TRACEABILITY OF FISH AND FISHERY PRODUCTS
AQUACULTURE PRODUCTS

SEAFDEC/MFRD

I. INTRODUCTION

The Codex Alimentarius Commission (2004) defines traceability or product tracing as “The ability to follow the movement of a food through specified stage(s) of production, processing and distribution”. In an increasingly complex food system, traceability has become the major tool to deal with issues/problems associated with food safety and quality assurance, thus allowing business to prevent risk and gain consumer trust.

The strengthened ties between countries across the globe encourage and facilitate bilateral trade. It is not uncommon for food to travel thousands of miles to reach a market. In trade, records of traceability are used as proof of compliance to food safety, bio-security and regulatory requirements; these records also ensure quality and other contractual requirements are fulfilled. Thus it is imperative that traceability of food products be strengthened to support food safety worldwide. In the situation such as a food recall, robust traceability systems allow efficient tracing of affected products throughout the supply chain.

Traceability in the aquaculture supply chain aims to ensure the safety and quality of aquatic organisms and, to verify that they are farmed in compliance with national or international management requirements or to meet national security and public safety objectives. In order to facilitate trade with specific countries such as the United States of America (USA), the European Union (EU), as well as Japan, traceability has also become a vital tool and requirement for necessary market penetration.

ASEAN exports a significant volume of aquaculture fish and fish products annually to regional and global markets. As traceability becomes a trade requirement for eligibility to export aquaculture products to the major markets, such as Japan, European Union (EU) and United States of America (USA), establishing reliable traceability system is crucial for the sustainable development of aquaculture industry in ASEAN. To tap into the demand for aquaculture fish these markets, several large scale aquaculture companies in ASEAN are able to comply with the stringent export requirements. Governments and organizations around the world have also been developing different systems on seafood traceability e.g. TraceFish (EU), TraceShrimp (Thailand). Some countries in the ASEAN region which are major seafood exporters, such as Thailand (shrimps) and Viet Nam (catfish), have begun implementing of traceability systems for their aquaculture products.

Beside stringent regulatory requirement, the greatest pressure for businesses to implement traceability system for aquaculture products has been coming from the general public. A new generation of educated consumers with higher level of awareness drives a growing market demand for food safety, security and sustainability for aquaculture products. Consumers are getting more and more cautious over what they eat – whether the food comes from a safe and sustainable source, and whether production, transportation, and storage conditions can ensure food safety and quality.

II. NATIONAL AND REGIONAL INITIATIVES

The status of traceability system implementation for aquaculture products differs among the ASEAN Member Countries. Some countries which are major exporters of fish and fishery products have
implemented traceability systems for their aquaculture products such as Malaysia (shrimp), Thailand (shrimp) and Viet Nam (catfish and shrimp). However, with increasing requirements for traceability in the international markets, there is an urgent need for all countries in the ASEAN region to implement traceability systems in their aquaculture industry so as to comply with the regulations of the importing countries. For countries that already have implemented traceability systems that permit them to export their aquaculture products to European Union (EU) or the United States (US), they have established a certain degree of legal framework as well as computerised/electronic traceability systems to track the aquaculture products from farm to fork. On the other hand, Member Countries that are in the process of implementing the traceability system have been enhancing their capabilities by building up the legal framework for traceability implementation and introducing traceability system to their industry through government support such as regulatory requirements, education and training.

**Brunei Darussalam**
Three private companies engaged in blue shrimp aquaculture have implemented traceability in their operations. The shrimp farmer maintains records of date of stocking, feeding and harvest. The country has a sole supplier of blue shrimp fry which are cultured by the private companies and will be harvested and sold to local shrimp buyers for the domestic market or to a processing company which is also operating the shrimp hatchery in the country.

**Cambodia**
Aquaculture production is only for domestic consumption. To ensure the safety and quality of the aquacultured products, the Fisheries Administration (FiA) has issued the Aquaculture Technical Guideline and a technical manual on Good Aquaculture Practices (GAqP) which include elements of product traceability. Training on GAqP has also been provided to fish farmers and model farms have been selected for GAqP certification. However, GAqP implementation entails a high cost to the fish farmers who also may find it difficult to obtain a better price for their products.

**Indonesia**
The traceability system for aquaculture products in Indonesia is being piloted in three provinces namely Lampung, East Java and South Sulawesi. The traceability system is expected to be gradually implemented in 2016. Indonesia recognizes the need to encourage stakeholders to be involved in the implementation of the established traceability system. Directorate General of Aquaculture of the Ministry of Marine Affairs and Fisheries as the competent authority for aquaculture has conducted a number of training workshops, socialization program and activities to build stakeholder awareness on traceability to support the implementation of the traceability system in Indonesia.

Various data/information gathering systems for Internal record keeping in hatcheries, farms, processing plants and feed mills as well as establishing farmers’ identification have also been developed to support the traceability implementation.

However, a strong legislation is needed to ensure the system could be carried out successfully. Currently, Indonesia is developing such a government regulation to ensure the implementation of the traceability system that can help improve aquaculture product traceability.

**Lao PDR**
Presently, traceability for aquaculture products had yet to be implemented in Lao PDR. There is only document inspection for import, export and transit of commodities, as well as inspection at the International Checkpoint before entering into Lao PDR.

**Malaysia**
The Aquaculture Product Traceability System has been developed to support the aquaculture shrimp industry export their products to the US and EU. The system was developed in 2011 and fully established in 2012. The main objective of the system is to ensure the origin and food safety of the aquaculture products. Currently, the traceability system is paper-based but an electronic system is
being developed. Malaysia has also implemented another Live Fish Traceability System for ornamental fish to ensure the fish health and minimize or prevent the spread of fish diseases.

**Myanmar**

Myanmar is in the process of implementing traceability systems in all supply chains for aquaculture products. The Department of Fisheries of Myanmar has already initiated Good Aquaculture Practices (GAqP) for fish and shrimp farming since 2011. Recently, the Department of Fisheries has issued GAqP certificates for a total of 1549.2 hectares for fish, shrimp and soft-shelled crab farming. GAqP training is also being conducted for fish inspectors, extension aquaculture officers, fish farmers and other stakeholders in the aquaculture supply chain.

**Philippines**

Traceability for aquaculture products in the Philippines is being implemented under the purview of the Bureau of Fisheries and Aquatic Resources (BFAR). The BFAR as the competent authority for aquaculture and fishery products has programs and activities that will enhance and strengthen the implementation of the traceability system.

The BFAR Administrative Circular Order No. 251 of 2014 on traceability system for fish and fishery products provides the requirements on documentation for traceability for wild caught, farmed fish and other aquatic products. The Circular applies to all fishery and aquaculture business operators directly or indirectly involved in production and processing of fishery and aquatic products for export. Based on the BFAR Administrative Circular Order No. 251, the aquaculture supply chain is divided into three main sections, namely: i) pre-production (hatchery/nursery, feed mill/aquatic veterinary products); ii) production (grow-out farm), and; iii) post-harvest (auction market, transport, processing establishment, cold storage, shipment). Each stage in these main sections of the supply chain requires documentation system for traceability. For large operators, there is an internal traceability system for the stages of supply chain, such as within hatcheries, farms, processing plants and feed mills. However, external traceability linking all parts of the supply chain has yet to be strengthened. Further, small-scale aquaculture operators and the auction markets mostly have minimal records for traceability.

The Code of Good Aquaculture Practice (GAqP) developed by BFAR has also been approved and adopted as a Philippine National Standard by the Bureau of Agriculture and Fisheries Standard (BAFS, 2014). Based on the RA 10654, amendment to the Philippine Fisheries Code of 1988, the farmers have to implement the GAqP to minimize the risks associated with aquaculture production. The GAqP focuses on food safety, animal health and traceability.

**Singapore**

The Agri-Food & Veterinary Authority of Singapore (AVA) is the national authority responsible for aquaculture development in Singapore and licenses all marine food fish farms and land-based farms in Singapore.

In Singapore, at farm level, AVA leverages on the Good Aquaculture Practice for Fish Farming (GAP-FF) scheme for the traceability of aquaculture products. The GAP-FF scheme which was launched in August 2014 is a voluntary scheme which consists of a set of consolidated practices or Code of Practices (COP) formulated by AVA for on-farm safe and quality fish farming. The COP, which is based on the concept of Hazard Analysis of Critical Control Points (HACCP) and quality management principles, focuses on 6 key aspects, namely; farm structure and maintenance, farm management, farming and packaging practices, fish health management, farm environment and human health and safety. The objective of GAP-FF scheme is to promote responsible management practices in food fish farming and at the same time the guidelines for GAP-FF provide the basis and framework for farms to implement some elements of traceability in their farm products.

Under the GAP-FF’s COP guidelines, farms are required to document all farming activities such as fish species, culture/stocking period, stocking size and density, source of stock, feeding regime, and
seasonal stocking trends. Farms certified under this scheme must stock fish from known origin i.e. from hatchery source for traceability purposes. Records and invoices of incoming fish stocks are to be kept for verification and audit purposes. There must be proper documentation of fish stocks in the various net cages and records of fish movement between net cages must be tracked and updated.

GAP-FF certified farms are encouraged to use dry formulated pelleted feeds which can be traced to source. Other than farm feeding records, the farms are also expected to have in place records for farm environment monitoring, health and disease treatment and fish mortality. Prophylactic measures and disease treatment regime must be documented as part of health management records. In addition, certified farms are required to maintain and update farm Standard Operating Procedures (SOPs), instruction manuals, laboratory tests, log records and other information required under GAP-FF certification.

GAP-FF is a positive step forward in the implementation of traceability in the Singapore aquaculture industry. Only GAP-FF certified farms are allowed to use the GAP-FF logo when marketing their farm products. AVA will conduct yearly audit checks on the GAP-FF certified farms and certification is also renewed annually after the audit checks. Currently, 4 farms have been certified with the GAP-FF scheme and more farms have expressed interest in joining the scheme.

In response to change in consumers’ preference, some local farms are value-adding their aquaculture products. Harvested fish are sent to AVA-licensed fish establishments/processors for further processing into fillets before being sold to retailers such as supermarkets. AVA-licensed fish establishments/processors are GMP/ HACCP certified and under the licensing conditions, these establishments are required to keep proper documented records for all their incoming raw materials as well as all outgoing finished products. This traceability system enables the manufacturer or distributor to promptly remove any unsafe products along the food supply chain in order to safeguard public health.

**Thailand**

Thailand has implemented traceability system for its aquaculture shrimp since 2002 as it is one of the main export products of the Thai fisheries industry. From a manual paper-based system known as “Fry Movement Document” or FMD and “Movement document” or MD, the Thai Department of Fisheries (DOF) with assistance from the French Government developed a computerized traceability system known as TraceShrimp in 2005 to provide a reliable traceability management tool not only for the Thai stakeholders in the aquaculture shrimp production and supply chain but also for their local and foreign buyers. TraceShrimp is a voluntary scheme managed by the Thai DOF and requires membership by the Thai stakeholders. The TraceShrimp member can give access to its local and foreign buyers all information/data on a given lot of shrimp identified by means of lot number, invoice number, delivery bill number, client/buyer name or operation date through the TraceShrimp website. The lot of shrimp can be traced back all the way to the brood stock origins.

**Vietnam**

In Vietnam the aquaculture product supply chain is managed by three agencies. The stage from stocking to harvest is managed by the Directorate of Fisheries/DoF (under the Ministry of Agriculture and Rural Development - MARD). The stage from harvest to processing is managed by the National Agro- Forestry- Fisheries Quality Control Department/NAFIQAD (also under MARD). The retail stage (sale in the market to consumers) is managed by the Ministry of Industry and Trade. The Ministerial Circular No. 03/2011/TT-BNNPTNT dated 21/01/2011 – Regulation on tracing and recall of fishery products failing to meet food quality and safety requirements (hereinafter called Circular No. 03) is the legal basis for MARD to regulate traceability for fisheries products from farming to processing. The Circular No. 03 applies to organizations and individuals involved in fisheries production and business in fisheries such as feed, chemicals, products for treatment and improvement of environment, seed, nursery and rearing. The Circular does not apply to households and individuals producing fisheries products for own use without sale in the market; and producers of products of aquatic origin which are not used as food. Article 5 of Circular No. 03 requires that organizations and
individuals involved in fisheries production and business in fisheries shall establish traceability system meeting the following requirements:

- The system shall be under the one step back-one step forward principle to enable the identification and tracking of a product unit in specific steps of production, processing and distribution.
- The system shall be able to trace product origin through information, including the system of product identification codes (coding), stored throughout production process of the establishment.
- Information shall be stored and provided to enable identification of production lots; lots of receipt, suppliers and lots of delivery and recipients:
- Measures shall be adopted to clearly separate lots of receipt, production lots and lots of delivery to ensure accuracy of information.

The Ministerial Decision No. 1503/QD-BNN-TCTS of 5 July 2011 on the National Standard on Good Aquaculture Practices in Viet Nam and which was subsequently replaced by Decision No. 3824/QD-BNN-TCTS issued on 6 September 2014, makes it compulsory for fish farmers to adopt the Vietnamese Good Agriculture Practice (VietGAP) standards in their farming process. VietGAP for Aquaculture was based on the Code of Conduct for Responsible Fisheries (FAO): General Principle, Technical Guideline on Aquaculture certification (FAO - Feb, 2011), AseanGAP and other international standards (GlobalGAP and ASC, GFSI, ISO, Codex). The scope of VietGAP covers: general requirements; food safety; animal health and welfare; environmental integrity and socio-economic aspects. From 2015 onwards, pangasius (catfish/Tra) farming and processing will be obligatory to apply VietGAP standard. Afterwards, VietGAP certification will be applied for other aquacultured species such as shrimp and tilapia.

Under the VietGAP standard, aquaculture farms shall record adequate information of the production process until harvest of each culture pond and keep records. Records related to traceability shall include:

- Records of receipt/delivery, use, storage of products, inputs;
- Records of handling of expired products/hazardous waste;
- Records of movement of farmed aquatic animals and identification of locations, products with/without VietGAP application;
- Records of seed;
- Diary of each culture pond;
- Records related to control and handling of diseases;
- Records of harvest, transportation including details of buyers.

Records shall be kept for 24 months from harvest date. Therefore, all farms certified by VietGAP have adequate records that are easy for tracing when required.

As of 1 August 2015, Viet Nam catfish farmers applied and obtained VietGAP certification for nearly 2500 ha of aquaculture water surface area. DoF/MARD has set up a website (http://vietgap.tongcucthuysan.gov.vn/) for VietGAP certified producers.

SEAFDEC under its MFRD Programmes, has initiated and implemented a project on traceability for aquaculture products in the ASEAN region. The project from 2010-201 is in line with the ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 which has been endorsed at the ASEAN-SEAFDEC Conference 2011 and with the SEAFDEC Program Thrust II: Enhancing Capacity & Competitiveness to Facilitate International and Intra-regional Trade. The goal of the project is to enhance the competitiveness of the ASEAN’s aquaculture products through the implementation of traceability system in the aquaculture production and supply chain.

The expected outcomes of the project are envisaged to be the establishment/promotion of traceability programmes for aquaculture products in the ASEAN Member Countries and enhanced capability and
knowledge on the development and implementation of traceability systems for aquaculture products in the member countries. A major deliverable of the project is the Regional Guidelines on Traceability System for Aquaculture Products in the ASEAN region, which has been developed in consultation with the Member Countries. This Regional Guidelines was drafted based on consensus of and in accordance to the collective inputs and efforts from all participating ASEAN Member. The Regional Guidelines will serve as a useful resource and common reference which could be used by Member Countries to assist in their implementation of traceability systems for aquaculture products and in the future formulation and development of national programmes and activities to promote traceability.

III. ISSUES/DIFFICULTIES FACED IN THE IMPLEMENTATION OF THE INITIATIVES

Despite the progress made, to have wider implementation of traceability system for aquaculture products, the industry (especially small scale stakeholders) in ASEAN Member Countries are still facing the following issues/difficulties:

**Lack of resources**

In the Member Countries, the supply chain of aquaculture products largely comprises of individual small scale stakeholders (i.e. hatcheries, feed mills, farmers, middlemen, etc.). These stakeholders, unlike bigger operators, usually face challenges in maintaining their product quality. The lack of resources makes it difficult for them to maintain relevant records of their products. Due to the small size and limited income of small scale stakeholders, their operations are often tightly run with limited manpower and funds. Record keeping, a key component of a traceability system usually entails the need to hire more manpower to establish and maintain the traceability system. Hiring of manpower requires additional funds which small scale stakeholders may lack.

**Lack of awareness**

Another issue facing the implementation of traceability system for aquaculture products in Member Countries is the lack of awareness or knowledge. The key stakeholders in the supply chain of aquaculture products are unaware about the benefits and advantages of having traceability system in their operations. Also some traditional stakeholders are averse to change and are reluctant implement traceability system.

**Complexity of supply chain**

The supply chain of aquaculture products in Member Countries is characterised by the presence of numerous small scale aquaculture farms with limited production capacity. This results in the need for central buying stations/collection centres or middlemen to collect aquaculture produce from various small farms. In addition, some stakeholders such as middlemen may be averse to sharing information (e.g. source of their raw materials) as they consider such information as confidential. The presence of diverse stakeholders at each stage of the supply chain results in the mixing of raw materials and end products. The absence of cooperatives to manage these stakeholders accentuates the problem. This forms a complex supply chain framework that makes it more difficult to implement traceability system.

**Legal framework**

Some Member Countries lack the necessary legal framework for enforcing of traceability in their aquaculture industry. Without the legal framework, various stakeholders lack the motivation and incentive to implement traceability system in their operation. For those who are keen, the lack of technical guidance and assistance further hinder the successful implementation of traceability system. In addition, the format of documents to track and record details of aquaculture products has not been established, making it more difficult for the small stakeholder to adopt traceability system.
IV. WAY FORWARD

Traceability implementation can be mandatory or voluntary depending on the governmental or private sector initiatives or obligations. Nonetheless, whether or not it is a regulatory requirement, traceability is now a common feature in international trade of fish and fish products.

According to the FAO Expert Panel Review 5.2 on “Servicing the aquaculture sector: role of state and private sectors”, to encourage traceability application/implementation, government could provide training and promote capability building on traceability requirements and system. Other roles of government include provision of infrastructure facilities and financial incentives to enhance implementation of traceability system to improve safety and productivity.

Governments of Member Countries should stipulate the pre-requisites of traceability application in their aquaculture industry through national standards, circular, laws and regulations. Government should also promote or impose the adoption of best practices e.g. Good Aquaculture Practice (GAP) in the industry.

On the other hand, the private sector should comply with regulatory provisions to support government initiatives and programmes and to ensure product traceability. They need to ensure that proper information and records pertaining to the various stakeholders in the aquaculture supply chain provided to the government are accurately documented and maintained throughout the supply chain.