiting the access of IUU fish and fishery products to markets.

Monitoring, control and surveillance (MCS) is a broadening of the traditional enforcement of national fishing rules, in order to support the wider problem of fisheries management.

Monitoring usually includes the measurement of catch, species composition, fishing effort, bycatch (i.e. species other than the one targeted captured incidentally by the primary effort) and the area of operations.

Control usually covers the regulatory conditions under which the exploitation of the resource may be conducted." This is usually considered to consist of legislation, regulations and international agreements.

Surveillance usually covers the proof of compliance with the regulatory controls imposed on fishing activities.

Ecosystem Approach to Fisheries (EAF) is a series of measures that focus solely on the sustainable harvest of target species, based on systems and decision-making processes that balance ecological well-being with human and societal well-being within improved governance frameworks: in other words, a practical means of achieving sustainable development. The Ecosystem Approach to Fisheries addresses the multiple needs and desires of societies without jeopardizing the options for future generations to benefit from the full range of goods and services provided by marine ecosystems (Garcia et al., 2003; Food and Agriculture Organization, 2003; 2011).

Fishing vessels refer to all fishing, carrier and factory vessels involved in fishing activities, except container vessels.

Flag state refers to the state under whose laws the vessel is registered and licensed. The flag state has the authority and responsibility to enforce regulations over vessels registered under its flag, including those relating to inspection and certification.

Illegal, unreported and unregulated fishing (IUU):

Illegal fishing refers to fishing activities:

(1) conducted by national or foreign vessels in waters under the jurisdiction of a state without the permission of that state, or in contravention of its laws and regulations;
(2) conducted by vessels flying the flag of states that are parties to a relevant regional fisheries management organization, but contravening the conservation and management measures adopted by that organization, or any relevant provisions of the applicable international law to which the states are bound; or
(3) violating national laws or international obligations, including those undertaken by states cooperating with a relevant regional fisheries management organization.

Unreported fishing refers to fishing activities:

(1) which have not been reported, or have been misreported, to the relevant national authority, thereby contravening national laws and regulations; or
(2) undertaken in the area of competence of a relevant regional fisheries management organization but which have not been reported or have been misreported, thereby contravening of the reporting procedures of that organization.

Unregulated fishing refers to fishing activities:

(1) in the area applicable to a relevant regional fisheries management organization, which are conducted by vessels without nationality, or flying the flag of a state not party to that organization, or a given fishing entity, in a manner that is not consistent with, or contravenes, the conservation and management measures of that organization; or
(2) in areas, or for fish stocks for which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with state responsibilities for the conservation of living marine resources under international law.

Laundering of fish: the process of concealing the illegal origin of fish by turning the proceeds and records of illegal transactions into legitimate business records and assets, often by sourcing products from IUU seafood operators or businesses. Laundering is a type of fish fraud, and can be committed by fishermen, middlemen, processors, vendors or all of them. It can occur in several ways:

- by post-capture mixing of illegally harvested fish with legally harvested fish in the supply chain;
- by inflating conversion factors so as to claim a smaller than actual weight loss in processing, thereby processing more source product than is declared;
- by falsifying certificates in documentation schemes with a weak traceability architecture;
- by under-reporting catch at the point of unloading, but selling higher quantities of fish (often over quota) on black markets.

Port State Measures Agreement refers to the international agreement establishing measures for fishing vessels to request permission to dock at a port, and inform the port of the details of its fishing operations. Permission to dock can be denied if unregulated fishing is occurring. The measure is intended to block illegally caught fish from entering the marketplace. Other measures in the treaty include inspections of equipment, paperwork, catches, and the ship's records. Though the treaty does not compel countries to apply these measures to ships under their own flags, they may choose to do so under the agreement.

Regional fisheries management organizations (RFMOs): regional fishery bodies (RFBs) with a management mandate. These bodies adopt fisheries conservation and management measures that are binding for their members. RFMOs can define Conservation and Management Measures that are binding for their members (hence defining the legality of practices and catches) as well as a CDS or more general documentation schemes.

Traceability: the ability to trace the food, feed, food-producing animal or substance to be included in food back through all stages of production, processing and distribution. Traceability will enable product recall after the product is placed on the market.

Electronic traceability is a set of tools for data to be recorded, stored, shared, and accessed via electronic means as opposed to using paper-based records.

Trade measure: is a border control that allows a state or territory to regulate, restrict or prohibit trade. Examples of trade measures include landing actions, certification, labelling, or size requirements, among other things. It is recognised, however, that some high seas controls, such as monitoring system and boarding requirements, while not technically trade measures, are related to them and can trigger the imposition of border controls.

Transhipment refers to the act of transferring catch from one fishing vessel to either another fishing vessel or a vessel used solely for the carriage of cargo (FAO, 1996).

1. INTRODUCTION

Background

Seafood products are among the most widely traded food commodities in the world, with estimates for 2015 placing the value of the international fish trade at USD 130 billion; however, the practice of illegal, unreported and unregulated fishing (IUU) estimated at between USD 10–23 billion annually is undermining the industry. FAO has reported that IUU fishing, which includes operating without the necessary authorization, harvesting protected species, using outlawed fishing gear and violating quota limits, may account for up to 26 million tonnes a year – or more than 15 percent – of the world's total annual capture fisheries output. The growing global demand for seafood products has tremendous potential to benefit developing countries, whose share of fishery exports is currently at 54 percent of the global total when measured by value, and 61 percent by quantity. For many countries, fishery exports are essential to the national economy; Asian countries are an example of this, with an extremely vibrant and well-developed intraregional seafood trade.

While intraregional trade in seafood is very important, the Asian capture fishery still relies on the major importing markets of the European Union and the United States of America, which have complex food and animal health, food safety and quality assurance requirements for market access, in line with World Trade Organization (WTO) rules. New market traceability requirements are now coming into force to eliminate illegal fish from entering the European Union and the United States of America. While these new requirements are being introduced amid an increasing consumer demand for the sustainable use of resources, they also have implications for developing countries that export products to the European Union and the United States of America. Trade in illegal fish products threatens the livelihoods, food security and long-term growth prospects of the seafood industry in Asia in general.

The theme of organizing a regional workshop to address national traceability systems was developed around the findings of a Summary Report of ten national traceability system case studies from ten countries in all regions, funded by the Government of Japan. The findings recognized the shortcomings in national traceability practices and the need to develop good practice indicators for countries to self-evaluate and strengthen their traceability systems as one way to prevent IUU fish from entering markets. Namely, work on national seafood traceability systems began with the "Fisheries management and marine conservation within a changing ecosystem context" project (GCP/INT/JPN/228), funded by the Government of Japan and implemented by FAO. Under this project, one component deals with fish traceability to combat IUU fishing. Within the project activities were ten country case studies of national traceability practices. An international consultant prepared a summary report and regional workshops were planned, one for each region, to brainstorm on good practices and develop guidelines to support government officials with traceability systems at the national level.

In cooperation with INFOFISH and the Government of India, and with financial support from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), FAO convened a capacity-building workshop on "National and regional good practices in seafood traceability in Asia to combat IUU fishing" in Kochi, India, in March 2016. Participating countries from Asia presented their national good practice to combat IUU fishing. Mr Francisco Blaha presented a comparative study of ten country case studies under the framework of the FAO lead programme, "Fisheries Management and Marine Conservation within a Changing Ecosystem Context". Other source documents include the FAO "Model Scheme on Port State Measures to Combat IUU Fishing", other FAO documents to combat IUU fishing and the FAO Voluntary Guidelines for Flag State Performance[1]. The Kochi workshop was the first regional event and brought together 33 participants from FAO, CITES, two intergovernmental organizations (SEAFDEC and INFOYU), international

[1]www.fao.org/3/a-i4577t.pdf

experts, and fisheries officials from nine Asian countries. The countries participating in the workshop were: Bangladesh, Cambodia, China, India, Maldives, Myanmar, Singapore, Sri Lanka and Thailand. The workshop addressed the challenges and opportunities for international and intraregional trade in sustainably-sourced and traceable seafood products. Topics presented by FAO and international experts included:

- Global trends in seafood and measures to combat IUU fishing (Victoria Chomo, FAO);
- Case examples of IUU fishing in the Asian region – links to Port State Measures (Simon Funge-Smith, FAO);
- Traceability standards and regulations for market access to the EU (Esther Garrido Gamaro, FAO);
- Traceability of CITES-listed aquatic species (Heiner Lehr, CITES);
- Review and analysis of traceability practices (Vincent André, traceability expert);
- Study on traceability of fisheries products (Francisco Blaha, traceability consultant);
- Key findings from the Areas Beyond National Jurisdiction tuna traceability and CDS project (Gilles Hosch, traceability consultant).

Country presentations made at the regional workshop revolved around national traceability practices including strengths, weaknesses opportunities and threats (SWOT analysis). Brainstorming sessions were comprised of small working groups of participants, each featuring two experts to facilitate the training exercise. Mr André presented the methodology to be used by working groups to: 1) develop a representative seafood supply chain; 2) identify good traceability practices along the supply chain; and 3) provide recommendations on how to prevent IUU fish entering the supply chain. Each group presented its findings in the plenary session for further discussion.

The majority of countries expressed concerns about their capacity to combat IUU fishing and indicated that they would appreciate technical assistance from FAO in this regard. The FAO experts provided a short briefing presentation on FAO “Mechanisms to request technical assistance” and followed up individually with countries that expressed interest. In the final plenary session, country delegations were asked to make recommendations; these are summarized below:

- This workshop was a good start to acknowledge the common problem of IUU in Asia and it is clear that no single country can address it alone, clearly indicating the need for regional collaboration to combat IUU.
- There is a need for greater openness among Asian countries in terms of the difficulties they are facing in combatting IUU.
- There is a large number of small boats in Asia and not all ports are registered; it is difficult to record harvest levels in order to prevent fraud and IUU fishing.
- Effective vessel records and landing documents are prerequisites to establishing a credible traceability system.
- Each Asian country has different laws and systems, indicating the need for a common (or harmonized) traceability system in Asia to bring countries together in the fight against IUU fishing.
- It is important to recognize that each country has special needs, as well as differences in traceability practices and capacity, and must build country capacity based on those needs.
- Enhance communication, collaboration and the sharing of information among Asian countries.
- The goal would be to eliminate conflicts in fishing areas within the Asian region.
- Seek to minimize the technical inequality among Asian countries to combat IUU through traceability.
- Need to raise awareness of traceability among fishers and companies so as to combat IUU fishing.
- Countries must start dialogue at the highest level in government, insuring that fishers and industry are involved.

- Not all exports are for the European Union; how do we improve intraregional trade flows and traceability?
- Electronic systems can make traceability easier, but how do we develop this for a multispecies, multigear fishery in tropical waters? A model for this is required.
- FAO should draft good practice guidelines on traceability: based on these guidelines, countries from Asia and other regions can have discussions; FAO is expected to develop good practice guidelines based on "minimum requirements" to trace seafood along the supply chain.
- FAO needs to provide capacity building, sending experts to countries to work on improving national traceability systems; countries may also want to follow up on FAO guidelines with new regulations in their legislation; countries need genuine technical and financial assistance in this area.

During the regional workshop, several countries requested that FAO develop good practices guidelines on national traceability to combat IUU fishing. The country recommendations and indicators developed at the workshop were incorporated into the guidelines on good practice in national traceability systems in Asia, in order to be used as a self-assessment tool by FAO Member Countries and to identify their further capacity building needs in future training workshops.

Participants of the Regional Workshop on "National and regional good practices in seafood traceability in Asia to combat IUU fishing", 22–24 March 2016, Kochi, India

@ FAO.

FAO workshop trainers (from right to left): Vincent André, Gilles Hosch Heiner Lehr (CITES) and Francisco Blaha

@ FAO.

Workshop participants during brainstorming session

@ FAO.

Overview

The development of guidelines to assist national fisheries authorities and stakeholders along the value chain, in order to improve their operations to combat IUU fishing, was initiated by the FAO Committee on Fisheries in 2011 at its Twenty-Ninth Session. The committee agreed that FAO should initiate work to document international "best" practice for the traceability of fish and fishery products. A consultant prepared a review of traceability systems and used a traffic light approach to compare the features of these systems so that this could facilitate the coherence of different traceability systems. In this regard, a review of common practices in seafood traceability was produced, analysing the different traceability systems, and a first draft of guidelines for traceability was presented in 2014. This draft of guidelines on best practices was not approved by the Members. Instead, Members requested further research, namely a gap analysis of the existing traceability systems which was produced as an FAO Circular. Finally, participants from Member countries at the regional workshop in Asia requested good practice guidelines to assist national authorities with country-level traceability. This document addresses those specific concerns and is based on documented good practices in the Asian region.

This document is based on the main findings of the aforementioned regional workshop, as well as stocktaking exercise carried out between 2016 and 2017 to identify good practice in seafood traceability in the Asian region as applicable to the capture fisheries sector, and in particular the prevention of illegal, unreported and unregulated (IUU) fish from entering supply chains.

The results of the case studies are the present Good Practice Guidelines (GPGs) on National Seafood Traceability Systems, which are proven to work well and produce good results, and are recommended for training purposes to build the capacity of government officials and fisheries stakeholders along the supply chain. These GPGs are voluntary and adopt the main principles from already established international standards and regulations, addressing the traceability practices which are applicable to markets and the trade in fish and fishery products.

This document aims to guide the relevant national authorities on the uniform and proactive application of good practices so as to ensure that fish and fishery products entering the global supply chain do not come from IUU fishing. Ultimately, these good practices will provide and/or facilitate capacity building and institutional strengthening opportunities for those responsible for developing, integrating, implementing and/or evaluating traceability systems. These GPGs are region-specific and must be considered in context when being used as training material for capacity building in other regions.

2. OBJECTIVE FRAMEWORK

Illegal, unreported and unregulated fishing (IUU) is a global problem with an estimated value of more than USD 10 billion per year. This represents approximatively 19 percent of the reported worldwide value of catches. IUU has been identified as a serious threat to sustainable fisheries, by both endangering sector stakeholders economically and damaging the marine environment.

IUU fishing is not a new phenomenon in capture fisheries, nor is it confined to high seas fisheries: it also occurs in the exclusive economic zones (EEZs) of coastal states, perpetrated by national and foreign vessels, and in river and inland fisheries. However, while it is difficult to estimate precisely the total IUU catch in tonnage or value terms, the level of IUU fishing in marine fisheries has reached gargantuan proportions for some species. In many cases these catches are being made by both authorized and non-authorized fishers; in other words, the catches are not being taken only by vessels operating under flags of non-compliance (FONC).

Seafood products are among the most widely traded food commodities in the world, with estimates for 2016 placing the value of the international fish trade at USD 143 billion. IUU fishing, which includes operating without authorization, harvesting protected species, using outlawed fishing gear and violating quota limits, could account for up to 26 million tonnes a year – or more than 15 percent – of the world's total annual capture fisheries output.

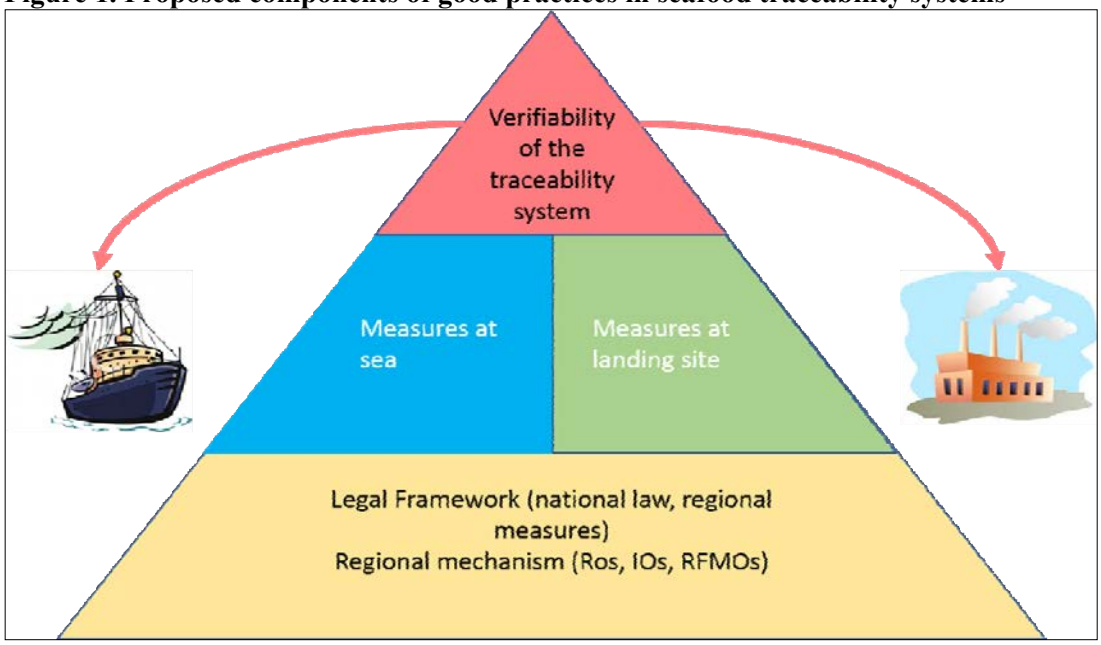
The growing global demand for seafood products has tremendous potential to benefit developing countries, whose share of fishery exports is currently at 54 percent of the global total when measured by value, and 61 percent when measured by quantity. For many countries fishery exports are essential to national economies. Asian countries are an example of this, with an extremely vibrant and well-developed intraregional seafood trade.

3. METHODOLOGY

Based on secondary sources (i.e. case studies of good practice in seafood traceability), the author gathered the relevant findings from nine cases presented at the FAO regional workshop on "National and regional good practices in seafood traceability systems to combat IUU fishing in Asia", which took place in Kochi, India, in 2016, together with the comparative study of ten country cases (Blaha, 2015) under the framework of the project GCP/INT/253/JPN "Fisheries Management and Marine Conservation within a Changing Ecosystem Context.

Twenty case studies were reviewed from countries in Asia (12), the Near East and North Africa (3), Sub-Saharan Africa (3) and South America (3). The findings are grouped and analysed according to four components, as outlined in Figure 1 below:

Figure 1. Proposed components of good practices in seafood traceability systems



Source: V. André (2017).

Figure 1 proposes a visual structure aiming to improve the efficiency and effectiveness of fisheries: at the bottom of the pyramid structure, the legal framework is the base which set the authorization required for fishing, the requirements for any traceability scheme, and any related control systems.

At-sea measures relate to vessel identification, vessel monitoring system (VMS), inspection, etc., whereas measures "upon landing" designate elements of control and management usually comprised in a catch documentation scheme.

All these provisions have to be verifiable through documents, and frequent audits must be applied to any traceability system established in a supply chain.

4. ANALYSIS AND SELECTED GOOD PRACTICES

The structure of the guidelines initially presents a number of elements which ease understanding of the control of the movement of fish and fishery products through the global supply chain, thanks to the application of traceability principles.

Thereafter, a number of criteria are provided in order to enable countries to conduct self-assessments of their national traceability system as it applies to the capture fisheries sector and in particular to the prevention of illegal, unreported and unregulated fish and fishery products from entering the supply chain. The table format was preferred so that it could easily be transferred to a "check-list" style of document.

Finally, some example countries are given to illustrate the work, ongoing activities and/or plan of action to prevent, deter and eliminate IUU fishing.

4.1 Regulatory framework for IUU

An international commitment and greater organization is required from states so that all fishing activities performed by flag state vessels are accomplished within the legislation established to prevent, deter and eliminate illegal, unreported and unregulated fishing (IUU).

IUU fishing needs to be clearly defined. This usually involves the recognition of fishing activities conducted by national or foreign fishing vessels in maritime waters under the jurisdiction of a given state, without the permission of that state, or in contravention of its laws and regulations.

National fishery authorities need to operate within a complete legal framework and address the inadequacies which permit IUU fishing. Competent authorities on fisheries need to fortify their laws with regulations focused on improving the mechanisms deployed to certify legal fishing activities. Provisions for political intervention should be in place to combat IUU fishing, including penalties against infringements. When it is necessary for several authorities (e.g. fishery, health, customs) to cooperate, harmonized actions and policies must be implemented to clarify the responsibilities between relevant agencies with regard to inspection. Fisheries law may constitute the basis of a tracing system and provide a common framework for collaboration between all these institutions. Legislation mandating logbooks of fishing activity should be part of fisheries management approaches.

Interagency cooperation or coordination between regulatory bodies that support the implementation of traceability through their activities is crucial, in terms of the application of mandatory or non-mandatory standards along the supply chain.

Command Center for Combating Illegal Fishing (CCIF)

Source: www.thaistopiuufishing.com.

A phased approach to implementing a single competent agency, with other agencies taking on technical advisory roles, should be prioritized. The single agency approach to supply chains minimizes the possible confusion of directives and outputs generated by the majority of interagency arrangements.

A fisheries Officer that regulates fishing rights maintains fishing authorization records for local and foreign fishing vessels and their owners, defines gear and fishery restrictions, and should stipulate sanctions for illegal activity on the basis of the following conditions:

- the violation of legislation
- a lack of appropriate documentation for fishing operations
- a vessel's base of operations
- the landing of catch
- the activity reflects the "proper management of fisheries resources" .

This important legislation does not currently exist to facilitate regional cooperation on the issues of IUU fishing prevention and quality assurance in the harvest sector. In order to achieve the objectives of long-term conservation and a sustainable use of fish stocks, measures agreed by RFMOs must be implemented by their members in line with the principles and objectives of the FAO Code of Conduct for Responsible Fisheries (FAO, 1995). There is also a need for a policy to enhance cooperation with other flag/costal states on combatting IUU fishing in order to strengthen the traceability of imported fish and raw materials throughout the fisheries supply chain. Effective regional cooperation and/or coordination is crucial for capacity building for international trade in fisheries resources, as well as transparent and responsible practices along the value chain, including in small-scale fisheries.

Subregional fisheries management plans, strategic action programmes for the improvement of regional governance of sustainable development and the management of fisheries resources will also assist in strengthening the implementation of international fisheries instruments. Several standards now aim to promote the implementation of management plans based on the ecosystem approach to fisheries (EAF), and to provide guidelines for the harmonization of national and regional efforts.

These standards usually include:

- increasing technical capacity for the facilitation of international compliance and trade;
- establishing regional and national capacity for the certification, accreditation, surveillance and assessment of procedures;
- establishing lateral and vertical linkages between organizations;
- the promotion of responsible fishing practices, preventing IUU fishing and the implementation of traceability so that fishers gradually become more familiar with traceability and IUU regulation practices.

Regional countries should share information on fishing vessels and fisheries resources management, especially in terms of traceability and enforcement inspections for IUU regulation.

Table 1. Regulatory framework and examples of criteria to be considered good practice

Regulatory framework	Example of criteria to be considered good practice
National legislation	▪ Existence of a comprehensive law governing safety and traceability of food products, applicable to seafood; ▪ national regulatory provisions covering fisheries management, traceability practices and the prevention of IUU fishing; ▪ national regulatory provisions/requirements are applicable to small-scale and industrial fisheries.
Clearly define control mechanism	▪ Specialized fisheries management body identified, one with the power to impose sanctions that will support the development of good traceability practices, in particular in relation to IUU. In the event that implementation of traceability requirements is driven by different official bodies (e.g. health, customs, fisheries), an integrated and effective coordination mechanism should be in place. ▪ Personnel involved in different traceability activities (in relation to human safety, security, environmental issues, quality assurance) have an adequate and specific education level to avoid confusion and inconsistencies in the scope, legal status, implementation capacity and control of traceability systems.
Regional scheme / management organization	▪ Availability of regional regulatory frameworks and enforcement bodies on shared fishing grounds resources; ▪ cross-country traceability linkages are enforced at the national and/or regional levels; ▪ coordination with relevant Regional Fisheries Management Organizations (RFMOs) or neighbouring countries where relevant; ▪ support provided to fishers to assist with up-scaling and education so that requirements are better understood, and to build capacity within the industry to implement the required traceability system; ▪ efforts to increase stakeholder capacity through education should involve a series of workshops targeting specific groups, conducting sensitization exercises, building partnerships with other stakeholders, collecting intelligence, etc.

Source: V. André (2017).

Thailand

Thailand has been reforming and modernizing its fisheries sector in line with international rules. The Thai government overhauled its legal and policy frameworks governing Thai fisheries within eight months of the reform. The passage of the Royal Ordinance on Fisheries 2015 and the adoption of the Fisheries Management Plan 2015–2019 are two important landmarks of the reform. The new Thai Ordinance provides the legislative framework to combat IUU fishing, including strong penalties against infringements.

Thailand has developed cooperation with third countries and RFMOs to combat IUU fishing. Traceability of imported fish and raw materials throughout the whole fisheries supply chain has been strengthened. Thailand is leading the development of a common Association of Southeast Asian Nations (ASEAN) Fisheries Policy to strengthen the association's collective efforts in achieving sustainable and responsible fisheries. The regional policy was discussed at the ASEAN Ministerial Meeting on Agriculture and Forestry (AMAF).

High-level Consultation on Regional Cooperation in Sustainable Fisheries Development Towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products, 3 August 2016, Bangkok, Thailand

Note: Thailand hosts the ASEAN-SEAFDEC cooperative forum and comes together with other countries in developing a joint declaration to combat IUU fishing and enhance sustainable fisheries development in the region.
Source: www. seafdec.org.

Indonesia

Fisheries Laws No. 31/2004 and No. 45/2009, Article No. 36 and No. 37 has now been strengthened, with the application of the Government's Ministry of Marine Affairs and Fisheries Regulation No. 27/2009, regarding the registration and marking of fishing vessels (Decree of Director General of Capture Fisheries No. 36/2010, regarding Specification and Arrangement System of Fishing Vessel Marking).

Indonesia continues to strengthen efforts to ensure that standards are applied, notably through NGO involvement and various partnerships within the seafood industry, thereby creating a positive environment for addressing the IUU concerns.

The Philippines

The Philippines clarified that the traceability system in practice could also address seafood fraud such as the misrepresentation of species, in response to a query presented by Malaysia. The Philippines has updated their traceability laws in line with the requirements in order to prevent illegal, unreported and unregulated fishing. The Philippines was required to develop a traceability system for wild catch as the European Union had issued a yellow card (in 2014) and lifted it after the amendment of fishery laws. Stakeholders in the Philippines now also have to be aware of the export requirement to avoid the high penalties incurred for violating the new legislation.

4.2 Measures at sea

One of RFMO's goals is to facilitate the effective exercise of flag states' responsibility over fishing vessels flying their flags. Aside from conventional (and costly) MCS by surveillance aircraft and patrol vessels, other commonly used MCS tools are: vessel registers, VMS, observer programmes and inspections. The purpose of these is to ensure that parties effectively carry out their obligations under relevant legislation so as to secure compliance with the conservation and management measures adopted by the RFMO. The various elements of an MCS system cannot be seen in isolation: they are all important parts of the total system.

All the relevant Regional Fisheries Bodies (RFBs) have adopted vessel registration procedures over the past decade; this is a fundamental tool which facilitates the control of fishing vessel activities at the national, regional and international levels.

Example of vessel registration and associated documents

Note: Standard Specifications for the marking and identification of fishing vessels, ASEAN Guidelines for preventing the entry of fish and fishery products from IUU fishing activities into the supply chain, endorsed by *the SSOM 36th AMAF (24 August 2015 version).*
Source: Mazalina, A. *et al.* (2015).

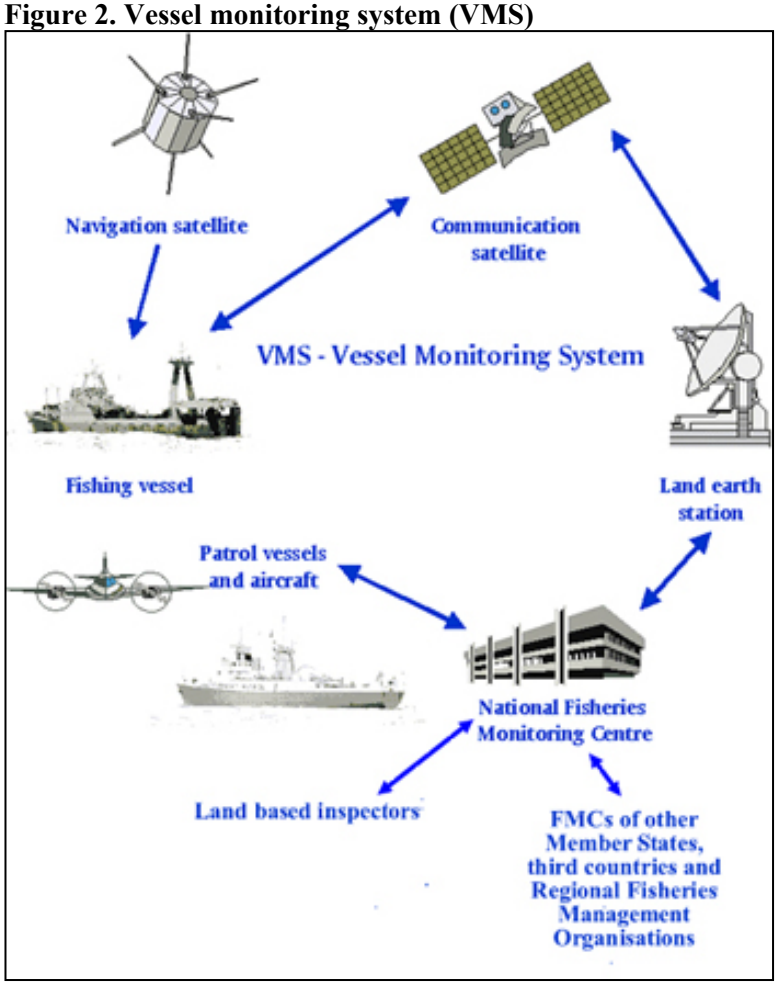
Vessel registers – or list of authorized vessels – are now available at RFMOs and national fishery authorities. The amount of information that must be submitted varies between RFMOs. It usually includes the vessel name, radio call sign, external registration number, owner name and vessel capacity, length and power. Others ask for additional information, such as details of the vessel's previous name(s), along with flag(s) and photographs of it.

Specific requirements may be applied when tuna-like species are fished, with the possible establishment of 'positive lists' or 'whitelists'.

Combined online IUU vessel lists are available to provide the best-known updated information on all vessels associated with IUU fishing activities, making use of the lists compiled by RFMOs and INTERPOL.

The inspection of fishing activities involves the verification of the species and quantities caught, cross-checking these with the quantities recorded in logbooks, in catch reports on exit, and in the reports of any other inspections carried out. Other tasks involve the verification of the mesh size of nets on board and the size of fish retained on board.

Figure 2. Vessel monitoring system (VMS)



Source: European Commission (2017) (available at http://ec.europa.eu.fisheries/cfp/control/technologies/vms_en).

An efficient and effective inspection system is necessary both to ensure compliance from RFMO members and provide a means of monitoring and discouraging illegal activities by non-members of the relevant RFMO. Among the measures to be taken by flag states are the development and implementation of VMS in accordance with such programmes as might have been agreed regionally or globally. There are currently no examples of global VMS programmes so far, but RFMOs are increasingly adopting a regional approach to VMS. The purpose of VMS is to provide a flag state or an RFMO with information on the position of a fishing vessel at regular intervals. Some VMS also allows for the transmission of catch and effort data from the fishing vessel to the flag state or the RFMO in close to real time.

All RFMOs have introduced, or are about to introduce, mandatory VMS for vessels operating within their area of competence since 2002. VMS may activate traditional means of MCS measures – inspections at sea or in port, for example – as a follow-up to the information received by VMS.

Fisheries observer in Papua New Guinea

@ L.A. Tauafiafi (2016).

At-sea boarding and inspection schemes have been adopted by some states. Inspectors designated by national authorities have the competence to board vessels of other parties and inspect the catch, fishing gear and records concerning any fishing activity. They may take photographs or video footage, document infringements and seize illegal gear; they must also be given appropriate assistance by the master of the vessel and have access to communication equipment. Inspectors shall complete an inspection report. Some cooperative schemes for the enforcement of regional conservation and management measures envisage that in any high seas area covered by an RFMO, regulatory bodies from that RFMO may board and inspect fishing vessels flying a state flag, whether or not that party is also a member of the RFMO concerned.

The regulation of transhipment has become an important tool in the fight against IUU fishing, as well as for the collection and verification of data. Many IUU operators tranship at sea as a way of reducing the chance of detection. By transferring catches to reefers, IUU fishing vessels can avoid entering ports in order to land their fish. On reefers, IUU catches are often laundered by mixing them with legallycaught fish. Furthermore, reefers are often used to transport the fish from the RFMO area where the fish were harvested to the ports of non-members of a particular RFMO. Consequently, some RFMOs have established specific measures for the supervision of transhipment – for example through the detailed reporting requirements and the restriction of transhipments to members of the RFMO concerned.

Fishing vessels at sea

@ F. Blaha (2017).

Table 2. Fleet Management and examples of criteria to be considered good practice

Fleet management	Example of criteria to be considered good practice
Registration/ licensing/authorization/ permit for fishing vessel	▪ Vessels are registered and have a Unique Vessel Identifier (UVI) i.e. registered owner, flag state, vessel name, international radio call sign, port of registry, vessel capacity, length and power, etc.; ▪ both industrial vessels and traditional and/or small-scale fishing vessels are registered.
Compliance and enforcement at sea	▪ Compliance with effective enforcement of individual fishing vessels in line with RFMO measures. ▪ Adequate measures for conservation and management of fisheries are supported by Catch Monitoring Control and Surveillance (MCS). ▪ Issuance of fishing licenses is based on sustainable resource management. ▪ A logbook is compulsory for both industrial and small-scale national fishing vessels. Vessels should keep a logbook containing information on catch area, catch date, assurance of quality and food safety while on vessel, storage conditions, quantity, gear used, identification details of the vessel which caught it, and catch area. ▪ Clear criteria for accurate inputting into logbooks based on specific requirements for fishing logbooks keeping and reporting of procedures that are in place in order to ensure the accuracy of the data reported. ▪ Each individual catch, including catches transhipped from other vessels, must be individually labelled with individual data. This label should accompany the catch when transferred from the vessel through the landing site and to the buyer. ▪ Authorities implement control measures for stakeholders both in artisanal fishing vessels and small-scale, traditional fisheries. ▪ Monitoring and control are undertaken through documents and if possible electronic systems to best capture and communicate data. Validation steps for the information captured occur at each step of the process until the point that the product is processed. ▪ MCS takes place both “at sea” and “on shore”, as part of the production chain; ▪ Restrictions on fishing gear are clearly established, including the ban of certain types of vessels in given areas, or controls on such parameters as the mesh size of fishing nets. These restrictions are enforced only by physical inspections at sea or at dockside. ▪ Catch and quota controls, by species or total catch e.g. Days at sea, daily time at sea, seasonal catch limits, per-trip catch limits, limits on catch within certain areas, individual (vessel) transferable quotas, minimum or maximum fish sizes, and bycatch are all part of the control system.
Vessel Monitoring System	▪ VMS has been developed and implemented, which provides data to fisheries authorities at regular intervals on the location, course and speed of vessels; ▪ a regional approach to VMS has been envisaged or agreed; ▪ small-scale and traditional fisheries are included in the VMS.

Fleet management	Example of criteria to be considered good practice
Transhipment	▪ Traceable units can be traced back to the fishing vessels; ▪ states have established formal arrangements with respect to landings between bordering countries; ▪ states conduct regular bilateral/multilateral meetings to discuss mutual agreements on licensing system, data recording, and sharing of information on licensing system, regulations, and other relevant information; ▪ transmission of catch and effort data from the fishing vessel to the flag state or the RFMO, or relayed to a fishing monitoring centre or through the VMS; ▪ states strengthen measures to regulate fishing vessels accessing their ports for transhipping and/or landing catch, and collect and exchange relevant data – including the origin of catch – among neighbouring countries; ▪ at-sea transhipments are allowed only if the fishing vessel (or donor vessel) has obtained prior authorization from its flag state and also obligations of notifications.
Inspection at sea	▪ An efficient and effective inspection system ensures compliance with the traceability system. Possible boarding of vessels to inspect catch, fishing gear and records concerning the fishing activities.

Turkey

A fisheries information system is one of the main components of the Turkish fisheries in the Black Sea. This system contains information on the Automatic Identification System (AIS) registry, which is mandatory for the fishing vessels over 15 m length.

The Turkish fisheries management authority has made significant progress in terms of compliance with the European Union framework for transition to responsible and sustainable fisheries by: reducing the fishing fleet (initiating a buy-back programme for boats longer than 10 m); activating a fisheries data processing system (SUBIS= integrated Fleet Register System to collect vessel data); reorganizing fisheries management (establishment of a Directorate-General of Fisheries and Aquaculture); extending port offices; performing stock assessment studies for some species; initiating quota application; and introducing a fishing boat monitoring system, which may be counted as particularly significant among these acquisitions.

Tanzania

The Ministry of Defence and National Services has the mandate of Monitoring, Control and Surveillance of IUU fishing in its EEZ and territorial waters. This applies to any law-abiding fishing fleets, whether foreign or Tanzanian. All fishing operations must comply with both local and international laws so as to operate in Tanzanian waters. In the monitoring of territorial waters, Zanzibar is controlled by the Ministry of State (President Office) Regional Administration and Special Departments (Zanzibar), with specialised units fighting smugglers with the help of the Fisheries Department of Zanzibar and trained local communities. In both cases there is clear communication at all levels of the governing bodies to make sure patrols are running smoothly without harming the groups involved (fishers or companies). Several countries have clearly regulated the use of some fishing gears, as in the case of Bangladesh. Similarly, the China operates controls on fishing nets.

4.3 Measures on landing

National regulatory bodies should implement a system able to track and trace fish from the point of capture to unloading and throughout the supply chain. This is only possible if basic principles of traceability such as Unique Vessel Identification, data collection and management, and clear procedures for the communication of data between stakeholders in the supply chain are understood and established. Traceability is therefore the tool to ensure that a CDS records and certifies information that identifies the origin of fish caught and ensures they were harvested in a manner consistent with the relevant national, regional and international conservation and management measures.

Japanese fisherman landing fish catch

Source: Facts and Details (2012).

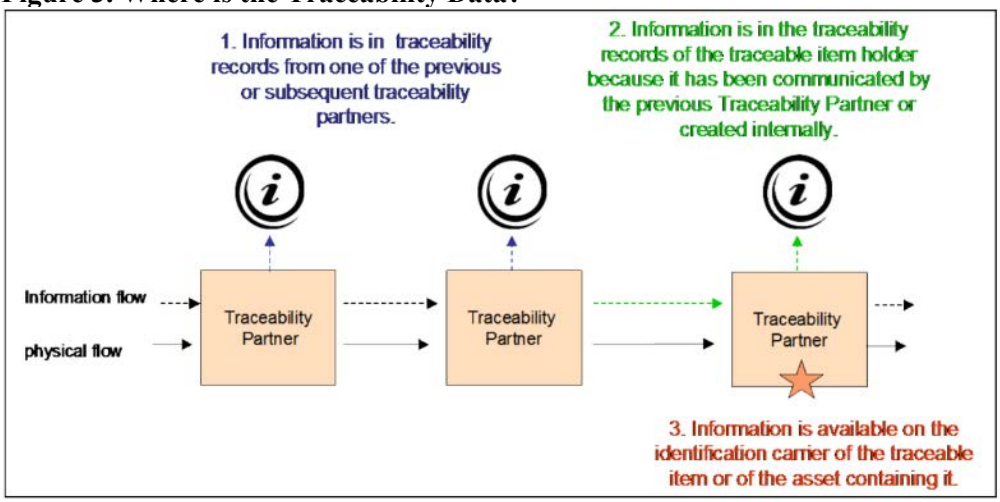
The objective of a CDS is to keep illegally sourced fish outside of legally certified supply chains, preventing them from entering markets. Achieving this goal rests squarely on the ability to identify and quantify legally certified fish at the beginning of the supply chain, and to prevent the laundering of illegal fish into the legally certified supply chain at any point thereafter. In order to achieve this, the CDS must be able to detect laundering as it is being attempted. The only tool that allows us to achieve this feat on an all-encompassing, permanent supply chain and fishery-wide basis – capturing all harvests, landings and trades – is a well-designed traceability mechanism. The legal quantity of fish entering the supply chain at the harvesting end is quantified and qualified, and this quantity of fish, broken down into thousands of individual catch certificates, is then traced stepwise throughout the supply chain via the issuance and re-issuance of export or re-export certificates (hereafter referred to as 'trade certificates'), which link the traded products to their previous certificates. The hard links between subsequent certificates allow for the monitoring of mass balance integrity, as fish products in various forms move through the supply chain, and this linkage of certificates is the nexus of a traceability mechanism inherent to a CDS.

All operators in a national supply chain keep a number of predetermined records. The authority must define the records, and these must be kept on company premises for a determined amount of time. Submission to the competent authority for centralized filing at recurrent intervals is an option, but requires additional resources and presents its own advantages and disadvantages.

Importance of traceability

Record-keeping rules are cheap, and do not require any elaborate infrastructure. Companies can for instance be requested to record the source, the volume, the form and the certificate numbers of all products received under a CDS, and log these data in dedicated records for which the format is specified. The same type of records must be kept by operators for all products leaving a company, whether as an international export or as a business-to-business transfer/sale of products within the national supply chain. In this way, a trace is created, allowing for the complete reconstruction of a batch of products flowing through the national supply chain, and can be accessed by authorities for inspection purposes if needed.

Figure 3. Where is the Traceability Data?



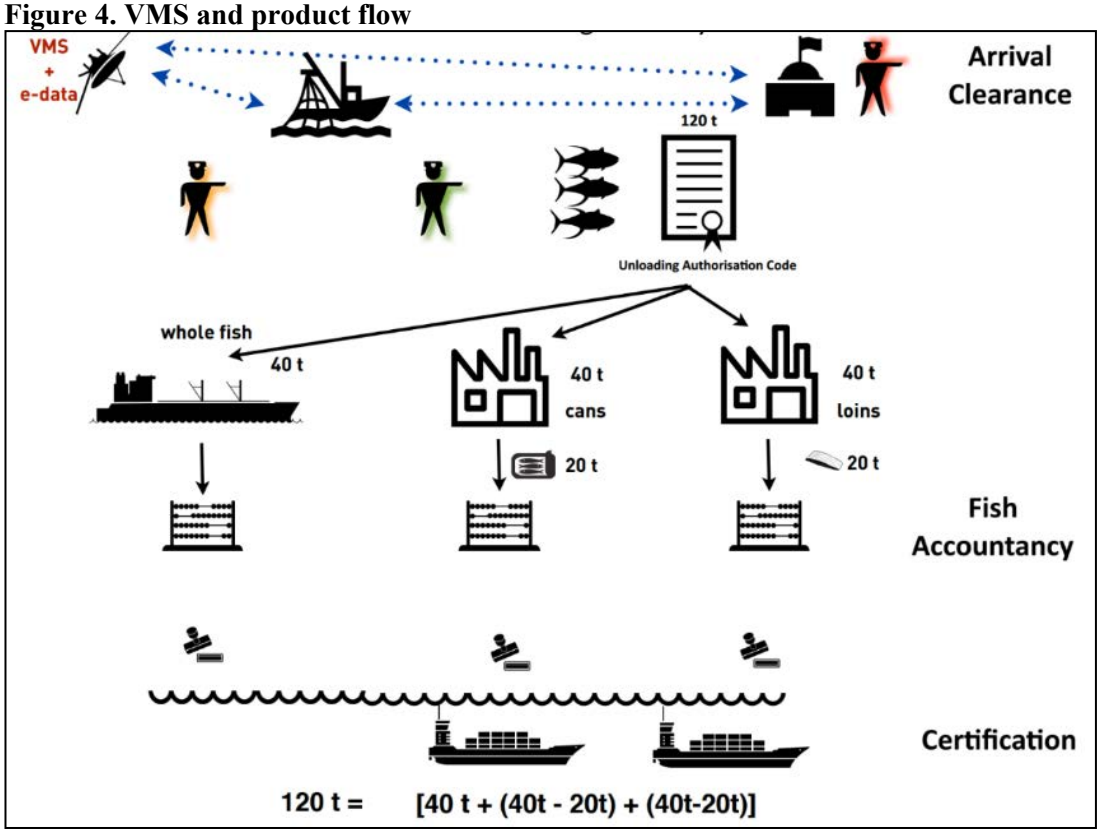
Source: GS1 Standard Document: Business Process and System Requirements for Full Supply Chain Traceability. Issue 1.3.0 (November 2012).

Another aspect of the control system is more commonly called Port State Measures (PSM). These measures are requirements established or interventions undertaken by port states, which a foreign fishing vessel must comply with or be subjected to as a condition for the use of ports within the port state. National PSM would typically include: requirements related to prior notification of port entry, the use of designated ports, restrictions on port entry and landing/transshipment of fish; restrictions on supplies and services, documentation requirements and port inspections; as well as related measures, such as IUU vessel listing, trade-related measures and sanctions. Many of these measures have been included and developed as part of international instruments in recent years.

In recent years, RFMOs have recognized the importance of coordinated Port State Measures: both because all harvested fish must be landed at some point, and because the use of such measures does not require substantial resources compared to other tools such as inspection at sea.

Overall, an integrated traceability system needs to be in place in order to establish the principles and requirements for the design and implementation of a feed and food traceability system, with data and information management that utilizes the latest technology so as to allow a national fisheries authority to take decisions in a timely manner. The below figure is an example of a certification system for fishery products which gathers all the elements discussed above.

Figure 4. VMS and product flow



Source: Blaha, F. (2015). (https://static1.squarespace.com/static/52a9273ae4b07fa2610392dd/t/53c7c47be4b002651824de6c/1405600913332/?format=1000w)

Table 3 Catch Documentation Scheme and examples of criteria to be considered good practice

Catch Documentation Scheme	Example of criteria to be considered a good practice
Access to port/landing sites	▪ Landing sites with adequate infrastructure exist and are clearly identified, as defined on the PSM; ▪ specific arrangements are in place to deal with foreign vessels landing catch in domestic ports (including port measures) including step-by-step procedures to organize the administrative mechanism for landings; ▪ port monitoring of landings is effective enough to enable catch to be attributed to a specific vessel; ▪ a list of designated ports is available upon request.
Records at landing sites	▪ A procedure implementing traceability documents such as landing reports issued and/or validated by the national competent authority is in place. ▪ All fish landed must be traced by source, species, volume and value by law on landing. All catches must be registered with origin and destination information and issued with a fish movement permit by national fish inspectors. ▪ Catch certification should be made upon provision of minimum information about the catch such as: - From whom: vessel identification - To whom: designated port - How: Fishing authorization - When: dates of fishing trip and etd/eta - What: quantities/quantities to be landed/ transhipped - From where: fishing zones. ▪ Vessel and fisher identification information and catch quantity may comprise: - Individual catch identification and labelling for supply chain - Catch date - Assurance of food safety and quality while on board - Information on storage conditions - Specific identification of the vessel which harvested the catch - Transhipping details. ▪ The exact weight of fish must be recorded, not merely an estimate of the volume of fish caught.
Data transfer	▪ Information flow accurately follows the product in a way that can be verifiable; ▪ there is a system (electronic or paper) to transfer the information along the supply chain, and the information is compatible and comparable among countries e.g. matching of export and import data; ▪ data is transferred along the supply chain and critical points are identified where data could be lost or where IUU fish could enter the supply chain.

Morocco

A computerized traceability system has been established with the intention of reducing the use of paper documents and ensuring continuous traceability, as well as verification from landing to export. The traceable unit is linked to the fishing vessel. Processing factories gain access to the catch information from the wholesaler in order to establish a catch transfer. This catch transfer, together with the information contained in the other CDS documents, allows the factory owner to verify the traceability required to be transmitted to the exporter. At the end of the chain, the exporter will have all the traceability needed to ask for the validation of the catch certificate.

Argentina

The traceability system for seafood is linked to landing reports issued by the national fishery regulatory body, together with a sanitary certificate. The documents are attached to the transport documents and invoices supplied to factories with the product as it arrives from each vessel. Each processing plant has a log of all products entering and leaving the plant. Plant logs must be compared with the landing reports on a weekly basis.

Several countries are developing similar computerized systems to capture vessel data and validate catch certificates such as India, Thailand. Sri Lanka, meanwhile, is actively promoting the use of VMS.

4.4 Verifiability

Internal and/or third-party audits aim to secure the reliability of the traceability system and to evaluate its effectiveness in reaching its objective. System monitoring can therefore be conducted at regular intervals.

A report on the monitoring should be taken into account for the next planned audits.

Audits usually involve the following checks:

a. whether the work is being performed according to the predetermined procedures;
b. the food and related information can be tracked and traced;
c. changes in the weight and/or quantity of food before and after the work is conducted are identified, together with any abnormal increase or decrease (quantitative account).

The tracing and tracking test means randomly choosing and checking on several traceable unit samples or actual products of specific raw materials and products, upstream and downstream, where traceability is conducted. By conducting this test, it is possible to check if tracing and tracking was conducted properly (time needed) and what kind of problems exist for tracing and tracking.

Table 4. Verifiability and examples of criteria to be considered good practice

Verifiability	Example of criteria to be considered good practice
Possibility of verifying the legality of the catch (Flag – Coastal – Port State Responsibility)	▪ Was the vessel fishing legally during the time of harvest and landing? (i.e. Does it have a valid license?) ▪ Does the MCS system provide assurances that the vessel was complying with the license conditions during the time of the harvest and landing? For example: the VMS track of the vessel shows compliance, the logsheet was provided/loaded, the observer report was verified /legal gear, were there pending fines, instances of non-compliance, etc.
Traceability and fish accountancy (Port – Processing State – Industry responsibility)	▪ Can we follow the trail that links the volumes in the catch certificate to the total landed? (This requires retracing the path from the volume in the container to the landing of that particular vessel, and account for the volumes landed, locally sold, exported, and any remains). ▪ Does the "fish accountancy" system include all "conversion ratios" associated with the processing of fish and waste, renderings, fish meal, etc.?

5. CONCLUSION

The Good Practice Guidelines summarize some possible actions for combating IUU fishing, in accordance with the Plan of Action on Sustainable Fisheries in various regions of the world. The proposed structure of the guidelines initially explains some principles of traceability designed to ensure that fish and fishery products in the supply chain do not come from IUU fishing activities. The second part provides a number of requirements that will hopefully help national fisheries authorities to conduct self-assessment exercises on the situation in their country. The third part of the guidelines encompasses both initiatives and examples of good practice to combat IUU fishing, which have either been achieved or are in progress.

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