

Technical Compilation of Traceability Systems for Aquaculture Products in the ASEAN Region 2010 – 2015



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Authority of Singapore

Marine Fisheries Research Department

Technical Compilation of Traceability Systems for Aquaculture Products in the ASEAN Region

Japanese Trust Fund V:
Traceability Systems For Aquaculture Products In The ASEAN Region
2010 – 2015

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Southeast Asian Fisheries Development Center (SEAFDEC)
In collaboration with : The Government of Japan (Japanese Trust Fund V Project)



SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

The Southeast Asian Fisheries Development Center (SEAFDEC) is a technical organization devoted to the accelerated development of fisheries in the region. The member countries of SEAFDEC are Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. SEAFDEC has four departments, namely, the Marine Fisheries Research Department (MFRD) Programmes in Singapore, the Training Department (TD) in Thailand, the Aquaculture Department (AQD) in Philippines and the Marine Fishery Resources Development and Management Development (MFRDMD) in Malaysia.

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Foreword

Traceability has become a major concern of the aquaculture industry, especially since it has become a legitimate requirement in major international markets, such as the European Union (EU) and the United States of America (USA). Some countries in the ASEAN region which are major exporters of seafood have begun implementation of traceability systems for their aquaculture products such as Thailand (shrimps) and Viet Nam (catfish). However, with increasing requirements for traceability in the international seafood 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. In addition, domestic consumers in the region who are becoming more affluent and educated also demand a higher level of food safety and quality in their seafood. In view of these developments, the Southeast Asian Fisheries Development Center (SEAFDEC), under its Marine Fisheries Research Department (MFRD) Programmes, implemented a project on traceability for aquaculture products in the ASEAN region. This project serves to provide a platform for the sharing of information and experiences among the ASEAN member countries on traceability systems, to better enable their aquaculture industries to implement appropriate traceability systems in aquaculture products and to meet international traceability requirements in the network of aquaculture production, marketing, and trade.

I hope that this Technical Compilation, which is a major output of the project, would be a useful resource to policy makers, technologists, scientists as well as extension and regulatory personnel in the fisheries aquaculture sector. I would like to express my sincere gratitude and appreciation to the fisheries officers in the Member Countries and the officers of the Post-Harvest Technology Center of the Agri-Food and Veterinary Authority of Singapore as the Collaborating Center for SEAFDEC / MFRD programmes for their hard work and effort in preparing this Technical Compilation. In addition, I would like to thank the Government of Japan for funding this project under the Japanese Trust Fund Program.



Mr. Yeap Soon Eong
Chief, MFRD Programmes

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Introduction

Traceability has become a major concern of the aquaculture industry, especially since it has become a legitimate requirement in major international markets, such as the European Union (EU) and the United States of America (USA).

Besides, the ASEAN countries export significant and growing volumes of aquaculture fish and fish products annually to regional and global markets. Therefore, with the increasing requirements for traceability in the international seafood 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. Furthermore, with traceability systems in place, in situations like food products recall, robust traceability systems would allow efficiency in tracing the affected products from its source along the supply chain.

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 competitive food system, traceability has become a major tool in dealing with concerns of food safety, quality assurance, risk prevention, and gaining consumer trust. Traceability can be used to achieve different purposes or objectives, such as for food safety, bio-security and regulatory requirements or to ensure quality and other contractual requirements.

For instance, external traceability allows the tracking of a product and/or attribute(s) of that product through the successive stages of the distribution chain (from farm to fork), while internal traceability (or enterprise traceability) is aimed at productivity improvement and cost reduction within a production unit (e.g. fish plant). Governments and organizations around the world have also been developing different systems on seafood traceability e.g TraceFish (EU), TraceShrimp (Thailand).

In view of this, MFRD worked together with the ASEAN member countries to implement a project on traceability for aquaculture products in the ASEAN region. This project serves to provide a platform for the sharing of information and experiences among the ASEAN member countries on traceability systems, to better enable their aquaculture industries to implement appropriate traceability systems in aquaculture products and to meet international traceability requirements in the network of aquaculture production, marketing and trade.

The purpose of this project aims to:

- Provide a platform for the sharing of information and experiences among ASEAN member countries on implementation of traceability systems for aquaculture products in the region as well as an overview of the status of implementation of traceability systems in the aquaculture industries in the ASEAN Region.
- Enhance regional capability on implementation of traceability systems for aquaculture products and promote their implementation in the region.

This project comprised of 5 activities as follows:

SCHEDULE OF ACTIVITIES (2010 – 2015):

| Activities / Sub-Activities | 2010 | | | | 2011 | | | | 2012 | | | | 2013 | | | | 2014 | | | | 2015 | | | |
|--|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 Regional Technical Consultation (RTC) | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 On-site training workshops on traceability systems for aquaculture products | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.1 1 st on-site in Viet Nam (Fish) | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 2 nd on-site in Thailand (Shrimp) | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 Mid-Term Project Review Meeting | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 Documentation and preparation of Technical Compilation and Regional Guidelines | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 End-Of-Project (EOP) Meeting | | | | | | | | | | | | | | | | | | | | | | | | |

Upon completion of all 5 activities, participating member countries would be able to enhance their regional capability on implementation of traceability systems for aquaculture products and in turn promote their implementation in the region.

Country Reports

Brunei Darussalam

Cambodia

Indonesia

Lao PDR

Malaysia

Myanmar

Philippines

Singapore

Thailand

Viet Nam

Brunei Darussalam

► MS. AQILAH JUNAIDI

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I. Introduction to Aquaculture Industry in Brunei Darussalam

The Agriculture, Forestry and Fisheries Department under the umbrella of the Ministry of Primary Resources is one of the contributor in the Gross Domestic Product besides the Oil and Gas Sector.

These sectors contributed around B\$146 million dollar in GDP in 2013. It is estimated that the fisheries resources is worth at least \$373 million by 2023, arising from the three main sectors such as capture fisheries, aquaculture and processing.

In 2013, the country' fisheries production is about 18,251 mt (B\$91.65 million), more than enough to supply the needs of the local market (Figure 1). Aquaculture alone contributed about 606 mt which equivalent to B\$5.43 million dollars in 2013. The exported products are about 134.56 mt in 2013.

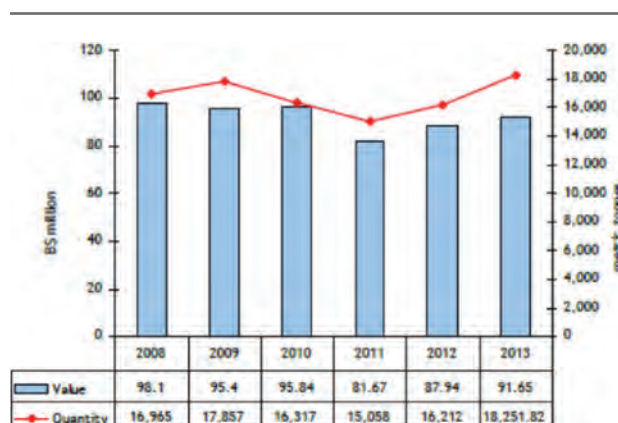


Figure 1. Brunei Fisheries Production



Figure 2. Aquaculture Production from 2008 to 2013

The aquaculture farming of marine fishes and prawn culture began in the 1980s in Brunei Darussalam. Aquaculture is another fast developing sector in the fisheries industry. The semi-intensive shrimp farming, sea cages, freshwater pond and the introduction of recirculating aquaculture systems are the present facilities that will boost the estimated aquaculture production to \$200 million annually in the year 2023.

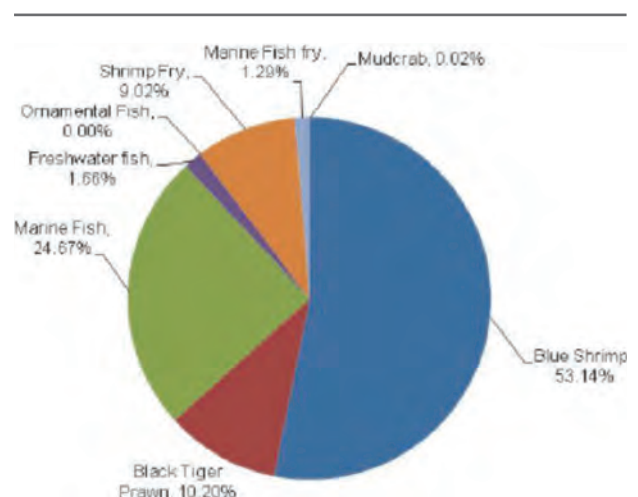


Figure 3. Distribution of aquaculture commodities (\$million) in 2013

The major marine species cultured are seabass, grouper, snapper, trevally and pompano, while the freshwater species cultured are tilapia, catfish and freshwater prawn. The two species of shrimp being cultured are SPF *Penaeus monodon* and SPF *Litopenaeus stylirostris*. The distribution of the different aquaculture commodities is shown in Figure 3.

II. Current Status Of Traceability Systems For Aquaculture Products In Brunei Darussalam

There are three private companies namely 'Semaun Aquaculture Sdn Bhd', 'TMM Sdn Bhd' and 'Golden Corporation Sdn Bhd' that are doing traceability systems particularly in shrimp farming. Each shrimp farmer has his own records of date of stocking, feeding and harvest. The country has a sole supplier of blue shrimp fry *Litopenaeus stylirostris*. The fry will be cultured in different private companies and will be harvested and sold to the local shrimp buyer for local market or in a big processing company which is also operating the shrimp hatchery in the country.

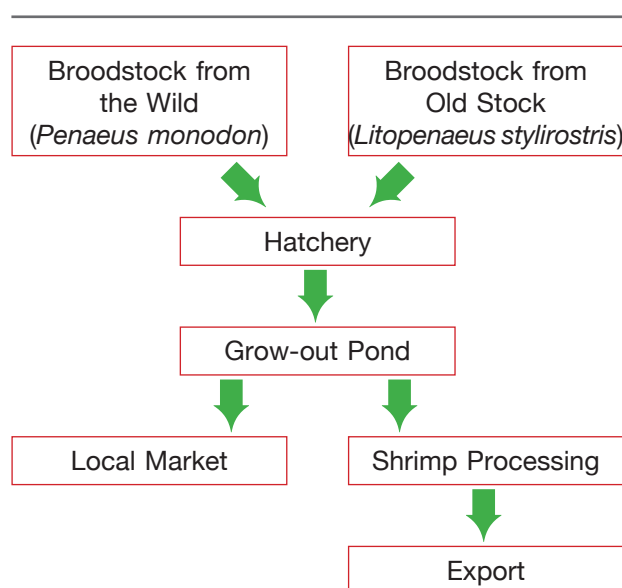


Figure 4. Supply chain of shrimp industry

The shrimp processing plants as the wholesaler and exporter have their style of traceability such as recording the code on the harvested shrimp, supplier, time of processing, batch of finished products, date of production and source of materials (Figure 5).

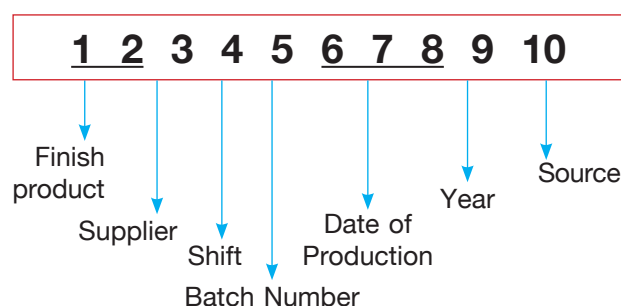


Figure 5. Shrimp product traceability code used in Brunei*

(*Source: Golden Corporation Sdn Bhd)

III. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Brunei Darussalam

The countries had sent several DOF staff to attend and learn about traceability techniques from other countries. Experts from European Countries, US and Malaysia had also given some basic lectures to the DOF staff and some operators.

IV. Recommendations for implementation

1. Strengthen the implementation of traceability and certification of qualified companies.
2. Series of seminars and trainings should be conducted and initiated by international experts.
3. It is also recommended that the ASEAN region should have a standard manual for traceability systems to avoid misunderstanding among farmers and exporters as well as the countries receiving the products. The draft manual should be reviewed by ASEAN countries, and seek further suggestions either from EU or US auditors. The traceability manual should not only focus with the proper documentation but also include controlling the quality and safety of products from farm to table of consumers.

V. Conclusion

This report focuses only on shrimp production. Information on traceability for other stakeholders is still in infancy stage.

Cambodia

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Fisheries administration
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► **DR. EM PUTHY**

National Coordinator for Cambodia
Fisheries administration
Cambodia

I. Introduction to Aquaculture Industry in Cambodia

Cambodia has a total land area of 181,035 km² with total population 14.1 million (NIS, 2003) Cambodia's climate is characterized by two major seasons, a dry season and a rainy season. An annual average temperature is 27°C, and rises to a maximum of 38°C and falls to a minimum of 14°C in December-January.

Cambodia's coastal zone, which is located in the southwest of the country, has a total length of approximately 435km.

Agriculture is the major occupation for about 85% of the population, which can be provided. Rice and fish are the basic diets of people of the country. Fish is the most important source of animal protein for Cambodian people, providing 75% of total animal protein intake for the population. National statistic of the country has shown that the average fish consumption of Cambodian is 52.4kg/per/year while average HH between 60-66kg/per/year and HH around Tole Sap Lake is 67-80kg/per/year.

II. Current Status Of Traceability Systems For Aquaculture Products In Cambodia

Inland Capture Fisheries

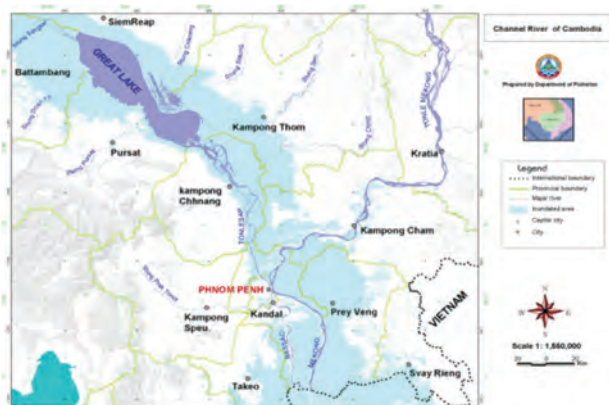
Tonle Sap Great Lake Mekong and Tonle Sap are the main system to support fisheries of Cambodia, which can be estimated greater than 30% of the total area. Fishing activities are divided into:

1. Small-scale (family scale)
2. Medium-scale (enterprise-scale)
3. Large-scale (industry-scale)

However, the fisheries reform policies enforcement has shifted this all the system to be small scale fishing activities or community fisheries to support and provide right to rural community to alleviate poverty of the country. All in all, there are more than 500 freshwater fish species caught within the

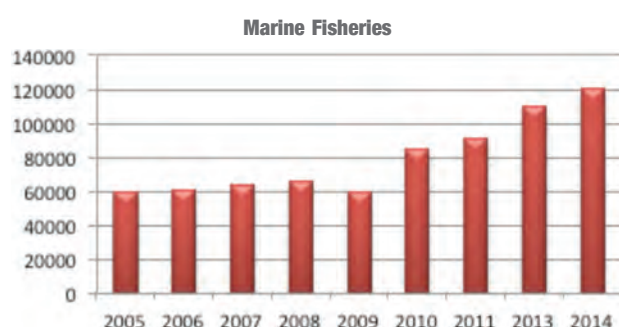
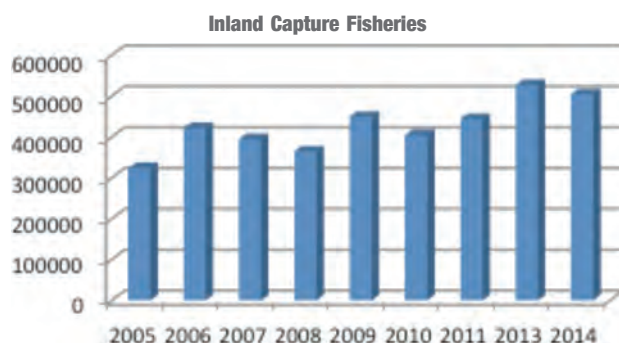


system. Total estimated annual catch is 405,000 - 445,000 tons between 2010 and 2011. The change of productivity is closely related to the change of flooding level which occurs on annual basis.



Marine fisheries

Cambodia Coastline is extended at 435 km long, which can be produced about 60,000 tons annually. More than 476 fish species from over 97 families in the marine water of Cambodia. Mackerel, Snapper, Grouper, Shrimp, Squid and Crabs were identified as the most commercially important pelagic fish species.



Fish Export

Total fish export of the country is 56,400 tons, which can be categorized as frozen shrimp, frozen squid / octopus, crab meat, snail fillet meat, fish ball, frozen finfish, live sand goby, live grouper, live mantis shrimp and traditional product such as salt dried fish, smoked fish, fermented fish were also fall into this category. However, there is a limitation of regulation in term of traceability for fisheries products.

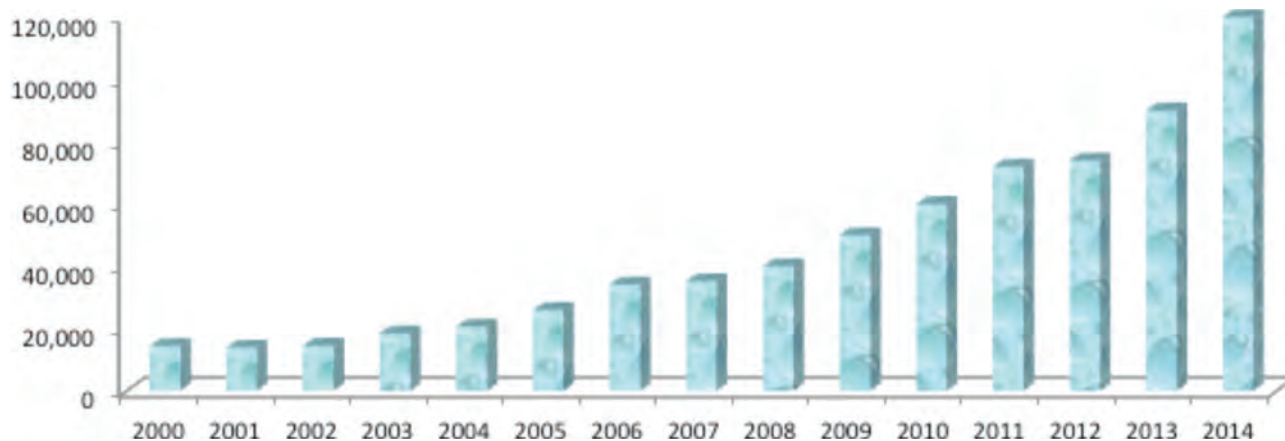


Aquaculture Development in Cambodia

Aquaculture development in Cambodia has been practiced since long time ago to supply source of animal protein for rural areas and local market. In terms of method and techniques, they are still defined as a traditional way to compare with the neighbouring countries. Till present, diverse farming systems, operations, scales and operations from small-scale using on-farm waste inputs / domestic wastes to large scale are using mix / formulated feed to produce fish.

Inland aquaculture production has increased to 72,000 metric tons in 2002, and 120,000 tons in 2014 with pond and cage culture estimated to contribute around 5% and 80% of this respectively. The most important species of fish in terms of volume and value produced by inland aquaculture are *Pangasius* spp. and *Channa* spp. (snakehead). However, as a result of inland cage and pond culture being heavily dependent on wild indigenous fish both for seed and feed, the Government has recently banned the culture of snakehead.

Aquaculture Production (ton), 2000-2014



Donor attention has been primarily focused on the development of small-scale pond culture for poverty reduction purposes, particularly for communities in areas away from wild fish production centers. Constraints faced by small-scale pond farmers include high mortality levels of seed from hatcheries, reliance on traditional knowledge, unreliable water supplies, droughts and a lack of credit. The development of small-scale aquaculture is also constrained by a lack of co-ordination by government and other institutions.

Rice-fish culture has also been promoted by Government as a means to increase fish supply and yields from rice fields. It has been recently introduced into Prey Veng, Svay Rieng and Takeo provinces. Crocodile farming has increased in the Great Lake and Sihanoukville areas. Constraints faced by crocodile farmers include disease outbreaks, a lack of availability of feed and a variable market.

On the coast, marine pen and cage culture has been constrained by the lack of hatchery technology for marine fish species. The current reliance on wild seed for stocking and trash fish for feeding is seen as a limit to the expansion of cage culture. Marine cage and pen farmers also have problems with disease and water salinity. Another problem is that cyanide is used to catch the seed for growing on in pens and cages.

Seaweed farming has developed in recent years, particularly in Kampot Province. It employs a relatively large number of poor stakeholders who grow and dry small amounts of seaweed that are collected by middlemen who in turn supply exporters. There are thought to be new areas suitable for seaweed culture development. Further expansion of this sector is likely to increase employment opportunities and incomes to the coastal poor.

Both intensive and extensive shrimp culture are practiced on the coast. Intensive shrimp culture

experienced a boom in the early to mid-1990s but production has now dropped primarily due to problem of disease, pollution and high soil acidity. This form of shrimp culture led to the destruction of areas of mangrove. Extensive shrimp culture has had less of an environmental impact. It is practiced mainly in Kampot Province and requires relatively low levels of investment.

The market price of aquaculture products produced in Cambodia is influenced by imported products from neighbouring countries and the availability of wild caught fish. Farmers complain that market prices are variable and blame low prices on unknown quantities of imported fish from neighbouring countries. Imports are said to be especially high during the closed fishing season when the availability of wild fish in the country is less.

Government policy is to promote aquaculture in order to meet the demand for fish as well as reduce pressure on the natural fisheries resources. By collaborating with NGOs and IOs, the Department of Fisheries has established public sector hatcheries in different provinces and has also assisted in establishing private sector hatcheries in many rural areas to make seed available for small-scale farmers. Future priorities of Government include the continued establishment of provincial fish seed production and research centres, and the development of a freshwater aquaculture research institute. There is also recognized to be a need for improved technical expertise, extension services and financial incentives.

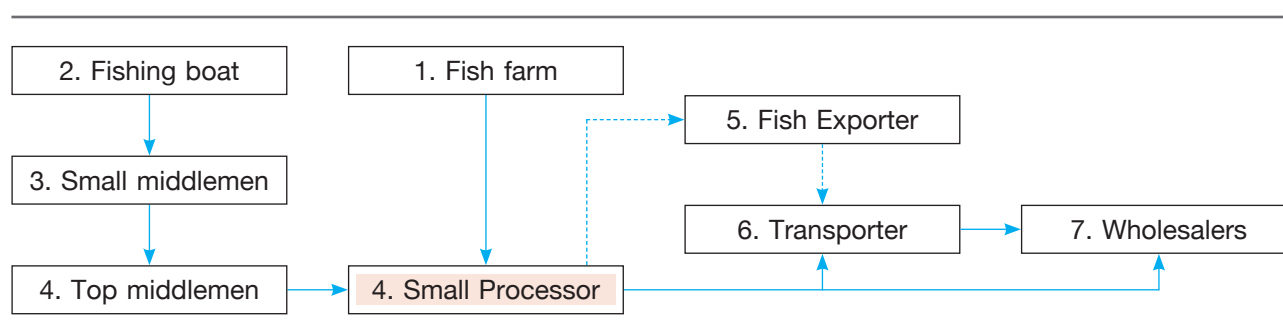
Information on post-harvest issues of aquaculture activities, and the stakeholders involved in these activities would be limited. However, the policies of GAP has been developed and enacted by ministry of agriculture forestry and fisheries to support Traceability system in Aquaculture and post-harvest of fisheries product as a whole. The graph as shown below explained about the production increased in aquaculture sector.

Overview of aquaculture industry and Food Safety Control

The number of people working in fisheries sector is around 994,502 producing 445,000 tons of catch fish and 72,000 tons of farmed fish (FiA: 2011). According to MAFF, farming played an important role in the sector and national economy. Mostly the production chains of fisheries in Cambodia are small business (in terms of productivity and capital). In Cambodia, there is auction-market the so-called middle-men system. They collected fish from fish farm to the

markets and few small local fish processor. There can be different level of middlemen, this means there are also some “middlemen” of others “middlemen”.

The production management of all step before processing do not applied any sort of information technology. Farmers, fishermen, middlemen and farmers involved usually poorly educated and therefore documenting is difficult for them to do. Figure below can be simplified the production flow in Cambodia.



Implementation of traceability system for aquaculture products

Cambodian aquaculture production grew average range from 15% to 20% per year as from the previous year in 2011 was from 72,000 tons. Cambodia has approximately 280 fish hatcheries including 267 private hatcheries producing over 130 million hatchlings in 2011. In addition, Cambodia also has 61,000 households, engaged in aquaculture, growing many species of fish products, while domestic consumption is important for mainly food security. Since aquaculture operating in Cambodia, all the productions are mainly playing important role for only supplying in local markets to meet demand of people consumption. As data of aquaculture production mentioned in above graphs showed that it is increasingly developed from year to year to meet the population increase. To meet the requirements, quality of the aquaculture production has been concerned by Fisheries Administration (FiA) and identified quantities of chemical components usage are not properly. To enhance controlling the concerned activities Fisheries Administration issued summary regulation on Aquaculture Technical Guideline including list of banned chemical components in aquaculture activities to improve Good Aquaculture Practices (GAqP). The regulation on Aquaculture Technical Guideline mentioned as below:

1. Establishment of the aquaculture farm
2. Seed selection for culture
3. Seed selection for breeding

4. Feed production
5. Organic fish farms
6. Management of aquaculture farms
 - a. water quality
 - b. disease management
 - c. environmental management
7. Transportation
8. Good sanitary practices
9. Applications of hormones and chemicals.

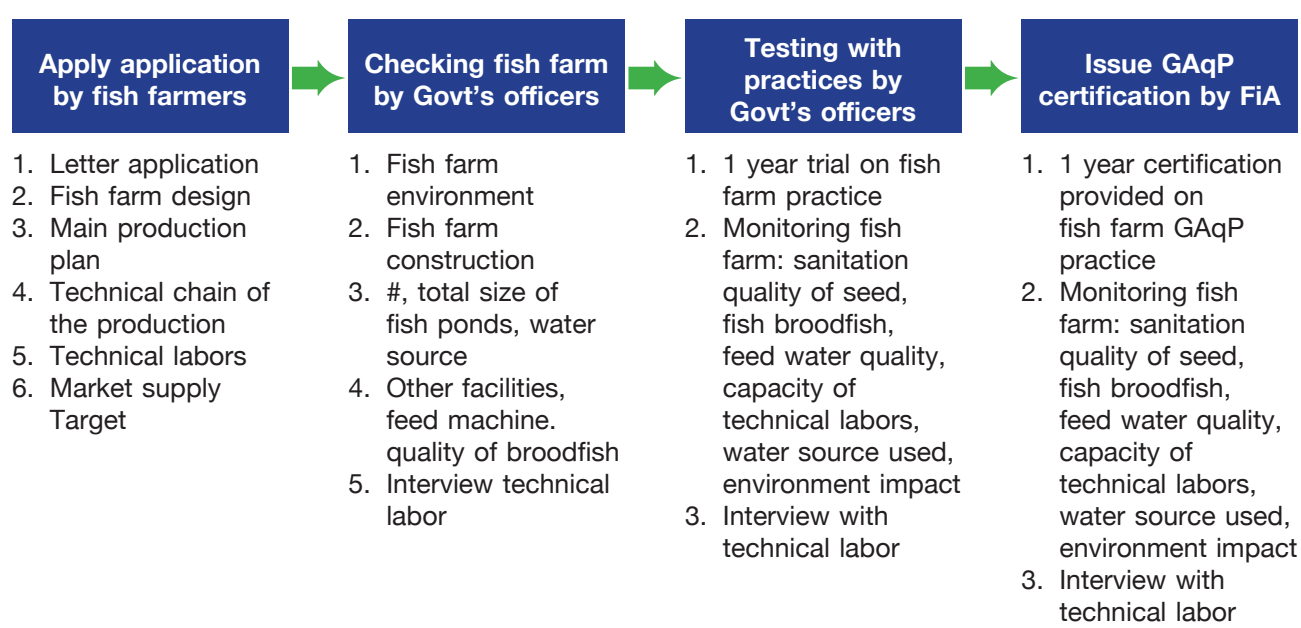
Fisheries Administration has used FAO and Regional Code of Conduct on Aquaculture Development and Responsibility in Fisheries Management by translating into local language. For the effective dissemination, Department of Aquaculture Development of FiA has produced and published a technical manual on GAqP to distribute to fish farmers through training courses, workshop, and meetings, etc.

In 2014 and 2015, there have been 120 aquaculture farmers operating small, medium and large scale volume in ponds and floating cages selected from some of fish farmers in two target provinces among 25 provinces of Cambodia to check and interview on their current aquaculture practices. The interview identified that almost of small scale fish farmers have been operating their own fish farms with organic manures and other inputs are available in their localities and without using chemical suspends. All the selected farmers have been trained on GAqP in order to get safety products from their farmed fish. Some of them selected to do model fish farms on the GAqP certified by Fisheries

Administration (FiA). All steps of fish farm activities of the selected fish farmers under monitoring of aquaculture technical officers with proper recording for farmers individual questionnaire/checking list. This project implementation with monthly controlling of aquaculture technical officers has just been supported by EU and testing for this year with 10 fish farmers in 2 target provinces of Cambodia. After testing and controlling, aquaculture technical officers will identify which fish farmer can properly practice the GAqP and FiA will provide GAqP Certification for their 1 year GAqP implementation. The GAqP Certification can provide to individual fish farmers only 1 year period. In case of FiA identified those

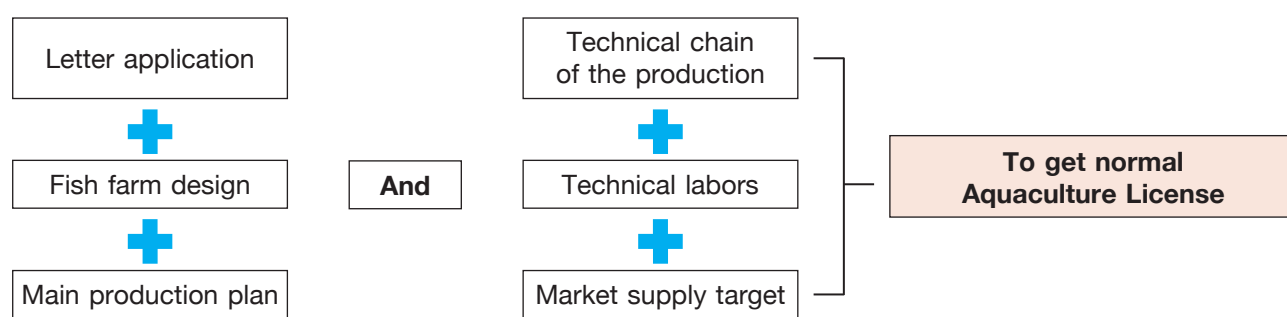
fish farmers has practiced proper GAqP and they want to apply the GAqP again, FiA will provide the GAqP Certification to them again. Their safety farmed fish products are good price in super markets and restaurants mainly.

The present implementation of GAqP is too difficult for fish farmers. However, some of them understand that safety in farmed fish has gradually become a main priority and preferred by local customer demands, particularly for city or rich people. For fish farmers whom want to apply GAqP Certification, they have to abide the traceability system management as per the following:



Besides issuing the GAqP certification, FiA has also provided normal Aquaculture License for controlling aquaculture statistic. In general, fish farmers must

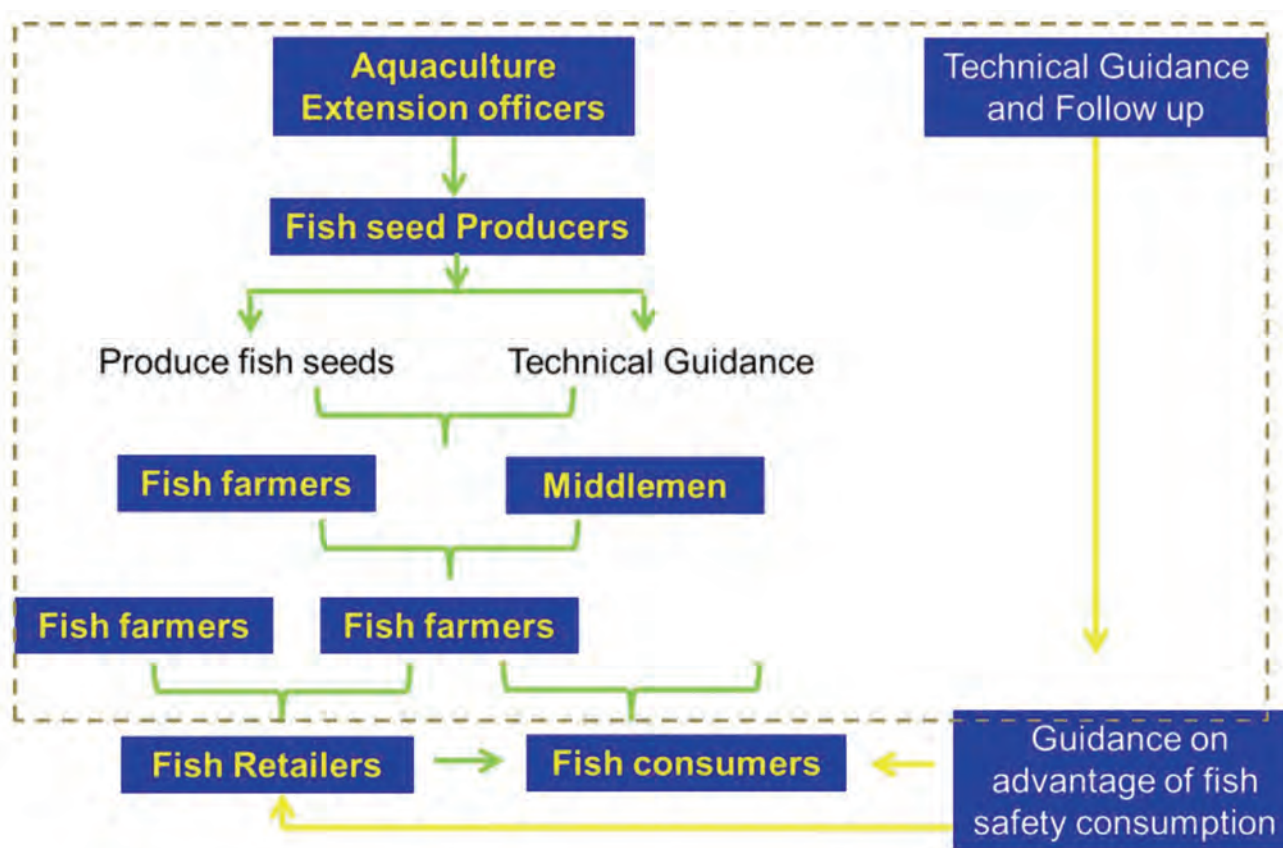
apply the normal Aquaculture License with complete documents as per the following requirements:



Department of Aquaculture Development (DAD) of FiA has provided technical advices / guidance on GAqP of fish seed and farmed fish production. To be sustainable, DAD has formed Fish Seed Producing Farmers Network and build capacity to the network's Fish Seed Producing Farmers on GAqP of fish seed production techniques and good skill local trainers. Through the building capacity, Fish Seed Producing Farmers have not only good capacity to produce good quality of fish seeds, but they also have good capacity to transfer fish culture and fish

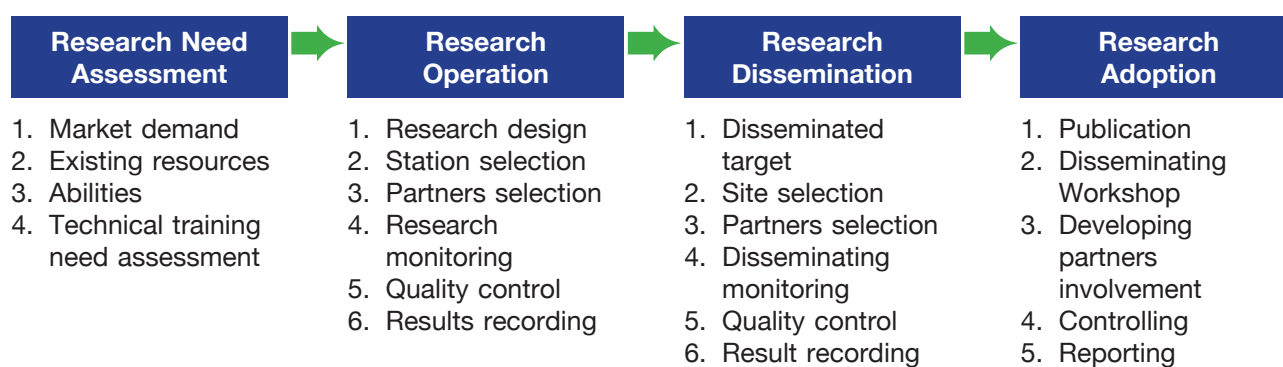
seed production techniques through training course and meetings.

In the present, Department of Aquaculture Development (DAD) of FiA has disseminated advantage of the consumption of farmed fish products to customers and fish farmers. FiA has requested them to further disseminate the information to other fish farmers and customers. The above description shows the management system.



On the other hand, to develop and promote the implementation of GAqP, Government Fish Hatcheries Stations and Institute of FiA have conducted experiments on the GAqP, to try on the

production of good quality broodfish and fish seeds for distributing to fish farmers. The process of the experiments conducted is as follows:



III. Challenges faced in implementation and solutions and other relevant information

- The GAqP implementation is a costly practice, which uses more inputs and sometimes it is difficult for fish farmers to find good markets to sell their farmed fish products with high price.
- Rural people are mainly relying on natural resources for their daily consumption, but from year to year the natural fisheries resources are not enough for their requirement; the aquaculture production is still low, as they are lacking of fish consumption. Therefore, food security is most critical important for them, which is why, it is difficult for fish farmers to apply GAqP in all scale of fish production.
- In general, record keeping are hard job for aquaculture farmers to take care for recording properly,
- Almost every year, drought occurred in some places, that is difficult for fish farmers to enforce the GAqP, due to they need to expend much inputs/ budgets,
- Flood is also occurred in some places during raining season, fish farmers have expended much more budgets to prevent flooding and avoid their fish escaping. This in turn could increase their input costs,
- Lack of facilities and mobile laboratories to control quality of farmed fish produced in country and imported before consumption,
- Lack of funds to develop model intensive fish farms on GAqP implementation,
- Organic fish farms are most safety and quality products, but the farmed fish production is lower and not met requirement.
- Lack of funds to disseminate the program on the GAqP and traceability system management in order to get the safety of Aquaculture production/ processing and the proper distribution of the safety products.

IV. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Cambodia

National activities / program

There is a statement of Cambodian Royal Government on National Fisheries Sector Policy is to: (Picture. 1)

- Encourage the development of different kinds and scales of aquaculture, both inland and coastal by implementing the “Regional Code of Conduct for Aquaculture”
- Extension of indigenous species of fauna and flora aquaculture, especially of species with a high economic export value;
- Carefully monitoring the import of exotic fauna and flora species that may have a negative impacts on Cambodian’s Fisheries Resources;
- Develop aquaculture technologies to ensure the quality and safety of aquaculture products.

For achieving the Cambodian Royal Government on National Fisheries Sector Policy, FiA has developed Strategic Planning Framework for Fisheries (SPF) 2010-2019 and some parts of this document also mentioned on the development and promotion of aquaculture technologies to ensure the quality and safety of aquaculture products (Picture. 2).

Based on the both key important documents, Department of Aquaculture Development of FiA has produced and published National Strategic Planning for Aquaculture Development in Cambodia 2014-2030 (Picture. 3). This long term strategic planning is aiming to achieve increasing both quantities and quality of aquaculture production for not only local markets consumption, but also for exporting by achieving 7 main strategic objectives as below:

1. To increase access to high quality seed for a range of species in demand in local, regional and global markets



Picture. 1



Picture. 2



Picture. 3

2. To increase access to sufficient and consistent supplies of high quality water, and to reduce flood risks.
3. To ensure widespread availability of sustainably sourced, reasonably priced, high quality feed suitable for a range of species.
4. To improve efficiency, profitability and sustainability of aquaculture production through increased knowledge, skill and organization.
5. To maintain environmental quality and minimize loss from disease.
6. To increase the quality and value of production.
7. To facilitate access to credit as appropriate to the needs, potential and risks associated with aquaculture development.

Fisheries Administration has also issued the Health Certification on Good quality and safety of Fisheries Products for exporting (Picture. 4).



Picture. 4

Future activities / program / directions

- Continue to promote the implementation of GAqP with some of fish farmers are aiming to produce safety farmed fish for selling with good price in super markets;
- Cooperate with developing partners international and local NGOs to support and contribute to the promotion of the GAqP and traceability system implementation;

- Increase awareness of local customers / consumers on the benefit of the safety farmed fish products consumption through conducting training, workshop, meeting and broadcasting in TV and radios;
- Continue to provide the technical training on the GAqP and traceability system implementation to government fisheries officers and fish farmers;
- Cooperate with other ASEAN countries members to learn experiences on the GAqP and traceability system management;
- Continue to promote organic fish farms, particularly in rural areas where poor farmers are able to grow fish with low cost inputs and they are still continuing their safety farmed fish consumption.

V. Recommendations for implementation

Regulatory solution

It is recommended that the Aquaculture Development Department accelerates the extension of Good aquaculture practice (GAP) to whole country since it was already enacted by the government. On the other hand, drafted traceability system of fisheries production should be approved and disseminate soon to all stakeholders, especially fish processors. The guideline should give detailed description on the method to document the traceability information at each step of fish production as per the following suggestion:

- Using date and volume of production for raw material in the chain at the farm in order to identify the lots of recipe.
- Improve the availability of documentation, attached to the traceability purpose. This can help build up the capacity of processor in the production chain.
- Fish farmer: Create the available of records for proper document for source of fry, seed and chemical until selling information for example date and volume...). Farms should be able to assure internal traceability for the purpose of controlling quality and efficiency of production.
- Processor: traceability should be focused on safety and quality products including condition, temperature fluctuation during storage and processing.
- For long term perspective traceability of fisheries products, not only for fish export.

Indonesia

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I. Introduction to Aquaculture Industry in Indonesia

Back ground information

This report is written for the technical compilation publication for the JTFV project concerning a country status report on the implementation of aquaculture products traceability system through applying movement document in Indonesia. This country status report is organised within 3 parts as follows. The first part discussed about introduction to aquaculture industry and followed with the second part discussing about current status of traceability systems for aquaculture products. The final part presented on the future plans / programmes for implementation of traceability systems for aquaculture products and recommendations for their implementation.

Introduction to Aquaculture Industry in Indonesia

This part consists of two sections. The first sections talk about marine and freshwater aquaculture industry of certain aquaculture species farmed as economy commodities in Indonesia, as well as their production figures. The second sections discuss about the significance of aquaculture industry in the country, including contribution in percentage to total fish production, export values and quantities, contribution to national GDP / economy of Indonesia and other relevant information.

Marine, brackish water and freshwater aquaculture industry

Indonesia is an archipelagic country with more than 17,000 islands and a coastline of about 81,000 km. Based on the water sources, aquaculture in Indonesia is practiced in marine, brackish and freshwater, culturing a variety of species.

Current government policy to support marine, brackish water and freshwater aquaculture development is increasing production for fulfilling competitive export and domestic consumption requirement through industrialization. Mariculture has developed for almost 20 years and is dominated by groupers and seaweeds. With a coastline of around 81,000 km, Indonesia has an extensive potential for mariculture development, although this potential is variable and unevenly spread across the Provinces.

Development of brackish water pond was started since late 1970s, indicated by the increased of number of brackish water pond significantly, following the successful development of the eyestalk ablation technique and the rapid growth of shrimp hatcheries. The extent of areas with potential for brackish water potential is calculated based on technical suitability criteria and areas which are already in use for brackish water aquaculture. The oldest aquaculture is freshwater culture developed in the 1970s. The potential areas for freshwater aquaculture consist of freshwater ponds, paddy fields (combined fish / rice farming) and publicly owned freshwater bodies (public waters).

Recently, Indonesia implements two aquaculture development strategies which are in line with blue economy principle. The first strategy is to encourage aquaculture technology modernization to create aquaculture as an industry. Technology needed should be measured, efficient and based on environmental outlook. The second strategy is selecting on important economic commodity based on market demand. Every year, the Indonesian aquaculture production continues to increase. Based on the production data between 2009 and 2013, marine aquaculture production has increased by 31.57%, brackish water aquaculture production rose by 27.99%. Freshwater culture includes ponds, cages, floating net, and paddy field. Fresh water aquaculture ponds production rose by 34.10%, aquaculture cages production increased by 18.85%,

the production of floating net rises 20.81%, while rice cum fish aquaculture production increased by 3.55%. Aquaculture production in the year 2009 to 2012 experienced a growth rate of 29.78%. In other

words, aquaculture as a whole is showing positive growth. Aquaculture production based on type of aquaculture from the period 2009 - 2012 is shown on Table 1 as follows:

Unit: Metric Ton

| Type of Aquaculture | 2009 | 2010 | 2011 | 2012 | 2013 | Increasing Average (%) |
|---------------------------|------------------|------------------|------------------|------------------|-------------------|------------------------|
| Mariculture | 2,820,083 | 3,514,702 | 4,605,827 | 5,769,737 | 8,386,271 | 31.57 |
| Brackishwater pond | 907,123 | 1,416,038 | 1,602,748 | 1,756,799 | 2,337,671 | 27.99 |
| Freshwater pond | 554,067 | 819,809 | 1,127,127 | 1,433,820 | 1,774,407 | 34.10 |
| Cage culture | 101,771 | 121,271 | 131,383 | 178,367 | 200,006 | 18.85 |
| Floating net-cage culture | 238,606 | 309,499 | 375,430 | 455,012 | 505,248 | 20.81 |
| Rice cum fish culture | 86,913 | 96,605 | 86,448 | 81,818 | 97,303 | 3.55 |
| Total | 4,708,565 | 6,277,923 | 7,928,962 | 9,675,553 | 13,300,906 | 29.78 |

Source: Directorate General of Aquaculture, 2014.

Over the period of 2009 - 2013, the extent of areas used for aquaculture increased from 996,223 hectares in the year 2009 to 1,1278,464 hectares in 2013 with an average growth rate of 6.54% per year. Mariculture area underwent a significant increase, with a growth rate of 75.12% per year (Directorate General of Aquaculture, 2014). The size of the increase in extent of aquaculture areas gives an indication of the success of the aquaculture development programme.

This report shed a light on the five main important economic fish commodities for the developing aquaculture industry, which includes grouper, shrimp, milkfish, walking catfish, and tilapia. The consideration is to focus on only five main fish commodities of those five commodities that meet one of the following criteria, as follows:

1. Has a relatively high price
2. Has an opportunity for further development
3. Enhance export
4. Source of food products of fish origin
5. Has a potency to be included in the implementation of traceability system.

Based on the statistics of aquaculture production by commodities, increasing percentage on production of five major commodities of aquaculture in Indonesia

was 27.97% achieved by grouper, 16.49% achieved by shrimp (giant tiger prawn and vannamei shrimp), 15.44% achieved by milkfish, 39.60% achieved by walking catfish, and 13.62% achieved by Nile tilapia. Overall progress on the basis of commodity production has increased significantly (23.95%). Production of aquaculture based on commodities 2009-2013 is shown on Table 2.

Grouper

Grouper is a mariculture commodity with high prestige value in the eyes of consumers, especially in Asian countries. Grouper is a fish which could command a high sale price, with developed farming technology and also has the opportunities for segmentation of its production. The segmentation may start from the seed production stage through fingerling production in nurseries and in grow-out.

There are a number of grouper that have been successfully cultured namely marbled brown grouper (*Epinephelus fuscoguttatus*), and hump back grouper (*Cromileptes altivelis*). These commodities have good market values. Price of tiger grouper in global market has reached about 11 USD/kg and price of hump back grouper is approximately 50 – 60 USD/kg. Center for grouper culture is spread out in several places such as Lampung, Bali, Lombok, Sumbawa, Bangka, and Ambon. Some concerns about grouper culture are (i) use of trash fish and

Table 2. Aquaculture Production by Major Commodities, 2009-2013 (in MT)

| No | Commodities | Year | | | | | Increasing Average (%) |
|----|----------------------|-----------|-----------|-----------|-----------|------------|------------------------|
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2009-2013 |
| 1 | Shrimp | 337,015 | 379,327 | 383,334 | 396,073 | 590,528 | 16.49 |
| 2 | Grouper | 8,791 | 10,398 | 10,579 | 11,950 | 11,464 | 27.97 |
| 3 | Seaweed | 2,963,556 | 3,915,017 | 5,170,201 | 6,514,854 | 9,310,874 | 29.53 |
| 4 | Nile Tilapia | 541,536 | 869,262 | 1,001,260 | 918,233 | 1,408,291 | 13.62 |
| 5 | Common carp | 249,279 | 282,695 | 332,206 | 374,366 | 412,703 | 13.46 |
| 6 | Milkfish | 328,288 | 422,068 | 467,732 | 519,066 | 575,256 | 15.44 |
| 7 | Barramundi | 6,400 | 5,738 | 5,236 | 6,198 | 6,735 | 1.97 |
| 8 | <i>Pangasius spp</i> | 109,685 | 147,888 | 229,267 | 347,000 | 268,828 | 35.50 |
| 9 | Walking catfish | 144,755 | 242,811 | 337,577 | 441,217 | 533,663 | 39.60 |
| 10 | Giant Gouramy | 46,254 | 58,889 | 64,252 | 84,681 | 92,929 | 19.49 |
| | Total | 4,708,565 | 6,277,923 | 7,928,962 | 9,675,553 | 11,223,582 | 23.95 |

Source: Directorate General of Aquaculture, 2013.

requirement for hatchery-based seed production (otherwise unsustainable of seed supply from the wild). However, market potential for grouper culture is relatively high. They transport from the farm by means of shipping with sea water circulation.

Overall, the volume of grouper production in Indonesia has increased more than 27% during 2009 to 2013. In 2009, the total production amounted to 8,791 MT, and in 2013, it has increased to 11,464 MT.

Shrimp

Shrimp farming development is carried out through making use of brackish water and other coastal areas with good potential, mainly through farming shrimp in brackish water. Strategy applied in the shrimp farming is the development of the vanamei strain, as this shrimp species is more adaptable to environmental variations, and the farming technology is simpler. In 2000, Directorate General of Aquaculture, Ministry of Marine Affairs and Fisheries gave a license to private sectors to import the white shrimp, *Penaeus vannamei* broodstock as well as post larvae into Indonesia. Since then, the *P. vannamei* culture has been widely practiced in many provinces in Indonesia.

For tiger prawn, the main thrust will be towards the application of simple organic farming systems in community brackish water ponds.

The success story of vannamei culture has been continued till now, even though many problems have occurred along with the introduction of that species. The new exotic viral disease has also been reported in the vannamei farming such as Taura Syndrome Virus (TSV) and Infectious Myonecrosis Virus (IMNV).

Based on the statistical data, shrimp culture production has increased slightly from 337,015 MT in 2009 to 590,258 MT in 2013 or it has increased nearly 17% during 2009 to 2013. This phenomenon occurred due to the rise of shrimp diseases that infected the *P. vannamei* shrimp and lead to the decreasing amount of production. The kinds of disease include White Spot Syndrome Virus (WSSV), Infectious Myonecrosis Virus (INMV) and others. However, Indonesia is the remaining among a few countries in the word which is free from Early Mortality Syndrome disease.

Milkfish

There are wide market openings for milkfish (*Chanos chanos*) both for local consumption and for export. Milkfish is used as bait in the high seas tuna fishery. Milkfish farming activities can be divided into a number of segments or stages, including seed production, grow-out phases and post-harvest processing. Milkfish is cultured in brackish water pond that used traditional and semi-intensive system. Source of feed mainly come from cultivated Blue

Green Algae (Klekap). Some farmers use pellet feed as fattening to boost the growth rate. Milkfish is commonly consumed directly in fresh and frozen boneless milkfish; most of the milkfish is consumed after processing, as smoked and boneless milkfish.

In general, the volume of milkfish production in Indonesia has increased more than 15 % during 2009 to 2013. In 2009, the total production amounted to 328,189 MT, and in 2013, it amounted to 575,175 MT, in other words, the milkfish production had been almost doubled during 2009 to 2013.

Walking catfish

Walking catfish (*Clarias spp*) is a freshwater fish that are commonly cultured by fish farmers in Sumatra, Java and Kalimantan. The fish is relatively easy to be cultured; due to its culture technology is relatively simple. It could be farmed with high density stocking in a small area (area efficient) in marginal lands with low water requirements. The development of catfish farming could be divided into a number of stages or segments, each of which is profitable.

Overall, the volume of walking catfish production in Indonesia has increased at 41.01% from 2008 to 2012. In 2008, the total production amounted to 114,371 MT, and in 2012, it increased to 441,217 MT. The production in 2010 was almost doubled compared to the production in the previous year from 144,755 MT to 242,811 MT. In subsequent years, it continued to increase and to reach its peak in 2012 that amounted to 441,217 MT.

Tilapia

From a biological standpoint, tilapia are fast-growing and can be farmed in a variety of aquaculture environments (pond, fixed cages, floating cages, running-water systems and rice-fish culture in irrigated paddy fields). Besides consumed for domestic purposes, tilapia was also exported to overseas. Tilapia is mainly exported to the United States. Tilapia export products are mostly made in frozen form.

Tilapia fish production has increased significantly, from year to year. The volume of Tilapia production in cages has increased from 291,037 MT in 2008 to 695,063 MT in 2012.

Significance of Aquaculture industry

The area that can potentially be used for aquaculture development is of 26,606,000 ha. Aquaculture plays an important role in reducing unemployment. In 2003, there were 2,284,208 households involved in the aquaculture industry, representing around 40% of the total number.

Since the development of Marine and Fisheries sector in 1998, aquaculture production has increased significantly. In 2010, fisheries production was 6.2 million MTs for aquaculture and 5.2 million MTs for capture fisheries. In 2013, aquaculture production reached 13.3 million MTs. Aquaculture production of 13.3 million MTs is produced through the development of traditional technologies, semi-intensive and intensive aquaculture systems with a pond, floating net cage (KJA), and rice cum fish. In accordance with Indonesia's natural resource, wealth cultured fish species includes seaweed, shrimp, grouper, snapper, milkfish, catfish, tilapia, carp, catfish, and oyster.

The fisheries and aquaculture sector plays a crucial role in Indonesia's economy, producing a combined of just under 10 million MTnes in 2009, and contributing around 3% of Gross Domestic Product (GDP) and employing around 5 million people. Indonesia is the fourth biggest aquaculture product exporter country after China, Canada, and Thailand with total export value US\$ 1.4 Billion in 2013 or 10% increase compared to 2012.

The Indonesian aquaculture products distribute mostly to domestic market in the region mainly: catfish, tilapia, giant gourami, milkfish, etc., and some of the aquaculture products designated for export market such as shrimp, grouper, tilapia, and milkfish. For instance, the export market destination for shrimp is USA, Japan, and European Union countries, while the tilapia is exported to USA, Netherlands, Belgium, Denmark and Germany and the groupers exported to Hong Kong, Singapore, China and Malaysia.

II. Current Status Of Traceability Systems For Aquaculture Products In Indonesia

Second part of this report discussed about the Current Status of the implementation of Traceability Systems for Aquaculture Products in Indonesia. This part described the national systems / programmes that have been implemented / initiated in three selected pilot provinces, namely East Java Province situated in Java Island, Lampung Province in Sumatera Island and South Sulawesi Province in Sulawesi (Celebes) Island. Figure 1 shows the sites of traceability implementation areas using movement document.

Description of national systems / programmes that have been implemented / initiated

Implementation of traceability national system has been implemented, with the referring generic supply chain flow chart for aquaculture product (fish and shrimps) described in Regional Guideline for Aquaculture Products in Southeast Asia. As per the following chart, the stakeholders involve

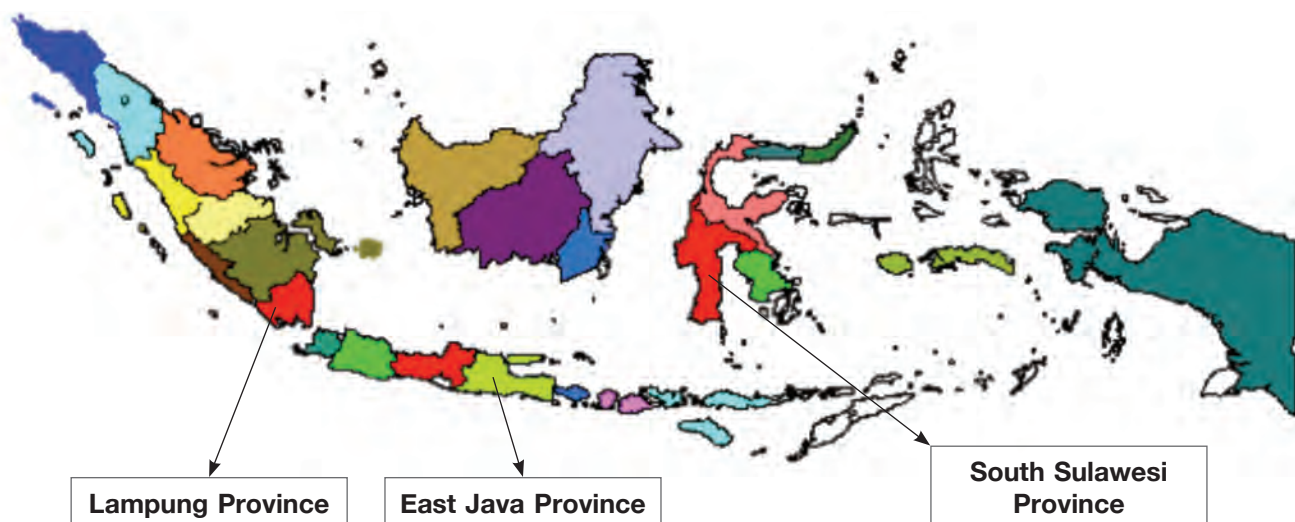


Figure 1. Sites of Pilot Implementation of Traceability Using Movement

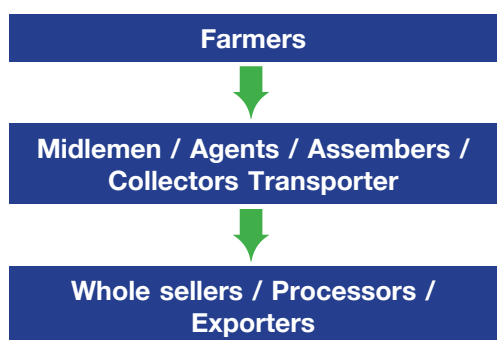


Figure 2. Stakeholders Involved in the Pilot Implementation of Traceability Using Movement Document

in traceability system implementation are farmers, middlemen and processors.

Shrimp and walking catfish are chosen as commodity in this pilot traceability implementation system. Three provinces are selected to be involved in the pilot project, as according to the 2012 statistics, each of them contributed to a significant aquaculture production volume in 2012 especially for shrimp and catfish. The production volume of shrimp in East Java, Lampung and South Sulawesi is 54,760 MT, 43,102 MT and 28,006 MT or represents 13%, 10%, and, 7% of national shrimp production respectively. Meanwhile, the rest of shrimp production is contributed by other 30 provinces.

Especially for East Java Province, walking catfish is another commodity which is involved in this pilot project in addition to shrimp. The intention for including walking catfish as commodity traced in East Java Province is not only due to the significant production value of catfish exported to Europe but also it is significant in walking catfish production volume which is 62,432 MT (Indonesian Aquaculture Statistics 2012).

In comparison to the total national production, this province contributes for about 14% of national catfish production, while the other 84% of walking catfish production is more or less contributed by among the 32 provinces.

In line with the finalized flow diagram, implementation of traceability systems in Indonesia is limited to last three stakeholders of the diagram, starting from Farm to Middlemen and then to the processors. It is common practice that processors in Indonesia are also exporter. Because of big number of retailers and this pilot implementation focusses only on fish products aimed for export.

We established Aquaculture Product Traceability Form with 5 different colours, white, blue, red, yellow and green (Figure 3). Steps for moving on the

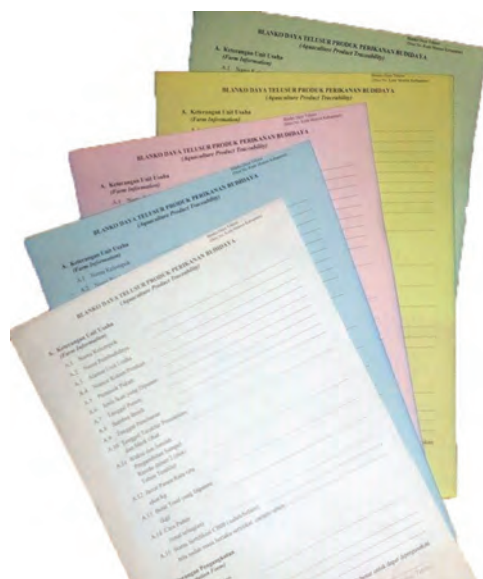


Figure 3. Five different color sheets using Non Carbon Required (NCR) paper

movement document are shown in Figure 4. The first page (white colour) is for fish/shrimp farmers. The second page (blue colour) is for supplier, the third page (red colour) is for processors / exporter, the fourth page (yellow colour) is for provincial fisheries (PFO) service office, and the last page (green colour) is for District Fisheries (DFO) Officer. The form made of Non Carbon Required (NCR) paper should be filled at once. The information contained in the form is shown in Figure 5.

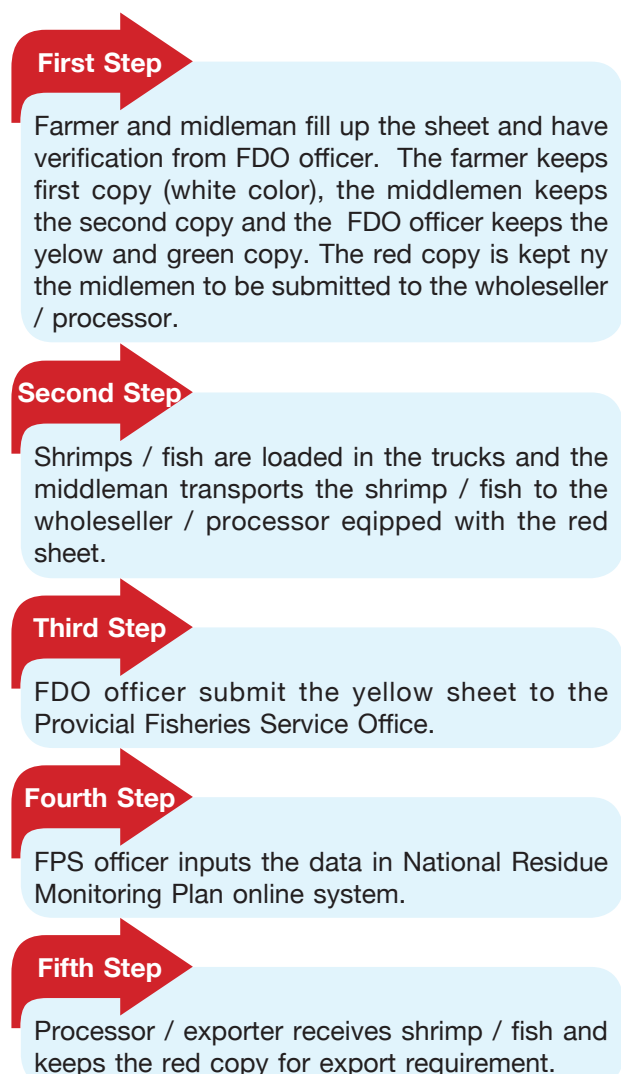


Figure 4. Steps required in using the movement document for traceability.

Note: In the future, when the system has been fully implemented, the processors should use the first page or the original page (white colour) of the movement document to apply for export certificate. FDO should produce separate regular verification report to its Provincial Fisheries Service.

Below is a form containing a list of questions to be filled up by the farmers and transporters during harvesting and loading of aquaculture products.

No:
(Diisi No. Kode Monres Kabupaten)

BLANKO DAYA TELUSUR PRODUK PERIKANAN BUDIDAYA
(Aquaculture Product Traceability Form)

A. Keterangan Unit Usaha (Farm Information)

A.1 Nama Kelompok (Aqua farmer Group) :
A.2 Nama Pembudidaya (Name of Farmers) :
A.3 Alamat Unit Usaha (Address) :
A.4 Nomor Kolam/Petakan (Pond Code) :
A.5 Pemasok Pakan (Feed Supplier) :
A.6 Jenis Ikan yang Dipanen (Type of Fish/shrimp) :
A.7 Tanggal Panen (Date of harvest) :
A.8 Sumber Benih (Source of seed) :
A.9 Tanggal Penebaran (Date of stocking) :
A.10 Tanggal Terakhir Pemakaian dan Merk Obat (Last Date using medicine) :
A.11 Waktu dan Jumlah Pengambilan Sampel Residu dalam 2 (dua) Tahun Terakhir (Date of residue sampling for the the last 2 years) :
A.12 Berat Panen Rata-rata-ekor/kg (Average weight of harvest-piece/kg) :
A.13 Berat Total yang Dipanen (kg) (Total weight of harvest (kg)) :
A.14 Cara Panen (total/sebagian) Harvest system (Total/partly) :
A.15 Status Sertifikasi CBIB (sudah/belum) bila sudah masa berlaku sertifikat sampai tahun (GAP Certificate Status)

B. Keterangan Pengangkutan (Transportation Form)

B.1 Nama Perusahaan Pengangkut (Name of Transporter Company/middlemen) :
B.2 Nomor Registrasi Kendaraan (Vehicle registration number/middlemen address) :
B.3 Nama Pengemudi (Name of Driver/police number) :
B.4 Tanggal Pengangkutan (Date of transportation and invoice number) :

Dengan ini saya nyatakan bahwa semua informasi di atas adalah benar untuk dapat dipergunakan sebagaimana mestinya. (I, hereby, the above information is true)

.....
(Tempat, Tanggal, Bulan, Tahun)
(Place, DD, MM, YR)

(.....)
Nama Pembudidaya (Name)

Figure 4. Aquaculture Product Traceability Form

Table 5. Level of Participation in Traceability Pilot Project

| No. | Province | No of Farmers involved | Number of Middle Man / transporter involved | Remarks |
|-----|----------------|------------------------|---|--|
| 1. | East Java | 11 | 2 | Transporters are also the processors / exporters |
| 2. | South Sulawesi | 22 | 2 | Transporters are also the processors / exporters |
| 3. | Lampung | 17 | 7 | Transporters are also the processors / exporters |

The blank sheets have been distributed to 17 provinces in December 2013. However, only three provinces namely East Java, South Sulawesi and Lampung have filled up and keep the appropriate page of the sheets. Main results of traceability implementation using movement documents are shown in Table 3.

It would be easier to trace back the source of aquaculture products in both East Java and South Sulawesi Provinces, as compared to Lampung province, as only 2 middlemen / transporters were involved in the supply chain. Therefore, for some reasons traceability is also stronger in East Java and South Sulawesi Provinces.

Since 2012 socialization and piloting have been conducted in the Province of East Java, Lampung and South Sulawesi participated with processors / Exporter, shrimp farmers and middlemen as well as representatives of association such as Shrimp Club Indonesia. In 2015, socialization and workshop for traceability system have also been conducted in Lampung and East Java Provinces in July, August, September and November 2015 The next implementation reports is expected to be received by Directorate General of Aquaculture, Ministry of Marine Affairs and Fisheries at the beginning of December 2015.

III. Challenges faced in implementation and solutions and other relevant information

Implementation of traceability system in the three provinces is challenging. Most farmers are reluctant to participate due to various reasons. Some reasons identified causing the reluctantancy of fish farmers to participate in implementing this traceability system includes:

1. Farmers perceived that being involved in implementing the traceability system pursues them to spending time to fill in the traceability form provided.
2. Traceability form would lead to having their products to be identified easily and they would tend to be blamed by the processors or exporters who had bought the products, or whenever the processors or exporters found that any of the supplied products' quality is lower than the processors or exporters' standards. The traceability form may function as an accurate source of information of product origin. Farmers, who sold aquaculture products to the exporters / processors with the traceability forms, would feel that they represented the whole farmers that supplied shrimp / fish products to processors or exporters. This is because majority of the farmers had yet to provide the traceability form when they sold their products.
3. Farmers perceived that having to participate in the implementation of traceability system had not gained any benefits for them, neither had any better price nor other incentives received from the buyers.
4. The Majority District Fisheries Service Offices, the front lines were still reluctant to produce the traceability form by their own budget. They perceived that the form should be procured by the central office. However, the central office had not been allocated to having enough budget to procure the form for approximately 300 districts. As a result, this contributed to a low level of involvement of the District office that might lead to slow implementation of traceability system nationally.
5. The role of fish / shrimp collectors in movement of aquaculture products is vital. They also play an important role in connecting the fish farmers with processors / exporters. However, unclear role of government institution in supervising collectors' works might slow down the traceability implementation process. Similarly to the farmers' case, the collectors perceived that by participating in the implementation of the traceability system had not gained any benefits for them.
6. For better implementation, further improvements on Traceability Form by adding several other

necessary questions would be required. A total of 4 additional information would be required from fish farmers and 2 additional information from middlemen. The 4 questions that would be required from the fish farmers include geographical position, local and scientific name of harvested fish, sanction and punishment that have been received from government, type of aquaculture (pond, cage etc). On the other hand, the 2 additional information required from middlemen include name of processors or exporters who bought the products and the reception date of fish products.

Besides providing proper training or education to the farmers on future benefit of implementing traceability system for national shrimp and catfish industry, no solutions are identified to overcome the above challenges.

IV. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Indonesia

The third or the last section of this report contains Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Indonesia and Recommendations for implementation.

Future plan for traceability implementation

- Improving Movement Document System:
 - Subject to availability of funding from national budget in 2015, there would be 2 provinces chosen as sites for further implementation of the movement document traceability system. These selected provinces were East java and Lampung. The reasons for selecting these two provinces were their strong commitment that had been shown during the trial period. In

addition, these two provinces were the main producer areas for aquaculture products. However, there were several other provinces that would have high potential for implementing the system. They were not able to be involved to implement the traceability system using the movement document in 2015, due to the lack of allocated funding. The Movement Document system would be further developed through applying bar code in the traceability sheet. Through the bar code, a more accurate information transfer from farm to exporter would be established.

- Optimizing the use of Residue Monitoring Information Management System:

➢ Currently, with the support of Trade Support Programme of the European Union, Directorate General of Aquaculture is developing an electronic recording system on the status of residue monitoring in the 17 provinces. The system known as Information Management System (IMS) on Residue Monitoring contained data related to residue monitoring activity. In addition, the system also contains data about farm status, including the source of used feed, seed as well as medicines. To achieve maximum benefit of this system, Directorate General of Aquaculture would further improve the IMS so that the system would be enable to trace back any non-compliant products found in the market. It is also very important to avoid aquaculture products that contained residues that were above the maximum limit that might threaten consumers' health.

➢ This further enhancement of the development of the traceability system has been proposed to be funded by 2nd phase of Trade Support Programme (TSP II) of European Union. An example of the interface in the IMS on residue is shown below:

| Home / Daftar Sample / Sample 73007302/U/13/10007 | | | |
|---|-------------------------------------|----------------------------|---|
| Q, Sample 73007302/U/13/10007 | | | |
| Provinsi | : Sulawesi Selatan | Pakan | : Alami (Non Fabricant) |
| Kabupaten | : Bulukumba | Obat | : Tidak terdaftar, URSAL, CAIR, OBT, CI, Bunga Tani |
| Komoditas | : Udang | Farm | : Suardi Bulukumba |
| Period | : Q1 | Petakan | : 11 |
| Tahun | : 2013 | Petakan Lintang | : 5° 30' 73" S |
| Kode Sample | : 73007302/U/13/10007 | Petakan Bujur | : 120° 18' 488" E |
| Sample Status | : Collected | Tanggal Pengambilan Sample | : 2013-03-14 |
| Berat | : 500 Gram | Dikumpulkan oleh | : mardian Muh, Ardiansyah |
| Asal Benih | : Takalar, Barru - Sulawesi Selatan | Tanggal Pengujian | : |
| Laboratorium | : PT. Mutu Agung Lestari | Tanggal Terima LHU | : |
| Metode Uji | : LC-MS/MS | Compliant | : 1 |
| Substansi | : A6 | Notes | : 1 |
| | | Aktif | : Ya |

Buttons at the bottom: Daftar Sample Detail Sample Tambah Sample Cancel



Figure 6. Workshop on Development of Aquaculture Traceability System in Lampung, 6 September 2015

Linking with other new Initiative to Developed traceability system

Recently, another traceability systems is being developed in Indonesia namely *Ikan Biru*. *Ikan Biru* (blue fish) is a network-based electronic design applications (networking) that assist in the development of traceability systems in Fish Processing Unit. Till now, the system is still under trial basis. Another new initiative that might support the development of the aquaculture traceability system is through developing a data base for quality assessment of aquaculture stakeholders. The principle of this initiative is to build a rapport system for the fish farmers, hatchers and the aquaculture technicians. Fish farmers, hatchers and the technicians' performance were evaluated periodically. Each of these stakeholders was provided with a card called Aquacard. Each card would provide a specific identification number and a bar code. As a new initiative, the Aquacard has not been fully implemented, as thus far only several walking catfish farmers in East Java province had already have their Aquacard.



Figure 7. Workshop on Development of Aquaculture Traceability System in Lampung, 6 November 2015

Strengthening traceability implementation

As the budget for implementing traceability system is limited, the collected data are insufficient to reflect the real situation of traceability system implementation using movement document. Therefore, further technical assistant is required to build up capacity in traceability of aquaculture products in South-East Asia countries. The implementation of traceability system among the SEAFDEC member countries should be evaluated periodically for the sake of food safety and quality assurance of aquaculture products of South-East Asia countries through a Periodic Focus Group Discussion, facilitated by SEAFDEC. SEAFDEC through ASEAN Secretariat should encourage ASEAN Member State to allocate reasonable budget for proper implementation of traceability system in each member country.

V. Recommendations for implementation

Apart from many challenges and issues are faced such as lack of supporting regulation, limited national and local government budget to implement the traceability system, a strong commitment from

the parties concerned (Stakeholders), is required to speed up the implementation of traceability system in Indonesia. Immediate traceability system implementation is needed to solve problems to trace the source of residue of antibiotic and contaminants if detected in any sample of aquaculture products. Quick successful tracing the source of the residue will help developing risk based sampling and improve the quality of corrective action. Considering that the role of stakeholders especially the wholesalers / processors are increasingly important to verify the quality of aquaculture products for consumption and processing purpose, immediate implementation of the traceability system will help their business efficiency.

VI. Conclusion

Traceability system for aquaculture products in Indonesia is being piloted in three provinces namely Lampung, East Java and South Sulawesi Provinces. The traceability system is expected to be gradually implemented next year. Indonesia recognizes the need to encourage stakeholders to involve 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 is having a

number of trainings and workshops, socialization program and activities to build awareness to stakeholders on traceability. Awareness building is emphasised to support the implementation of the traceability system in Indonesia.

Various data / information gathering system related with the traceability system has also been developed that can enhance the recent traceability system development. Internal record keeping within hatcheries, farms, processing plants and feedmills as well as establishing farmers' identification system are among the various data/information gathering system. The developed regional guidelines on traceability systems for aquaculture products in Southeast Asia have been used as basis for development of traceability system in Indonesia.

However, Indonesia traceability system needs to have a strong legislation binding to ensure the system could be carried out successfully. Non Carbon Required (NCR) paper-based is used in combination with on Line system of the National Residue Monitoring Plan. Currently, Indonesia is developing a government regulation for Aquaculture. Once regulation is available it can improve the limitation and ensure the implementation of the traceability system that can help improve aquaculture product traceability.

Lao PDR

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I. Introduction to Aquaculture Industry in Lao PDR

The Lao Peoples' Democratic Republic (Lao PDR) is a landlocked country with generally rugged terrain, limited infrastructure, a narrow human capital base and emerging social and economic institutions. Lao PDR is located in Southeast Asia, bordered by Viet Nam to the east, Cambodia to the south, Thailand to the west and south, and Myanmar and China to the north.

The Capital of Lao is Vientiane Municipality, Administratively; the country is divided into 17 provinces, which in turn are subdivided into 139 districts, and then sub district where required and 11,000 villages. According to population census of 2010, the population is estimated at 5, 5 million of which 75% were living in the rural areas. The population is expected to increase to 8, 2 million in 2020.

The country occupies a total area of 236,800 square kilometers. About 20% of land area is lowland (70-200 msl); the other 80% is upland and mountainous. 88% of the land area is in the Mekong Basin, which drains south to the South China Sea, while the other 12% is in the Northeast and drains through Viet Nam to the Gulf of Tonkin. The country has a tropical monsoon climate: annual rainfall averages 1000-1500mm in most of the country but exceeds 3000mm on the Southern peaks of the Mountains. Floods and droughts are also commonly experienced.

The Government estimates percent per capita consumption of fish at 12-15 kg per annum, accounting for about 40% of the animal protein intake and has set itself a target of increasing per capita availability of fish to 20-23 kg by the year 2020. This is reflected in the national policy for the development of the fisheries sub-sector which has set the target of:

- Meeting food security (increasing present per

capita consumption from 12kg/annum to 20-23 kg/annum by year 2020.

- Ensuring the provision of aquaculture products as commercial commodities for local market and for future export.
- Contributing to the gradual reduction of slash and burn shifting cultivation by integrating fish culture into the upland farming system.
- Contributing to the sustainable use, appropriate management and protection of aquatic resources including aquatic biodiversity.
- Upgrading and establishing appropriate basic infrastructure requires for further aquatic resources research, management and development for the country.

Since it is believed that substantial increases in production from capture fisheries may not be possible, any planned increase in fish production has to come from aquaculture or enhanced fisheries. While ponds and rice fields hold potential for aquaculture, the large number of small and large reservoirs developed in the country hold potential for cage culture and also enhanced fisheries.

In recent years, the government has been emphasizing the importance for aquaculture development. The government plans for the aquaculture to be focussed on:

- Assessing traditional fish culture systems and floodplain resource potentials in different agro ecological zones.
- To search and promote appropriate types of extensive and semi-intensive farming system.
- To search for approaches and efficient interventions for extending fish seed distribution networks.
- To search for and develop appropriate extension approaches for upgrading the multitude of small holder farmer in rural areas.

- Fish disease prevention
- Improvement of feeding techniques / quality of feeds
- Enlarge the area for aquaculture

Aquaculture System in Lao PDR

There are various aquaculture system which are small-scaled, such as: pond culture, Fish cage culture, rice cum fish, integrated system, communities' pond, hatcheries and others.

Freshwater aquaculture, Species farmed, production figures

- Fish seed and Fish meat production
 - Presently, there are approximately 29 government fish stations and 92 small farms of private hatcheries, both capacities produced 200-250 million fry/fingerlings/year. This was supplemented to 30 million fry/fingerlings by the Government sector and 220 million by private sector. The production of fish meat from aquaculture was estimated to be 24,325 tonnes/year, but is still insufficient for consumption.
- Fish Consumption
 - Estimation of fish consumed by Lao people and tourism were estimated to be approximately 50,000 tonnes/year.
- Requirement fish seed and fish meat
 - As per mentioned above, there is still a shortage of fry/fingerling supply to the farmers. As a result, the quantity of the in entry of fry/fingerlings from across the border (Thailand, Viet Nam and China), especially to the districts / provinces situated along the border, would be difficult to be estimated. Presently, the demand fish seed is about 350-400 million fry/fingerling/year while the requirements for Fish meat production for consumption from aquaculture were estimated to be approximately 25,000 tones/year.
- Fish species
 - Economically, the most popular freshwater fish culture species were Tilapia, Silver barb, Common carb, Catfish, and Pangasius. Fish cage culture is the most common form of aquaculture practice in the rivers and reservoirs.

National GDP / economy

Fisheries and Aquaculture play an important economic role, contributing to 14% of the GDP.

II. Current Status Of Traceability Systems For Aquaculture Products In Lao PDR

Presently, the status of traceability System for Aquaculture products had yet to be implemented. However, the current implementation is only on documents inspection for import, export and transit of commodities, as well as International Checkpoint before entering into Lao PDR.

1. Documents inspection for import, export and transit of commodities

Importation

- Permission of import-export (final destination and origin country)
- Certificate of pedigree
- Certificate of sanitary
- Certificate of medicine and hormone (Suprefact, motilium) quality

Exportation

- Permission export of Livestock and Fisheries Department, Ministry of Agriculture and Forestry
- Certificate of pedigree
- Certificate of sanitary
- Certificate of medicine quality

Transit to Third country

- Permission of pass in transit from Livestock and Fisheries Department, Ministry of Agriculture and Forestry
- Certificate of pedigree
- Certificate of sanitary
- Certificate of medicine quality

2. List of epidemic disease needed to pass certification from international Checkpoint before entering into Lao PDR

Fresh water fish disease

- Skin spoiled disease
- White spot disease

3. Commodities analysis needed to pass certification from International Checkpoint

Import inspection Commodities

- Antibiotic residue analysis
- Contaminant analysis

Seafood

- Contaminant analysis

Feed

- Mineral and feed analysis (Protein, Carbohydrate, Fiber, Moistness etc)

III. Challenges faced in implementation and solutions and other relevant information

1. Small farms and some old hatcheries.
2. Low applications in the new technologies and low productions.
3. Aquaculture sector not yet fully developed (Small-scale aquaculture) (Extensive and Semi-intensive).
4. Lacked of certification system for aquaculture products.
5. General inspection by livestock and veterinary Authority and department of food and drug.
6. Lacked of Laboratory.
7. Lacked of Funding to promote.
8. Information is sometimes inaccurate records.
9. Lacked of knowledge and experience on Traceability system.
10. No specific regulation on traceability of aquaculture products.
11. No Traceability system on aquaculture products.

IV. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Lao PDR

1. Government regulation / Decree regarding, Quality and safety.
2. Developed technical standards on food safety for Aquaculture products to supply domestic market and future export.
3. Improved knowledge and technical capacity on traceability of Aquaculture products.
4. Necessary for the training on Traceability system for aquaculture products (need project support).
5. Sharing of information, experiences amongst ASEAN members on application of traceability systems for the aquaculture products.
6. Initiation Promote and application, implementation of traceability systems for aquaculture products in Lao PDR.
7. Encourage farmers to apply for GAP.
8. Developed guidelines of traceability systems for improved management practices and disseminate.

Malaysia

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I. Introduction to Aquaculture Industry in Malaysia

Overview of Fisheries Industry in Malaysia

Global aquaculture shows significant growth due to high demand from the food-producing sector and now accounts for almost 50% of the world's fish that is used for food (FAO, 2014). The production expanded at an average annual rate of 6.2% in the period 2000–2012 which is more than doubled from 32.4 million tonnes to 66.6 million tonnes respectively. Concurrently, fisheries industry in Malaysia plays a significant role in the national economy. Apart from contributing to National Domestic Product (GDP), it is also a source of employment, foreign exchange and a source of protein supply for the rural population in the country (FAO, 2001). In year 2012, Malaysia is one of the top fish consuming countries in the world, with an average consumption of 52 kg/person/year.

Basically, fisheries industry in Malaysia encompasses two (2) main sub-sectors namely the (i) capture fisheries and (ii) aquaculture. In 2012, the fisheries sector had shown a significant increase with the contribution of RM11, 440.31 million to the nation's economy. The food fish sector which comprises of marine capture fisheries and aquaculture produced 1,780,168 tonnes worth RM10, 597.60 million while the non-food fish sector, namely seaweeds, ornamental fish and aquatic plants contributed a total of RM842.71 million. As a whole, the fisheries sector contributed 1.1% or RM7.822 billion to the nation's GDP in 2012 (Annual Fisheries Statistics, 2012).

Malaysia's export on fishery commodity was decline rapidly from 2008 to 2009 which is 302.2 thousand metric tonnes valued at RM2.598 billion to 253.7

thousand metric tonnes valued at RM2.292 billion respectively. There are some contributing factors to the decline, such as the rise of cost, higher cost input but low demand or price and other mandated international requirements. At that particular moment, the deficit occur is also due to the voluntarily delisting by the government that effected several Malaysian owned companies from the list of European Union (EU) trade partner list, and rejection of non-compliance cases.

Both incidents require the government to urgently revamp the structure in fisheries industry, both the primary production to finished products. In 2008, the Department of Fisheries (DOF) under the Ministry of Agriculture and Agro-based Industry (MOA) has established the Fisheries Biosecurity Division (FBD). DOF is also recognized as the national Competent Authority (CA) responsible for all matters involving the live fish. The establishment of FBD is to control and manage the fish health and food safety, in particular fish and fishery products via the empowerment of the Fisheries Act 1985 and its respective regulations.

The aim of FBD is to ensure that it is free of contaminants for the safe consumption and prevent the spread of fish diseases. In order to achieve the aim, FBD conducts various activities i.e. official control, official analysis and official guarantee at the primary production of the supply chain, in particular aquaculture farms, fishing vessels, feed mills and fish meal manufacturing plants. Therefore, strengthening of the official control and official guarantee mechanism through traceability was introduced as a supportive for issuing health certificate and origin of product attestation declaration from Malaysia to the EU and USA particularly.

II. Current Status Of Traceability Systems For Aquaculture Products In Malaysia

According to ISO 9000:2005, traceability refers to the ability to trace the history, application or location of what is under consideration. In other words, the capacity is to trace one step backward and one step forward. Therefore, in agriculture and fish and fishery industry sector, the traceability scope is precisely on the movement of origin of the source, transportation, distribution to the food establishment until export. The implementation of traceability systems in Malaysia are various according to the structure of supply chain and risk management. Traceability system for aquaculture products in Malaysia divide into two categories such as (i) Aquaculture Product Traceability and (ii) Live Fish Traceability.

Aquaculture Product Traceability (BP-DJ01)

The system has been developed in 2011 and fully established in 2012. Aquaculture Product Traceability Form (BP-DJ01) has been introduced to all registered farm to track the movement of the shrimp. The main

objective of Aquaculture Product Traceability is food safety which is to ensure the aquaculture product supply to the processor/exporter safe for human consumption. The Aquaculture Product Traceability System has been developed to support the shrimp exporter/importer declaration form (Form DS2031) by United State Department of State to ensure the shrimps are from aquaculture sources and not from wild capture. The system also support the Ministry of Health (MOH) Malaysia to respond to Food and Veterinary Office (FVO) EU report to prove all shrimp consignment exports from Malaysia are obtained from approved sources before issuing Health Certificate (HC). Figure 1 shows the traceability of shrimp movement from approved farm to approved processor.

Only approved and certified farm by Department of Fisheries (DoF) could supply raw materials to approved and certified establishment by Ministry of Health (MoH) Malaysia. Figure 2 shows the flow of application for Certificate of Origin of Frozen Shrimp Export to United State of America (USA).

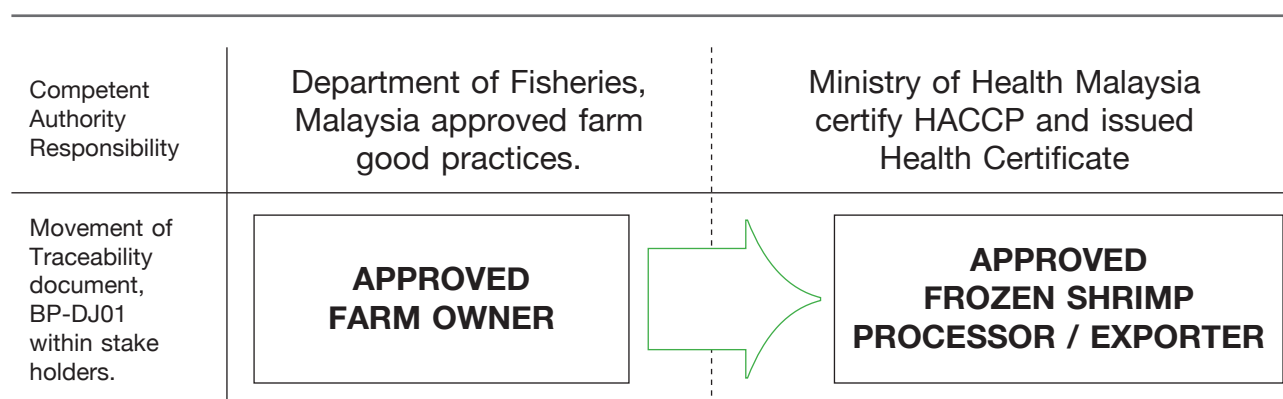


Figure 1. Aquaculture Product Traceability System

| ROLE | Frozen Shrimp Establishment (EXPORTER) | DOFM | Chambers of Commerce (representative of MITI) |
|----------------------|--|--|---|
| ACTION | Apply Letter of Attestation and DS2031 Form | Process application of DS2031 based on supporting documents. | Process and issued Certificate of Origin for fish and fisheries product |
| SUPPORTING DOCUMENTS | Traceability Form, BP-DJ01 from registered farm. | Traceability Form, BP-DJ01 from registered farm. | Letter of Attestation and Form DS2031 |

Figure 2. Flow of Application for Certificate of Origin of Frozen Shrimp Export to United State of America (USA)

Attestation of source of shrimp exported to USA involved three parties which is Frozen Shrimp Processor cum exporter, DOF and Ministry of International Trade and Industry (MITI). The issuance of Certificate of Origin by Chamber of Commerce has been delegated by MITI. For exporting shrimp to USA, traceability document are necessary to be fill up starting from farm and move by transporter to Fisheries District Office for verification and frozen shrimp establishment cum exporter will collect two pieces of document for their own file and application for Letter of Attestation Source of Shrimp (LOA) and DS2031 Form should be attached with original document of Traceability Form, BP-DJ01. The role of office issuing LOA and DS2031 is to check and verify the source declared and information in BP-DJ01 are sufficient and sourced from approved farm (Figure 3).

The effectiveness of the system implementation is subject to supervision of registered entities along the supply value chain via monitoring, surveillance and auditing by Competent Authority (CA).

Live Fish Traceability (BP-DJ02)

Introduction of new emerging diseases into new geographical area was caused by trans boundary pathogen movement. Therefore, to control and prevent the potential emerging disease, DOF has developed the Live Fish Traceability System. The main concern of Live Fish Traceability is for aquatic animal health control which is to minimize or prevent the spreading of fish diseases including emerging disease to environment and trade. The system has been developed to respond to FVO EU report (2008) as a supportive document to prove all exportation of ornamental fish from Malaysia are obtained from registered/ approved sources and free from World Organization for Animal Health (OIE) listed diseases. Live Fish Traceability Form (BP-DJ02) has been introduced to all registered ornamental fish farm. Modus operation of Live Fish Traceability system (BP-DJ02) was developed

quite similar with Aquaculture Product Traceability (BP-DJ01). Movement of traceability form are from approved ornamental fish farm to the approved exporter's premise and from approved exporter's premise to approved exporter's premise shall be verified by DoF during Inspection Prior to Export (IPTE). Health Certificate (HC) will be issued by DoF after the export consignment complies with IPTE requirements (Figure 4).

Approved farm refers to any ornamental fish farm registered and certified with Fish Quality Certificate (FQC) under the disease surveillance programme. Only approved farms could supply to approve exporter's premises.

III. Challenges faced in implementation and solutions and other relevant information

Fisheries Biosecurity Division is responsible to control and manage the fish health and food safety, in particularly fish and fishery product. Apart from the biosecurity control and management is the implementation of traceability system. Upon the traceability system implementation, there were several issues and challenges have been identified at different level of stakeholder.

Legislation

Federal government is responsible to establish policy and regulation and engage with state government to implement biosecurity and traceability. However, there is no legislation to control any aquaculture activities in Malaysia. Therefore, DOF Malaysia with the assistant from Norwegian Authority has prepared Inland Fisheries Rules (Aquaculture) 2015 to control aquaculture activity in the Federal Territories of Kuala Lumpur and Labuan. This regulation shall be adapted to the states level once it has been gazetted by Minister of Agriculture and Agro-Based Industries. The regulation consists of elements such as permit to set up aquaculture business, license to

| Farm Owner | Transporter | DOF District Office | Frozen Shrimp Establishment (EXPORTER) |
|--|---|---|---|
| Harvesting Live Shrimp from registered farm | Collecting and transport shrimp from farm to establishment. | Verify the source of shrimp from registered farm. | Received raw shrimp and fill Section D. |
| Farm owner fill up Section A in Traceability Form, BP-DJ01 | Transporter fills up Section B in Traceability Form, BP-DJ01 and go to DOF District Office. | Verify and fill up Section C in Traceability Form, BP-DJ01. | Verify and fill up Section D in Traceability Form, BP-DJ01. |

Figure 3. Flow of Traceability Documentation for Frozen Aquaculture Shrimp Exported from Malaysia to United State of America (USA)

| Farm Owner / Exporter's premise | Transporter | Ornamental Fish Premise (EXPORTER) | DOF Competent Authority |
|---|--|---|--|
| Harvesting ornamental fish from registered farm | Collecting and transport ornamental fish from farm / exporter's premise to exporter's premise. | Received ornamental fish and fill Section C. | Verify the source of ornamental fish from approved farm / exporter's premise. |
| Farm / Exporter's premise owner fill up Section A in Traceability Form, BP-DJ02 | Transporter fills up Section B in Traceability Form, BP-DJ02 and go to exporter's premise.. | Fill up Section C in Traceability Form, BP-DJ02. | Inspection prior to export at exporter's premise / exit point and issued the health certificate. |

Figure 4. Flow of Traceability Documentation for Live Fish Exported from Malaysia

operate the aquaculture business, good aquaculture practice including traceability and fish health management. To facilitate the export and import of fish and fisheries product, DOF has prepared and implemented Fisheries (Quality Control of Fish for Export to the European Union) 2009 and Fisheries (Fish Disease Control Compliance for Exports and Imports) Regulation 2002.

Importing Country Requirement

Developed countries such as EU, USA and Australia have set higher standards on import requirements for fish and fisheries products compared to ASEAN countries. ASEAN Countries need to improve control system to ensure for fish & fishery products destined for export meet the relevant importing country requirements. Collaboration of ASEAN countries will have a pool of biosecurity experts in order to ensure control system implemented by the ASEAN Countries are in line with importing country requirements via capacity building. In Malaysia, the biosecurity quality and standard has been developed based on the importing country requirements. The engagement between federal and state government is to implement the biosecurity and traceability system.

Biosecurity Compliance:

Emerging disease

The fisheries sector, mainly aquaculture had suffered significant losses due to diseases. Much of the impact falls upon small-scale farmers, who constitute the majority of producers in the Asian region, with devastating effects on their incomes and livelihoods as well as on international trade. Due to close trade connections, aquatic animal pathogens tend to spread rapidly throughout the region and internationally, multiplying the losses and impact on farmers.

Knowledge gap

Lack of skilled and semi-skilled workers on biosecurity continues to be a challenge in the aquaculture industry. It is a challenge to educate farmers and exporters especially the conservative farmers to accept biosecurity measures such as record keeping and traceability. They just want to maintain their "old style" business without any documentation except for invoice. Furthermore, the introduction of e-Biosecurity System to small farmers is burden for them. Knowledge and technology gap are barrier for them to initiate and involve into the system.

False declaration

False declaration on harvest information by farmers/exporters due to limited of sources from approved farm/exporter's premise. Besides that, they used to make false declaration to avoid annual income declaration and provide different documentation for same transaction.

Voluntary registration and certification

Farm registration and certification in Malaysia is voluntary and export oriented. Only huge farm and exporter's premise which intend to export registered with DoF and apply for certification. Therefore, no further action can be taken due to no legislation binding.

IV. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Brunei Darussalam

In this respect, effective biosecurity, particular aquatic animal health management is a shared responsibility that requires coordinated approach from all the related countries. Countries should work closely and form proactive cooperation with

international and regional organizations such as NACA, SEAFDEC, OIE, CODEX, FAO and other relevant bodies to address the biosecurity issues.

For efficient biosecurity implementation, there is need to establish integrated approach between fisheries operators and governments to exclude and combat aquatic animal diseases. There are likely to be significant improvements in biosecurity systems and outputs if more coherent national and international approaches are applied.

Benefits include improved regulatory and policy frameworks for human health (particularly food safety), improved animal and plant health, greater efficiencies in the use of human and financial resources, better understanding of potential risks and appropriate measures to manage them, and improved protection and sustainable use of the environment. Moreover, a more holistic approach to biosecurity will enable these benefits to be achieved in a manner that avoids inconsistencies, fills gaps, and prevents the creation of unnecessary barriers to trade (FAO, 2007).

V. Recommendations for implementation

Inland Fisheries Rules (Aquaculture) 2015 has been drafted and pending approval from the Attorney-General office. Once the regulation has been gazetted, enforcement to all unregistered farm, non-compliance farm/ exporter, false declaration activities shall be compounded under strong legal. Moreover, awareness programme to all stakeholders from time to time to ensure the biosecurity compliance in aquaculture activities and comprehensive training will be emphasised once the regulation gazetted.

VI. Conclusion

Malaysia traceability monitoring system need to have a strong legislation binding to ensure the system could be carried out successfully. For the time being, paper-based still plays the significant role in traceability while the module enhancement of electronic system to be done. Awareness to stakeholders on traceability shall be emphasised once the regulation were gazetted to improve the limitation and ensure the implementation contribute to higher business efficiency.

Myanmar

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I. Introduction to Aquaculture Industry in Myanmar

Myanmar has a total area of 676,578 km² and the population has estimated over 51 million by the Census (2014). Myanmar is one of the sufficient countries for fish and fishery products in the domestic consumption of food security and share the surplus with neighbouring and other countries to export for national income. The people of Myanmar like fish and fishery products which are essentially of daily meals to them, such as fish sauce, fish and shrimp paste are favourite dishes of Myanmar. Fish constitutes a major source of animal protein in the diet of Myanmar People.

The type of fisheries in Myanmar can be classified into freshwater fisheries and marine fisheries. Freshwater fisheries consist of (a) fish culture, (b) leasable fisheries and (c) open fisheries. Marine fisheries include (a) inshore fisheries and (b) offshore fisheries.

Fisheries Production

Fisheries Production included culture-based fisheries and capture fisheries had gradually increased from 2004-2005 to 2014-2015 fiscal year. Fisheries statistics of Myanmar indicated that total fisheries production increased from 2217.47 thousand metric tons in 2004-2005 fiscal year to 5250.95 thousand metric tons in 2014-2015 fiscal year. (Fig. 1)



(Source of Fisheries statistics of Myanmar 2014)

Figure 1. Fisheries Production in Myanmar (2004-2005 to 2014-2015)

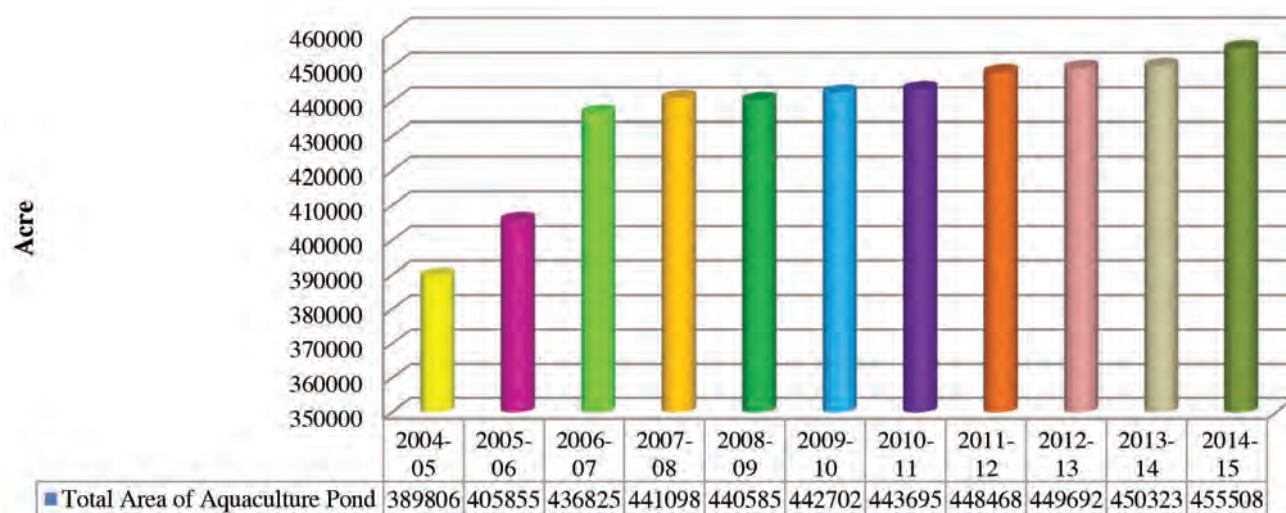
Aquaculture pond

Aquaculture ponds had gradually increased from 2004-2005 to 2014-2015 fiscal year. Fisheries statistics of Myanmar indicated that total areas of aquaculture pond increased from 389806 acres in 2004-2005 fiscal years to 455504 acres in 2014-2015 fiscal years. (Fig. 2) In 2004-2005 to 2014-2015 fiscal years, aquaculture ponds increased from fish ponds 182452 acres and shrimp ponds 207354 acres in 2004-2005 fiscal years to fish ponds 226474 acres

and shrimp ponds 229034 acres in 2014-2015 fiscal years.

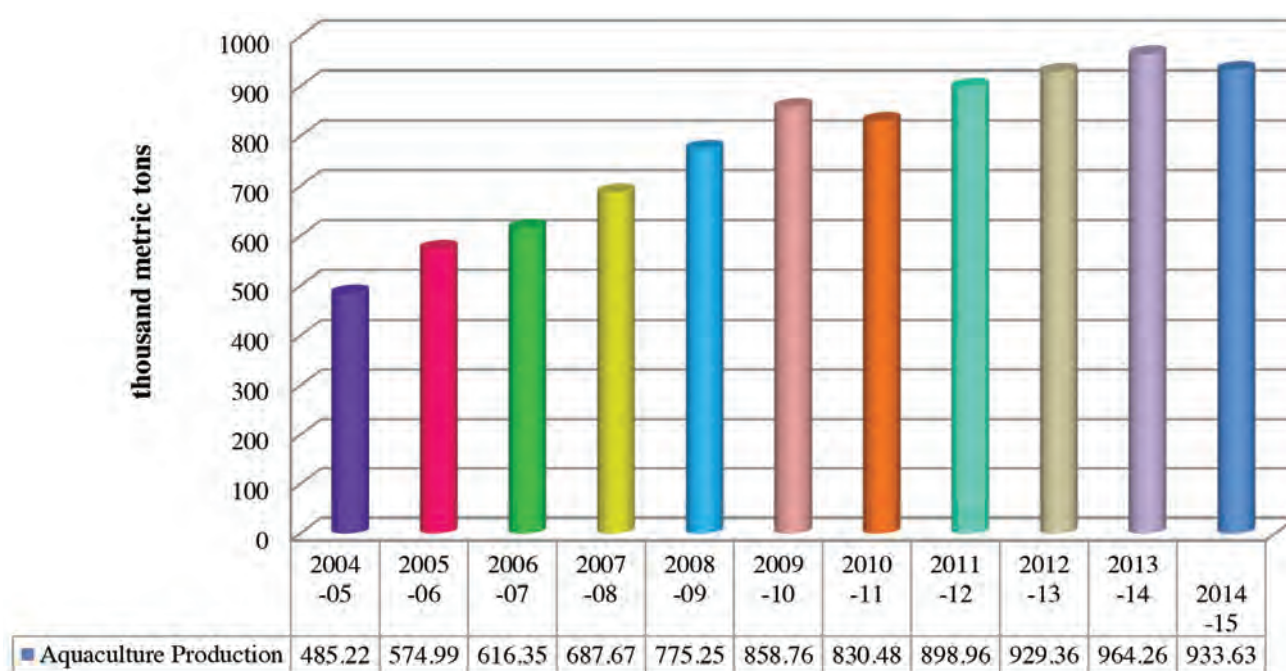
Aquaculture production

Fisheries statistics of Myanmar indicated that the total area of aquaculture production increased from 485.48 (Thousand Metric Ton) in 2004-2005 fiscal years to 933.63 (Thousand Metric Ton) in 2014-2015 fiscal years in Myanmar.



(Source of Fisheries statistics of Myanmar 2014)

Figure 2. Total Area of Aquaculture Pond



(Source of Fisheries statistics of Myanmar 2014)

Figure 3. Aquaculture Productions (Thousand Metric Ton)

Aquaculture Species

At present, freshwater aquaculture was established in terms of seed production and grow-out culture, with more than 20 species of freshwater fish being cultured. The most popular freshwater culture species are Rohu (*Labeo rohita*), Mrigal (*Cirrhinus mrigala*), Bighead (*Aristichthys nobilis*), Silver carp (*Hypophthalmichthys molitrix*), Grass carp (*Ctenophryngodon idellus*), Catla (*Catla catla*), Pacu (*Piractus brachypomus*), Tilapia (*Oreochromis nilotica*), Barb (*Puntius gonionotus*), Common carp (*Cyprinus carpio*), Catfish (*Pangasius sutchi*) and Catfish (*Clarias batrachus*). Rohu (*Labeo rohita*) withstands as the most common and commercial culture species which is native to Myanmar.

The most common and prioritized species are commercially important giant freshwater prawn, *Macrobranchium rosenbergii*. Monoculture of *M. rosenbergii* was conducted in semi-intensive level and a result with low production was gained. To minimize the operating cost of prawn farming, the farmers changed to prawn and fish poly culture. In recent years, many fish farmer's benefits of poly-culture of freshwater prawns.

Myanmar has 3 types of shrimp farming: Semi-intensive shrimp ponds, Extensive plus shrimp ponds and Extensive or traditional shrimp ponds.

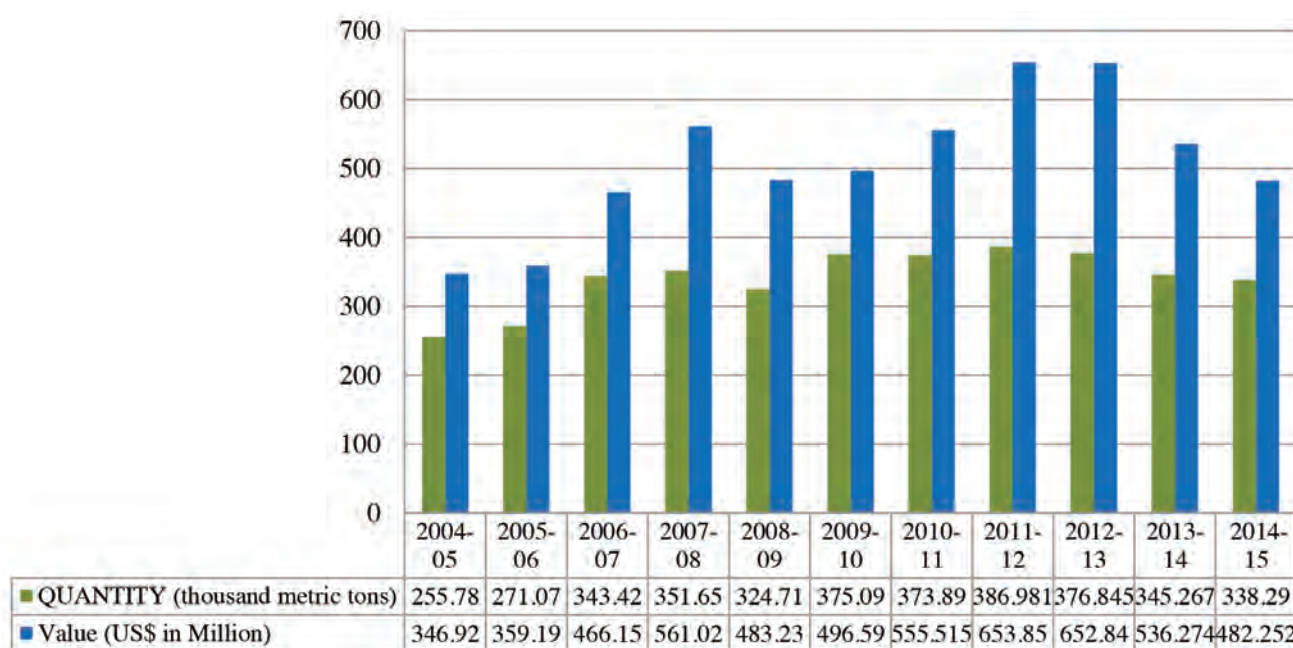
In terms of marine fin-fish farming, seabass, red snapper and grouper are the most common and commercial species in Myanmar. Stocked fish or the fish seed are usually collected from the wild. But the seed production technology of seabass has been succeeded since 2004 in both DOF and private sectors. Firstly, the broodstocks were collected from the wild and later induced breed seabass are used as broodstocks. However, the grow-out culture of seabass was done by only a few farmers. Grouper sp also conducted on seed production at marine research station of DOF, Tanintharyi region by experimental scale.

Mud crab fattening has become the booming industry as domestic consumption and export demand are growing rapidly. Soft shell mud crab farming has become very popular as it commands a high price. At the same time, supply of crab juveniles from nature is decreasing due to over exploitation, habitat deterioration caused by man impact and world climate change. Adequate supply of mud crab seed for soft shell mud crab farming has become a urgent need and included in the future plan. However, the hatchery operation performs very low survival rate. Myanmar DOF has planned to expand more mud crab hatcheries in suitable areas based on the success of the present hatchery operation and recommended cooperation of regional institutes and among the countries in the region by conducting more research and study should be conducted in order to get high survival rate.

Export for Fish and Fishery product

Aquaculture products have been part of the major export in fisheries. Myanmar has exported various fishery products as chilled, live, frozen, salted and dried products. In 2014-2015, the top 10 species of fish and fisheries products that Myanmar have been exporting includes Rohu, Live Mud Crab, Live Eel, Pink, Tiger, Hilsa, Ribbon Fish, Soft Shell Crab, Fish Meal and white shrimp, etc. These products are being exported to 32 countries, include EU member countries (UK, Italy, Sweden, Netherlands, Greece, France, Belgium, Ireland, Cyprus, Germany), Middle East, China, Japan and ASEAN countries.

The exported amount of fish and fisheries products and values were followed. Fish is one of the highest value species of Myanmar's exported products. Myanmar mostly exported fish from wild catch and leasable fisheries.



(Source of Fisheries statistics of Myanmar 2014)

Figure 4. Fish and Fishery Product Exported in Myanmar (2004-2005 to 2014-2015)

II. Current Status Of Traceability Systems For Aquaculture Products In Myanmar

Currently in Myanmar, fishes from wild catch are exported to EU member countries. Shortly, the farms would be able to export aquaculture products to EU member countries.

Relevant Regulation on Food Safety with traceability requirements

DOF had adopted and complied with EU Commission Decision, Regulation and Directive for hygiene, sanitation and food safety management system.

- EU Commission Regulation (EU) No. 178/2002
- GMP, SSOP and HACCP system implemented in processing establishment
- ISO 22000 and ISO 14000 System implemented in some processing plants

There are four relevant fisheries existing laws promulgated by the Government of Myanmar to manage the fishery industries and to protect the fishery resources more efficiently.

- “Law relating to the Fishing Rights of Foreign Fishing Vessels” in 1989.
- “Aquaculture Fisheries Law” in 1989,
- “Myanmar Marine Fisheries Law” in 1990,
- “Freshwater Fisheries Law” in 1991.

Nowadays, DOF has prepared to update Union Fisheries Law (10th revised) amendment on fisheries Existing DOF laws. Moreover, DOF promulgated directives 2/2015 of Technical Regulation for Export and Import of Fish and Fishery Products.

Department of Fisheries has issued the following directives of food control for fishery products.

- Directive 3/2009 Legislation on food control of Fishery Product
- Directive 4/2009 To implement for GMP / HACCP System
- Directive 1/2010 registration for processing, landing site, auction markets
- Directive 4/2011 To analyze fish meal
- Directive 5/2011 Safety and Hygiene standard concerning exports fish meal
- Directive 6/2013 To register for chilled type, dried type and other processed products
- Directive 1/2014 To implement GMP / HACCP and GAQp in catching, farming, processing, landing site, ice plant and feed mill
- Directive 2/2014 use of chemicals and drug residue and prohibit of chemicals and drug residue
- Directive 3/2014 ASEAN Food guidelines
 - Guidelines on ASEAN common principles for food control system
 - Guidelines on ASEAN common principles and requirements for food hygiene

- Guidelines on ASEAN common principles and requirements for labeling and pre-package food
- Guidelines on the use of chemical in aquaculture within ASEAN
- Directive 6/2014 To apply EU legislation on food control of fishery products
- Directive 7/20014 To export China (China Decree 135)

Supply Chains:

Feed Producer

- Some feed mills have applied documentation and record keeping system (such as Manufacturing date and expiry date, list of feed ingredients, batch and lot number of products, quantity of supply (weight), feed types and its main composition).
- The Feed producer sale feeds directly to hatcheries and farms.
- But all feed mills are not registered with the Department of fisheries.

Chemical suppliers

- In Myanmar, Department of Fisheries does not issue a certificate for chemical suppliers. If farm owners required the use of chemicals from hatcheries / farms (or) processing plants, they would need to submit to the Department of fisheries for imported chemicals from other countries.
- Myanmar has issued directives 2/2014 for permitted chemicals and drugs and prohibited chemicals and drug used in aquaculture.

Hatcheries and farms

- Some fish farmers have applied proper documentation and record keeping that can be useful for traceability.
- Department of fisheries issued licenses to fish farmers for Hatcheries and grow-out farms.
- Most of the fish farmers would directly harvest the fish and sold them to the middleman and then sent to the market for local consumption and processing plant for export.
- The hatchery has applied to farm by Fry Movement Document (FMD).
- The farm has applied to Processing Plant by Movement Document (MD) for traceability.

Processor

- At present, a total of 116 fish processing establishments had already issued licenses by DOF and situated in Yangon and along the coastal region area.
- Generally, the basic requirement of hygiene, sanitation and quality management system such as GMP and HACCP was implemented in all processing plants.

- Up to 2015, EU has already approved 20 processing plants for wild catch.
- The processor keeps data on farm sources of raw materials, reception, and delivery receipt and product identification using the batch / lot number. The batch / lot number is reflected throughout the production, processing, value adding, at the label and package of the finish product.

Strategies of Traceability System:

Farm and hatchery GAqP certification

- The Department of Fisheries of Myanmar already initiated Good Aquaculture Practices for fish and shrimp farming since 2011. Recently, Department of Fisheries has issued GAqP certificates on 1549.2 hectares for fish, shrimp and soft-shelled crab farming. Recently, EU-GIZ is implementing on GAqP training for DOF inspectors, extension aquaculture officers, fish farmers and stakeholders.

Implementation of National Residue Monitoring Program

- Myanmar exports a major portion of aquaculture production and as such is highly dependent on maintaining competitiveness and developing access to highly lucrative export markets. Many exporting countries, including the European Union (EU), require exporting countries to have a national food control program that includes a monitoring program for drug residues and contaminants.
- National Residue Monitoring Program just started in April 2014 and the targeted species are freshwater fish such as Rohu, Mirgal, Catla, Puti, Pangush, Tilapia and crustaceans such as Soft Shell Crab from aquaculture farms located in Yangon and Ayeyarwaddy regions. It includes farm registration and it requires hygiene inspection, disease surveillance.

Products Surveillance

- Microbiological Test: (TPC, Coliform, E.coli, Salmonella, Staph aureus, etc.)
- Chemical Analysis: (veterinary drugs, chemical residue, contaminant, Histamine & Food additive)
- Microbiological Test (5) parameters and Chemical analysis (2) parameters are accredited to ISO 17025.

Traceability System

Currently in Myanmar, fishes and fishery products are exported to EU member countries from wild catch. Recently, NRMP is approved by the EU. Therefore, DOF would allow aquaculture products to EU market. In addition, Myanmar has also implemented internal traceability procedures, external traceability procedures and recall procedures.

III. Challenges faced in implementation and solutions and other relevant information

The weakness of a traceability system in supply chain:

1. All feed producers need to register for their feed mills to the Department of Fisheries.
2. In Myanmar, Department of Fisheries need to issue certificates for chemical suppliers.
3. Farmers, Feed producers, Distributors, Processors, Retailers and Exporters do not have much knowledge and experience in both GAqP and Traceability system.
4. To increase awareness of GAqP system and Traceability System, more training would be needed for the farmers with regard to the GAqP and Traceability system.

IV. Future Plans/ Programmes for implementation of Traceability Systems for aquaculture products in Myanmar

1. To improve implementation of GAqP certification programmes in fish and shrimp farming
2. Continuously improving the implementation of the National Residue Monitoring Plan (NRMP) in Aquaculture, with shrimp to be included as a commodity in NRMP 2015-2016.

V. Recommendations for implementation

Department of Fisheries will promulgate the directive for Regional Guidelines on traceability system for Aquaculture Product in South-East Asia.

VI. Conclusion

Myanmar will implement Traceability System on all supply chains for Aquaculture Products to food safety.

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I. Introduction to Aquaculture Industry in the Philippines

The Philippines is among the top fish producing countries in the world. In 2012, production of fish, crustaceans, mollusks and aquatic plants including seaweeds totalling at 4.87 million metric tons ranked seventh in the world. It constituted 2.66% of the total world production of 182.9 million metric tons. In the same year, aquaculture production of fish, crustaceans and mollusc was eleventh in the world, sharing about 1.19% to the total global aquaculture production of 66.63 million metric tons and valued at over \$ 1.95 billion. Philippines was also the third largest producer of aquatic plants including seaweeds, with 1.75 million metric tons, about 6.36% of the total world production of 23.78 million metric tons (FAO website).

The industry's contribution to the country's Gross Domestic Products (GDP) were 1.7% and 1.9% at current and constant 2000 prices, respectively. This translates to some P 199.3 billion for current prices and P 131 billion for constant prices of the country's GDP of P 11,548 billion (current prices) and P 6,765 billion (constant prices). The fisheries industry has

the largest share next to agricultural crops (Philippine Fisheries Profile, 2013).

In 2013, the fisheries production totalled to 4,705,413 MT. The aquaculture sector contributed 2,373,386 MT to the total fisheries production, whereas, the municipal and commercial fisheries contributed 1,264,416 MT and 1,067,610 MT, respectively. Figure 1 shows the fisheries production in 2013. Figure 2 shows the trend in fisheries production from 2004-2013.

In terms of value, the aquaculture sector contributed about P 93.7 billion or 38% of the whole fisheries production. The municipal fisheries sector shared P 80.9 billion or 33%, of which P71.9 billion came from marine catch and P8.99 billion from inland fisheries production. The commercial fisheries sector contributed P69.9 billion or 29% (Philippine Fisheries Profile, 2013).

The employment in fishing industry totaled 1,614,368 fishing operators nationwide. Table 1 shows the data of employment based on the National Statistics Office Census for Fisheries in 2002.

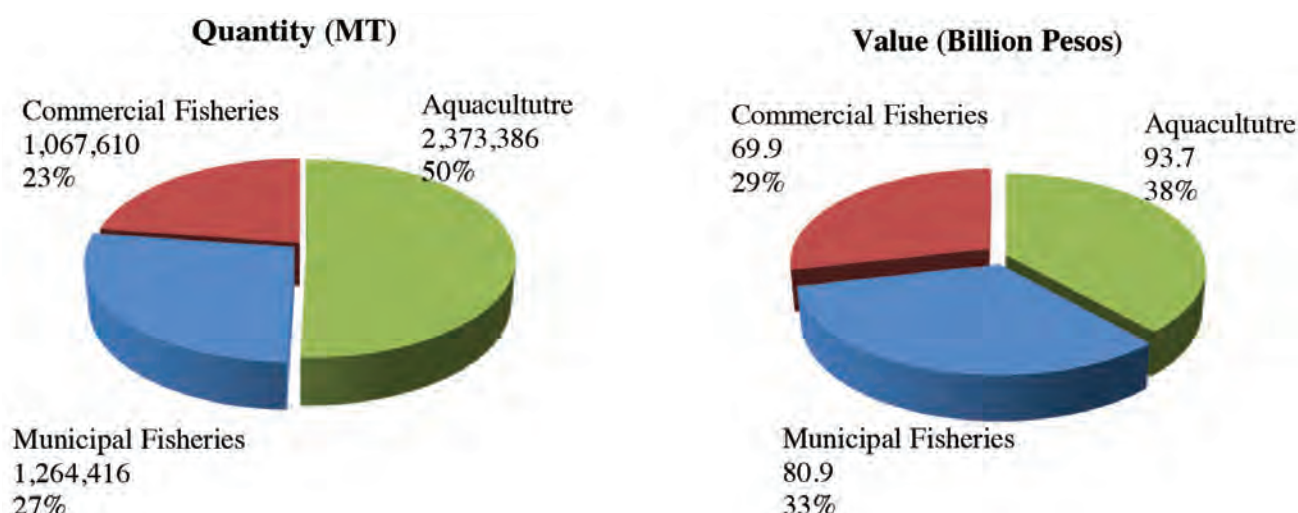


Figure 1. Quantity (MT) and Value (Billion Pesos) of production of three sectors of fisheries (2013).

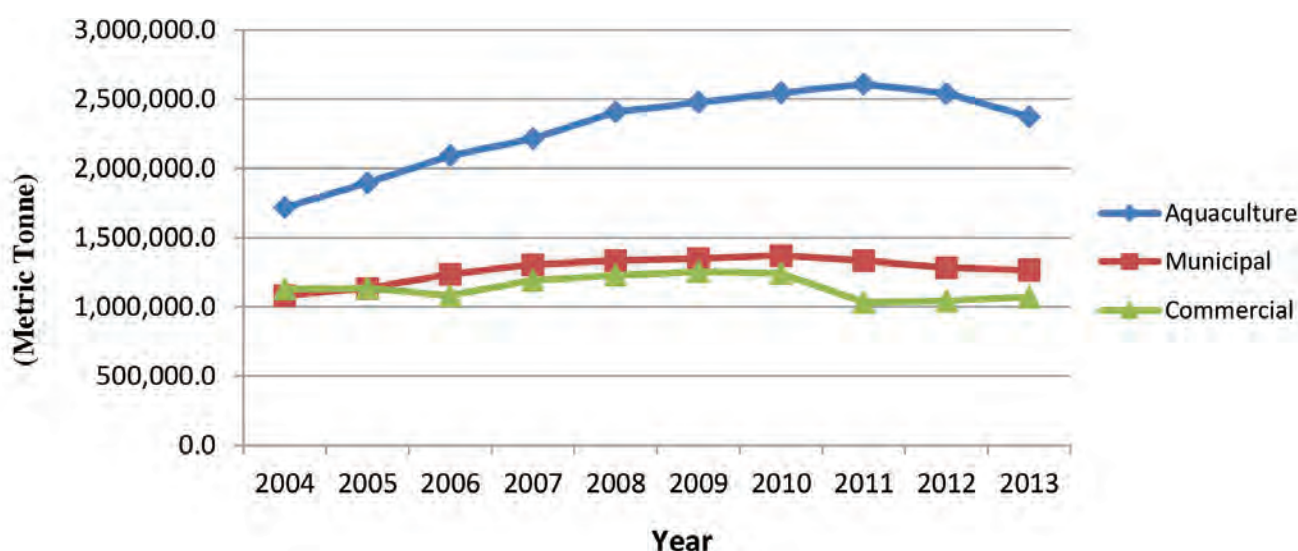


Figure 2. The trend in fisheries production from 2004 – 2013

Table 1. Number of fishing operators by sector

| Sector | Operators |
|-------------|-----------|
| Aquaculture | 226,195 |
| Municipal | 1,371,676 |
| Commercial | 16,497 |
| Total | 1,614,368 |

Philippine Fisheries Profile, 2013

The fisheries export value in 2013 was about 1,386 million US dollars. Tuna was the top export commodity in fisheries. Seaweed was the second export commodity where 80% percent comprised of carrageenan as the major product. Shrimp / prawn was the third in fresh/chilled or frozen preparations. Other major fishery exports were crabs/crab fat, octopus, grouper, cuttlefish / squid, ornamental fish,

rounds cad and sea cucumber. Among the major destinations of shrimp / prawn products are Japan, USA and France. Figure 3 indicates the major fishery and aquaculture exports in terms of value. The export of products in kind, quantity and value is shown in Table 2 (Philippine Fisheries Profile, 2013).

Import of fishery products was valued at about 300 million US dollars. The imports in terms of value originated from the countries such as China, Indonesia, Taiwan, Papua New Guinea, Viet Nam, Japan, Korea, USA, Denmark and other countries. The import of fish and fishery products is indicated in Table 3.

Exporting countries such as the Philippines have to ensure that products that enter the international market fulfill the food safety requirements. The traceability system for aquaculture and fishery products is one of the major concerns in food safety

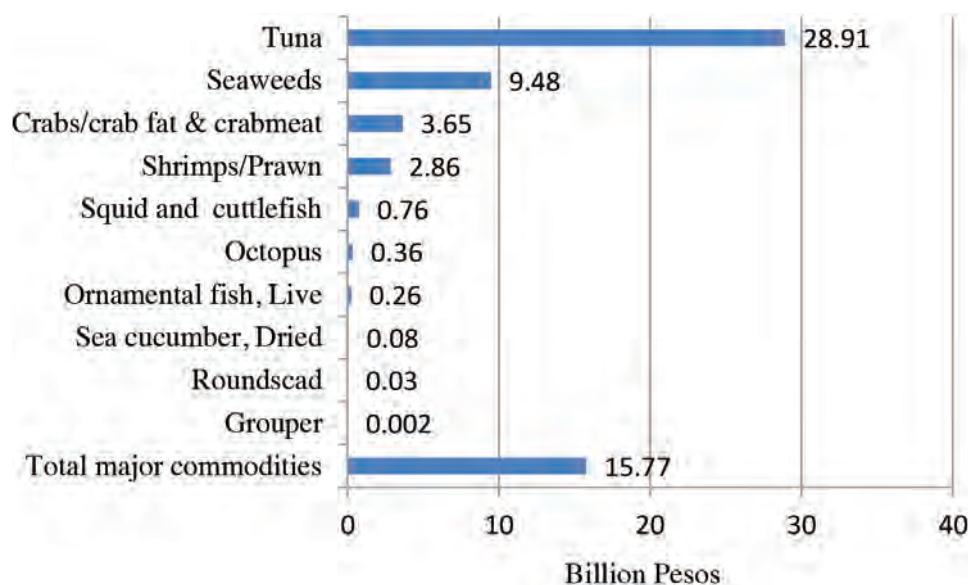


Figure 3. Major fisheries export in terms of value, 2013

Table 2. Export of fish and fishery products by kind, quantity and value, 2013

| Commodity | Quantity (MT) | FOB value ('000\$) |
|--|----------------|--------------------|
| A. Fish, crustacean, mollusk, etc and preparation | 266,078 | 1,156,964 |
| i. Fish, fresh (live / dead), chilled / frozen | 73,828 | 299,066 |
| ii. Fish, dried, salted / in brine; smoked fish | 4,082 | 18,904 |
| iii. Crustaceans, mollusks and aquatic invertebrates, chilled / frozen | 30,280 | 160,034 |
| iv. Fish and other aquatic invertebrates, prepared / preserved | 157,887 | 678,960 |
| B. Shells and by-products | 5,273 | 8,090 |
| C. Miscellaneous fishery products and other by-products | 62,114 | 221,103 |
| Total | 333,465 | 1,386,157 |

Table 3. Import of fish and fishery products by kind, quantity and value, 2013

| Commodity | Quantity (MT) | FOB value ('000\$) |
|--|----------------|--------------------|
| A. Fish, crustacean, mollusk, etc and preparation | 228,569 | 244,375 |
| i. Fish, fresh (live / dead), chilled / frozen | 202,888 | 206,313 |
| ii. Fish, dried, salted / in brine; smoked fish | 80 | 72 |
| iii. Crustaceans, mollusks and aquatic invertebrates, chilled / frozen | 23,712 | 35,305 |
| iv. Fish and other aquatic invertebrates, prepared / preserved | 1,888 | 2,685 |
| B. Shells and by-products | 850 | 244 |
| C. Miscellaneous fishery products and other by-products | 32,702 | 54,996 |
| Total | 262,121 | 299,615 |

and trade. It is known to be an essential tool to identify risk and problems, and facilitate immediate action and management intervention. There are new regulations on food safety and traceability requirements for fish and fishery products that have been enacted. This paper will discuss the status of the traceability system and other relevant activities being implemented at different stages of the aquaculture supply chain.

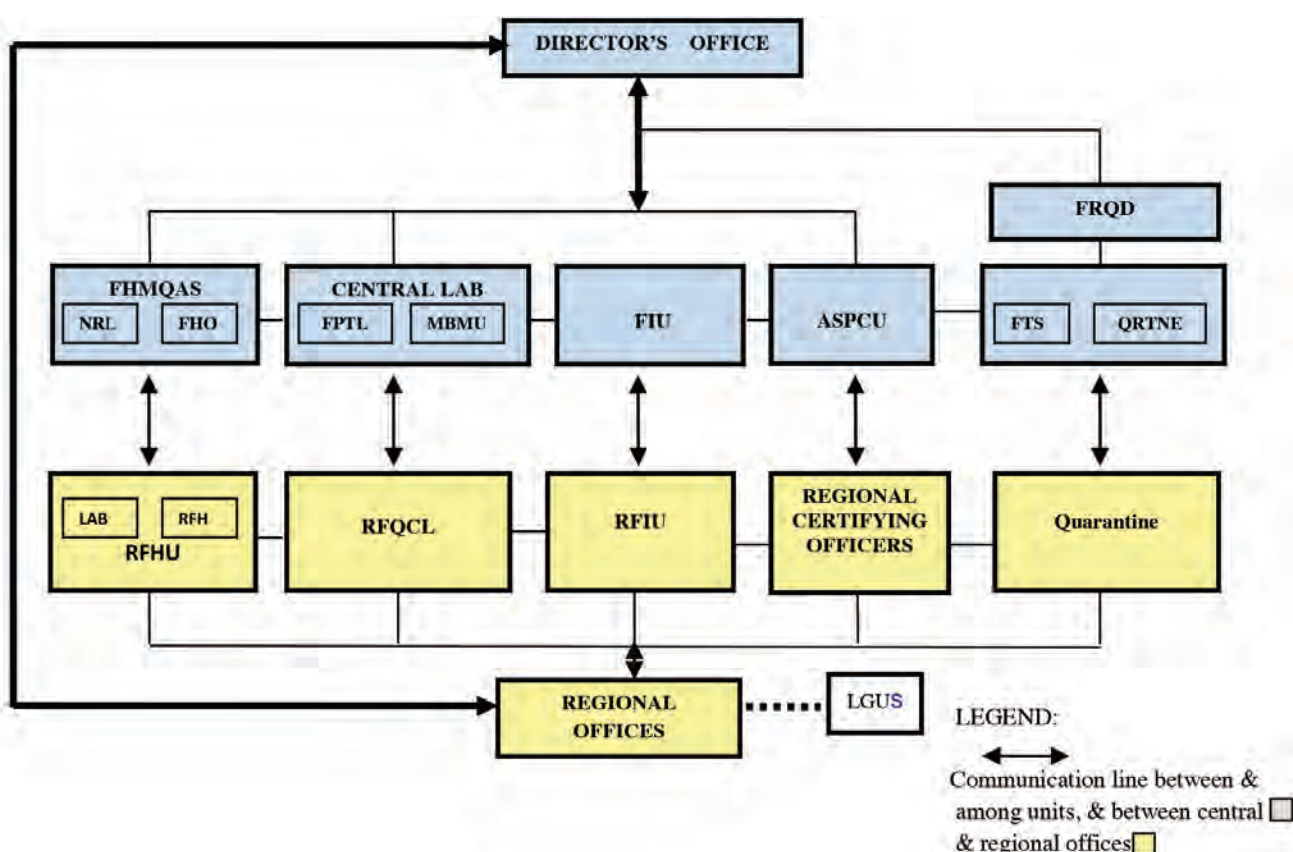
II. Current Status of Traceability Systems for Aquaculture Products in the Philippines

Structure of the Competent Authority for aquaculture and fishery products

BFAR as the competent authority for aquaculture and fishery products develops and implements a food safety control program, including regulatory measures applicable at all stages of the production

chain consistent with the international standards. In order to facilitate food safety control program of aquaculture and fishery products, BFAR created the Fish Inspection and Quality Assurance Service (FIQAS). The FIQAS is composed of several units in BFAR with regulatory support functions relative to food safety and trade. It operates under the direct supervision of the Office of the BFAR Director, and in coordination with the regional offices counterparts. The FIQAS implements a residue monitoring program, Hazard Analysis Critical Control Point (HACCP) based inspection program, and a coordinated product certification program. The structure of the FIQAS demonstrating their inter-relationships is indicated in Figure 4.

The Fish Health Management and Quality Assurance Section (FHMQAS) is in-charge of the primary production. The section implements farm registration scheme based on the GAqP, national residue control program, and disease surveillance and reporting



Legend:

ASPCU - Administrative Support & Product Certification Unit
 FRQD - Fisheries Regulatory and Quarantine Division
 FPTL - Fishery Product Testing Laboratory
 FHMQAS - Fish Health Management & Quality Assurance Section
 FTS - Foreign Trade Section
 FIU - Fish Inspection Unit

LGU - Local Government Unit
 MBMU - Marine Biotxin Monitoring Unit
 NRL - National Reference Laboratory
 QRTNE - Quarantine
 RFQL - Regional Fish Quality Control
 RFHU - Regional Fish Health Unit
 RFIU - Regional Fish Inspection Unit

Source: BFAR, 2014. Plan for monitoring certain substances and residues thereof in aquaculture. Residue monitoring report and plan in accordance with European Union Council Directive 96/23/EC.

Figure 4. Structure of the Fish Inspection and Quality Assurance Service

system. The FHMQAS has eight (8) permanent staff and twenty eight (28) support contractual staff. The Regional Fish Health Unit (RFHU) in fifteen regions is manned by ninety one (91) Regional Fish Health Officers.

The Fish Inspection Unit (FIU) is responsible for the inspection, accreditation and approval of the post-harvest processing establishments to be able to export aquaculture and fishery products. There are eleven (11) staff at the FIU and fifty three (53) Regional Fish Inspectors nationwide. The Fishery Product Testing Laboratory (FPTL) and the Marine Biotoxin Monitoring Unit (MBMU) serve as support laboratories for the regulatory units particularly on inspector's verification activities, and other regular monitoring activities related to food safety. Health certification of aquaculture and fishery products is issued by the Administrative Support and Product Certification Unit (ASPCU) based on the recommendation of the Fish Inspectors and results of laboratory analysis. Checking of documentation requirements and border clearance of the product is being done by the Quarantine Unit. All the enumerated activities are being coordinated at the regional counterparts that serve as the arm of the central office in implementing the programs. Figure 5 shows the location of BFAR offices.

The BFAR is in the process of re-organization where additional manpower with permanent positions is proposed to cope with the changes and needs of the industry, as well as the new requirements that need to be complied with, such as the enactment of the Food Safety Act and Amendment to the Fisheries Code of the Philippines.

Regulations on Food Safety and Traceability Requirements for Aquaculture Products

Several regulations have been ratified to ensure aquaculture and fishery products safety and quality from farm-to-table. Regulations are in the form of Republic Acts, Administrative Orders and Fisheries Office Orders. Among the relevant regulations with traceability requirements are:

- Republic Act 10654, Series of 2014, an Act to prevent, deter and eliminate illegal, unreported and unregulated fishing amending Republic Act 8550, otherwise known as the "Philippine Fisheries Code of 1998" and for other purposes.
- Republic Act No. 10611 or the Food Safety Act of 2013. An act to strengthen the food safety regulatory system in the country to protect consumer health and facilitate market access of local foods and food products, and for other purposes.

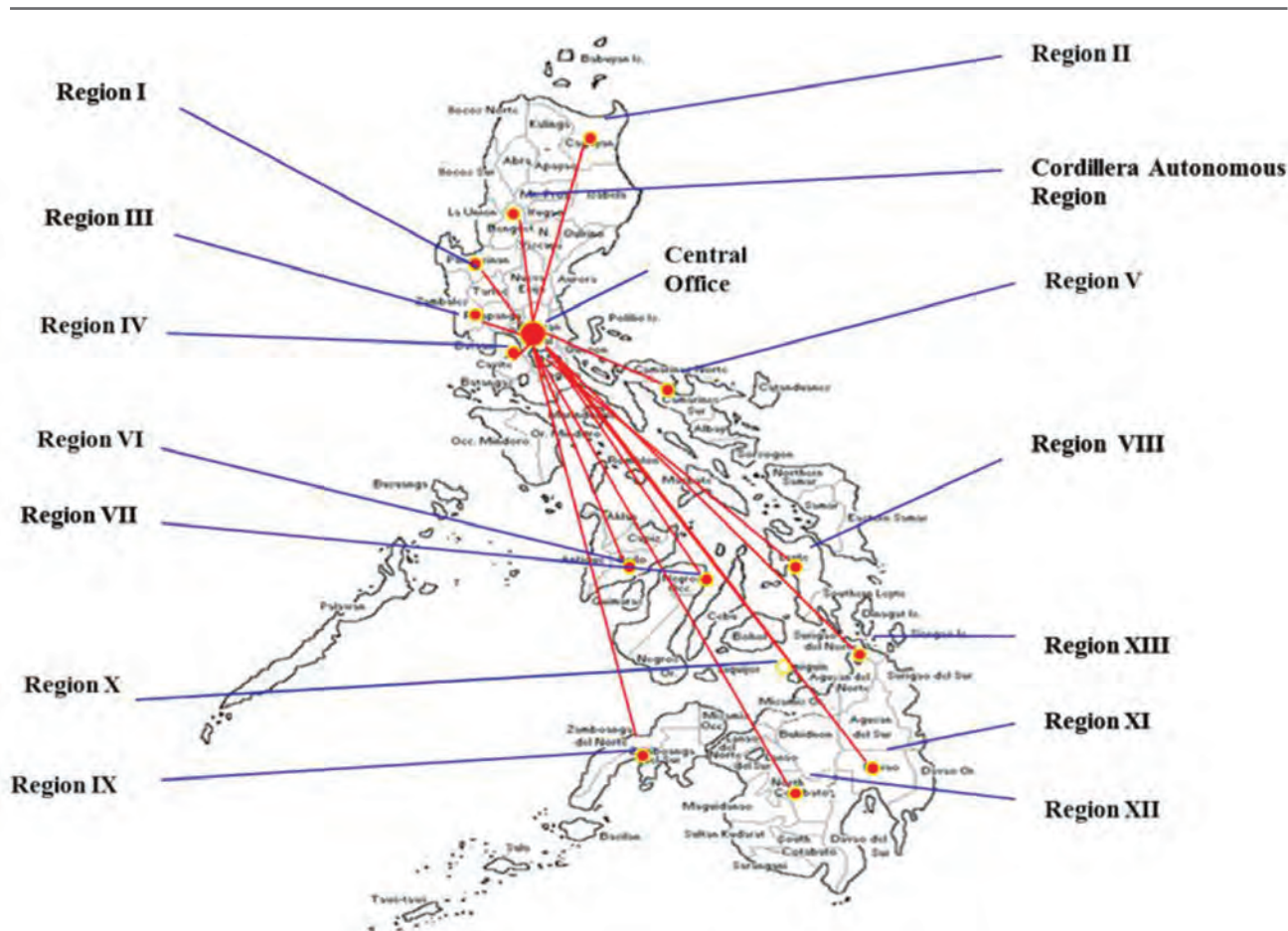


Figure 5. Location of BFAR Offices

- Republic Act 8550 otherwise known as the Philippine Fisheries Code of 1998. An act providing for the development, management and conservation of fisheries and aquatic resources integrating all laws pertinent thereto, and for other purposes.
- BFAR Administrative Circular Order No. 251, Series of 2014. Traceability system for fish and fishery products.
- Department of Agriculture Administrative Order (DA-AO) No. 24, Series of 2009. Implementing guidelines on the national veterinary drug residues control program in food pursuant to Administrative Order No. 14, Series of 2006.
- Fisheries Administrative Order (FAO) 227, Series of 2008. Rules and regulations governing the export of fish and aquatic products to European Union Member Countries.
- FAO 228, series of 2008. Rules governing the organization and implementation of official controls on fishery and aquatic products intended for export to the EU market for human consumption.
- DA-AO No. 14, Series of 2006 – Implementation of the National Veterinary Drug Residues Control Program and Creation of the Inter-agency Committee.
- FAO No. 210, Series of 2001 – Regulations for the Exportation of Fresh / Chilled and Frozen Fish and Fishery Aquatic Products.
- FAO No. 212, Series of 2001 – Guidelines on the Implementation of HACCP System.

Aquaculture Supply Chain

Based on the BFAR Administrative Circular Order on traceability, the aquaculture supply chain is divided into three main groups, namely: i) pre-production (hatchery / nursery, feedmill / aquatic veterinary products); ii) production (grow-out farm), and; iii) post-harvest (auction market, transport, processing establishment, cold storage, shipment). Each stage of the supply chain requires documentation system for traceability.

1. Pre-production

Hatchery and Nursery

Generally, the hatchery maintains information about the source and distribution of the broodstock, fry and post larvae (PL) in the receiving and distribution logs, respectively. The nursery keeps fry and PL receiving and distribution logs. Both hatchery and nursery keep wild caught fry collection report when fry is sourced from the wild.

The hatchery and nursery keep records on the management practices being implemented i.e. feeding, supplementation, medication and other inputs. For feeding, the data required is kept in the feed receiving, dispatch and feeding logs. The records on the use of drugs / biological / chemicals are kept at the receiving and supplement / medication log sheets. The details on the traceability documentation are indicated in Table 4.

In shrimp, hatcheries import specific pathogen free or specific pathogen resistant (SPF / SPR) *Penaeus vannamei* broodstock into the country. Since this is an exotic species in the Philippines, hatcheries are required to obtain accreditation from BFAR prior to importation. Accreditation requires evaluation of the hatchery facility, management system documentation and implementation. It includes document desk review and on-site inspection and verification of implementation of the management system including biosecurity measures.

Upon importation, the shrimp hatchery is required for traceability purposes to submit a copy of the import permit and documents such as airway bill (flight schedule, number of broodstock, shipper, consignee, etc.). In addition, documents about broodstock are needed such as: (i) certification of a competent authority from the country of origin that the broodstock facility has a 2 years disease free status; (ii) disease history of broodstock facility for a period covering its commercialization; (iii) laboratory results of samples taken from a lot intended for shipment from competent authority; (iv) samples shall be subjected for laboratory analysis.

The fry produced by the imported broodstock needs traceability profile as indicated in the table of data requirements for farmed fish. The hatchery has to submit disposition report within five working days upon shipment.

Feedmill / drug / biological / chemical supplier

The aquatic feed manufacturers keep traceability records such as suppliers, delivery receipt of each batch of raw materials received for production and feed produced dispatch. They also implement internal traceability covering the production process until release of the finish product.

Registration of aquatic feedmills is the mandate of the Bureau of Animal Industry (BAI). Through a Memorandum of Agreement, the BFAR was deputized to conduct monitoring of the aquatic feedmills as part of the national residue monitoring program. Sampling for antibiotic and aflatoxin analyses is being done at least twice a year. Violations committed are reported to the BAI for their issuance of non-compliance memorandum and appropriate actions are done jointly by both agencies. Figure 6 shows

Table 4. Documentation and data required for traceability of aquaculture products at different stages of the supply chain

| | Supply Chain | Documentation | Data Required | |
|-----------------------|---|--|--|---|
| | | | | |
| Pre-Production | Feed procurement and distribution | Receiving & Dispatch Log | Date received, Supplier name Batch/lot, Quantity | Date of dispatch Destination |
| | Drug/ Biological/ Chemical Distribution | Receiving Log | Date received, Supplier name Name of Product, Batch/Lot | Intended Use Dosage & Quantity |
| | Hatchery, Nursery, | Broodstock, Fry and PL Receiving Log | Receiving date, Supplier name Permit/Registration No. | Species & Quantity Health Certificate |
| | | Fry and PL Distribution Log | Releasing Date Farm w/ Registration No. | Quantity & Size Health Certificate |
| | Wild-caught Fry | Feeding Log | Date of Delivery Pond No., Date of feeding | Time of feeding Quantity used |
| Production | | Supplement/Medication Log | Name of Product Batch/Lot No. Intended Use and Dosage | Date and Time of Application Duration of Application |
| | | Wild-caught Fry Collection Report | Control/Ref. No., Permit No. Collection/catch Area Date of Collection/ harvest | Distribution List Species Quantity Health Certificate |
| | Grow-out | Fry/Fingerling/PL Receiving Log | Supplier name & Permit/ Registration No. | Receiving date Species, Quantity, Size |
| | | Consumable Inputs Receiving Log | Receipt No. Nature of input (feed, supplement, drug, etc.) | Receiving date Supplier name Quantity, Batch/Lot No. |
| | | Feeding Log | Date & time of feeding Feeds Consumed, Cage/Pond No. | Production Stage (size/age) |
| Post-Harvest | | Supplement/Medication Log | Name of Product Batch/Lot No. Intended Use and Dosage | Brand and Type of Feed Date and Time of Application Duration of Application |
| | | Harvest Log | Farm Registration No. Date of harvest Species & Quantity Pond/Cage No. | Production Lot (size/age/weight) Destination of harvest (processing plant/ auction market/retailer) |
| | Transport | Transport Log Sheet | Name of Transporter Driver's name Vehicle Plate No. Volume and Size/Age | Destination Date and time loading Local Transport Permit (LTP) No. Issued by BFAR (when necessary) |
| | Auction Market | Log Sheet | Supplier Name Farm Registration No. | Volume Distribution List |
| | Transport | Transport Log Sheet | LTP No., Supplier | Box Number |
| Post-Harvest | Processing | Fish Receiving Report / Batch Monitoring Report | Supplier name Time and date received Total weight and age/size Farm Registration No. | LTP No. Lot / Batch No. Destination |
| | | Production Report | Date and time processed Batch / Lot No. | Product Type, Production Code |
| | | Labeling and Packing Report | Production Code Batch / Lot No. Product description, Species Manufacturing date | Destination Establishment Approval No. Best before date Brand Country of origin |
| | Cold Storage | Cold Storage Report | Stowage Plan Location in stacking lay-out Production Code Name Processing Establishment | Destination Registration No. (If separated from the processing plant) |
| | Transport | Pre-trip Inspection Report | Requested setting of temperature Container interchange | Container & Seal No. (sea freight) Airway Bill No. (air freight) |
| Post-Harvest | | Loading Report | Pre-trip Inspection Report | Establishment Approval No. Production code, Quantity |
| | | Pre-shipment Inspection Report | Country of destination Loading Report Labeling requirement Storage Requirement (temp.) | Packing List Proforma Invoice |
| | Shipment | Health certificate Export Commodity Clearance Airway bill/bill of lading | Pre-shipment inspection report Health certificate AW/BL No., Date issued/Shipment Shipper, Consignee, Product | Proforma Invoice Vessel/Voyage No., Port loading Port destination, Net weight |

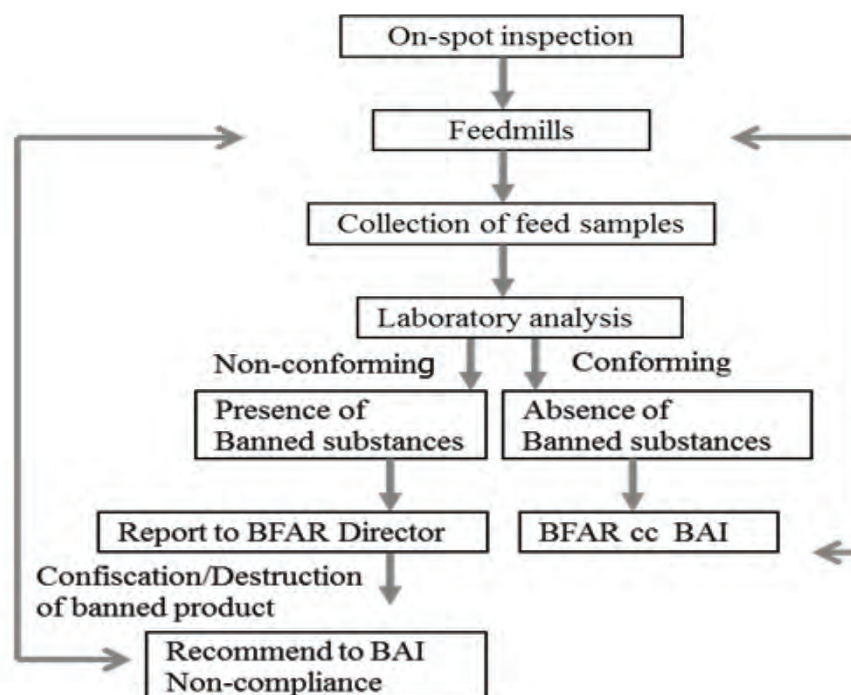


Figure 6. On-spot inspection and sampling at the aquatic feedmill

the inspection and sampling procedure for aquatic feedmill monitoring.

The Food Safety Act of 2013 has provided for the BFAR, as the Food Safety Regulatory Agency for fish and fishery products, to implement and enforce controls at the primary production including all inputs used in fish farming including feeds, veterinary drugs and chemicals. BFAR is now in the process of drafting regulations for this purpose.

2. Production

Grow-out Farm

The grow-out farms maintain traceability records including fry / fingerling / PL receiving report, feeding, supplement and consumable inputs, and harvest logs. Small- scale farms retain records by keeping all delivery and purchase receipts of fry, feeds, medication, and other inputs. In bigger farms, detailed records of their farm management practices including feeding, water quality monitoring, health monitoring of stocks, medications and other information relative to their stocks are kept (DA-BFAR, 2008; Regidor & Dabbadie, 2010).

A farm registration scheme is being implemented by BFAR based on Good Aquaculture Practice (GAqP). This is voluntary for the farms that would like to be included in the national residue monitoring program and to be able to supply their raw materials to the accredited processing establishments for export market. Registered farms are assigned with a unique

identification number which is valid for two years and renewable thereafter. These farms are monitored for hygiene inspection, disease surveillance and residue monitoring. The procedure for farm registration is shown in Figure 7.

At present, there are a total of three hundred thirty three (333) registered farms, one hundred seven (107) milkfish farms, forty nine (49) shrimp farms, forty one (41) tilapia farms and one hundred thirty six (136) farms with polyculture system. The list of registered farms can be accessed through the BFAR website (www.bfar.da.gov.ph).

These registered farms are being monitored at least once a year by the regional fish health officers. They conduct inspection and sampling for residue analysis. In case of non-compliance with the standards being followed by the Competent Authority on aquatic animal health and food safety, particularly the World Organization for Animal Health (OIE) and Codex Alimentarius Commission, the farm is subjected to stricter monitoring and sampling.

In case of detection of banned antibiotics or residues above Maximum Residue Limits (MRLs) for regulated substances, the fish health officers inform the farm operator and ask to trace the current location or destination of the batch where positive sample were taken, as well as its origin, and determine the cause of having sample positive detection and conduct additional sampling. Figure 8 shows the farm inspection and sampling for residue monitoring program.

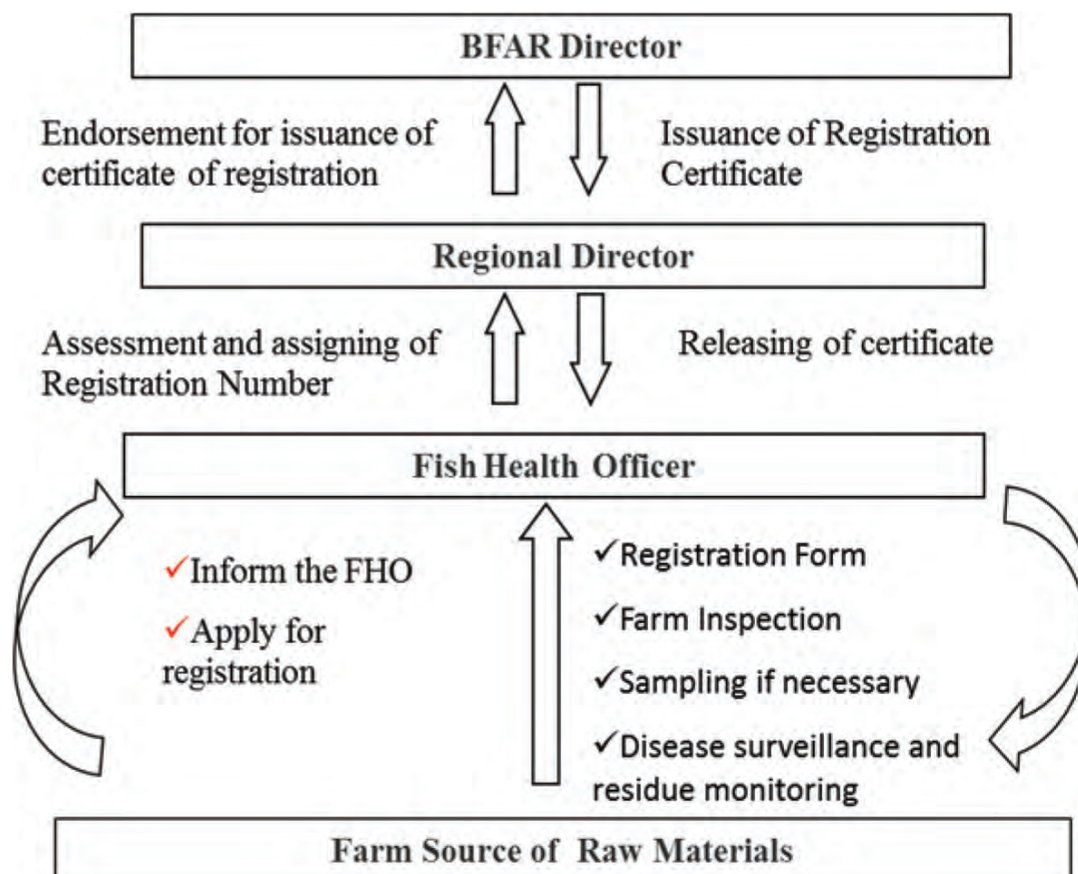


Figure 7. Mechanism of farm registration

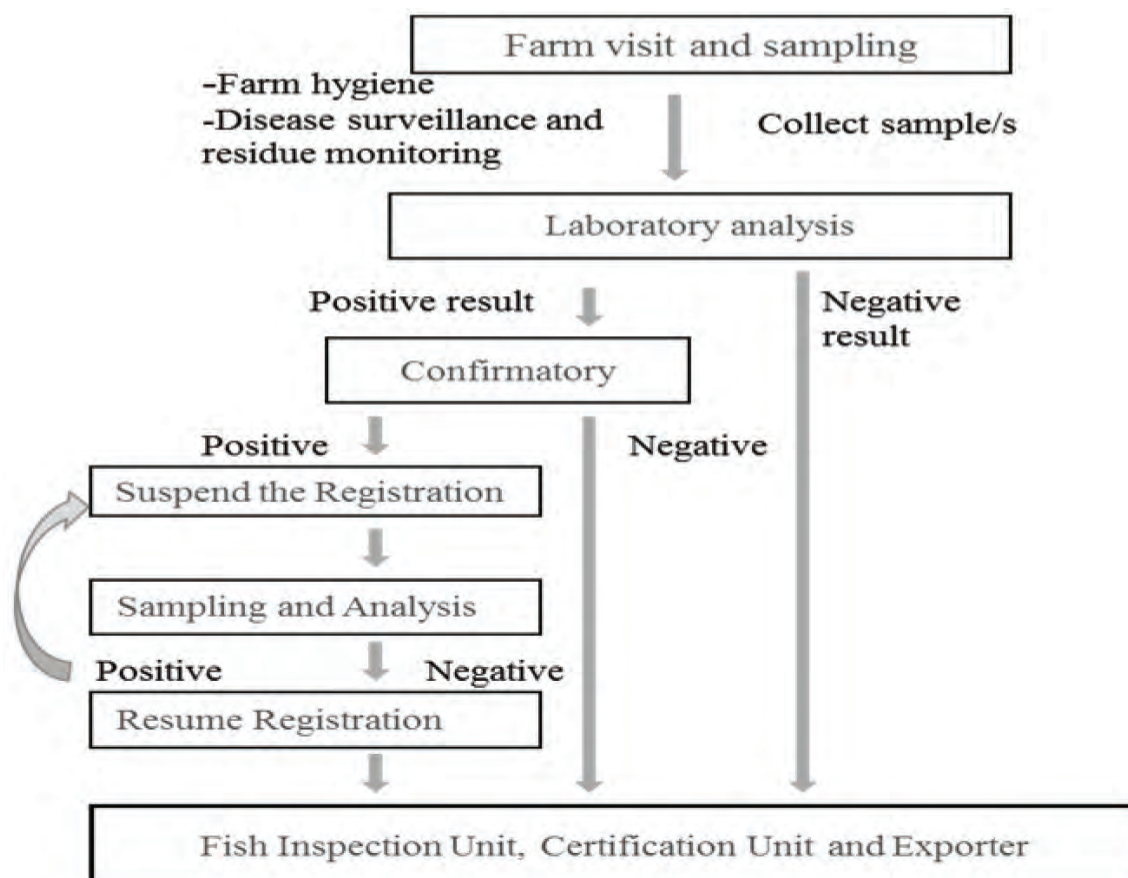


Figure 8. Farm inspection and sampling procedure

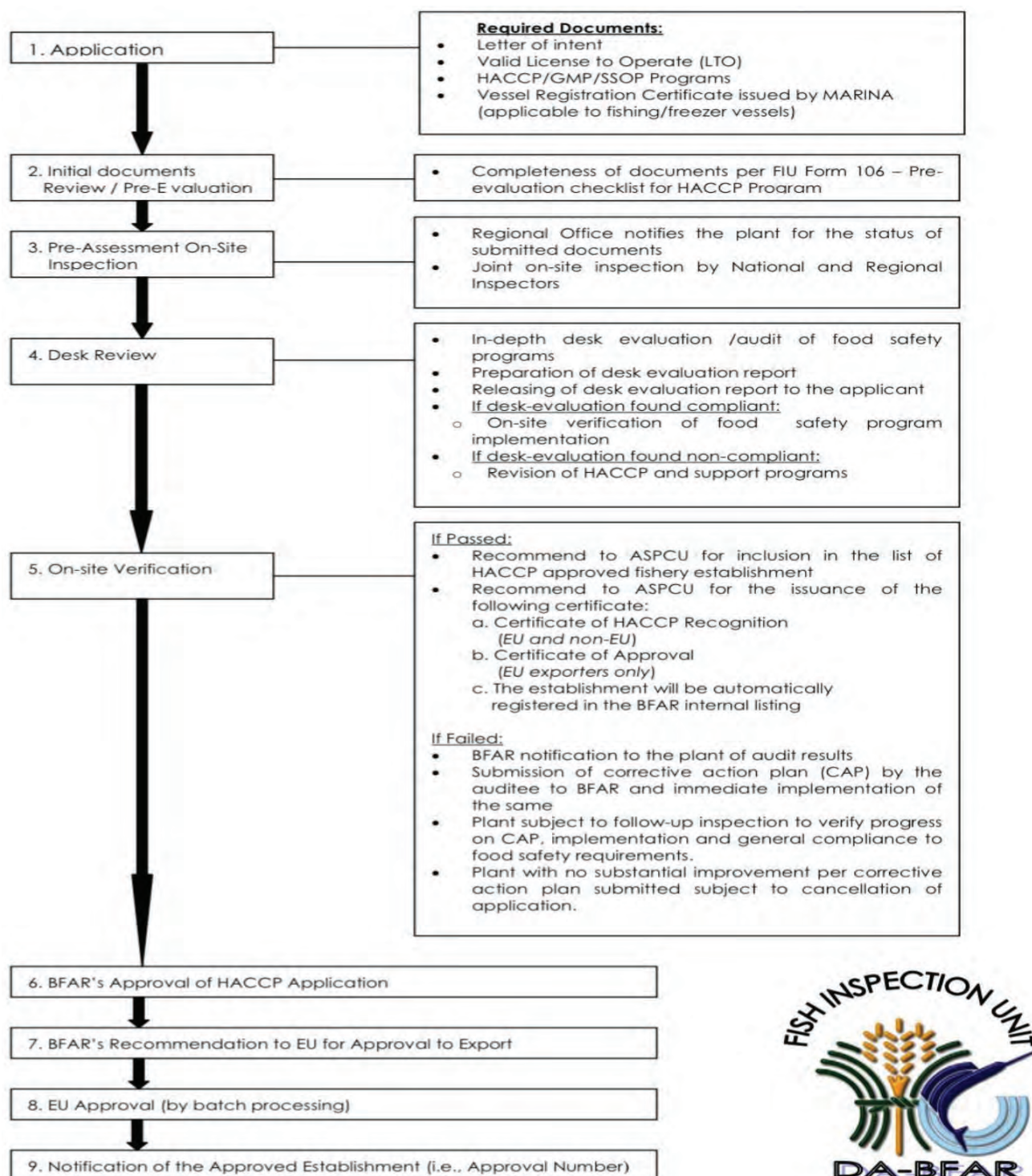


Figure 9. HACCP accreditation process

The aquatic animal health services of the Philippines has been evaluated by the OIE experts mission in 2013 against the four fundamental component of the OIE PVS tool such as the human, physical and financial resources, technical authority and capability, interaction with stakeholders and access to market. It was aimed to establish current performance and develop strategic priorities for improvement of aquatic animal health services.

The impact of the evaluation has lead to some developments such as provision for permanent positions in BFAR reorganization, creation of veterinary positions, capacity building on aquatic animal health, strengthening of laboratory services through procurement of equipment and improvement of facilities. The technical committee of regulatory board of veterinary medicine proposed to incorporate aquaculture medicine and aquaculture production in draft curriculum to the Commission on Higher Education. There will be a follow-up mission by

the OIE to conduct gap analysis following the PVS pathway.

3. Post-Harvest

Auction market

Auction market keeps log that contains information on the supplier such as the name of the farm and its registration number, volume of the product, and distribution list. Since there are many farm sources, auction markets are pooling and mixing fish / shrimp, but they have a method of identification for each lot and their origin.

The BFAR Fish Inspection Unit started to implement a voluntary registration system for auction market in 2010 based on HACCP principles. The registration system focuses on hygiene requirements. They are required to develop and implement SSOP / GMP on their operation. Their facilities are being inspected to verify compliance. Since registration system has just recently started, auction markets are not yet adept with the standards and have difficulty in their compliances. There is still a need to continue the information and education campaign about the registration system and help them understand their

important role in the traceability of aquaculture products being part of the supply chain.

Processing Plant

The processing plants have been implementing a high level of traceability. This is incorporated in their management system throughout the production / processing. They keep fish receiving report / batch monitoring report, production report, labelling and packing report. The lot / batch number is reflected throughout the production, processing, value adding and at the label and package. The shipment and buyers records are also maintained. They are also required to have a recall procedure in case problem on their shipment happens.

Processing plants are registered with BFAR. They are required to have GMP / SSOP program and HACCP plan. HACCP accreditation process is in Figure 9. Evaluation process includes document review and series of inspection and verification by fish inspectors. Official control sampling is also conducted (Figure 10). For those that export their products to the EU member countries, an EU approval number is required upon recommendation by the competent authority.

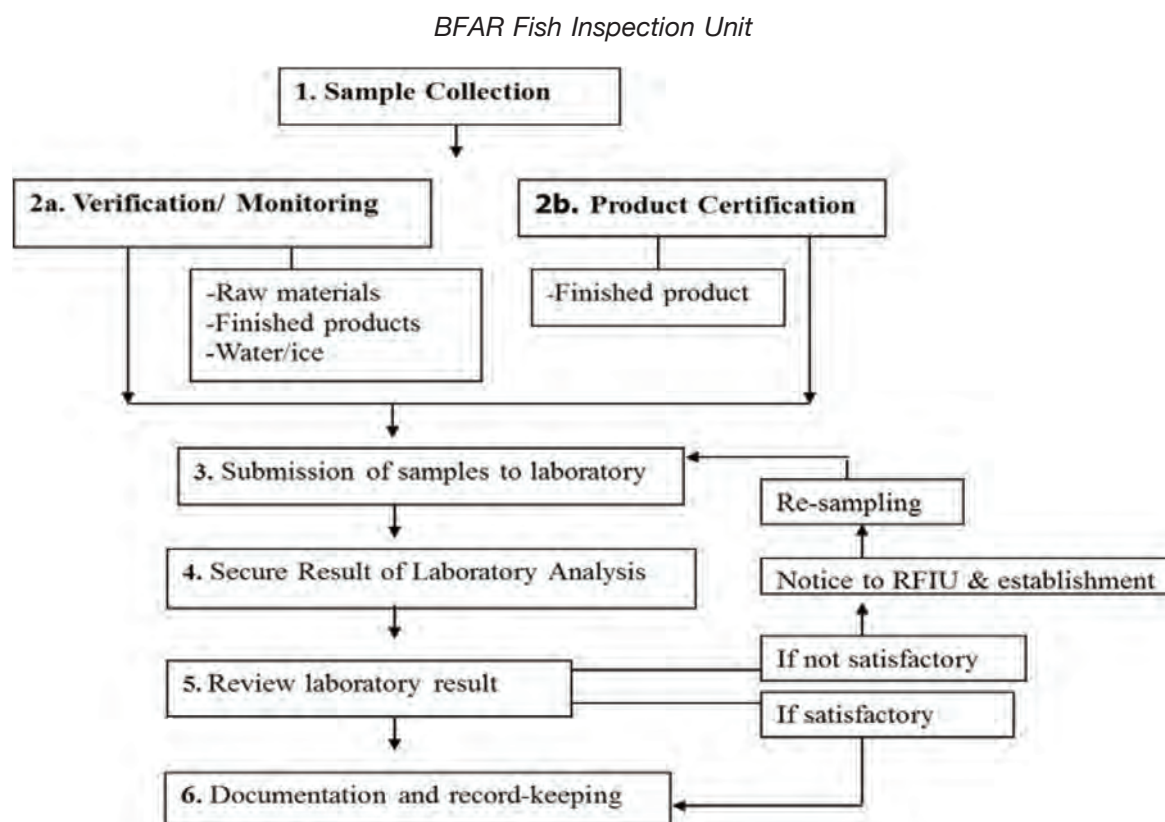


Figure 10. Official control sampling at the processing establishment

The BFAR Fish Inspection Unit has developed its quality management system and has obtained its accreditation on ISO / IEC 17020 for the inspection system from the Philippine Accreditation Bureau.

Presently, there are a total of one hundred twelve (112) processing establishments approved by BFAR for fishery and aquaculture products. Sixteen (16) processing establishment are allowed to export aquaculture products to non EU market, and thirteen (13) are approved for EU market.

Transport

The documents required for the transport are indicated in the transport logs at different stages of the supply chain. The documentation requirements for transport at the pre-production and production stages still need to be disseminated. At the post-harvest stage, transport documentation is already implemented particularly during the van loading and pre-shipment inspection.

Cold storage

Cold storage facilities are inspected and approved by the Fish Inspection Unit. The facility keeps data required in the cold storage report for traceability according to the type of the product.

Shipment

The product shipment requires traceability documents such as health certificate issued by the Certifying Officer, export commodity clearance from the Quarantine Officer and airway bill / bill of lading from the shipping line.

Challenges Faced in Implementation and Solutions and Other Relevant Information

1. Lack of understanding on the importance of traceability in the supply chain

Generally, there is lack of understanding on the importance of traceability at different stages of the supply chain. Considering that implementation of traceability entails resources, the small scale farmers have constraints in documentation and record keeping. Although minimum records are kept like purchase and selling invoices / receipts, other relevant information on management practices are not recorded which is important for internal traceability. Unlike in bigger farms where the required documentation and record keeping are already practiced and maintained.

The GAqP developed thru the European Union Trade Related Technical Assistance (EU TRTA) project has been approved as the Philippine National Standard on Code of Good Aquaculture Practice. This will

serve as guide for the farmers in the documentation and record keeping according to the requirements of the standard. The extension officers of BFAR will be trained on GAqP for them to teach farmers on the requirements of the standard.

2. The weak traceability system at the auction market

The auction market is part of the aquaculture supply chain that distributes either to the processing establishments or to the retailers. They can provide the volume required for processing at once through pooling or mixing of raw materials from different sources, generally, even with incomplete documentation.

Since farm registration is voluntary, other farms that are not registered can supply their harvest to the auction market. Further, harvest from small scale farms, with inadequate traceability data is also a limitation of the traceability system.

There is a need to strengthen the registration program of BFAR for the auction market. At present, there is still a minimum traceability data that can be obtained at the auction market. The recently approved BFAR Administrative Circular No. 251 Series 2014 on traceability system for fish and fishery products provides for the traceability documentation requirements for all stages of the supply chain including the auction market.

3. Difficulty in documentation and maintaining records

Small-scale farms generally do not practice documentation and record keeping. They use their extensive experiences in farming and monitor their stocks through observations without keeping records.

Traceability documentation template for farmers was developed as one of the outputs of the project under the EU-TRTA3 project on the implementation of Good Aquaculture Practice. The farmers will be trained and will be provided with the forms for their guidance and implementation.

IV. Future Plans / Programs for Implementation of Traceability System

1. Implementation of new regulations on food safety and traceability

There are several regulations that have been recently approved relative to food safety and traceability. The Food Safety Act of 2013 mandated BFAR as the food safety regulatory agency for fish and fishery products in the primary production and post-harvest stages.

As such, BFAR is now in the process of developing framework for the implementation of the law within its jurisdiction.

The Food Safety Act is also the basis for drafting BFAR Administrative Circular on regulations on veterinary drugs used in aquaculture. This regulation will define the controls of veterinary drugs and products manufacturing, importation / exportation, distribution and usage in aquaculture. A technical assistance for the development of the legal instrument for its implementation is supported by the EU TRTA3 Project.

The BFAR Administrative Circular No. 251 Series 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.

2. Implementation of the Philippine National Standard (PNS) on Code of Good Aquaculture Practice (GAqP)

The Code of Good Aquaculture Practice developed by BFAR under the EU TRTA project has been approved and adapted 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 good aquaculture practice. The GAqP aims to minimize the risks associated with aquaculture production. It focuses on food safety, animal health and traceability.

The GAqP standard will be disseminated to the extension officers who will teach the farmers and assist them to comply with the requirements. Trainor's training will be done for the officers working on aquaculture production, fish health, provincial fisheries and local government units to capacitate them. Preparation of materials for information and education campaign about GAqP is also included.

3. Continue capacity building of laboratories to conform to the International Standard

The BFAR central laboratories, FHMQUAL and FPTL have already obtained PNS ISO/IEC 17025:2005 laboratory accreditation from the Philippine Accreditation Bureau for testing of fishery and aquaculture products. The regional laboratory counterparts are provided with assistance to develop their quality management system, and harmonize laboratory methods and procedures with the central laboratory and among the regions. Six (6) regional laboratories, namely regions 3,4a, 6, 7, 9 and 12

obtained technical support from EU TRTA 3 project for the preparation for their accreditation with the PNS ISO/IEC 17025:2005.

V. Recommendations for Implementation

The following are the recommendations in line with the challenges identified in the implementation of traceability in aquaculture:

1. Promote and strengthen the implementation of food safety and traceability in accordance with national regulations through trainings and workshops of the implementers and stakeholders. Information and education campaign is another approach to disseminate the importance of food safety and traceability in each stage of the supply chain.
2. Develop a program that will provide incentives for the operators that will implement traceability to encourage them to maintain records and documents.
3. Establish movement document system for major fishery commodities that will link all the parts of supply chain.
4. Establish a national traceability program for aquaculture products either in paper-based or electronic/web based format that will link all levels of supply chain.
5. Establish and adapt the regional guideline on traceability, in particular, the Regional Guidelines on Traceability Systems for Aquaculture Products in Southeast Asia, drafted under this MFRD-SEAFDEC project on Japanese Trust Fund V: traceability systems for aquaculture products in the ASEAN Region. This guideline will provide a harmonized standard on traceability for aquaculture products which is important in the regional integration, and trade within / outside the ASEAN member countries.

VI. Conclusion

Traceability for aquaculture products in the Philippines is being implemented. However, BFAR recognizes the need to improve the traceability system in place. The BFAR as the competent authority for aquaculture and fishery products is having program and activities that will enhance and strengthen the implementation of the traceability system.

For large operators, there is an internal traceability system for the stages of supply chain, such as within hatcheries, farms, processing plants and feedmills. 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.

Regulations on food safety and traceability for fish and fishery products, and national standard on good aquaculture practice are in place to guide the stakeholders. Trainings and workshops are being conducted to address the gap between the actual practices and what is required in the regulation and standard.

The development of the regional guidelines on traceability systems for aquaculture products in Southeast Asia, as an output of this project, will provide a set of harmonized standard among the member countries.

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I. Introduction to Aquaculture Industry in Singapore

Singapore has a small but thriving and increasingly important food fish farming industry which accounts for about 7% of local food fish consumption. The main bulk of food fish production comes from coastal farming in floating net cages along East and West Johor Straits with a total of 119 marine fish farms. In 2013, these coastal farms produced about 4,100 MT of seafood valued at S\$20.6 million, of which about 88% was finfish and the remaining were shellfish and crustaceans. Common marine food fish species cultured include Seabass (*Lateolabrax japonicus*), groupers (*Epinephelus* spp.), snappers (*Lutjanus* spp.), milkfish (*Chanos chanos*) and mullet (*Mugil* spp.). Green mussel (*Perna viridis*) is farmed mainly along the West Johor Straits that forms the bulk of shellfish production in Singapore.

Land-based food fish farms accounts for about 620MT of freshwater food fish, valued at around S\$4.7 million. Main species cultured include the giant snakehead (*Channa micropeltes*) and tilapia (*Oreochromis* spp.). Other species include marble goby (*Oxyeleotris mamorata*), bighead carp (*Aristichthys nobilis*) and catfish (*Clarias batrachus*).

II. Current Status Of Traceability Systems For Aquaculture Products In 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. AVA works closely with local farmers to raise productivity and capability of the farms through advising farmers on good farm management practices, helping farms manage animal diseases, monitoring water quality around farming areas and promoting local produce to consumers. AVA also

conducts R&D to transfer technology to farms and work closely with the farming sector to develop innovative solutions to maximise productivity.

In Singapore, at farm level, we leverage on the Good Aquaculture Practice for Fish Farming (GAP-FF) scheme for the traceability of aquaculture products. The GAP-FF scheme was launched in August 2014. It 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.

III. Challenges faced in implementation and solutions and other relevant information

However, like many of the regional countries, many of the farms in Singapore are small-scale and have yet to adopt traceability. Cost is one of the biggest challenges in the development and adaptation of traceability system for aquaculture products at

farm level. Even though technology such as RFID technology, QR and QP codes are readily available, the key to success of a traceability system is the cost effectiveness and benefits of implementation to farmers. This success also depends on the consumers' willingness to pay a premium for product traceability.

IV. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Singapore

Currently, AVA is enhancing its efforts to encourage the implementation of traceability at farm level. To promote a better understanding of traceability among farmers, AVA conducts workshops on good farm management. Farmers are encouraged to improve their capacity to adopt traceability and farm management systems e.g. starting from the basics of stocking hatchery produced fry and fingerlings, and the usage of formulated dry pelleted feed. In addition, to improve the consumers' perception of traceable products, AVA also educates consumers on benefits of traceability such as product quality assurance and food safety through promotions at major supermarkets.

Future plans/programmes for implementation of traceability will likely be to look into leveraging on the use of technology in product tracking and also promote the uptake of GAP-FF and to expand the scheme to include local hatcheries. The driving force for traceability in aquaculture will be from customers/ consumers who are concerned about food safety and food origin and their desire for quality and safe aquaculture products.

Thailand

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I. Introduction to Aquaculture Industry in Thailand

Thailand is located in the Indo-Chinese peninsula. It is bounded by Myanmar in the north and the west, Laos in the north and northeast, Cambodia in the east and Malaysia in the south. In 2014, the estimated population is 65 million. Thailand is divided into four major regions: (1) the central plain, (2) the mountainous, (3) the northeast plateau and (4) the southern peninsula.

The major inland resources available for freshwater aquaculture and fisheries development include 66 rivers, 10,233 lakes and swamps, 685 reservoirs and man-made lakes with a water surface area of 3.54 million rais or 566,400 hectares.

The Gulf of Thailand faces the western part of the South China Sea to the North-West of the Thai-Malaysia peninsula. It has an area of about 320,000 Km² and a coastline of 1,874 km. The gulf water is fertilized by prevailing Southwest and Northeast monsoon. It is rich of phytoplankton, zooplankton and fish diversity due to high nutrients from river outflow, land runoff, upwelling and mangrove forests. The west of the peninsula is Andaman Sea with area of 116,280 km² and a coastline of 740 km.

Both coasts (length of 2,614 km) have a wide diversity of habitat types, including mangrove forests, with total area of 272,000 ha. Some mangrove areas have been developed for shrimp culture. In 1993, about 71,886.7 ha of mangrove areas were being used for shrimp culture. In addition, there are about 38,400 ha of shallow sea areas in many provinces suitable for mollusk culture. Many areas near to the shore and bays are suitable for cage culture of Asian-seabass and grouper. There 23 provinces located on the coastal zone where a major sources of income is from deep sea and coastal fisheries.

II. Current Status Of Traceability Systems For Aquaculture Products In Thailand

Fisheries Situation in Thailand

Fisheries production, including culture-based and capture fisheries, had gradually decreased from 2005 to 2011. Fisheries statistics of Thailand indicated that total fisheries production decreased from 4.2 million tons in 2005 to 3.04 million tons in 2011, but the value increased from 4,407.1 million US\$ to 5,085.6 million US\$. There are 4 main sectors for Thailand fisheries: (1) Marine fishing (2) Inland fishing (3) Coastal Aquaculture and (4) Freshwater culture.

Marine fishing production decreased by an average 10% per year from 2.6 million tons in 2005 to 1.6 million tons in 2011. The value of this sector also decreased from 1,975.7 million US\$ to 1,551.0 million US\$. Inland fishing production comprises of 7.4% of the total, most is small scale fisheries and for domestic consumption. The production of this sector increased from 198,800 tons in 2005 to 224,700 tons in 2011 and also the value increased from 245.4 million US\$ to 332.4 million US\$.

Coastal aquaculture is a very important sector for Thailand fisheries. The production of this sector increased from 764,700 tons in 2005 to 817,000 tons in 2011 and the value also increased from 1,555.9 million US\$ to 2,544.5 million US\$. Most of the coastal aquaculture production came from shrimp aquaculture (*Penaeus vanamei*). Cultured species in this sector include white shrimp (*Penaeus vanamei*), sea bass, grouper, green mussel, blood cockle, mud crab and swimming crab. Freshwater culture production decreased from 539,400 tons in 2005 to 384,400 tons in 2011.

Cultured species in this sector include Nile tilapia, walk catfish hybrid, silver barb, sepat Siam, striped catfish, freshwater prawn (*Macrobrachium*

rosenbergii) and snakehead fish. However, the value increased from 630.1 US\$ to 657.8 million US\$.

Import and export:

- Import
 - In 2009, Thailand imported 1.6 million tons of fisheries products, and its value is 68.5 million baht. The main import product is fish. The main commodities are fresh chilled and frozen tuna (52.38) and other fresh chilled and frozen fish (31.37%). Tuna products are mainly canned and other fish are processed into surimi and fillets.
- Export
 - In 2009, Thailand exported fisheries products in amount of 1.9 million tons, and its value was 224,542 million baht. The main products are canned tuna, frozen shrimp and frozen fish and the value are 52.9, 91.9 and 23.1 million baht respectively.

Thai Shrimp Traceability System:

Thai Shrimp Production

Marine Shrimp is one of an important aquaculture export product of Thailand. According to the national fisheries statistics reported, the export volume was approximately 250,000 metric tons per year and its value was over 70 billion baht. The highlight of export value increase significantly in the year 2000 which was up to 100 billion baht. By the high exportation volume, Thailand, then, became the number one country of the world largest black tiger shrimp exporter for more than a decade with 30% of global market share. This shrimp industry not only brings in revenues to the country but also provide career opportunities for the whole supply chain for more than one million people in Thailand.

Since shrimp farming has been booming, the successfulness in expanding culture area and production had in turn caused a problem. With the lack of awareness on the maintenance of good environmental condition and poor farming practices of the farmers, the harsh chemical and veterinary drug, especially antibiotics were often applied and misused at farms. This had caused the shrimp products to encompass existing antibiotics residue, which in turn also caused the volume of shrimp exports to reduce drastically.

With the concern of Thai government on the safe products to human health, various Ministries have been working together to solve the problem and to ensure safe food products. Some of these Ministries are Ministry of Agriculture and Cooperatives, Ministry of Health, Ministry of Commerce and Ministry of

Interior. In 2004, the food safety year programme was started, as the Royal Thai Government declared “Food Safety Year” which many activities in regulation and monitoring started implementation, in order to improve food quality for human safe consumption. Some of the examples of the various agricultural products at the early stage of the Thai Food Safety Programme are fish and shrimp products. This is not only to seve the national policy of Food-safety but also to promote fisheries products from Thailand. The Department of Fisheries of Thailand (DOF) has set up various food-safety projects and one of them are fish food standard and the implementations of traceability system.

Shrimp Traceability System

With the need of global market for the quality and safety products, the better and more efficient traceability system is in an urgent need for Thailand whom is known as one of the top shrimp exporters of the world. The DOF has created the manual documentation traceability system in 2002 known as “Fry Movement Document” or FMD and “Movement document” or MD. However, this manual documentation system has not been completed for the whole supply chain and are not well functioned. There are some shortcomings that require more improvements. The elements of raw materials to feed production and feed distribution to hatchery or farm have not been included.

A model of Computerized Traceability System seems to be very well accepted and efficient in the global market. In this regard, the DOF has put an effort to develop the traceability system in particular marine shrimp. The concept of traceability and computerized traceability system has been developed with assistance of France Government by French experts under Thai-France Cooperation Program since year 2002, as a continuing program of certification program for CoC shrimp and labelling started earlier since 2000.

Thai TraceShrimp

Computerized Traceability System of DOF known as TraceShrimp was created in 2005 with assistance from the French expert. TraceShrimp is the opportunity to enhance shrimp traceability capability providing a reliable traceability management tool not only for Thai shrimp stakeholders but also for their local and foreign clients. The programme developed as tool to enabling applicable function to trace and track back of shrimp products from Shrimp producers and many other local and foreign clients. In basic principle, TraceShrimp enables traceability management, beyond the national legislation and the international standards on traceability for a better access to world trade exchanges. Its step by step

approach helps TraceShrimp's members to build robust and efficient traceability systems so that the inter-stakeholders traceability throughout the whole production chain can be guaranteed.

The TraceShrimp programme develops for any producer applied to be a member. The member, then can remote record and transfer traceability data all along the chain of production. These stakeholders required to be certified to a quality assurance program e.g. Good Aquaculture Practices (GAP), Code of Conduct (CoC), Bio Shrimp are subjected to regular controls by the Thailand Department of Fisheries (DOF) to guaranty the accuracy of the information transmitted to TraceShrimp.

In addition, TraceShrimp has been designed as inter-operators traceability data exchange device for Thai Shrimp supply chain, the focus here is on the capture of data necessary to follow the product from one link in the supply chain to the next such that traceability is established through all stages of production, processing and distribution. Moreover, even if TraceShrimp does not focus on internal traceability, it makes an incentive for the stakeholders to improve internal traceability.

Following the whole system of TraceShrimp, it is ensured to provide a secure, automated product tracking and confidential online data exchange between operators in Thailand and in the countries of exportation.

Besides enhancing the paper based traceability in Thailand (Fry Movement document and Movement Document), TraceShrimp can be sued to record, review and report supply chain traceability data. Data report can be found with an invoice number, a delivery bill number, a product lot number or an event data (data of purchase, or production, etc.). Data can also be transferred from TraceShrimp data base to any other client or partner database.

The volunteer actors involved may include hatcheries, nurseries, farms, shrimp distributors, processors, exporters/importers and retailers. The users are

mainly the customers in the exportation countries so they can learn about the quality standards all along the supply chain up to the feed given to the fry and the shrimp.

TraceShrimp is a collective organization managed by Thailand Department of Fisheries, impartial in management and guarantee of confidentiality.

Last year (2013), Thailand Department of Fisheries set the training course for the volunteer actors of the whole supply chain such as shrimp hatchery, shrimp farm, processing plant, feed producer and distributor. For that training, there are 4 main supply chain who are interested in Thai Traceshrimp system and are involved to test the system. In conclusion, the system should be developed to support the client in many sections such as the template, the linked information, the server of database and etc.

Moving forward,, Thailand Department of Fisheries will plan to train the administrator of the membership and DoF staff who services the Thai traceshrimp system for client in next year 2015.

Unfortunately, at this moment, Thai Traceshrimp system cannot operate due to system error. Thailand Department of Fisheries would try to solve this problem by establishing the system on the new stabilizer server.

Viet Nam

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I. Introduction to Aquaculture Industry in Viet Nam

During the last decade, the fisheries production in Viet Nam has been significantly increased in production volume and the export value. Fisheries sector plays an important role in the national economy and rural development. Fisheries industry provides about 40% of the animal protein to daily meals and creating approximately 4 million jobs.

With more than 3,260 km of coastline, the total area for marine and brackish water aquaculture is around 685,000 ha. Total area of freshwater aquaculture is around 300,000 ha, out of which 120,000 ha of ponds. Total productions and export turnover of aquaculture and fisheries in the period of 1990s-2010s in Viet Nam to be showed in figure 1 and 2.

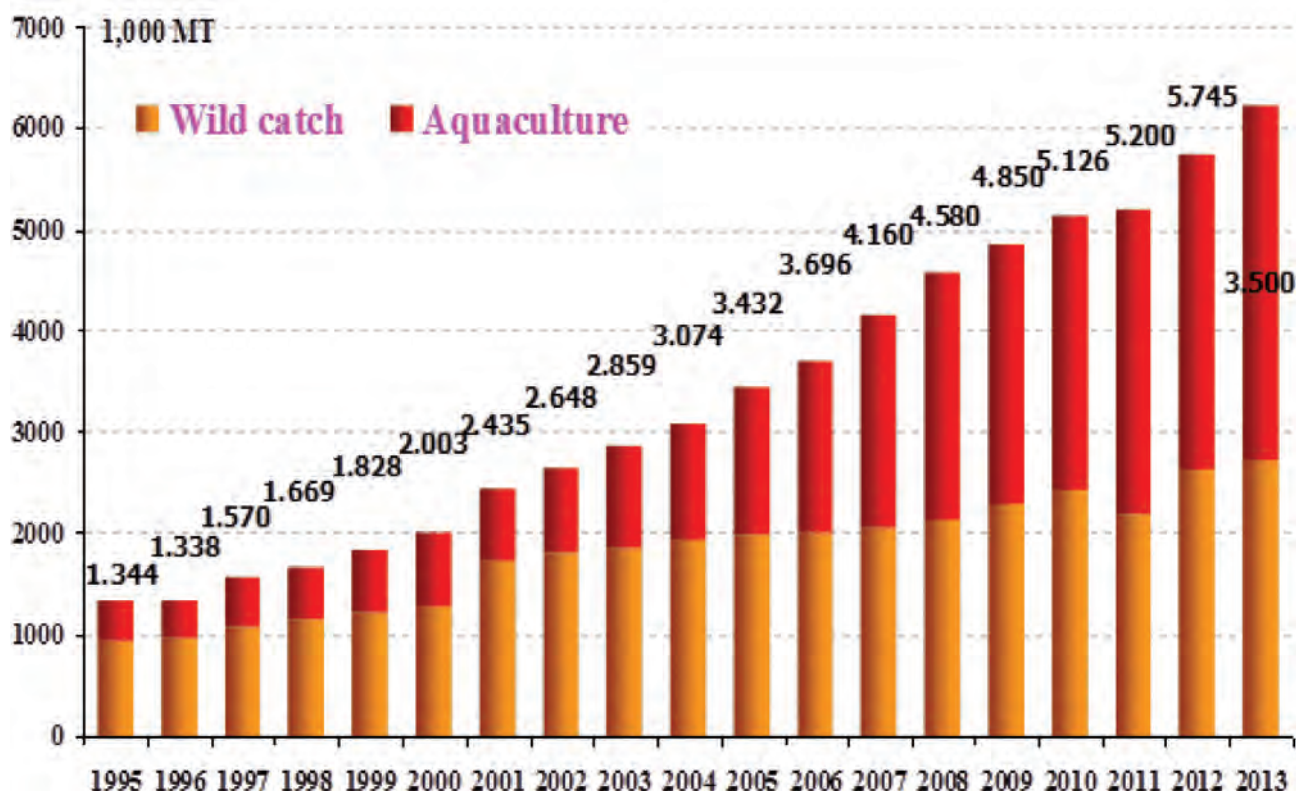


Figure 1. Statistics data on Fisheries and Aquaculture yield in period of 1995 – 2013 in Viet Nam.

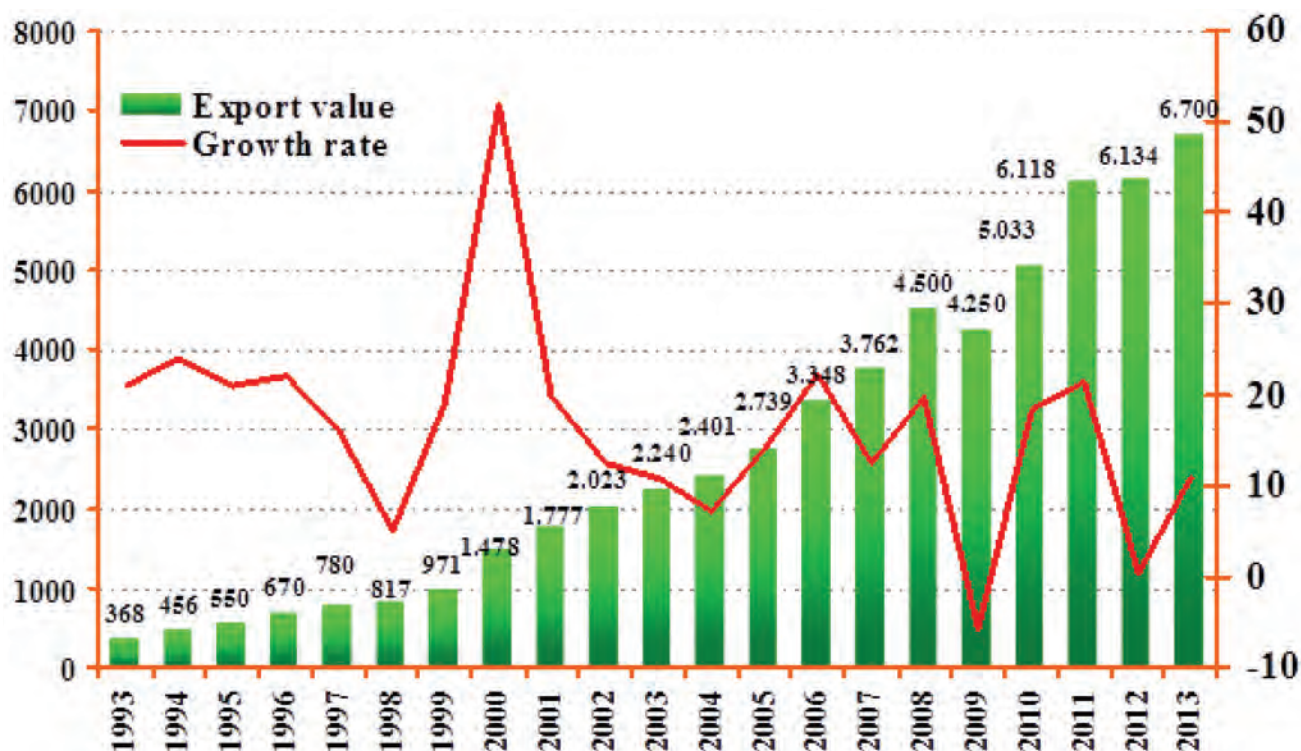
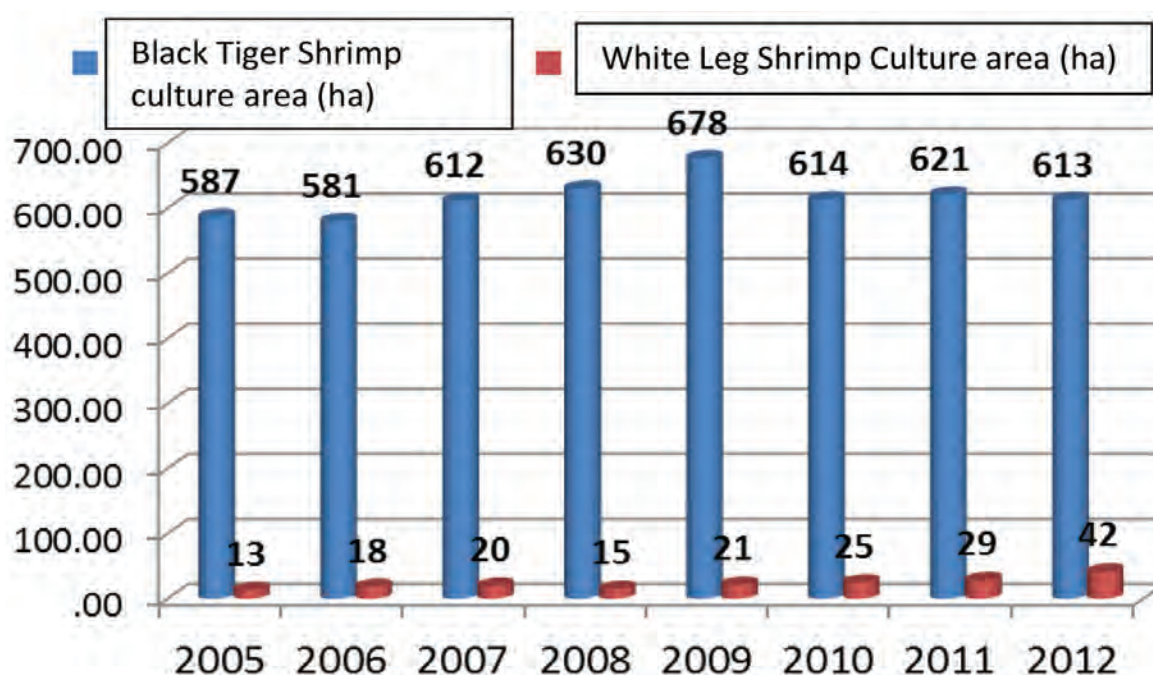


Figure 2. Exported turnover in the period of 1993 – 2013 in Viet Nam

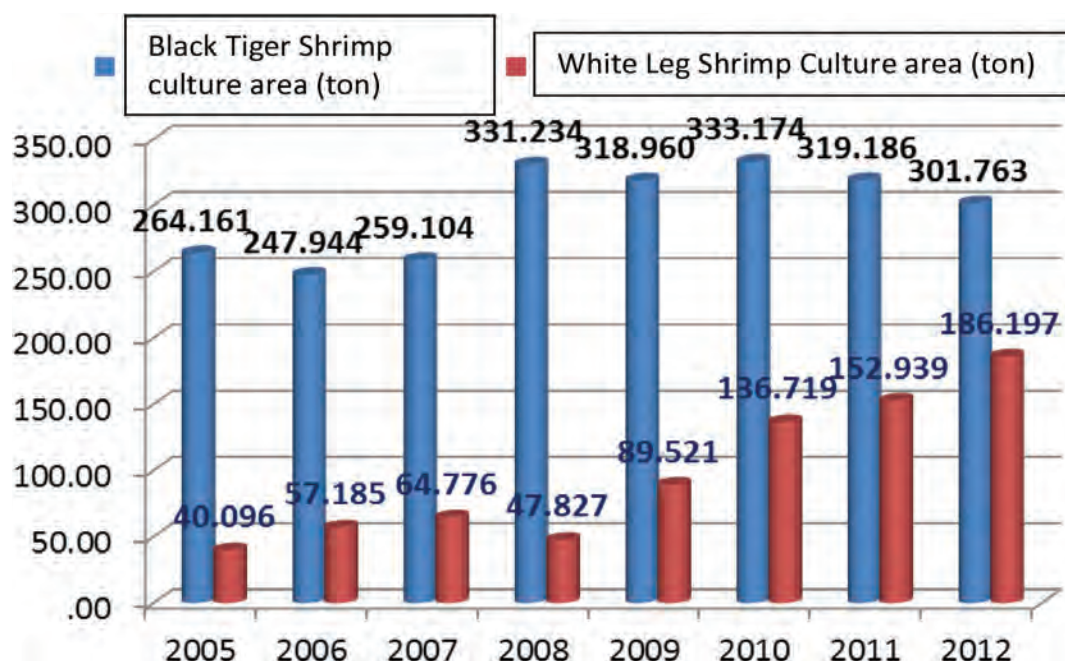
The most important aquaculture species by volume is Pangasius (*Pangasianodon hypophthalmus*) (38%), followed by the traditional freshwater fish species (28%) and brackish water shrimp (16%) (*monodon* and *vanamei*). While the traditional freshwater species to be cultured for domestic consumption, the shrimp and pangasius productions are processed for export target, mainly.

For main export commodities such as shrimp and pangasius, the figure 3, 4 show the data of annual culture area, production of black tiger shrimp and white leg shrimp area and figure 5 show the data involve to Tra catfish as well.



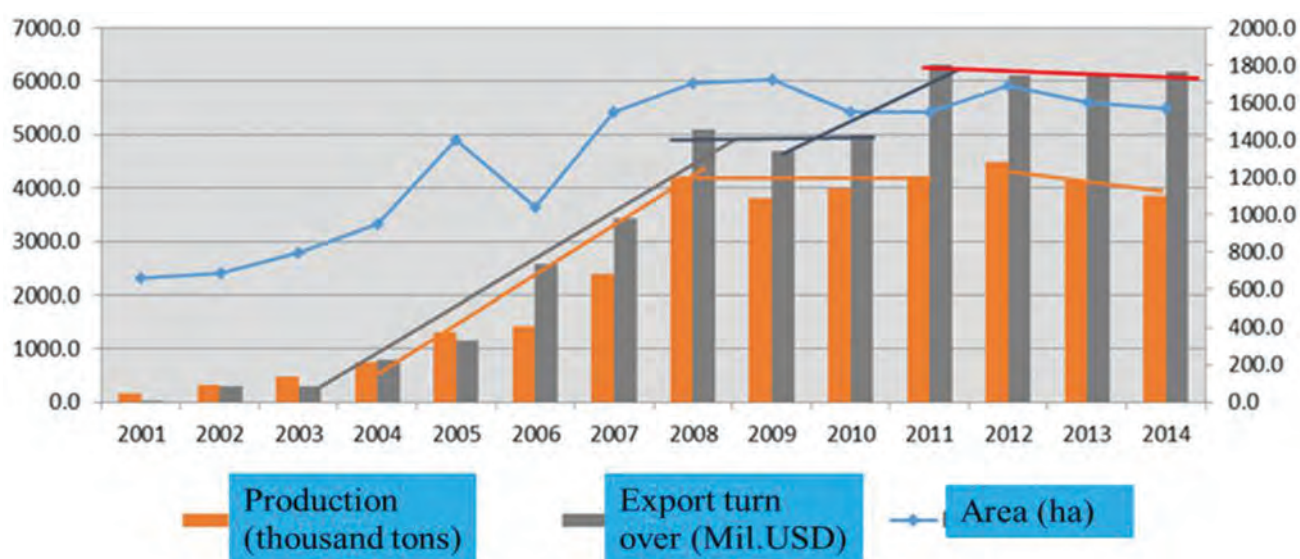
Source: Directorate of Fisheries, Ministry of Agriculture and Rural Development

Figure 3. Data of annual culture area of black tiger shrimp and white leg shrimp area during 2005-2012



Source: Directorate of Fisheries, Ministry of Agriculture and Rural Development

Figure 4. Data of annual production of black tiger shrimp and white leg shrimp area during 2005-2012



Source: Directorate of Fisheries, Ministry of Agriculture and Rural Development

Figure 5. Data of production, export turn over and area of Tra catfish in the period of 2001-2014

Tra / catfish were originally raised in a family's pond for daily consumption. When Viet Nam opened its doors to the world market, Tra/catfish became a commercial product and is now exported around the world. People in the Delta have shifted the business of raising Tra from a small to a large scale. Many farms and special areas of hundreds of hectares have been established for the production of catfish. Scientific and technological applications in raising catfish have become popular on each farm.

In 2001 the Tra output in the Mekong Delta was only 100,000 tons. The number increased to over 1,000,000 tons in 2009 of yield and export turn over of 1.4 billion USD, at the present is more than 1.17 million tons of yield and 1.8 billion USD of export turn over. Many fish farmers have become rich due to the raising of Tra but many of them bankrupt because of raising Tra / catfish.

For other major species to be cultured in Viet Nam, production to be showed as follow:

- Tilapia: 72.730 tons
- Marine fish production: 33.848 tons
- Other brackish water fish: 31.895 tons
- Lobster: 1.482,5 tons
- Molluscs: 165.000 tons
- Cage culture: 176.000 tons, of which: freshwater fish culture: 160.000 tons
- Brackish and Marine fish: 16.000 tons

II. Current Status Of Traceability Systems For Aquaculture Products In Viet Nam

Legal documents involved to aquaculture traceability

Based on FAO document (CAC/GL 60 -2006), producers have to set up an own traceability system for the purpose of food inspection and certification; TBT requirement on traceability, Viet Nam government issued the Food Safety Law in the year of 2001. In the article 7, item 2 of Food Safety Law, individual/organization who related to produce/deal in material for food or food, they must to keep dossier, food sample, and necessary information as the requirement of traceability activities. List of Laws, Decrees, Decisions, Circulars as well as the National technical standards which regulate the aquaculture industry and traceability in aquaculture industry as below:

- Food safety Law;
- Decree No. 36/ND-CP dated April 29th 2014 of the Government on farming, processing and export of pangasius/catfish/Tra (hereinafter called as Decree 36);
- Circular No. 55/2011/TT-BNNPTNT dated 03/8/2011 of Minister: Regulation on Inspection and Certification of Seafood Quality and Safety. Article 22, Section 4: "Farm has to keep in file all documents which related to production of product to ensure traceability";
- Circular No. 03/2011/TT-BNNPTNT dated 21/01/2011 of Minister – Regulation on regarding tracing and recall of fishery products failing to meet food quality and safety requirements (hereinafter called Circular 03);
- Circular No. 44/2010/TT-BNNPTNT and Circular 45/2010/TT-BNNPTNT dated October 22nd 2010 of Minister, all farmers who culture Tra catfish and shrimp have to record data daily and keep profile at least 2 years since harvesting.
- Decision No. 3824/QĐ-BNN-TCTS dated September 6, 2014 of Minister on issuance of the Viet Nam national standard on Good Aquaculture

Practices (VietGAP) (hereinafter called Decision 3824). This decision is the version 2 of VietGAP and issued in order to instead of Decion No. 1503/QĐ-BNN-TCTS date July 5th, 2011 on the National Standard on Good Aquaculture Practices in Viet Nam (VietGAP);

- Decision No. 4669/QĐ-BNN-TCTS dated October 28th, 2014 of Minister on Guidelines for the application of VietGAP for Pangasius. This decision is instead of Minister decision No. 1617/QĐ-BNN-TCTS date July 18th, 2011 on Guidelines for the application of VietGAP standards for pangasius (*P.hypophthalmus*), tiger shrimp (*P. monodon*) and white leg shrimp (*P. vannamei*)
- National technical regulation on brackish water shrimp culture farm - Conditions for veterinary hygiene, environmental protection and food safety (hereinafter called QCVN 02 - 19: 2014/BNNPTNT);
- National technical regulation on striped catfish (*Pangasianodon hypophthalmus* Sauvage, 1878) culture farm in pond - Conditions for veterinary hygiene, environmental protection and food safety (hereinafter called QCVN 02-20: 2014/BNNPTNT).

Circular No. 03/2011/TT-BNNPTNT applies to organizations, individuals participating in production, business in fisheries such as feed, chemicals, products for treatment and improvement of environment, seed, nursery and rearing. This Circular does not apply to households and individuals producing fishery products for domestic use without sale in the market; and producers of products of aquatic origin which are not used as food. Article 5, Circular 03 requires that individual/organization who acts in fishery production; fishery business 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 o (delivery to ensure accuracy of needed information

Due to the decentralization, assignment of each Ministry, Department, Directorate, farmed aquatic animals in Viet Nam are managed by 3 agencies. The stage from stocking to harvest is managed by Directorate of Fisheries (under the Ministry of

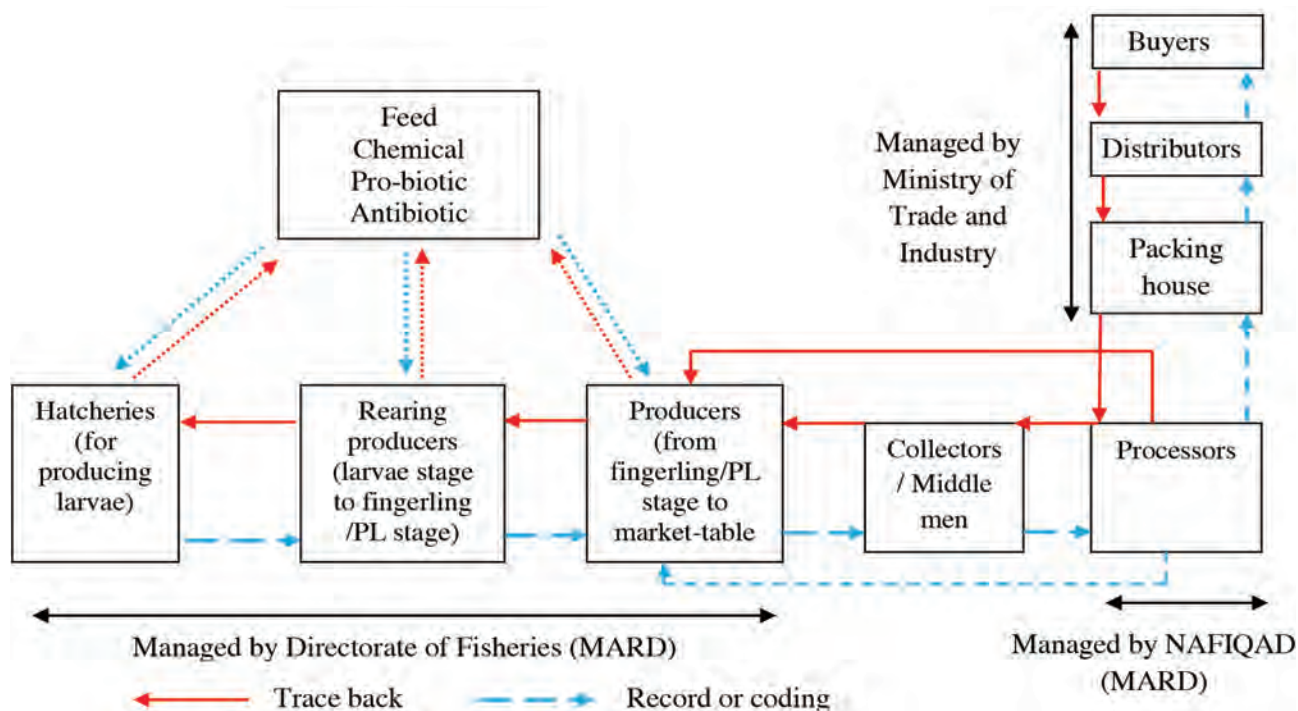


Figure 6. Product chain and traceability

Agriculture and Rural Development - MARD). The stage from harvest to processing is managed by National Agro- Forestry- Fisheries Quality Control Department (MARD). The stage from goods on sale in the market to consumers is managed by Ministry of Industry and Trade. Therefore, the tracing of origin from a product being on sale in the market back to the processing factory, farm, unit/individuals supplying inputs for production encounters with considerable difficulty, requiring linkage among Ministry of Industry and Trade with Ministry of Agriculture and Rural Development.

Therefore, Circular 03 is the legal basis to enable MARD to perform traceability for fisheries product from farming to processing.

Traceability in processing

As aquaculture activities of Viet Nam are closely linked with market, so in order to exist, traceability is compulsory. Traceability enables i) to recall accurately and fully products failing to meet food quality and safety requirements from of the chain of production, processing, distribution of products; ii) to identify steps which is not under control resulting in unsafe food to establish solution for correction. Therefore, the traceability activity in the step of materials- processing is seriously implemented by processing enterprises. When there is an warning of contamination with antibiotic residue for an export lot, NAFIQAD will investigate into causes and require the processing enterprise to carry out internal trace

back and do corrective action. While NAFIQAD will increase sampling frequency for antibiotic residue before issuing the health certificate for the next lot. If a enterprise which is continuously found to have its products contaminated with antibiotic, it may be prohibited to export such goods. With such tough measures, processing enterprises comply strictly in terms of record keeping, coding lots for tracing upon warning.

The processing enterprise may keep records and code in traditional way or GS1/EAN code including EAN 13 digits and EAN 8 digits or QR code.

Traceability in aquaculture

To develop aquaculture sustainability and link closely to market-oriented development, VietGAP is a comprehensive solution for controlling the quality of input materials, maintaining good health for aquatic animals, ensuring a better life for labors or farmers, ensuring the integrity of environment as well as easy to trace back by completely profile system.

VietGAP for Aquaculture was based on the Code of conduct for responsible fisheries (FAO): General principle, Technical guideline on aquaculture certification (FAO - Feb, 2011): general principal, structure and certification regulation, AseanGAP for shrimp: Structure with 4 main components, other recognized standards (GlobalGAP and ASC, GFSI, ISO, Codex).

List of exporters/processors now are exporting to some main markets:

| No. | Market | Amount of Viet Nam exporters/processors | Validity date from |
|-----|---|--|--------------------|
| 1 | Korea | 623 | June 07th 2015 |
| 2 | EU | 448 (farmed aquaculture product, exclusive bivalve molluscs) | July 10th 2015 |
| 3 | EU | 20 (for bivalve molluscs product) | |
| 4 | Economy alliance Asia-EU (Russia, Kazakhstan, Belarus, Armenia, Kyrgyztani) | 26 | July 21st 2015 |

Source: National Agro Forestry Fisheries Quality Assurance Department, Ministry of Agriculture and Rural Development

Viet Nam Good Aquaculture Practice standard is a single aquaculture module which complies with existing legislation and allows the application of VietGAP standard to different species. Due to, there are many international standards in Viet Nam were being introduced causing confusion and neglecting the small scale producers and sustainability of the industry became an issue for concern. So the concept of VietGAP for aquaculture emerged, it became a national standard that applied to on growing stage to the postharvest stage. VietGAP documents including 5 parts:

- General requirements on legal documents
- Food safety
- Animal health and welfare
- Environmental integrity
- Socio-Economic aspects.

According to Decree No. 36, by December 31, 2015, every commercial pangasius grow-out farm must obtain the Certificate of Good Aquaculture Practice according to VietGAP or an equivalent international certificate. Pangasius grow-out farm must register for grow-out culture at least 20 days prior to stocking and register for identification code with local fisheries authority. According to compulsory regulations, Tra catfish farmers are requested to record and keep profile in order to register VietGAP certification or other international standards since 31st Dec 2015. In the case farmers have not got certificate on VietGAP or other international standards for Tra catfish product, processors cannot export their product by Viet Nam authority.

According to Decision No. 3824 (version 2 of VietGAP), farm when applying VietGAP shall record adequate information of production process until harvest of each culture pond and keep record. 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 stored within 24 months from harvest date. Therefore, all farms certified by GAPs have adequate records that are easy for tracing when required. Up to August 1st, 2015, Viet Nam catfish producer applied and get GAP certified for nearly 2500 ha of aquaculture water surface area. Website <http://vietgap.tongcucthuysan.gov.vn/> to be set up by the Directorate of Fisheries and it is the offline management website for VietGAP certified producers. DoF will approve and give user a username and password to access website. User easy to trace information for VietGAP certified producers.

For 02 regulation (QCVN 02-19: 2014/BNNPTNT, QCVN 02-20: 2014/BNNPTNT), due to the main objectives of these regulations are toward products meeting food safety requirements so they only require that the farm culturing brackish shrimp, pangasius shall record information related to purchase of seed, use of medicines, chemicals, probiotics during the culture. Such regulations are not sufficient to trace, identify causes for correction when a lot is found to be contaminated with antibiotics.

Besides, Directorate of Fisheries set up a website <http://csdlthucan.tongcucthuysan.gov.vn/> to manage registered feed, probiotic, environment treatment chemicals. Based on information on this website, aquaculture producers easy to look up productions

and make a purchasing decision. However, this website cannot trace back information.

Directorate of Fisheries cooperates with provincial aquaculture/fisheries management department to conduct several of training courses annually. Traceability is one of contents.

III. Challenges faced in implementation and solutions and other relevant information

For traceability, it is compulsory for producer to make records, and keep dossiers according to principle of one step forward- one step back to ensure traceability for the previous step and the following step during production. However, small and scattered producers normally spend little time for recording and records keeping. In case records are made and kept, the farm normally does not store carefully keep or lose records after the crop is over.

There are plenty of legal documents on traceability for major aquaculture commodities such as brackish shrimp, pangasius, tilapia but not adequate of legal documents on this issue for remain commodities. Moreover, most of producers who culture remain commodities are small scale farmer with limited education background so it is difficult to require them to comply with requirement in recording and record keeping. Besides, farmers rarely get the bill or voucher when purchase input materials such as fingerling, drug. Therefore, when implement the traceability program in aquaculture, small scale farmers meet hindrance when apply.

In some case, information of buyers and suppliers would be lost because of middle men.

Solutions:

Provincial Agriculture and Rural Development Department and Provincial Fisheries Management Authorities strengthen instruction, encouragement, monitoring and supervision of small and scattered producers in making and keeping records. However, this solution is not really efficient and only temporary. Domestic customers through supermarket system to require farmers who sell their products into supermarket need to keep dossier.

IV. Future Plans / Programmes for implementation of Traceability Systems for aquaculture products in Viet Nam

Besides the above Decree No 36/2014/ND-CP for Tra/catfish only, Ministry of Agriculture and Rural Development (MARD) of Viet Nam have a plan to issue a Circular on farm coding. MARD request provincial DARDs (department of agriculture and rural development) strictly implementing the traceability system in aquaculture based on circular 44/2010/TT-BNN, circular 45/2010/TT-BNN and Minister Decision No 3824/QD-BNN-TCTS for catfish, shrimp and tilapia commodities.

To build up a recording and dossier instruction handbook and delivery to farmer.

To build up a website for a traceability purpose.





Annexes

Annex 1

JAPANESE TRUST FUND V TRACEABILITY SYSTEMS FOR THE AQUACULTURE PRODUCTS IN THE ASEAN REGION

FIRST ON-SITE REGIONAL TRAINING WORKSHOP ON TRACEABILITY VIET NAM

28-30 November 2011

Technical Report

Submitted 18 April 2012 by Denise Thong

Introduction

1. This technical report summarises the outcome of the break out session conducted on day 3 of the JTF 5 regional on-site training on traceability systems for aquaculture products in ASEAN

region. The on-site training was conducted from 28-30 November 2011. 23 participants from 10 ASEAN member countries attended the training and contributed to the data captured in this technical report. The 23 participants were divided into 3 groups for discussion of the following topics:

Table 1: Topics for Breakout session on 30 November 2011

| No. | Topic | Details |
|-----|--|---|
| 1 | Issues / Challenges for implementing traceability. How do we overcome? (Allocate approximately 15 minutes for each topic) | <ol style="list-style-type: none"> 1) Identify the challenges for implementing aquaculture traceability systems 2) How can we overcome the challenges and introduce traceability systems to the aquaculture products industry? 3) How to incentivize / attract industry to use traceability systems in aquaculture products |
| 2 | Devise method/s suitable for implementing traceability in aquaculture products in ASEAN Region (Allocate approximately 30 minutes for each topic) | <ol style="list-style-type: none"> 1) Create a generic supply chain diagram for aquaculture products and identify the data that is needed to be captured at each point of the supply chain 2) Based on the above points, how can we instigate product recall in event of food borne disease outbreak using traceability systems? 3) Describe how you would verify if your traceability system can effectively recall products? |

2. The summary of their points of discussions will be shared in this technical report In the following format:

- Topic 1: Issues and Challenges for Implementing Traceability; How do we overcome? – Pages 3-6
- Topic 2: Devise method/s suitable for implementing traceability in aquaculture products in ASEAN Region – Pages 7-9

Topic 1: Issues and Challenges for Implementing Traceability; How do we overcome?

3. Due to the overexploitation of natural resources in the world's capture fisheries, the global population including ASEAN has moved steadily away from reliance on capture fisheries to greater dependence on aquaculture.
4. As with all aquacultures fisheries, the potential of overuse of antibiotics or banned substances in the rearing and processing of the aquaculture

fishes can be quite a concern. A means to ensure that only safe and high-quality products are being sold to the final consumer would be through the implementation of an aquaculture traceability system. With proper record keeping and the adequate sharing of key information between stakeholders, it is much easier to ensure that the aquaculture product remains safe and fresh till it reaches the consumer.

5. In addition, in the event that the product fails to deliver the promised safety, quality or freshness, a good traceability system can help facilitate efficient product recall to prevent further sales of the compromised product.
6. This report will attempt to address the issue of aquaculture traceability by segmenting the various aquaculture supply chains into two main groups for discussion. They are:
 - The large scale aquaculture companies
 - The smaller scale individual stakeholder framework.

Large Scale Aquaculture Companies (Vertical integration)

Introduction

7. ASEAN export huge volumes of aquaculture fish each year to regional and global markets. To tap into the demand for aquaculture fish in stringent export markets (i.e EU, USA, Japan), some ASEAN member countries have successfully cultured several large scale aquaculture companies that are able to comply to the stringent export requirements of these global markets. One of the criteria for assessment of illegibility to export is the presence of a comprehensive aquaculture traceability system.

Vertical Integration

8. To ensure that all the stakeholders of the aquaculture supply chain comply to the required best practices stipulated by the importing nations, large aquaculture companies have begun incorporated vertical integration into their business concept. They now own all the key stakeholders of the entire supply chain. (i.e. Hatcheries, Feed mill, Farmers, Processing plant)
9. As such, incorporating documentation and traceability into their operations becomes much easier. At the same time, the company is able properly time its various processes (i.e The delivery of farmed fish to processing plant) in a manner to prevent the mixing of aquaculture products from different sources. This will prevent potential cross contamination thereby ensuring that any potential non-compliance is well contained.

Small scale Individual stakeholders

Introduction

10. In ASEAN, the predominant model of ASEAN aquaculture supply chain is the trade amongst many small scale individual stakeholders. (i.e. Hatcheries, Feed mill, Farmers, Middlemen, Buying Stations/Collection Centres, Processing Plants and Retailers)
11. The challenges faced by these small scale individual stakeholders include complex supply chains, limited resources, the lack of enforcement and the lack of 3rd party auditors. As traceability involves the inclusion of additional processes, a legitimate concern will definitely be on the division of costs amongst the stakeholders.

12. These points will be discussed in greater detail in section 2.2.

Challenges and Recommendations

Complex Supply Chains

13. Due to the presence of many different stakeholders at each level of the processing, and the absence of cooperatives to manage these stakeholders, it is easy for the stakeholders to trade freely amongst each other resulting in mixing of raw materials and end products. This forms a complex supply chain framework that is fundamentally more difficult to implement traceability in.
14. The challenge is exacerbated by the presence of middlemen and central buying stations/collection centres that tend to consolidate the products from my farms. This makes traceability nearly impossible to implement. In addition, some stakeholders such as middlemen may be averse to sharing information (eg. Source of their raw materials) as they guard such information as trade secrets.

Recommendations

15. To overcome the issue of complex supply chains, the stakeholders may group up to form cooperatives or associations. (eg. Farmer's cooperatives) The stakeholders within the associations may agree to only trade within themselves and sell their products to a stipulated pool of one step up stakeholders.
16. In addition, if they can consolidate their products, they would be able to trade directly with the next key stakeholder, thereby by-passing the middlemen. In doing so, the supply chain becomes a lot less complicated and easy to manage.
17. The competent authority may also consider registering and licensing middlemen. Training and dialogue sessions may be arranged to educate middle men on proper record keeping and handling of aquaculture products.

Limited Resources (Education/Manpower/Funding/Technology)

18. Many small scale aquaculture stakeholders in ASEAN are not aware of the advantages of implementing traceability. Many of them operate their processes much like how their families have operated over the generations. As such, they may be averse to change.

19. Due to the small size and limited income of small scale stakeholders, the operations of small stakeholders are often tightly run without the presence of spare manpower or funds.

20. Record keeping, a key component of traceability will result in the need for more operating processes. This inadvertently translates to the need to hire more manpower to fill up this new job scope. Hiring of help requires funds which small scale stakeholders lack.

Recommendations:

21. To overcome the issue of stakeholder's aversion to change, the competent authorities in the ASEAN nations may hold training to educate these stakeholders on the advantages of implementing traceability as well as the manner in which traceability may be implemented on small scale operations.

22. To overcome the issue of lack of manpower and funding, the government may help provide funding to stakeholders to allow them to hire extra manpower to help implement traceability. The extra funding may also come in the form of tax subsidies.

23. With regard to the use of technology to implement traceability, one cannot deny the increase in productivity that technology can bring. However, due to the lack of resources, simple paper document would suffice. Local competent authorities may also help encourage paper documentation by providing templates (In local language) for record keeping that is prepared specially for each point of the supply chain (i.e. Hatcheries, Feed mill, Farmers, Middlemen, Buying Stations/Collection Centres, Processing Plants and Retailers)

24. Several stakeholders may also group together to jointly purchase simple technology to assist them in data keeping (i.e. Barcode printer and reader). This will help reduce the cost of traceability implementation on each individual stakeholder.

Lack of Enforcement (Legislation): Too many standards

25. The ASEAN member countries also lack a legal framework for the enforcement of traceability in the aquaculture industry. In the absence of a legal framework, the various stakeholders lack the incentive to implement traceability. In addition, they lack the guidance to implement the document keeping not aware of what manner or detail of document keeping is necessary.

26. Another concern would be the presence of too many best practices and standards with regard to traceability in aquaculture systems. Small stakeholders may find it difficult to select a standard to operate by.

Recommendations:

27. To overcome this issue, the government may develop a legal framework accompanied with guidelines and models (i.e. template for record keeping) to encourage the uptake of traceability by the various stakeholders. Under this legal framework, each of the stakeholders must be probably registered and licensed regular in order to partake in the trade within the aquaculture supply chain.

28. To support the enforcement of the new legal framework, it is important for the competent authorities to build up their capabilities (i.e. Establish a department for the inspection and licensing of traceability systems). In addition, it is also important to strengthen the national extension service system to provide sufficient guidance to the stakeholders.

29. Foreign consultants may be hired to help the competent authorities develop and implement the legal framework.

30. To over the confusion of having too best practices and standards, ASEAN may develop a harmonised aquaculture traceability standard.

Lack of 3rd Party Auditors

31. To ensure the integrity of the traceability system, it is important to hire 3rd party auditors to conduct audits on a regular basis. However, due to the lack of trained 3rd party auditors in most of the ASEAN member countries, it is difficult to ascertain the integrity and adequacy of the traceability systems implemented.

Recommendations:

32. A way to overcome this issue is for the competent authorities to train a pool of auditors to conduct traceability verification for the various stakeholders.

Who to shoulder the additional costs of traceability?

33. A possible way to buffer the additional cost of implementing traceability is to transfer part the cost to consumers. However, consumers in ASEAN countries are often not educated on the benefits of aquaculture traceability. It

is therefore difficult for traceable aquaculture products to fetch a premium price to non-traceable aquaculture products.

Recommendations:

34. A way to overcome the lack of consumer awareness is to hold a nationwide campaign to educate consumers on the importance of traceability. In doing so, consumers will value traceable aquaculture products and be willing to pay more for them. Co-operatives can then, upon discussion with competent authority, increase the price of their products to accommodate the additional cost of traceability implementation.

Topic 2: Devise method/s suitable for implementing traceability in aquaculture products in ASEAN Region

35. The ASEAN member countries discussed and came up with a generic supply chain diagram for aquaculture products. (Figure 1)

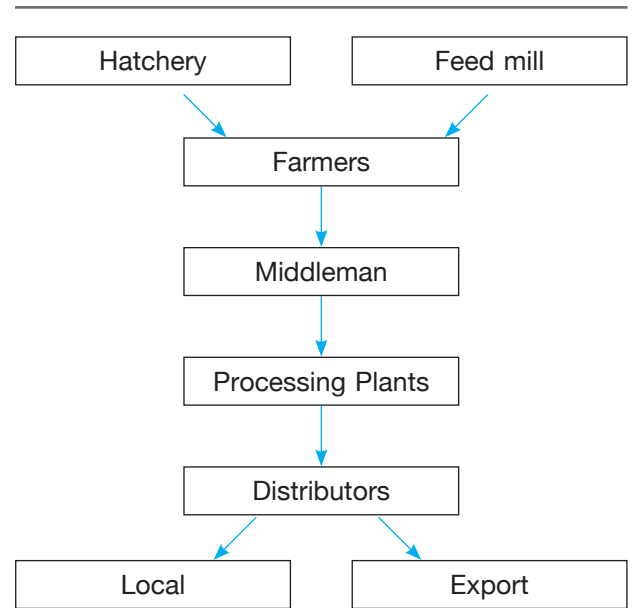


Figure 1: Generic Aquaculture Chain by ASEAN member countries

36. The ASEAN member countries also discussed and listed the information/documents needed to be kept internally (For productivity improvement and cost reduction) as well as information / documents needed to be shared with one up one down stakeholders for external traceability. External traceability allows for the tracking of a product and/or product attribute(s) through successive stages of the supply chain to ensure that objectives such as food safety, bio security and regulatory requirements are met.

37. The information needed to be kept for internal and external traceability are as shown in table 2 below:

Table 2: Summary of Information needed for Internal and External Traceability

| No. | Member of the Supply Chain | Information to be kept and/or shared | |
|-----|----------------------------|---|--|
| | | Internal Traceability | External Traceability |
| 1 | Hatchery | <ul style="list-style-type: none"> • List of buyers • List of suppliers (i.e. broodstock) and supplier details (eg. Accreditation) • Date of sale • Type and quantity of antibiotics / hormone used • Feed, Chemicals, Drugs lab test results • Date of spawning • Pond/tank number • Quantity of fingerlings • Health Certificate | <ul style="list-style-type: none"> • Origins of broodstock • Pond / tank number |
| 2. | Feed mill | <ul style="list-style-type: none"> • List of buyers • Labelling • Certification (eg. ISO 22000) • Date of production • Food additives • Source of Raw Material • Batch Number | <ul style="list-style-type: none"> • Batch Number |
| 3. | Farmer | <ul style="list-style-type: none"> • List of buyers • List of suppliers • Details of production (eg. Environment, chemical and water monitoring) • Feed, Chemicals, Drugs lab test results • Registration number • Batch number • Harvest volume and pond number • Movement documents | <ul style="list-style-type: none"> • Batch number • Harvest volume and pond number |
| 4. | Middleman | <ul style="list-style-type: none"> • List of suppliers and supplier details (eg. Farm number, batch number) • List of buyers • Invoices / Delivery orders • Batch number • Registration number • Transportation records (eg. Boat Number) • Movement document from farm to middleman • Drugs lab test results | <ul style="list-style-type: none"> • Batch number • Registration number |
| 5. | Distributors – Local | <ul style="list-style-type: none"> • List of suppliers • Storage details • Date of purchase • Quantity of each batch sold • Batch / Lot number | <ul style="list-style-type: none"> • Batch/Lot number |

| No. | Member of the Supply Chain | Information to be kept and/or shared | |
|-----|----------------------------|---|--|
| | | Internal Traceability | External Traceability |
| 6. | Distributors – Export | <ul style="list-style-type: none"> • List of suppliers • Storage details • Date of purchase • Quantity of each batch sold • Batch / Lot number • Shipping details • Container number | <ul style="list-style-type: none"> • Batch/Lot number |

38. The ASEAN member countries discussed and came up with a generic supply chain diagram to illustrate product recall for aquaculture products. (Figure 2)

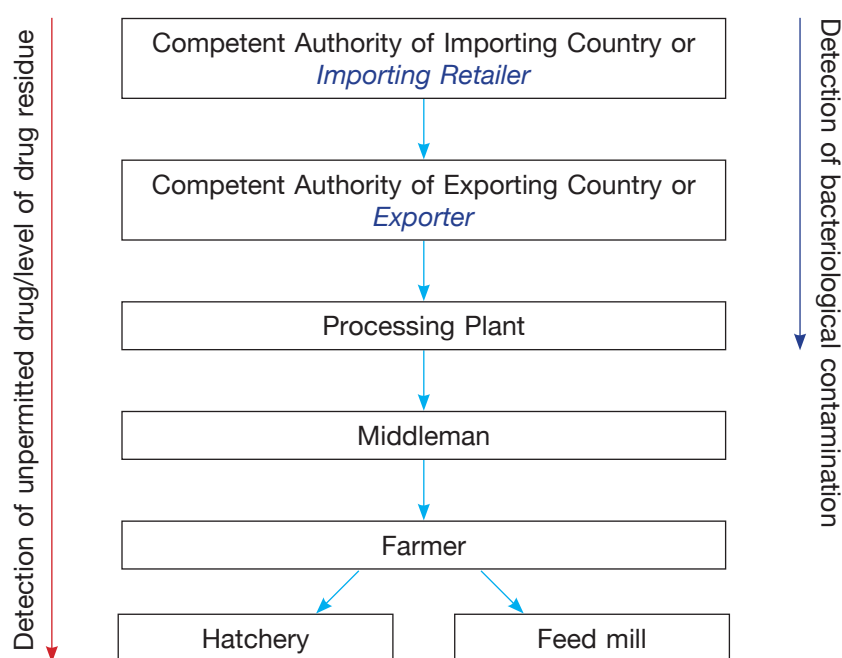


Figure 2: Generic Product Recall Flow Chart for Aquaculture Chain

39. To initiate product recall in event of a food incident (i.e. Due to bacteriological contamination, unpermitted drugs and / or drug level residues), the ASEAN member countries have identified a few key information that should be shared between stakeholders. They are as summarised in table 3 below.

Table 3: Information to be shared in the event of a product recall

| Sharing of information between stakeholders | | Information to be shared |
|---|----------------------------|--|
| From | To | |
| Importing Retailer | One up: Consumer | • Batch/Lot number* |
| Exporter | One up: Importing Retailer | • Batch/Lot number* • Name of processing plant |
| Processing Plant | One up: Exporter | • Distribution List • Batch/Lot number* |
| Middleman | One up: Processing plant | • List of raw material suppliers and corresponding details (Date of receipt, Time of receipt, Quantity received) |

| Sharing of information between stakeholders | | Information to be shared |
|---|-------------------|--|
| From | To | |
| Farmer | One up: Middleman | <ul style="list-style-type: none"> • Pond number • Date of harvest and quantity of harvest • List of buyers |
| Hatchery and Feed mill | One up: Farmer | <ul style="list-style-type: none"> • Origins of Broodstock • Pond/Tank number |

* *Batch / lot number consists of information on type of product, source of product, date of processing and time of processing*

40. A food incident due to bacteriological contamination is probably the result of improper handling of products at the processing plant. As such, the product need only be traced back from consumer / retailer to the processing plant. In the case of a food incident due to the presence of unpermitted drugs and / or drug level residues, the traceability system should be able to trace from consumer/retailer all the way back to the hatchery and/or feed mill.
41. To verify if traceability system is effectively in recalling products, auditors may be hired to conduct internal or 3rd party audits on each of the individual stakeholders in the supply chain.

Annex 2

JAPANESE TRUST FUND V TRACEABILITY SYSTEMS FOR THE AQUACULTURE PRODUCTS IN THE ASEAN REGION

MID-TERM PROJECT REVIEW MEETING SINGAPORE

7-8 November 2012

Mid-Term Meeting Report

INTRODUCTION

1. At the invitation of the SEAFDEC Marine Fisheries Research Department (MFRD), the Japanese Trust Fund V Mid-term Project Review meeting on “Traceability Systems for Aquaculture Products in the ASEAN Region” was held from 7 - 8 November 2012 in Singapore.
2. The meeting was attended by representatives from all SEAFDEC member countries except Brunei, SEAFDEC Secretariat and Technical Coordinator, the Chief of MFRD Programmes, the Deputy Director for Post-Harvest Technology Division (PHTD) of the Agri-Food & Veterinary Authority of Singapore (AVA) and other staff from PHTD as the collaborating center for MFRD Programmes. A resource speaker from Singapore, namely the Chief Executive Officer of GenoMar South East Asia Ptd. Ltd. and the director of Trapia Malaysia Sdn. Bhd was invited for the morning session on 8 November 2012. A total of 17 participants from 9 ASEAN countries attended the Mid-term Project Review meeting. The list of participants is as in Annex 1.

I. OPENING OF THE MEETING BY CHIEF, MFRD

3. The Chief of MFRD Programmes, Mr Yeap Soon Eong, welcomed the participants to the Mid-term Project Review meeting and delivered the welcome address.
4. The Deputy Director of Post-Harvest Technology Division, Ms Khoo Gek Hoon, delivered her opening remarks to the participants of the meeting.
5. The chairperson and who is the MFRD project officer, Ms Felicia Loh, presented on the agenda of the meeting and the agenda was adopted. The agenda appears in Annex 2.

II. PROJECT INTRODUCTION OF JAPANESE TRUST FUND V PROJECT BY THE MARINE FISHERIES RESEARCH DEPARTMENT

6. The MFRD project officer presented on the project overview, which includes the project background, project objectives, project activities, expected project deliverables as well as project duration and schedules.
7. The Chief of MFRD Programmes informed the meeting that Brunei was unable to attend due to unforeseen circumstances.

IV. PRESENTATION OF COUNTRY PROGRESS REPORT

Cambodia

8. Mr Bun Chantrea, the KPL (Key Project Leader) of Cambodia, presented on their country's progress. It was reported that the status of traceability system implementation in Cambodia was still pending.
9. Mr Bun reported that the farmers tend to follow after the practices of other farmers which made the country's implementation a challenge, and that the traditional methods of local processing practiced by the farmers were also seen as a challenge for tracing record. It was reported that poor quality fish products were due to the poor quality of fish feeds, and there was a heavy reliance on the neighbouring countries for shrimp post larvae due to poor local production capacity and quality, as well as limited human resources. It was also informed that Cambodia would need more time to build up on her capability through training to establish the knowledge of the farmers or workers on GAP (Good Aquaculture Practices) and traceability.
10. Mr Bun informed the meeting that the GAP guidelines have been enacted by the Cambodian Government in October 2012.
11. Mr Bun also informed that the drafting of traceability guidelines by Fisheries Committee/ Administration is in progress and is pending for government endorsement. The Cambodian Government also aims to adopt strategies and extension with regards to Traceability of aquacultured products for GAP / HACCP.
12. Upon the enquiry by Philippines on how the Cambodian government tracks aquaculture products along supply chain for product export to USA, Mr Bun updated that they worked closely with CAM Control (Cambodia Import-Export Inspection and Fraud Repression Department) of Department of Commerce, to apply for the certification which meets the standards when exporting to other countries.
13. Upon the enquiry by Chief of MFRD Programmes on the expected challenges faced when enforcing GAP on small and fragmented farms, Mr Bun informed that there is a challenge of maintaining the quality of seed and feed based on market demand.

Indonesia

14. Dr Reza Shah Pahlevi, KPL of Indonesia, presented on his country's progress update, and reported that the implementation of traceability system is currently in progress.
15. He mentioned that the main challenges and issues that Indonesia are facing would be the numerous parties along the fish supply chain and the limited knowledge of these parties to assess fishery product quality and traceability to meet international standards / requirements for export. He reported that along the fish supply chain, the middlemen tend to collect and pool small amounts of fish products from various fish farmers, and in turn, posed as a challenge for implementing traceability.
16. Dr Reza informed that some of the national activities that have been initiated are namely 1) sampling map where each province of Indonesia is tagged with a code number, and 2) conduct of training workshops with regards to quality and safety of fishery products. He also added that the Indonesian government is also looking at the development of central software at Jakarta for the consolidation of Traceability data from all provinces as a part of the future activity.
17. Upon the enquiry by Chief of MFRD Programmes on the government initiatives on the implementation of traceability, Dr Reza informed that traceability implementation in Indonesia is currently on a voluntary basis. The Indonesian government is also exploring on more workshops and trainings to be conducted for the aquaculture industry for knowledge improvement. However, he added that it may be challenging for them to build up on laboratory testing capability for quality assurance purpose.
18. Upon the enquiry by Philippines on the number of laboratories currently Indonesia has and are being audited upon by the government, Dr Reza replied that to date, the number of accredited laboratories are estimated to be 3 from the private sector, and 7 government laboratories. However, with this number of laboratories, it is still insufficient to support the current demand of samples to be analysed. He informed that auditing of the laboratories is done on a regular basis by the Agency of Quarantine and Food Safety and Quality Control.

Lao PDR

19. Mr Oudone Khounsavan presented on Lao's country progress. He informed that the status of traceability implementation in Lao was still pending.
20. Mr Oudone updated that the main challenge that Lao is facing is that the aquaculture sector is not fully developed and that there is currently no specific regulation on traceability of aquaculture products. He added that there it is a paramount need to develop specific regulation arising from the recent participation in WTO and ASEAN community. He also informed that currently Lao government are imposing permit registration of fish farm under household and commercial level.
21. Mr Oudone informed that for future activities and directions, they have plans to develop technical standards on food safety for aquaculture products to supply domestic market and future exports, and the building of knowledge and technical capacity on traceability systems. is necessary.
22. Upon the enquiry by Myanmar on the method of checking Formalin during the laboratory inspection, Mr Oudone replied that they are currently analysing the fish feed only and they are usually sent to control laboratory for testing. Upon queried by MFRD with regards to the future activities on food safety and traceability issues by the Lao government, Mr Oudone informed that the Lao government is currently drafting out the project proposal for the mentioned future activities as well as the annual budget allocation.

Malaysia

23. Mr Mohd. Ghazali bin Abdul Manap presented Malaysia's country progress on behalf of KPL of Malaysia, Mr Ismail, as he was unable to attend the mid-term review meeting. It was reported that the status of traceability implementation in Malaysia is currently in progress.
24. Mr Mohd. Ghazali informed that traceability programme had been introduced as part of the GAP at farm level since 2004 in Malaysia. However, GAP implementation is currently on a voluntary basis. The traceability form (BP-DJ01) is needed to be filled as part of the export requirements for shrimp products since year 2011.
25. With regards to the challenges and issues faced by Malaysia, it was reported that along the supply chain, there is a prevalence of many

middlemen and collectors that are involved and market secrecy was commonly seen for source information protection. In order to address to the current situation, future plans will include the mandatory filing of traceability form for fishery products, as well as the promotion of the adoption of inland fisheries regulations to the state government of Malaysia though discussion with state legal advisor. Mr Mohd. Ghazali also informed that some national measures to strengthen the traceability system can be done through internal audits annually, as well as the provision of standard guidelines in SOP (Standard Operating Procedure) for traceability forms usage.

26. With regards to the enquiry made by Thailand on the transparency of inventory management for the traceability system, Mr. Mohd. Ghazali mentioned that farmers would need to possess information of their buyers and were required to fill in the necessary information into the traceability form.

Myanmar

27. Mrs Aye Aye Thein, KPL of Myanmar presented on Myanmar's country progress on the status of traceability implementation in Myanmar.
28. Mrs Aye Aye Thein informed that Myanmar has been implementing traceability systems as well as recall procedures in the aquaculture farms and for their exports respectively. For foreign fishing vessels, registration and licensing was reported to be required as a form of traceability system. Mrs Aye Aye Thein also informed that there is also currently a GAP standard in place for fish and shrimp farms.
29. With regards to the challenges and issues faced by Myanmar, it was reported that records such as water quality monitoring data, feed data, as well as the data of veterinary drugs and chemicals usages for aquaculture purpose are currently still weakness. She added that there is certainly a room for improvement to increase the knowledge and awareness of the GAP compliances and guidelines. Traceability was also reported to be challenging especially in the situation of pooling or mixing of shrimps from various farms at the central market.
30. In order to address to the reported issues, Mrs Aye Aye Thein mentioned that 1549.2 hectares of farms have to be certified for GAP, and the Fry Movement Document (FMD) applied. She also added that a total of 13 processing plants were approved by the EU and implementation of HACCP was reported.
31. Mrs Aye Aye Thein added that there is a need to improve all farms and hatcheries to at least meeting the guidelines of GAP in future. On top of that, she mentioned that there are also on-going measures for the monitoring of veterinary drug residues for aquaculture products exporting to EU.

Philippines

32. Ms Somga, Sonia Sebastian, KPL of the Philippines presented on the country progress of Philippines. It was reported that the implementation of traceability in Philippines is in progress.
33. Ms Somga updated that the implementation of traceability is very much dependant on the intended market, and that currently all documentations are paper-based. She added that the level of traceability varies in every stage of the supply chain as well as the size of the establishments. The government of Philippines is currently drafting the Fisheries Administrative Order on Inspection and Certification. She further mentioned that GAP is currently on a voluntary basis.
34. The meeting was informed that national activity such as registration programme for the aquaculture farms is being implemented by BFAR (Bureau of Fisheries and Aquatic Resources) based on GAP (Good Aquaculture Practice) to achieve hygiene and traceability requirements. The Philippine GAP was also reported to be developed in 2010 through the assistance of the EU Trade Related Technical Assistance. Trainings on GAP implementation would also be conducted for the extension officers as well as farmers, where the schedule of training of extension officers is planned to be on the 1st quarter in year 2013.
35. With regards to the enquiry made by Indonesia on the presence of antibiotics in feed and the detection method, Ms Somga replied that once there is any antibiotic detection, the government of Philippines will ensure the destruction and corrective actions will be taken against the affected batch of feed. However, since 2007 there have been no problems encountered thus far. She also added that antibiotics residue analysis will only be conducted on at the adult shrimp fry in hatcheries.

Singapore

36. Mr Tan Yit Wee, participant of Singapore, updated on Singapore's implementation progress and it was noted that the implementation of traceability is currently in progress.

37. Mr Tan informed that there is currently on-going implementation of Good Farm Management Practice in the fish farms, with the necessary protocol documentation and record keeping in place. He mentioned that currently the usage of dried pellet feeds are being encouraged as its source can be traced upon imported into Singapore by AVA (Agri-Food and Veterinary Authority of Singapore).
38. With regards to the challenges and issues faced by Singapore's small aquaculture producers, Mr Tan updated that the cost of implementation of traceability is rather high; hence changing the mindsets of farmers on implementation cost, introduction of better feed quality, and benefits of record keeping is also seen as a challenge. As such, the national activity includes the provision of assistance in the implementation of traceability in the marine fish hatchery.
39. Mr Tan mentioned that plans are made to send officers for training on GAP as GAP is currently still in pipeline. He further added that currently a few farms have already expressed interest in the GAP and traceability scheme.

Thailand

40. Mr Somboon Laoprasert, KPL of Thailand reported on the country progress of Thailand. It was noted in the meeting that the status of implementation is in progress.
41. Mr Laoprasert informed that there had been implementation of manual traceability since year 2002. He updated on the strategies of the government of Thailand to control the farms, hatcheries as well as aquatic feeds by forms of certification and licensing programmes. It was noted that there had been implementation of processing plants control by means of certifications, inspections, product surveillance program, as well as assurance of product quality and safety compliance in lined with the criteria of Department of Fisheries (DOF) and importing countries.
42. With regards to the national activities and direction, Mr Laoprasert updated that Thailand is currently in the midst of implementation of computerised traceability system for shrimp along the supply chain, and further equipped that the inputs would be manually recorded (subjected to approval) into the system by the users. Constant improvements could be done to the system with the consultation of traceability experts from France. He also mentioned that the system would be co-maintained by the DOF of Thailand.

Viet Nam

43. Ms Nguyen Thi Minh, KPL of Viet Nam presented on the country progress of Viet Nam. It was reported that the status of implementation is in progress.
44. Ms Nguyen informed that both aquaculture farms and factories in Viet Nam are required to keep records for traceability purpose and the recall system will be reviewed at least once per year.
45. With regards to the challenges and issues faced, Ms Nguyen updated that implementation of traceability was observed to be difficult for farms that are small in scale. They are often observed to provide inaccurate records and are unsynchronised. Measures like increasing farmer's awareness about rights and obligations, as well as providing more training and technical support for extension officers who are implementing traceability were implemented in order to address these challenges.
46. Ms Nguyen updated that the future directions and activities would be targeted at the continuation of traceability implementation as well as regulation compliance of food law and requirements from import countries. She further informed that more training would be rendered to the farmers while encouraging them to apply to GAP certification.
47. To Chief of MFRD Programmes enquiry on the statement "Implementation in processing plants that has been reviewed 1 time per year" in the report, Ms Nguyen clarified that regulation compliance would be reviewed at least once per year for facilities with a traceability system in place with regards to the circular No. 03/2011/TT-BNNPTNT.

V. DISCUSSION ON 2ND ON-SITE TRAINING WORKSHOP

48. The Chairperson presented on the recommendations made at the 1st on-site training workshop in Viet Nam, 2011 to facilitate the discussion on the 2nd on-site training workshop. It was informed that visits to the smaller farms may be incorporated as many of the ASEAN member countries have small farms with basic infrastructure, and that the training could also be extended to farmers and processing plant owners. Consultants for traceability implementation in the ASEAN nations could be invited to help facilitate guidance during the training.

49. Mr Somboon Laoprasert presented on the programme for the 2nd On-site training workshop which is scheduled for 3 days. The proposed programme outline appears in Annex 3.
50. Mr Somboon Laoprasert informed that one of the lectures would be delivered by Vincent Andre who is an expert on traceability system from France.
51. There would be a site visit to a shrimp farm in Chachengsao Province to enable the participants understand more about traceability on site.
52. It was mentioned in the meeting by Ms Kingduean Somjit that it was initially planned for the visit to a bigger processing plant in Rayong / Samutsakorn but due to the distance and travelling time it was changed to another smaller processing plant in Chachengsao.
53. DD of PHTD was of the opinion that it would be more beneficial to visit the bigger processing plant for better understanding of its comprehensive traceability system.
54. Ms Kingduean Somjit suggested that it would be possible to visit the bigger plant with the extension of an additional day in the programme.
55. The Chief of MFRD programmes agreed to the extension of another day in the programme.
56. The DD, PHTD further added that it would be better for the lecturer, Mr Vincent Andre, to stay on throughout and assist the project as a facilitator in the discussion session.
57. Viet Nam enquired about the possibility of sending the training materials to the participants before the workshop. The Chief of MFRD Programmes replied that it would be possible to send abstracts or synopsis of the training content.
58. Philippines asked about the maximum participants allowed to attend for the upcoming training workshop in 2013. The Chief of MFRD Programmes replied that two participants would be invited from each country and additional participants can be considered on a case-by-case basis upon request by the country. Malaysia suggested that it may be good to have small focus group discussions during the workshop. DD of PHTD supported the suggestion as it is timely to discuss the practical solutions in addressing the challenges / issues of implementing traceability in ASEAN.

59. The Chief of MFRD Programmes thanked the Thailand participants for their presentations and arrangements for the upcoming 2nd on-site training in 2013.

VI. DISCUSSION ON THE TECHNICAL COMPILATION PUBLICATION

60. Philippines suggested for MFRD to provide the participating ASEAN member countries on the guidelines / format for the preparation of the technical report. The Chief of MFRD Programmes replied that this would be provided in due course.
61. Indonesia enquired on whether there would be arrangements made for discussions before the technical compilation. The project leader informed that the draft of the technical compilation would be presented for discussion and finalization at the EOP meeting in 2014.
62. Malaysia enquired on whether there was intention to harmonize traceability systems among the ASEAN member countries. The SEAFDEC Technical Coordinator mentioned that it might be a challenge as some countries may have already implemented certain systems while others have yet to do so.
63. The Chief of MFRD Programmes added that the project aims to establish a common understanding on the basic components / requirements of a traceability system for aquaculture products among ASEAN member countries. However, as to the actual systems to be implemented it is up to the individual countries to decide.

VII. PRESENTATION FROM GUEST SPEAKER

64. Mr Chuah Chong Hin, CEO of GenoMar South East Asia Ptd. Ltd. and a director of Trapia Malaysia Sdn. Bhd. gave a presentation on his company's experience in the application of traceability system for their marketed Tilapia products. He shared on the challenges faced and highlighted the importance of the 3S principle (Safety, Security and Sustainability). GenoMar also employs verification of origin of their aquacultured Tilapia fish through DNA verification using their patented system called Genopass™ as part of the traceability system.

VIII. SUMMARY DISCUSSION

65. The summary discussions of the project progress and updates of each participating country during the meeting were summarised and presented for any amendments and confirmation.
66. The meeting agreed that it is important for project continuity that as far as possible countries should not change the KPL at each meeting.

IX. CLOSING REMARKS AND CONCLUSION OF MEETING

67. The Chairperson delivered her closing remarks and thanked the participants for their time and efforts for the preparation of the progress reports and presentations.
68. The Chief of MFRD programmes also thanked the participants for their hard work and contributions during the meeting.
69. The seminar was held in the traditional spirit of SEAFDEC co-operation and cordiality.

Annex 1 – List of Participants

| Country | Name | Official Designation |
|-------------|---|--|
| Cambodia | Mr. Bun Chantrea (KPL) | Acting Chief of Freshwater Aquaculture Division, Department of Aquaculture Development, FiA |
| | Mr. Sok Seyha | Vice-Chief of Food Security and Nutrition Division, Department of Fisheries Post-Harvest Technologies and Quality Control, FiA |
| Indonesia | Dr. Reza Shah Pahlevi (KPL) | Head of Sub Directorate of Residu Control Directorate General of Aquaculture, MMAF |
| | Sri Hartini Krisdianasari | Head of Quality Management of Post-Harvest Production Sub Division |
| Lao PDR | Ms. Dongdavanh Sibounthong (KPL) | Head of Fishery Resource Management Section, Fishery Division, Department of Livestock and Fishery |
| | Mr. Oudone Khounsavan | Fishing Officer of Division of Fishery , Department of Livestock and Fishery |
| Malaysia | Mr. Mohd. Ghazali bin Abdul.manap | Head, Audit and Certification Section, Department of Fisheries Malaysia |
| | Mr. Liew Vui Kien | Fisheries Officer of Aquaculture Development Division, Department of Fisheries, Perak, Malaysia |
| Myanmar | Mrs. Aye Aye Thein (KPL) | Fishery Officer, Head of Freshwater Research Section, Aquaculture Division, Department of Fisheries, Myanmar |
| | Ms. May Thanda Wint | Fishery Officer of Department of Fisheries, Myanmar |
| Philippines | Ms. Somga, Sonia Sebastian (KPL) | Senior Aquaculturist Fish Health Management and Quality Assurance Section (FHMQAS) |
| | Ms. Lumingkit, Evie Daroy | OIC, Regional Fish Health Laboratory/Regional Fish Health Officer/Senior Aquaculturist (BFAR 10) |
| Singapore | Mr. Tan Yit Wee | Senior Executive Manager of Aquaculture Technology Division, Technology & Industry Development Department, Agri-Food and Veterinary Authority of Singapore (AVA) |
| Thailand | Mr. Somboon Laoprasert (KPL) | Fishery Biologist, Senior Professional Level, Marine Shrimp Culture Research and Development Institute, Coastal Fisheries Research and Development Bureau |
| | Ms. Kingduean Somjit | Food Technologist, Professional Level, Fish Inspection and Quality Control Division |
| Viet Nam | Ms. Nguyen Thi Minh (KPL) | Officer of Department Aquaculture, Fisheries Administration, MB |
| | Ms. Nguyen Thi Hong Nhung | Officer of Department of Science, Technology and International Cooperation, Fisheries Administration, MB |

Annex 2 – Agenda

7 November 2012, Wednesday (Day 1)

| | |
|-------------|---|
| 0830 – 0900 | Registration |
| 900 – 0930 | Opening of the Meeting <ul style="list-style-type: none"> • Welcome remarks by the Chief of MFRD Programmes • Opening Address by Deputy Director of PHTD/TIDD • Introduction and Adoption of Agenda |
| 0930 – 1000 | Coffee Break and Group Photograph |
| 1000 – 1200 | Country Progress Report Presentation <i>(Presentation: 20 mins; Q&A: 10 mins)</i> <ul style="list-style-type: none"> 1000 – 1030: Brunei 1030 – 1100: Cambodia 1100 – 1130: Indonesia 1130 – 1200: Lao PDR |
| 1200 – 1330 | Welcome Lunch at Hotel |
| 1330 – 1500 | Country Progress Report Presentation (Cont.) <i>(Presentation: 20 mins; Q&A: 10 mins)</i> <ul style="list-style-type: none"> 1330 – 1400: Malaysia 1400 – 1430: Myanmar 1430 – 1500: Philippines |
| 1500 – 1530 | Coffee Break |
| 1530 – 1700 | Country Progress Report Presentation (Cont.) <i>(Presentation: 20 mins; Q&A: 10 mins)</i> <ul style="list-style-type: none"> 1530 – 1600: Singapore 1600 – 1630: Thailand 1630 – 1700: Viet Nam |

End of Day 1

8 November 2012, Thursday (Day 2)

| | |
|-------------|---|
| 0900 - 1030 | Discussion on Future Project Activities <ul style="list-style-type: none"> • On-site Training in 2013 • Technical Compilation |
| 1030 – 1100 | Coffee Break |
| 1100 – 1200 | Presentation from Guest Speaker <i>(Presentation: 40 mins; Q&A: 20 mins)</i> |
| 1200 – 1330 | Lunch Break |
| 1330 – 1500 | Summary Discussion |
| 1500 – 1530 | Final Remarks and Closing of Meeting |
| | Coffee Break |

~ END ~

Annex 3 – Proposed Programme Outline for 2nd On-site Training at Thailand 2013**2nd On-site Training Workshop on Traceability****Thailand****November 2013**

| Date | Day | Morning | | Afternoon |
|------|-----|--|---|---|
| | | 08.00-09.00 | 09.00 – 12.00 | 13.00 – 16.00 |
| 1 | | - | Arrival to BKK | |
| 2 | | Welcome and opening ceremony (30 min) (DOF DG) | Lec : General and Technical Requirement for Traceability | Lec: ThaiTraceShrimp Introduction Prac: TraceShrimp Programme |
| 3 | | Trip to Chachengsao Province | Visit: Chachengsao Coastal Research and Development Center for Manual Documentation Traceability (MD : Movement Document) | Trip to Rayong or Samutsakorn Province for visit Traceability in Processing Plant |
| 4 | | - | Departure | |

Annex 4: Summary Discussions

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|--|--|---|--|--|
| Cambodia | Status: Pending implementation | <ul style="list-style-type: none"> • Farmers tend to follow after the practices of other farmers • Local processing of products follow traditional methods which makes tracing challenging • Poor quality of fish feed resulting in poor fish growth • Heavy reliance on neighbouring countries for shrimp post larvae due to poor local production capacity and quality • Limited Human resource • Needs more time for Training/ Capability building/ Establishing knowledge of workers on GAP and traceability | <ul style="list-style-type: none"> • Query by MFRD on GAP guidelines: GAP guidelines have been enacted by the government in Oct 2012 • Drafting of Traceability guidelines by Fisheries Administration is in progress, pending initiation by government at ministerial level. | <ul style="list-style-type: none"> • Aims to adopt strategies and extension for GAP/ HACCP and traceability | <p>1) Query by Philippines on how Cambodia tracks product along supply chain for product export to USA:</p> <ul style="list-style-type: none"> • Works with CAM control department of Ministry of Commerce to apply for certification which meets standards of exporting country <p>2) Query by MFRD on expected challenges when enforcing GAP on small and fragmented farms</p> <ul style="list-style-type: none"> • Challenge is on how to maintain quality of seed, feed based on market demand • Capability building of Postharvest and aquaculture development department. |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|------------------|---|--|--|---|--|
| Indonesia | <p>Status: Implementation in progress</p> <p>Reference to International standards, e.g. Japan Food Sanitation Law, FDA Food Safety Modernization Act 2011, European Union: Mandatory Traceability found in "General Food Law", CODEX and ISO standards for traceability (With reference to this)</p> <p>Presence of Local regulations:</p> <ul style="list-style-type: none"> Ministry of Marine Affairs and Regulation..Chapter 3: Traceability for Business Operator Fisheries Law Ministerial Regulations and Decrees for control of food safety and quality, residue monitoring and GAP Most big aquaculture establishments / processors have established relationships with the suppliers and keep traceability records from hatchery to | <ul style="list-style-type: none"> Numerous parties along the supply chain <ul style="list-style-type: none"> Limited ability to assess fishery product quality and implement traceability to meet international standards/ requirement for export at farm and middlemen level. More handling along the supply chain which increases risk of contamination Supplier / Middleman collects small amounts from each fish farmer (can be as small as 6 tonnes), which makes traceability recording challenging. Need stronger commitment by industry and government for implementing traceability systems <ul style="list-style-type: none"> Capacity and capability building of laboratories for testing chemicals and drugs Training the industries e.g. HACCP inspectors and laboratory analysts | <ul style="list-style-type: none"> Improved organization structure of Competent Authority in yr 2011 Sampling map – each province is tagged with a code number (number of samples to be withdrawn every year for sampling in the NRCP) <p>Training workshops have been conducted (supported by Japan and Netherlands and Food reg Malaysia)</p> <ul style="list-style-type: none"> For quality and safety of fishery products Fish processing and value added product NRCP implementation Value capture fisheries Pilot project of shrimp culture product traceability 2011 – Difficult to implement. | <ul style="list-style-type: none"> To Amend regulations on Quality & Safety assurance systems Improving government controls, e.g. inspection, certification for HACCP, etc) Improve NRCP implementation, to include walking catfish in 2013 Continue capacity and capability building of inspectors and analysts Only one provinces (East Java) have local softwares for traceability systems. MMAF will attempt to develop the model of the Traceability system based on this software, for Jakarta to consolidate data from all provinces. | <p><u>Query by Thailand:</u> <u>What is the scale of mini plants?</u></p> <ul style="list-style-type: none"> Mini plants: Collected and processed in processing plants with freezing facilities of the products are gathered by fish collectors for export <p><u>Query by MFRD on any government initiatives:</u></p> <ul style="list-style-type: none"> Traceability is implemented on voluntary basis. However, trainings and workshops are conducted or under planning to improve knowledge of industry on traceability. However, it may be challenging to build capacity of technology for quality assurance. Main focus is to control residues for products meant for export |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|------------------|--|---|---|---|---|
| Indonesia | <p>production to processing stages either through paper, simple code, barcode, log book and computer / electronic base</p> <ul style="list-style-type: none"> • Other big processing units only have certain data one stage before and after • SME processors apply with simple code in the packaging • Only a few farmers and suppliers of fish have some proper recording for traceability • Encourage implementation of GAP and GHdp and NRCP (national residue control programs) at farms on voluntary basis to support traceability • Encourage GHdp (good hatcheries) at supplier / middleman • Encourage HACCP at processing plants | <p>– Awareness building of all stakeholders</p> | <p>Other National programmes:</p> <ul style="list-style-type: none"> • EU-RI trade support programmes- trainings for HACCP, Lab management (ISO), workshops and seminars, TSP II (2012-2014:Laboratory equipment) • Developing traceability systems on Indonesian Aquaculture Shrimp Product by local or national consultant. | | <p><u>Query by Philippines:</u> <u>How many laboratories does Indonesia have?</u></p> <ul style="list-style-type: none"> • Validated and accredited laboratories - 3 private, 7 government laboratories (however, this is not sufficient to support the great number of samples, which delays the generation of results which should be out within 10 days) <p><u>Query by Philippines:</u> <u>Are they controlling / auditing the private laboratories?</u></p> <ul style="list-style-type: none"> • Auditing is done on these NRCP Laboratories on regular basis (by agency of Quarantine and food safety and quality control). |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|----------------|--|---|---|---|---|
| Lao PDR | Status: Pending implementation | <ul style="list-style-type: none"> • Poor storage methods • Aquaculture sector not fully developed • No specific regulation on traceability of aquaculture products • Lack of certification system for aqua culture products • Only general inspection by livestock and veterinary authority and department of food and drug only • Lack of relevant knowledge and experience • Lack of laboratory • Need to register all farms • Need to develop specific regulation arising from recent participation in WTO and ASEAN community | <ul style="list-style-type: none"> • 3 points of inspection: (in farm or fish culture group; in market; and in border trade) • Requested for permit registration of fish farm under household level and commercial level • Uses border trade for international inspection point at the point of import | <ul style="list-style-type: none"> • Develop technical standards on food safety for aquaculture products to supply domestic market and future export • Improve knowledge and technical capacity • Necessary to have training course on traceability system for aquaculture products • Sharing of information, experiences amongst ASEAN members on application of traceability systems for the aquaculture products • Initiation promote and application of traceability systems for aquaculture products in Lao PDR | <p><u>Query by Myanmar: how to check formalin in the lab inspection?</u></p> <ul style="list-style-type: none"> • analyse the feed for fish only, and send to control lab for testing <p><u>Query by MFRD on future activities on food safety and traceability issues by government:</u></p> <ul style="list-style-type: none"> • Drafting out project proposal for future activity and annual budget allocation. |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|--|---|---|---|---|
| Malaysia | <p>Status: Implementation in progress</p> <p><u>GAqP</u></p> <p>Since 2004, traceability is introduced as part of the GAqP (Good Aquaculture Practice) at farm level. GAqP is implemented voluntarily</p> <p>Establish new regulation for aquaculture product (inland fisheries regulation)</p> <p><u>Aquaculture certification</u></p> <p>For food safety. Traceability is included.</p> <p><u>Aquaculture incentive</u></p> <p>For food security. Government reimburse some amount for per kg of production. Records have to be kept</p> <p><u>Pilot project for traceability</u> covering livestock, agriculture and aquaculture → unsuccessful</p> | <ul style="list-style-type: none"> • Small scale farmers with low production and low level of education • Many middlemen / collectors are involved along the supply chain but there is much market secrecy involved to protect their source • Lack of public awareness. Lack of information from exporter association with regards to shrimp product exports | <ul style="list-style-type: none"> • To facilitate shrimp export to USA, DOF conducted road show to interested stakeholders, and introduce traceability forms • <u>Web based system</u> Developing e-Biosecurity system (for applying export certification). End of 2012, the paper based system will be replaced with this web based system. • GAP Campaigns • Exhibitions, Farmer's day • Conducted Range of outreach program for traceability document and DS2031 (2011) • Start using of BPDJ01 form since 2011 for shrimp. • Strengthening the system through internal audit annually. • Providence of standard guidelines in SOP for using the traceability forms. | <ul style="list-style-type: none"> • Improving e-Biosecurity system • Make traceability form as mandatory for fishery product export (including live fishes) • Promoting to the state government for adoption of the inland fisheries regulations through discussion with the state legal advisor. | <p>Query by Thailand on <u>transparency of inventory keeping of the traceability system</u></p> <ul style="list-style-type: none"> • Farmers need to know their buyers and fill necessary information into traceability form |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|---|---|--|--|--|
| Malaysia | <p><u>Export requirement:</u> Farmers, transporter, processor need to fill in Traceability form, BP-DJ01</p> <ul style="list-style-type: none"> Food safety systems are strengthened for export purposes <ul style="list-style-type: none"> Compulsory farm certification for export to EU (farm registration, GAqP auditing), Fish quality certificate ARMP (Aquaculture residue monitoring) | | | | |
| Myanmar | <p>Status: Implementation in progress</p> <ul style="list-style-type: none"> Implemented internal and external traceability systems as well as recall procedures in the aquaculture farm and exports respectively. Have in place record keeping systems, production system traceability, pest system traceability, pest and disease traceability. Registration for fishing vessels | <ul style="list-style-type: none"> Imported feed and in-country production need to be registered at DoF Before distribution, need to control the quality and safety of aquatic feed by CA Weakness of record keeping for water quality monitoring data Weakness of record keeping for feeding Weakness of record keeping for used of veterinary drugs and chemical in aquaculture purposes | <ul style="list-style-type: none"> Ongoing activity to establish national residue monitoring plan aquaculture EU Directive 96/23/EC 13 processing plants approved by EU and applied HACCP system (additional implementation of ISO 22000 and ISO14000 system in some processing plant) | <p><u>Food safety management:</u></p> <ul style="list-style-type: none"> ASEAN-SEAFDEC Action plan for sustainable development in fisheries sector (2020) To reduce and eliminate drug residues in culture fish and shrimp by National Residues Monitoring Program Control the import and use of drugs. Improve all farms/hatcheries to at least meet GAP. | <p>Ongoing measures for monitoring and controlling residues for products to export to EU</p> |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|----------------|--|--|--|--|-------------------------|
| Myanmar | <ul style="list-style-type: none"> • Licensing for foreign fishing vessels • FAO issued the code of conduct for responsible fisheries in Myanmar in 1995 • EU commission regulation (EC) No. 178/2002 was forced on Myanmar on 1 January 2005 • Myanmar GAQP started the GAQP certification under the responsibility of department of fisheries • Have a GAQP standard for fish / shrimp farm | <ul style="list-style-type: none"> • Need to increase knowledge awareness and to comply with GAQP guideline • Central market, buyers / sellers applied FMD and MD • Mixing of shrimp from various farms at central markets • Legal frame for business (Registration, licensing): all fisheries activities such as fishing, farming processing should be registered at DoF. • Standard and others technical requirements have to depend on and comply to importing countries requirements (EU, China), especially food safety management systems (GMP/HACCP) | <ul style="list-style-type: none"> • Participated in combating IUU- Had an EU assessment mission on 25 July 2011-5 August 2011 to assess DOF IUU catch certification system and current status of implementation of 1005/2008 (Myanmar export wild catch fishery products to EU from 13 processing establishments since 2010) | <ul style="list-style-type: none"> • 1549.2 hectares have to be certified for GAP, the use of Fry Movement Document (FMD) and Movement Document (MD) that were introduced. • Drug residues determination in feeds, fry and shrimp products | |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|--------------------|---|--|--|---|--|
| Philippines | <p>Status: Implementation in progress</p> <ul style="list-style-type: none"> Generally, traceability of “one step-up and one-step down” can be demonstrated along the aquaculture supply chain for those farms that directly supply to the processing plants. Various food safety programs are followed for the purpose of export, e.g. by FAO, Fisheries Officer Order, etc. The implementation of traceability depends much on regulatory requirement intended market. <p>Documents for traceability records are in paper-based.</p> <ul style="list-style-type: none"> Level of traceability varies in every stage of the supply chain and the size of establishment | <p>Small scale aquaculture farmers have constraints in the documentation and record keeping</p> <ul style="list-style-type: none"> Aimed to be assisted by GAqP (final document for approval) One of its output is the forms to be provided to farmers for them to fill-up accordingly for harmonized recording accessible to farm inspectors for validation. <p>Weak traceability system at the auction market</p> <ul style="list-style-type: none"> harvest from small scale farms, which has inadequate traceability data records There is a need to strengthen the registration program of BFAR for the auction market. | <ul style="list-style-type: none"> Registration program has recently been implemented to achieve hygiene and traceability requirements. Implementation of National Residue Monitoring Program The Philippine GAqP was developed in 2010 through the assistance of the EU Trade Related Technical Assistance Trainings on GAqP implementation will be conducted for the extension officers and farmers. | <ul style="list-style-type: none"> Continue training of fish health officers to update knowledge and harmonize activities on traceability. EU TRTA3 programme to develop certification programme for some commodities, to cover traceability aspect. Scheduling of training of extension officers for GAP on 1st quarter of 2013 | <p><u>Queries by Indonesia:</u></p> <p><u>Antibiotics in feed and detection methods?</u></p> <ul style="list-style-type: none"> Government tested feed to be positive for antibiotics. Visits to feed millers proved the case, so tonnes of feed were destroyed. Since 2007, no problems with aquaculture feeds as corrective actions were done <p><u>Residue testing in hatcheries?</u></p> <ul style="list-style-type: none"> Only for organic aquaculture farming because shrimp fry is too low in weight to allow substantial amounts for testing, so testing is done at adult stage |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|--------------------|---|---|---|---|-------------------------|
| Philippines | <p><u>Feed, Hatchery, Farms, Auction markets and Processing plants:</u></p> <ul style="list-style-type: none"> Records on: <ul style="list-style-type: none"> Source of Broodstock/ Harvest time Feeding and management practices List of suppliers and buyers Name of farm/ Reg no. Lot no./ Batch no. Purchase receipt/ Sales Invoice/ delivery receipts Etc. Bigger farms keep detailed records of farm management practices Farm registration scheme Feedmills as source of feeds of the registered farms are also monitored and sampled for banned antibiotic and aflatoxin analysis BFAR laboratory acquired accreditation Drafting Fisheries Administrative Order on Inspection and Certification (farm-to-fork) | | | | |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|--------------------|--|---|---|---|-------------------------|
| Philippines | <p>Relevant food safety and quality programs</p> <ul style="list-style-type: none"> • BFAR Fish Inspection Unit started to implement a voluntary registration system for auction market in 2010 based on HACCP principles • GAQP is voluntary • Processing plants are required to have recall procedures, and GMP / SSOP program and HACCP plan. • Health Certificate • Hatchery Accreditation by BFAR as part of national residue monitoring program No. • Shrimp Fry Source Certificate • Grow-out Farm Certificate • Monitoring of feedmills by BFAR as part of National residue monitoring program | | | | |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|------------------|---|---|---|---|--|
| Singapore | <p>Status: Implementation in progress</p> <ul style="list-style-type: none"> • Implementation of good management practice on fish and facilities (e.g. fish health management; documenting protocols and keeping records) • Regular surveillance monitoring on pesticides/ antibiotics / any other harmful materials • Currently, encourage the usage of dried pellet feeds as it can be traced back to its source upon import into SG by AVA. • Encourages fingerlings as feed to maintain quality consistency | <ul style="list-style-type: none"> • Cost of implementing • Changing mindset of farmers about implementation costs, feed means, benefits of record keeping • Slow uptake of utilising dry pellet feeds instead of trash fish (but is on the increasing trend) • Keeping physical records (movement of fish stock and treatments etc) • Product differentiation in market • Singapore being a small aquaculture producer | <ul style="list-style-type: none"> • Assisted in implementing traceability in a SG marine fish hatchery • Farming of local fishes (SG Fish) - initial stage of product differentiation and some form of traceability implemented | <ul style="list-style-type: none"> • Sending officers for training on GAP. • GAP still in pipeline (encompassing farm structure and maintenance; farm management; farming and packaging practices; fish health management; farm environment; human health and safety at work) | Currently, a few farms have already expressed interest in the scheme |
| Thailand | <p>Status: Implementation in progress</p> <p>Manual Traceability started 2002</p> <ul style="list-style-type: none"> • Fry Movement Document Hatchery → Farm • Movement Document Farm → Processing Plant | | <p>Implementation of Computerized traceability for Shrimp along supply chain (started last two months, and complete in April 2013)</p> <ul style="list-style-type: none"> – Feed – Hatchery – Nursery – Grow-out farm – Distributor – Processor – importer | <p>Improving the computerized traceability system with consultation of France expert</p> <p>System requires further inputs, e.g. data from DOF on number of registered farms.</p> | |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|---|---|--|---|-------------------------|
| Thailand | <p>Strategies to control farm and hatcheries:</p> <ul style="list-style-type: none"> • Aquatic farms and hatcheries registration • Farm and hatcheries certification program (GAP, CoC) • DOF Certification Body are accredited for ISO / IEC Guide 65 • Sampling of shrimp / fry and feeds for antibiotic / drugs / dyes analysis <p>Strategies to control aquatic feeds</p> <ul style="list-style-type: none"> • Register and issue licenses GMP/HACCP Certification • Control illegal use of drugs in feeds <p>Control at processing plant:</p> <ul style="list-style-type: none"> • HACCP / GMP certified – mandatory since 1996 • Plant inspection carried out by Fish inspection and Quality control division which is accredited for ISO / IEC 17020 | | <ul style="list-style-type: none"> • Inputs of computerized traceability will be manually recorded into system by the users. Information must be from approved MD | | |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|--|---|---|---|-------------------------|
| Thailand | <p>Product surveillance Program</p> <ul style="list-style-type: none"> • Sampling and testing by laboratories of Fish Inspection and Quality Control Division (FIQD) which are accredited for ISO / IEC 17025 <p>Certification systems in place</p> <ul style="list-style-type: none"> • Movement Documents required • Ensuring compliance of product quality and safety with DOF criteria and importing countries • On-line Health Certificates available • Certification unit is accredited for ISO / IEC 17020 | | | | |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|--|--|--|---|--|
| Viet Nam | <p>Status: Implementation in progress</p> <ul style="list-style-type: none"> (in both factories and farms) Environment management; feed, chemical and antibiotic; seed; harvest; labour; and animal health are the general information required to be recorded in aquaculture area for traceability New ban of use antibiotics in aquaculture Requires facilities to establish traceability system based on circular no. 03/2011/TT-BNNPTNT dated 21/01/2011: Regulation on traceability and recall of unsafe products in fishery sector. According to actual situation of establishment, traceability and recall system will be required to be reviewed and amended at least 1 time per year. | <ul style="list-style-type: none"> Difficult to implement traceability to some small-scale farms, inaccurate records information provided in some cases, unsynchronised infrastructures at some places, change of farm owner but not report to authorities To address the issues and challenges by: <ul style="list-style-type: none"> increasing awareness of farmers about rights and obligations for aquaculture production activities more training for officials for knowledge of origin support officials working on traceability (especially those at remote areas and scattered farming areas) regularly update the market requirements need the support of other countries to learn about origin of products in aquaculture | <ul style="list-style-type: none"> Implement national development of strategies of fisheries to 2020. Continue implementing the national monitoring programmes for certain harmful substances and residues in thereof in aquaculture area. Other activities for food security and safety. | <ul style="list-style-type: none"> Continue with the implementation of traceability system for safe products To provide more training for farmers about regulations related to sanitary and food safety Encourage farmers to apply GAP Vietnamese regulations to continue complying with regulations of EU, FAO, American food law and requirements from import countries | <p>Query by MFRD on updates on implementation of traceability in processing plants that has been reviewed at least 1 time per year:</p> <ul style="list-style-type: none"> Traceability system of facilities has to be reviewed with compliance to the regulation at least once a year, following the circular No.03/2011/TT-BNNPTNT. |

| Country | Updates on implementation status (e.g. any improvements, how many farms, milestones) | Issues and challenges, and how they are addressed | National activities/ programmes conducted, including trainings (no. of activities, elaboration of activities) | Future activities/ programmes/ directions | Other comments/ remarks |
|-----------------|--|---|---|---|-------------------------|
| Viet Nam | <ul style="list-style-type: none"> Circular No.48/2012/ TT-BNNPTNT dated 26/9/2012: Regulation on certification of fisheries products, farming, livestock produced, prepared in accordance with process of GAP emphasizes on social responsibility, safety and health of workers as well as the socialisation of NGOs implementing GAP certification when organizations are accepted by the Ministry of Agriculture | | | | |

Annex 3

JAPANESE TRUST FUND V TRACEABILITY SYSTEMS FOR THE AQUACULTURE PRODUCTS IN THE ASEAN REGION

SECOND ON-SITE REGIONAL TRAINING WORKSHOP ON TRACEABILITY BANGKOK, THAILAND

5-7 November 2013

Technical Report

I. INTRODUCTION

The SEAFDEC Marine Fisheries Research Department (MFRD), the Japanese Trust Fund V second On-Site Regional Training Workshop on “Traceability Systems for Aquaculture Products in ASEAN Region” was held from 5-7 November 2013 in Bangkok, Thailand.

The meeting was attended by representatives from SEAFDEC member countries, one resource speaker from Thailand, organizing committee which comprised of staffs from Post-Harvest Technology Department, PHTD, of Agri-Food and Veterinary Authority of Singapore, which is the collaborating centre for SEAFDEC/MFRD; Deputy Secretary-General, Mr Hajime Kawamura, SEAFDEC Assistant Trust Fund Manager, Mr Hidenao Watanabe, as well as SEAFDEC Technical Coordinator, Mr Tadahiro Kawata.

The resource speaker, Mr Vincent Andre, was invited to give lectures on “General and Specific requirements to Traceability in fishery value chain”, “Demonstration of ThaiTraceShrimp System”, and “Development and Implementation of Traceability System for Aquaculture”. A total of 20 participants from 10 ASEAN countries (Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam) attended the on-site training. The attendees are listed in Annex 1.

The Provisional Agenda of 2nd Onsite Regional Training Workshop included two breakout sessions (prior and post field visits respectively) and site visits to Chachengsao Coastal Research and Development Center, Department of Fishery of Thailand for Movement Documentation and Fry Movement Documentation Traceability, Charoen Pokphand Foods (CP) Private Shrimp Farm in Chachengsao province and CP processing plant in Samutsakorn Province. The complete Provisional Agenda is attached in Annex 2.

II. OPENING OF THE MEETING AND PROJECT INTRODUCTION BY THE MARINE FISHERIES RESEARCH DEPARTMENT

Mr Yeap Soon Eong (Chief of MFRD Programmes) delivered the welcome speech to the participants. Mr Hajime Kawamura (Deputy Secretary-General, SEAFDEC) delivered his opening remarks to the participants.

The on-site training was conducted with the objective of studying the aquaculture traceability system of the participating country as well as to providing a platform for the sharing of information and experiences among ASEAN / SEAFDEC member

countries on implementation of traceability systems for aquaculture supply chain (e.g. farm and processing plant) in the region, to enable the regional aquaculture industries to strive to meet better requirements in the network of aquaculture production, marketing and trade through the implementation of traceability systems for the aquaculture products.

The 1st on-site regional training workshop was conducted in Viet Nam from 28-30 November 2011 focusing on aquaculture fish. This 2nd on-site regional training workshop in Thailand focuses on aquaculture shrimp, and the project activities include having lectures to provide an overview of traceability in aquaculture industry, site visit to Chachengsao Coastal Research and Development Center, aquaculture shrimp farm and shrimp processing establishment, breakout sessions to discuss the general supply chain flow chart and traceability challenges, requirements, processes and systems for aquaculture shrimp in ASEAN region, as well as for groups to share the points of discussion arising from the breakout session. The points of discussion are intended to act as the basis for drafting a set of harmonized traceability guidelines to encourage and promote the implementation of traceability systems for aquaculture products in the region.

Ms Felicia Loh, the project leader and Chairperson of the meeting (Scientist of the Supply Chain Section, Post-Harvest Technology Department, PHTD, AVA) presented the Provisional Agenda of the meeting for discussion and adoption. The agenda appears in Annex 2.

The meeting was informed that PHTD/ AVA would be responsible for the implementation of this project under the MFRD programme of SEAFDEC and would manage and coordinate all project activities. The project overview, which included project background and rationale, project objectives and proposed project activities were presented by the Chairperson for the benefit of the meeting’s participants.

III. PRESENTATION ON OVERVIEW OF TRACEABILITY IN AQUACULTURE INDUSTRY

Mr. Vincent Andre, AETS representative in Thailand, presented on the topics of “General and Specific requirements to Traceability in fishery value chain”, “Demonstration of ThaiTraceShrimp System”, and “Development and Implementation of Traceability System for Aquaculture”.

Mrs Nguyen enquired if Department of Fisheries (DOF) is responsible for auditing the TraceShrimp online system and ensuring information accuracy. Mr. Vincent responded that the website is commercially driven and relies on the commercial companies to

provide accurate data, which was built by trust. He added that the system is useful as it provides traceability information such as the source and quantity of the product and its raw materials. He explained that TraceShrimp does not keep track of food safety information such as health certificate and DOF only acts as the administrator of the system but does not verify the information, audit or use TraceShrimp as a food safety control system. Audit of this Traceshimp system would usually be covered by an external private party.

On Dr Reza's query on why DOF is hosting the system, Mr Vincent shared that DOF acts as a neutral party to host the system to keep commercial information private and confidential to unauthorized users.

Ms Somga queried about how information that could be transferred between the farm and processing plant stages as captured by the TraceShrimp system. Mr. Vincent responded that all distributors (including farmers) are registered under DOF and audited yearly, and besides TraceShrimp, information is recorded in the movement documents issued by DOF which is captured under TraceShrimp Programme.

Mr Ghazali enquired if TraceShrimp is useful for recalling products, and queried why Thailand has not considered integrating the TraceShrimp system with the food authority's control system. Mr. Vincent opined that the system may be used as a tool to track the movement of products along the supply chain and could be potentially be beneficial for recalling products. Mr Vincent shared that DOF is in the midst of establishing a computerized control system for the documentation of farm registration, instead of paper documentation.

IV. BREAKOUT SESSION 1 – DISCUSSION ON AND PRACTISING THE PROCESS OF ESTABLISHING TRACEABILITY SYSTEM FOR SELECTED PRODUCT

A breakout session was facilitated by Mr. Vincent Andre for participants to discuss and practise the process of establishing traceability system for

products of their choice, with the depicted steps: 1) Identifying product, 2) Generating supply chain flow chart, 3) Identifying information to be generated at each step of the supply chain, 4) Identifying the data to be transferred between steps and 5) Identifying the documents to keep, and duration for keeping. Participants are divided into three groups as follows for the discussion:

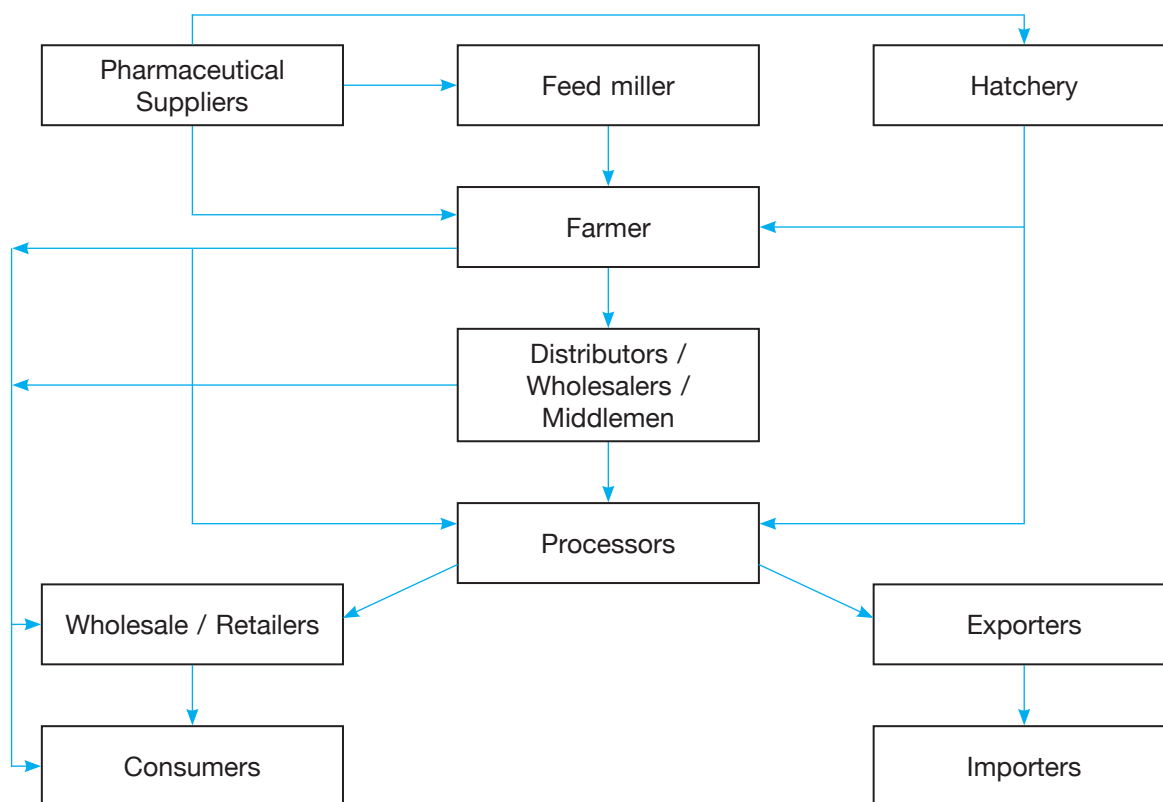
Table 1: Listing of group arrangement for breakout session 1 & 2.

| Group No. | Name of Delegate/ Country |
|-----------|--|
| 1 | i. Mrs. Aqilah Junaidi / Brunei ii. Mr. <u>Net</u> Chantha / Cambodia iii. Mr. Nasrul Efendi Hasibuan / Indonesia iv. Mr. Mohd. Ghazali Bin <u>Abdul Manap</u> / Malaysia v. Ms. Ligaya P. Cabrera / Philippines vi. Mrs. Nguyen Thi Bang Tam / Viet Nam vii. Mr. Somboon <u>Laoprasert</u> / Thailand |
| 2 | i. Mrs. Wanidawati Tamat / Brunei ii. Dr. Reza Shah Pahlevi / Indonesia iii. Mr. Souksakhone <u>Chanthaphone</u> / Lao PDR iv. Mrs. Aye Aye <u>Thein</u> / Myanmar v. Ms. Carolina C. Lopez / Philippines vi. Mr. Nguyen Thanh Binh / Viet Nam vii. Ms. Proyrat Chaowajaroenpong / Thailand |
| 3 | i. Mr. <u>Bun</u> Chantrea / Cambodia ii. Mr. Oudone <u>Khounsavan</u> / Lao PDR iii. Mr. Matlan Bin Thaufeck / Malaysia iv. Mrs. Khaing Khaing Oo / Myanmar v. Ms. <u>Somga</u> , Sonia Sebastian / Philippines vi. Mr. <u>Tan</u> Yit Wee / Singapore |

The groups presented on their points of discussion as shown below:

Group 1

Flow Diagram on Traceability for frozen shrimp (1st breakout)



Group 1 - Breakout Session 1

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping | | |
|--|--|--|--|--|---|
| Feedmiller | <ul style="list-style-type: none">• Name of feed miller• Name of retailer• Address• Telephone number / Fax• Registration certificate number (from the right authority)• Reference number• Date registered• Feed types<ul style="list-style-type: none">- Fry-mash- Grown pellets• Batch number• Lot number• Date manifested• Feed ingredients• List of ingredients• Date procured <table border="1"><tr><td>Imported</td></tr><tr><td>1. Soy bean 2. Fish meal 3. Vitamin (c, etc)</td></tr></table> <ul style="list-style-type: none">• Ingredients<ul style="list-style-type: none">- Soy bean- Fish meal- Vitamin (c, etc)- Feeds produced- Feed client- Feed quantity | Imported | 1. Soy bean 2. Fish meal 3. Vitamin (c, etc) | <ul style="list-style-type: none">• Name of feed miller• Address of the feed miller• Tel / fax• Mobile number• Regulatory certificate• Date of production• Expiration date• Lot number• Batch number• Ingredients | <ul style="list-style-type: none">• Name of feed miller• Address• Tel / fax• Mobile number• Registration number• Business permit<ul style="list-style-type: none">- Date of efficiency- Date of expiration• SEC<ul style="list-style-type: none">- Registration permit / feed type- Results of analysis / raw materials |
| Imported | | | | | |
| 1. Soy bean 2. Fish meal 3. Vitamin (c, etc) | | | | | |
| Farm | <ul style="list-style-type: none">• Name of farmers and registration number• Address of farmers• Contact numbers• Source of fry<ul style="list-style-type: none">- Name of hatchery and registration number- Address of hatchery- Number of fry supply / survival rate (%)- Date of supply- Certificate (date of expiry), Certification Body- Stocking round number- Date of supply and quantity number | <ul style="list-style-type: none">• Date of stocking• Date of harvesting• Antibiotic usage<ul style="list-style-type: none">- Date of use- Type of antibiotic• Type of harvest (partially / fully)• Overall weight : _____ kg• Pcs / kg weight: _____ pcs / kg• Mortality record• Number of pond | <ul style="list-style-type: none">• Invoice<ul style="list-style-type: none">- Date of harvest- Quantity- Price- Weight in pcs / kg• Number of pond• Individual boxes label• Source of ice- Supply of ice• Sampling record / Laboratory analysis report• 3 years for keeping record | | |

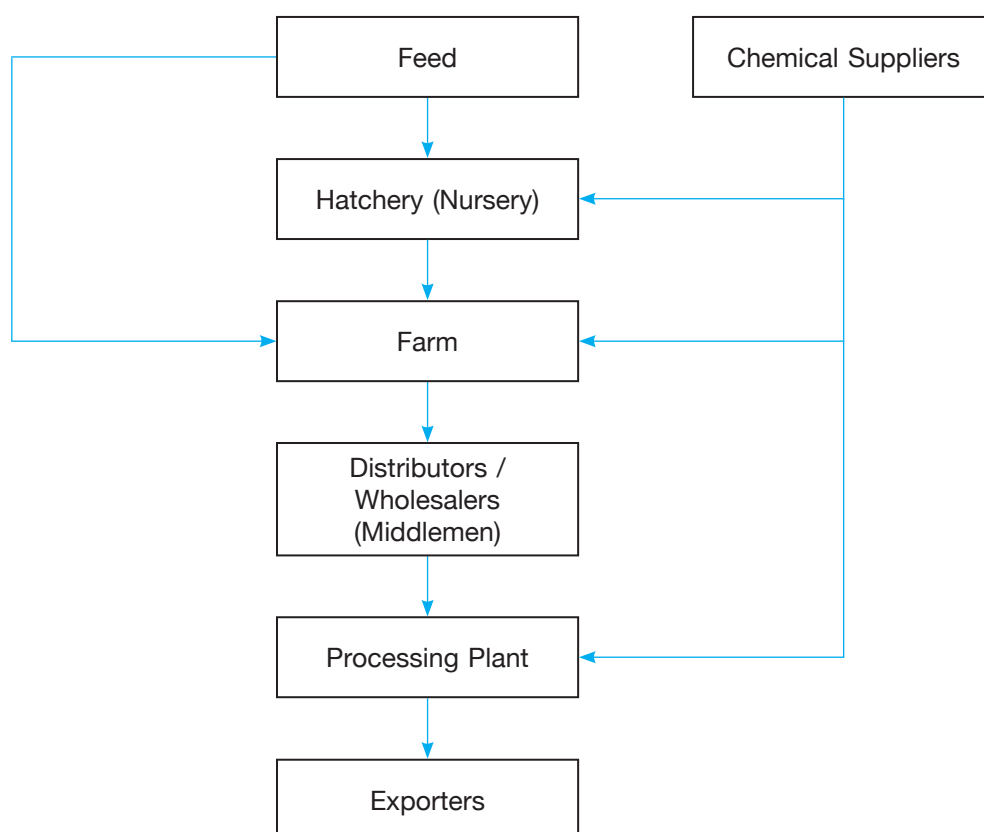
| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|----------|---|---|--|
| Farm | <ul style="list-style-type: none"> • Source of feed <ul style="list-style-type: none"> - Name of feed miller and registration number - Address of feed miller - Lot / batch number / product code - Supply date - Certification (date of expiry) • Culture activities <ul style="list-style-type: none"> - Pond number (stocking density) - Date of stocking - Date of harvesting - Medicine used <ol style="list-style-type: none"> 1. Date used and date of expiry 2. Type of antibiotic and its dosage 3. Source of antibiotic supplier - Mortality record (% death / day) - Weight (pcs / kg and overall weight) - Harvest application (full / partially) - Capacity of production • List of buyers <ul style="list-style-type: none"> - Distributor / collector / Middle-man - Production / Factory - Wholesale / Retailer | | |
| Hatchery | <ul style="list-style-type: none"> • Hatchery name • Address • Telephone / fax • Source of brood stock • Stocking density • Lot number <ul style="list-style-type: none"> - Hatching date (Batch number) • Feed <ul style="list-style-type: none"> - Artemia / rotifer (pellets) • Water quality parameters - Temperature etc • List of farmers • Farmers' address • Health certificate (lab analysis) <ul style="list-style-type: none"> - Fish free from any disease • Quantity supplied in pcs / kg • Delivery date • GAP • List of chemicals used | <ul style="list-style-type: none"> • Lot number <ul style="list-style-type: none"> - Hatching date (Batch number) • Quantity supplied in pcs / kg • Reception date • Fish invoice / delivery date • Health certificate (lab analysis) • Hatchery name • Address • Tel / fax | <ul style="list-style-type: none"> • Hatchery name • Address • Tel / fax • Delivery date • Invoice • Quantity supplied in pcs / kg |

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--|---|--|---|
| Chemical Suppliers – Pharmaceutical Supply | <ul style="list-style-type: none"> • Name and address of supplier • Authorised supplier (Registered, Licensed by FDA) • Drug or chemical from GMP or HACCP factory (certification) • List of banned drugs and chemicals • List of authorised drugs and chemical expiration of drugs • Name of buyer • Lot of drugs sell to buyers | <ul style="list-style-type: none"> • Licensee number • Name of drug or chemical and date of sell | <ul style="list-style-type: none"> • Name of buyer • Name of drug or chemical that is sold to buyer • Date of sell • Lot number • Kept for 2 years |
| Distributor | – | – | – |
| Distributor/ Wholesaler/ Middlemen | <ul style="list-style-type: none"> • Name of processor • Address, phone and email • Price of fish • Product frequency • Code of product • Name • Address • Price • Quantity of product • Size of product • Code number of product | <ul style="list-style-type: none"> • Name of consumer • Address and phone number • Quantity, time and delivery order • Price | <ul style="list-style-type: none"> • License of the processing • Invoice of the product • Certificate free from antibiotic, heavy metals etc |
| Processor | – | – | – |
| Processing Plant | <ul style="list-style-type: none"> • Where is the farm / geography location of the farm • Which is the standard they apply/ certified number • What is CB, AB or CR • How many fish can supply / batch / quantity plant buy • Date of medicine to stop using • Date of harvest • Quality of raw materials • Health certification / import procedures • HACCP number / certificate • EU accept letter • Health certification • Record keeping <ul style="list-style-type: none"> - Farmer / sources of raw materials | <ul style="list-style-type: none"> • Raw material <ul style="list-style-type: none"> - Certification on GAP number farm / product • Health certificate • Certifications <ul style="list-style-type: none"> - ISO - HACCP | |
| Retailer | – | – | – |

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|-------------|--|---|--|
| Exporter | – | – | <ul style="list-style-type: none"> • Keep in at least 2 years • Keep in document / computer / code of lot • Transfer via email + accompany with product invoice |
| Not specify | <ul style="list-style-type: none"> • Collected information • Telephone • Address • Brand name • Bar code • Register • Health certificate • Checking of water quality • Checking of ingredients for food or fish | | <ul style="list-style-type: none"> • Take sampling to analyse (Lab) • Register to apply for EAP and GAP • Drug register by MAFF (Chemical) |

Group 2

Flow Diagram on Traceability for frozen shrimp by Group 2 (1st breakout)



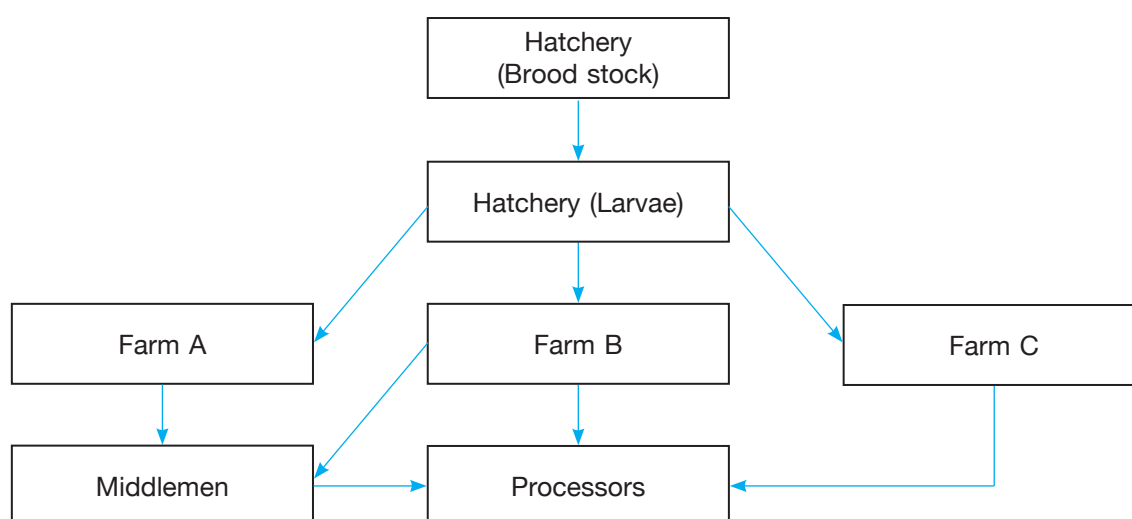
Group 2 - Breakout Session 1

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--------------------|---|--|---|
| Feed miller | <ul style="list-style-type: none"> • Ingredients • Proximate analysis • Nutritional values • Manufacturing date and expiry date • Lot of product • Registration of processing facility • Feed type (medicated / regular) • Quantity | <ul style="list-style-type: none"> • Label ingredients • Quantity supply | <ul style="list-style-type: none"> • Invoice • Label |
| Farm | <ul style="list-style-type: none"> • Fry movement documents • Registration of the farm • GAP certificate • National Residue Monitoring Program Report • Feed management • Health monitoring report • Drug use in the farm • Water treatment • Movement document <ul style="list-style-type: none"> - Date - Volume - Size • Invoice number | <ul style="list-style-type: none"> • Movement document • Invoice • Registration number | <ul style="list-style-type: none"> • Fry Movement Document (FMD) • Movement Document (MD) • GAP certificate • Residue monitoring • Health certificate • Invoice |
| Hatchery | <ul style="list-style-type: none"> • Source of brood stock <ul style="list-style-type: none"> - Wild or culture - Quantity - Health certificate • Health testing • Name, location and registration number • List of farm recipients • Water treatment and chemical use • Bio-security measures • Fry movement document <ul style="list-style-type: none"> - Name of buyers - Quantity • Invoice number | <ul style="list-style-type: none"> • Fry movement document • Origin of brood stock • Health certificate | <ul style="list-style-type: none"> • Fry movement document • GAP certificate • Health certificate • Invoice |
| Chemical Suppliers | <ul style="list-style-type: none"> • Registration number of the supplier /substances / products • Supplier name • Country of origin • Lot of product • Quantity • Invoice number | <ul style="list-style-type: none"> • Invoice | <ul style="list-style-type: none"> • Label • Invoice |
| Distributor | – | – | – |

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--|--|---|--|
| Distributor / Wholesaler / Middlemen | <ul style="list-style-type: none"> • Registration (number, name, location) • Movement document • Invoice number | <ul style="list-style-type: none"> • Identification • Movement document • Invoice | <ul style="list-style-type: none"> • Invoice • Movement document |
| Processor | – | – | – |
| Processing Plant | <ul style="list-style-type: none"> • Registration • Movement documents • Production batch • Water management • Standard (HACCP, ISO etc) • Packaging • Chemical management (Invoice etc) • Production record / keeping • Buyer names / country of origin • Health certificates of workers • Quality and safety monitoring | <ul style="list-style-type: none"> • Registration • Invoice • Health certificate (for product) | <ul style="list-style-type: none"> • Invoice • Movement document • Standard Certification |
| Retailer | – | – | – |
| Exporter | <ul style="list-style-type: none"> • Registration / identification • Invoice • Certificate of health (for products) • Destination and distributor volume | | <ul style="list-style-type: none"> • Invoice • Movement document • Product label |

Group 3

Flow Diagram for Traceability for frozen shrimp by Group 3 (1st breakout)



Group 3 - Breakout Session 1

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--|---|---|--|
| Farm | <ul style="list-style-type: none"> • Laboratory results • Residual monitoring and records • Feed analysis • Water quality monitoring and testing • Disease control • Temperature (harvest) • Organoleptic / approved ice supplier • Registration number • Approved number • Invoice number • Batch number • Pond number stocking date • Time and date of harvest • Quantity of harvest (size) • Transport registration • Seal number • Movement document | <ul style="list-style-type: none"> • Registration number • Invoice number • Time and date of harvest • Quantity and size • Seal number • Temperature at harvest | – |
| Hatchery | <ul style="list-style-type: none"> • Health certificate • Feed • GAP certificate (from C.A) QA (Farm) • GAP certificate (from C.A) • Registration number • Approved number • Invoice number • Batch number • Movement document | <ul style="list-style-type: none"> • Registration number • Invoice number • Batch number • Health certificate | – |
| Chemical Suppliers | – | – | – |
| Distributor | – | – | – |
| Distributor/ Wholesaler/ Middlemen | <ul style="list-style-type: none"> • Registration number • From C.A - Invoice | <ul style="list-style-type: none"> • Registration number • Invoice | – |
| Processor | <ul style="list-style-type: none"> • Temperature records • Name of receiving officer • Organoleptic • Laboratory report • HACCP certification • Invoice • Farm Registration number • Transport seal • Batch number • Seal number • Temperature • Time arrival | – | – |
| Retailer | – | – | – |
| Exporter | – | – | – |

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|---------------------|---|--|---|
| Brood stock | <ul style="list-style-type: none"> • Health certificate (free of disease) • Feed • SPF certification • Country of origin • Species • Farm, certification by CA. • Feed formulation • Batch number • Invoice number • Farm registration • Movement document | <ul style="list-style-type: none"> • SPF certification number • Batch number • Invoice number | – |
| Transport | <ul style="list-style-type: none"> • Registration number (C.A) • Invoice number • Temperature • Driver particulars • Vehicle registration number • Time (Leaving farm) | <ul style="list-style-type: none"> • Registration number • Driver's name • Vehicle registration number • Seal number • Time leaving farm • Temperature | – |
| Information to keep | – | – | <ul style="list-style-type: none"> • All information on yellow paper • 01year active record + 02 years archive • Network • Hard disk • Brood stock / Hatchery / Farm • Registration particulars – database archive • COA (forum) – paper base • Certificates of practices <ul style="list-style-type: none"> - GAP - HACCP |

Note: The column (blue) on “Documents to keep and Duration for keeping” from the above table exist similarly in both breakout session 1 and breakout session 2.

stipulates an extra year so that the food can be traced even when it expires. However, it was agreed in the meeting that 2 years of keeping relevant documentations is sufficient.

Other side discussions were made as follows:

- Mr Vincent explained that it is not necessary to include price into the traceability records as the data is often sensitive and confidential which not useful for tracing product movement.
- On Mr Ghazali's query if there is minimum number of pages to establish for traceability systems, Mr Vincent clarified that there is no minimum although FAO may have some guidelines on this. Moreover, it may be useful to understand the requirements of the final customers to decide on the data and information to keep for traceability.
- Mr Vincent also advised that documents should be kept for 2 years, and shared that EU standards

V. SITE VISIT TO CHACHENGSAO COASTAL RESEARCH AND DEVELOPMENT CENTRE, CP SHRIMP FARM AND CP PROCESSING PLANT

On the second day (6 November 2013), a site visit was conducted to the Chachengsao Coastal Research and Development Center for Manual Documentation Traceability and Charoen Pokphand Foods (CP) Private Shrimp Farm in Chachengsao province to understand and observe how the traceability system for Shrimp is being implemented in Thailand's shrimp industry.

The site visit began with a visit to Chachengsao Coastal Research and Development Center under DOF. The participants were introduced to the role of the R&D center on aquaculture produce and products, and briefed on the objective and contents of the Fry Movement Document (FMD) (Annex 3) and Movement Document (MD) (Annex 4) which is issued by DOF to all registered farmers for mandatory implementation. Farmers are required to renew their registration every three years.

The Coastal Research and Development Center staff shared that there are currently 3500 small scaled aquaculture shrimp farms in Chachengsao province, out of the about 10,000 farms in Thailand, out of which 80 to 90% are small scale farmers with 1 to 2 ponds each. Each farmer only has 1 registered owner. The FMD was first established due to some concerns with drug residue found in fry as well as tracing the source of where it originates from, and was developed based on EU requirements. There is a provincial fishery office in every province, under DOF, which does aquaculture disease control, farm registration, legislations and manages the FMD and MD for that province. The staffs of DOF are also responsible to certify farms with Good Aquaculture Practices (GAP). The FMD and MD sheets are complimentary, but the challenge remains in inviting farmers to fill up the document. It is the farmer's responsibility to keep the FMD for 3-4 months until the fish grows to a marketable size; thereafter they can apply for MD from DOF. It is also a mandatory requirement to have MD and FMD in place by the Thailand Government. One MD has to be generated for each harvest. Each FMD has 4 copies (1 for the farmer (green sheet), 1 for transferring down to the customer (white sheet), 2 for DOF (pink and yellow)).

The information which can be found in the FMD is as follows:

- Reference number (province, day, month, year, farm code)
- Name of Hatchery / Hatchery Owner
- ID card no. / Registration no. / Name
- Type of aquatic species
- Pond number and size
- Fry volume (tonnes and pieces/kg)
- Size of harvest
- Indication of whether the farm is certified Code of Conduct Standards (COC) or Good Aquaculture Practices (GAP)

For the FMD tracing from buyer to farmer, the information includes the following:

- ID card no. / Registration no. / Name
- Farmer's address
- Quantity of purchase
- Date of purchase

Usually, MD will follow after FMD. Where the information of a typical MD includes the following:

- FMD no.
- Production volume
- Farmers involved

MD is essential for a processing plant to apply for health certificate for its aquaculture products necessary for export; it is also usually required to document farmers supplying their aquaculture products to processing plants.

Participants visited the registration centre in the Coastal Research and Development Center, where computerized systems are used for capturing data on the FMD and MD.

At the end of the visit, Chief, MFRD programmes presented a token of appreciation to the representative staff of DOF.

After the visit to the Coastal Research and Development Center, the participants were provided the opportunity to visit Charoen Pokphand Foods (CP) Shrimp Farm in Chachengsao province. CP is a large food establishment that practices vertical integration (i.e. it has its own R&D, feed development, hatcheries, farms as well as processing factory). As such, it is able to successfully implement a framework for traceability for white shrimp products to facilitate export to EU, US, Japan and rest of South East Asia. The participants were introduced to the shrimp farm through a set of presentation slides presented by the staff of CP farm. It was mentioned that the transportation duration of chilled shrimps from farm to processing plant would usually require about an hour, under chiller condition of about 8-10°C. As for the case of live shrimps, the required temperature would usually be about 15-18°C in aerated water. Frozen shrimp is usually transported at a temperature of about -4°C.

A short tour was facilitated by the representative staffs of CPF. However, due to confidentiality issues, the group was briefly shown around the certain ponds for rearing of white shrimps, as not all ponds or facilities are open for public viewing.

The visit ended with Chief, MFRD programmes presenting a token of appreciation which was handed to the Vice Manager of CPF.

The site visit continued at CP processing plant on the third day (7 November 2013), where participants were introduced to the CP's processing business through the screening of the CP's corporate video and presentations by the QA manager on the implementation of traceability system in the company. CP's processed product range includes

cooked and pre-fried products. The processes and products undergo stringent chemical and microbiological testing, organoleptic tests, X-ray and metal detection test. The plant is ISO 9001, ISO 14001, BRC, HACCP and GMP certified.

CP informed that the farms use the FMD and MD issued by DOF for traceability purpose. The MD is filled and passed on to the processing plant, including information on source (farm, pond number), mass, sealing number of container and transport details. They also shared that an online system is used to trace an individual lot of their product in which the processing plant will assign a raw material code to each batch of raw material received (codes for date of receipt, whether it's CP or contract farm, and a running code in 1 day) at the processing plant. The source, peeled and unpeeled weight are also captured on the label tagged to the raw material. A finished product code is assigned to the final products which may be linked to the raw material code and packing time. The participants were informed that each batch of product will only come from one pond.

The QA manager of CP explained that if the samples from the farm were found to be positive for drug residue, CP will test on 5 ponds again to confirm the results. Drug residue monitoring is done to build confidence of CP and its customers in its products.

Following the video screening and presentation, the participants were geared with appropriate attire for entry into the processing factory to observe the processing line for frozen shrimp, and how traceability is implemented through the entire processing line.

Chief, MFRD programmes presented the staff at CP farm and processing plant with a token of appreciation to thank them for hosting the visits.

VI. BREAKOUT SESSION 2- TO DISCUSS IMPLEMENTATION OF TRACEABILITY FOR AQUACULTURED SHRIMP PRODUCTS IN ASEAN REGION

A breakout session was organized on the third day (7 November 2013) for the participants to offer their insights based on the observations they have made over the past 3 days of on-site training on the following topics:

Breakout session 2a – Challenges and Issues

1. Discuss potential issues and challenges faced while implementing traceability systems for aquaculture shrimps

Breakout session 2b – Establishing traceability system for aquaculture shrimp

1. Review the flow diagram of a typical supply chain for aquaculture shrimp (Reflected as Annex 5)
2. Review the information required at each stage of the supply chain
3. Identify the information required for transferring to another stage of the supply chain
4. Identify the documents to be archived, and indicate the duration of archive

The participants were divided into the same three teams as Breakout Session 1 to discuss the topics for this breakout session. The facilitators for this Breakout Session were Mr Vincent, Mr Yeap Soon Eong, Ms Felicia Loh and Ms Chung Hui Ling.

GROUP PRESENTATION**Breakout Session 2a: Issues/Challenges for implementing traceability**

The discussion findings by the three groups were presented on flip charts and shown in the table below:

| | Team | Discussion points on Challenges |
|---|--|--|
| 1 | Mrs. Aqilah Junaidi / Brunei Mr. <u>Net</u> Chantha / Cambodia Mr. Nasrul Efendi Hasibuan / Indonesia Mr. Mohd. Ghazali Bin <u>Abdul.Manap</u> / Malaysia Ms. Ligaya P. Cabrera / Philippines Mrs. Nguyen Thi Bang Tam / Viet Nam Mr. Somboon <u>Laoprasert</u> / Thailand | Training aspects: <ol style="list-style-type: none"> 1. Information Dissemination <ul style="list-style-type: none"> • Lack of awareness of programmes by the stake holder 2. Confidentiality of farmers / stakeholders 3. Education background of farmers 4. Record keeping at farm Government aspects: <ol style="list-style-type: none"> 1. Government policy <ul style="list-style-type: none"> • Mandatory for farmers 2. Financial Incentives for farmers |
| 2 | Mrs. Wanidawati Tamat / Brunei Dr. Reza Shah Pahlevi / Indonesia Mr. Souksakhone <u>Chanthalaphone</u> / Lao PDR Mrs. Aye Aye <u>Thein</u> / Myanmar Ms. Carolina C. Lopez / Philippines Mr. Nguyen Thanh Binh / Viet Nam Ms. Proyrat Chaowajaroenpong / Thailand | Training aspects: <ol style="list-style-type: none"> 1. Lack of monitoring drug residue, water quality 2. Understanding the benefits of traceshrimp, standards Government aspects: <ol style="list-style-type: none"> 1. T.S Link with food safety, as this is required by EU market – Domestic market 2. Transparency Level 3. Collection of data (system does not exist in some countries) 4. Location of farms (Remote) – Issuance of MD and FMD Incentives for farmers 5. (Voluntary), if mandatory, no incentives. |
| 3 | Mr. <u>Bun</u> Chantrea / Cambodia Mr. Oudone <u>Khounsavan</u> / Lao PDR Mr. Matlan Bin Thaufeck / Malaysia Mrs. Khaing Khaing Oo / Myanmar Ms. <u>Somga</u> , Sonia Sebastian / Philippines Mr. <u>Tan</u> Yit Wee / Singapore | Training aspects: <ol style="list-style-type: none"> 1. Awareness & knowledge of industry 2. Skill level of industry Government aspects: <ol style="list-style-type: none"> 1. Registrations of farms 2. Regulations and policies 3. Manpower (C.A) 4. Government Support 5. Infrastructure support |

For Group 1, Mr Matlan shared that farmers may not be transparent about the diseases or violation of laboratory testing at the farm, leading to a potential lapse in the traceability system. He further shared that for the case of Malaysia, the domestic market is regulated by their Ministry of Health. Ms Ligaya also commented that some industry players are not aware of the importance of traceability, and there remains a challenge for industry members to fill up traceability forms even if the form is only 2 pages long. The group feels that the government should play a role in providing extension services and training to the farmers on GAP.

In response to Group 1's presentation, Mr Vincent commented that the farmers should not be expected to record unnecessary data, and the traceability record form should be as short as possible to encourage farmers to establish the records. In addition, he commented that traceability should be driven by economic benefits and not by the government. Mr Watanabe agreed to Mr Vincent's comment.

For Group 2, Dr Reza commented that the success of traceability implementation is related to the geographic site and culture of the country. However, Mr Vincent responded that keeping of records should

be for practical purpose of audit, and should not be affected by culture. Mrs Nguyen also commented that farmers, especially from small-scale farms, may not understand the meaning or benefit of keeping records, and will record as instructed. Dr Reza also shared that shrimp farms in Indonesia are often found in remote areas and it may be challenging for farmers to deliver the MD over far distances. Mr Vincent suggested that the traceability framework may have to be modified to suit the different ways of handling either for local market, for the region or export overseas.

For Group 3, Mrs Aqilah shared that there is usually lack of manpower at the farms to establish the traceability records. She also shared that it would be good for the government to provide laboratory support to the companies who may not have

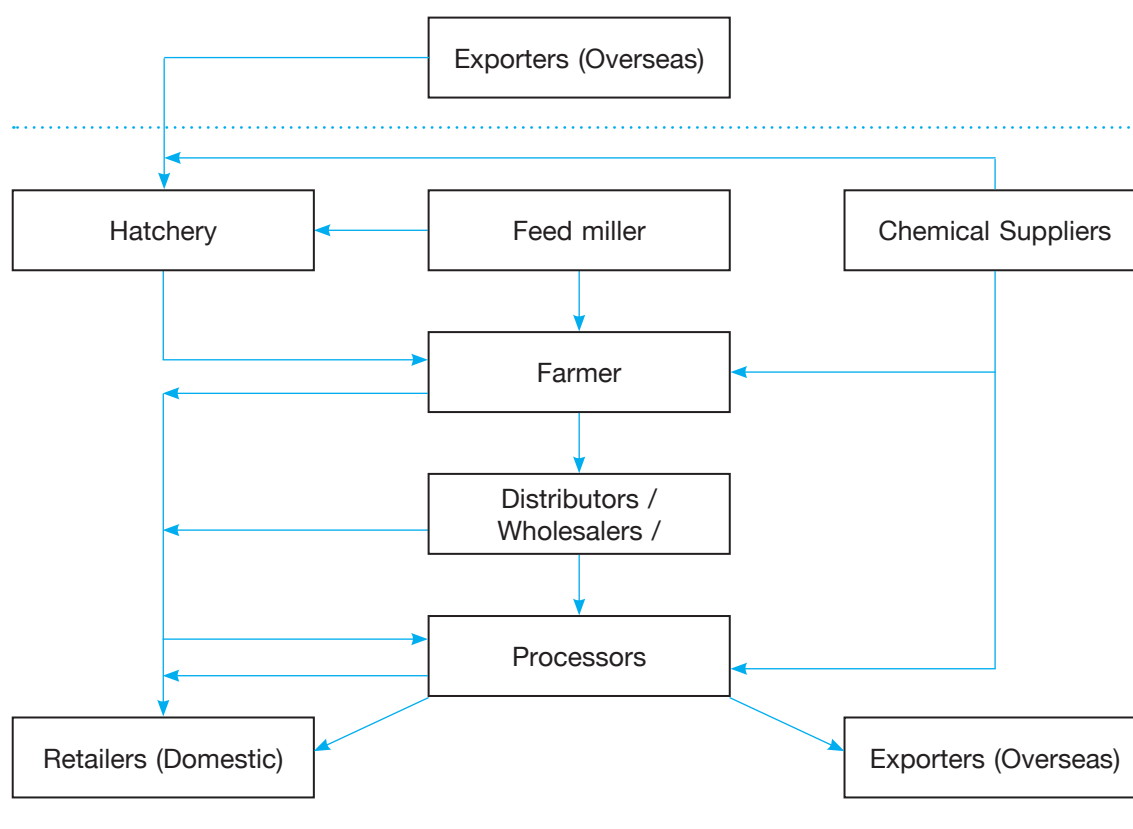
the capability or financial resources to establish equipment required for testing. Mr. Watanabe commented that it is common for processing factories in Japan to impose requirement on the farms for traceability records before they are allowed to supply them the raw produce.

Breakout session 2b: Establishing traceability system for aquaculture shrimp

The teams were tasked to review the flow diagram of a typical supply chain which can be found on Annex 5 for aquaculture shrimp, as well as review information required at each supply chain stage, for transfer to the next stage, and documents to be archived. The teams presented their discussion findings for these topics as shown in the diagrams and tables below.

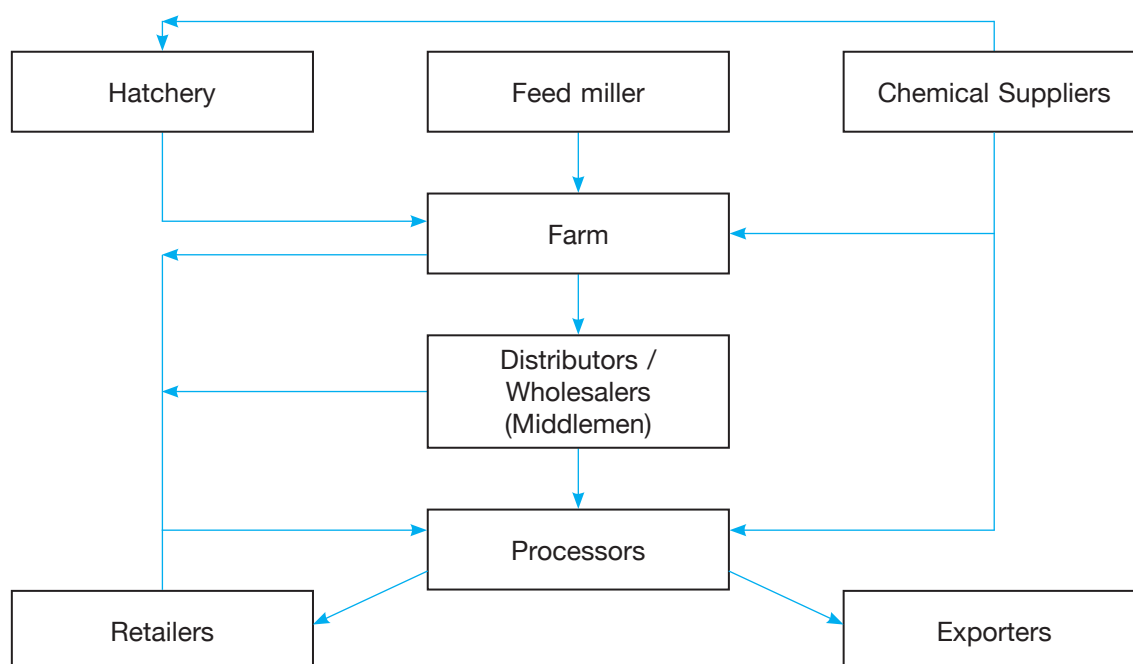
Group 1

Flow Diagram for Traceability for frozen shrimp (2nd breakout)



| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--|---|--|---|
| Feedmiller | <ul style="list-style-type: none"> • Name of feed miller • Address • Expiration date | <ul style="list-style-type: none"> • Feed composition • Batch / lot number • Production date • Feed type • Feed quality • Expiration date | <ul style="list-style-type: none"> • Feed composition • Batch number • Lab analysis report • Production date • Feed type • Feed quantity • Expiration date • Address / contact |
| Farm | <ul style="list-style-type: none"> • Name of farm • Owner • Address • Tel / fax | <ul style="list-style-type: none"> • Name of farmer • Address • Tel / fax • Registration number • Pond number • Stocking date • Time and date of harvest • Quantity of harvest | <ul style="list-style-type: none"> • Invoice number • Batch number • Pond number • Stocking date • Record of farm • Lab analysis |
| Hatchery | <ul style="list-style-type: none"> • Name of hatchery • Owner • Address • Quantity supplied • Delivery date | – | <ul style="list-style-type: none"> • Farm registration number • Farm certification • Source of origin • Batch number • Quantity supply • Delivery date • List of chemical and drug feed used |
| Chemical Suppliers | <ul style="list-style-type: none"> • License • Name / address • Tel / fax • Product name • Date manufactured • Date expired • Label / manual | <ul style="list-style-type: none"> • Registration number • Production lot number • Invoice number • Company name • Product name • Production date • Expiration date | <ul style="list-style-type: none"> • Invoice (copy) • Name / address of clients, product name / quantity they sold • Expiration date of each batch sold to client |
| Distributor | – | – | <ul style="list-style-type: none"> • Registration number • Invoice number • Name / address of clients they sold to • Quantity |
| Distributor/ Wholesaler/ Middlemen | <ul style="list-style-type: none"> • Name of distributor • Address • Company name | <ul style="list-style-type: none"> • Company name • Address • Tel / fax • Registration number | – |
| Processor | <ul style="list-style-type: none"> • Name / address • Tel / fax | <ul style="list-style-type: none"> • Company name • Address • Tel / fax • Certification • Production / batch number • Registration number • Country of origin | <ul style="list-style-type: none"> • Invoice number • Production number • Receiving records • Quality and safety monitoring records |
| Retailer | <ul style="list-style-type: none"> • Name / address • Tel / fax | <ul style="list-style-type: none"> • Name of retailer • Address • Tel / fax • Registration number • Invoice number | <ul style="list-style-type: none"> • Invoice number • Receiving records • Name, contact of sellers and buyers |

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|----------|--|---|---|
| Exporter | <ul style="list-style-type: none"> • Name / address • Name of importer / address | <ul style="list-style-type: none"> • Name of importer • Address • Tel / fax • Invoice number • HC • Distribution volume | <ul style="list-style-type: none"> • Health certificate (copy) • Invoice number • Distribution volume • Name / address of importers |

Group 2*Flow Diagram for Traceability for frozen shrimp (2nd breakout)*

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|-------------|--|---|--|
| Feed miller | <ul style="list-style-type: none"> • Registration number | <ul style="list-style-type: none"> • Batch / lot number • Laboratory analysis report • Production date • Feed type • Feed quality • Registration number | – |
| Farm | <ul style="list-style-type: none"> • Quality standard certificate (e.g. GAP) | <ul style="list-style-type: none"> • Registration number • Invoice number • Time and date of harvest • Quantity of harvest • Certificate farm | – |
| Hatchery | <ul style="list-style-type: none"> • Source of brood stock • Health testing • List of farm recipients • Water quality monitoring • Bio-security measures • Invoice number and supplier | <ul style="list-style-type: none"> • Health certificate • Invoice number | – |

| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--|---|---|---|
| Chemical Suppliers | – | • Invoice number | – |
| Distributor | • Invoice number • Registration number | • Registration number • Invoice number | – |
| Distributor / Wholesaler / Middlemen | – | – | – |
| Processor | – | • Invoice number • Production / batch number • Registration number | – |
| Retailer | – | • Registration number • Invoice number | – |
| Exporter | – | • Registration number • Invoice number • Health certificate • Destination • Distribution volume | – |

Flow Diagram for Traceability for frozen shrimp (2nd breakout)

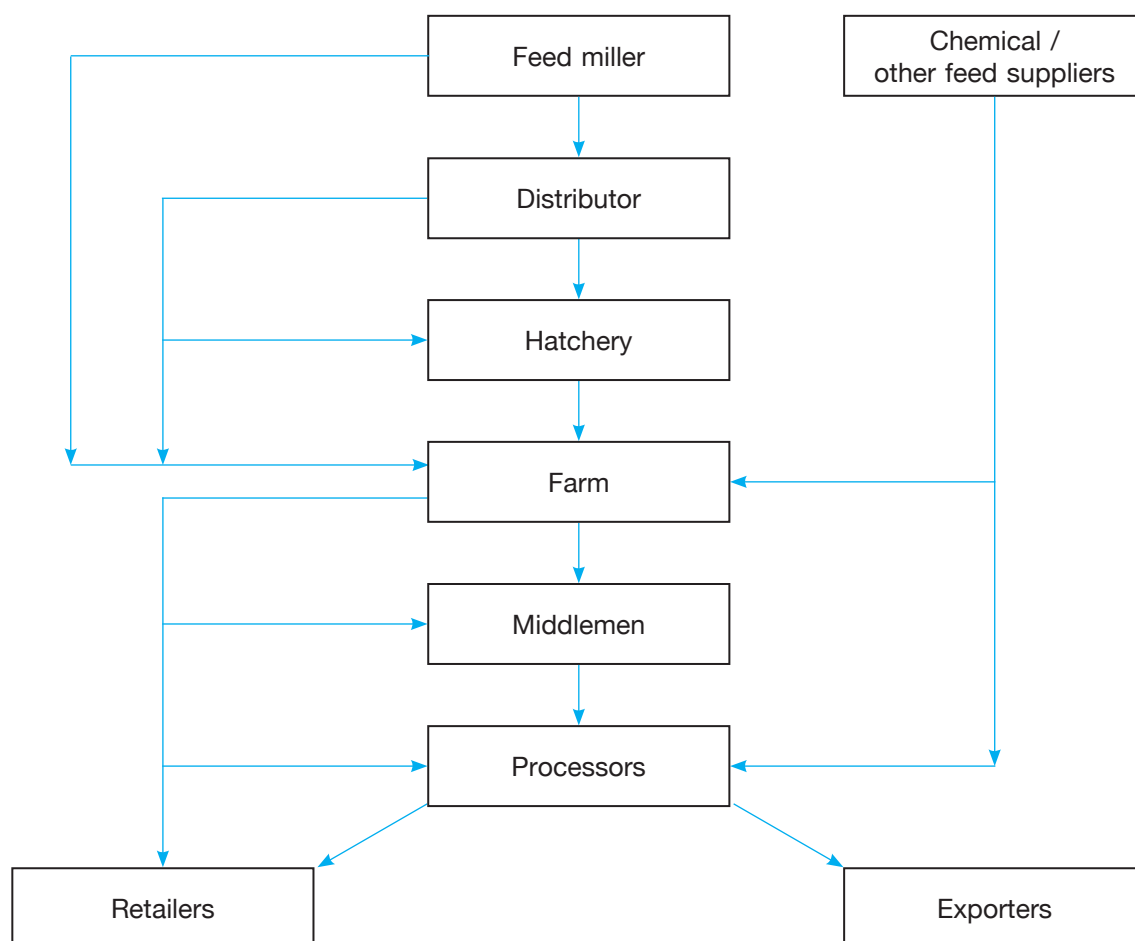
| | Yellow Information needed | Orange Information to transfer | Blue Documents to keep and Duration for keeping |
|--------------------------------------|--|--|--|
| Farm | – | <ul style="list-style-type: none"> • Registration number • Batch number • Pond number • Stocking date • Time and date of harvest • Quantity and size • Transport registration number • Seal number • Invoice number | – |
| Feed miller | – | <ul style="list-style-type: none"> • Production date / batch number • Feed type | – |
| Hatchery | – | <ul style="list-style-type: none"> • Farm registration number • Batch / lot number | – |
| Chemical Suppliers | – | <ul style="list-style-type: none"> • Registration number • Invoice number | – |
| Distributor | – | – | – |
| Distributor / Wholesaler / Middlemen | – | <ul style="list-style-type: none"> • Registration number • Invoice number | – |
| Processor | – | <ul style="list-style-type: none"> • Registration number • Production/batch number | – |
| Retailer | – | <ul style="list-style-type: none"> • Registration number • Invoice number | – |
| Exporter | – | <ul style="list-style-type: none"> • Registration number • Invoice number • Certificate of origin | – |

Discussion on the flow diagram of supply chain for aquaculture shrimp

Unlike Group 1 and 2, Group 3 felt that there is a need to include feed distributor into the supply chain for traceability system. Mr Tan commented that most of the farmers in Singapore, Malaysia and Philippines get their feed from the distributors and the group has assessed that risk is involved in this stage of the supply chain and should be included in the supply chain for traceability. Mr Vincent opined that the farmers should be responsible for the feed receiving condition, and information regarding the feed can be captured at the farm. However, he also agreed with the group that if the country does not have a feed mill and farmers tend to get their

feed from local distributors or overseas supply, it is reasonable to include distributor in the supply chain flow diagram.

The meeting eventually agreed on a finalized flow diagram of traceability of aquaculture products. This flow diagram, as shared to the participants by Chief, MFRD programmes, serves to illustrate the various essential components of a basic traceability system. This information such as the various stakeholders, as well as critical information required in each chain, will be utilized for the drafting of traceability reference guide which is one of the deliverables of this project. The final flow chart for aquaculture products in the ASEAN region is as shown below:

Flow Diagram for aquaculture products to be reflected in the ASEAN guidelines

VII. CLOSING REMARKS

Chief, MFRD programmes, Mr. Yeap Soon Eong as well as Project leader / Chairperson, Ms. Felicia Loh, concluded the Meeting and thanked the resource speaker, Mr Vincent Andre, Mr Somboon and Ms Proyrat for their coordinations and assistance to ensure the success of this event, Deputy Secretary-

General, Hajime Kawamura, SEAFDEC Assistant Trust Fund Manager, Mr Hidenao Watanabe, SEAFDEC Technical Coordinator, Mr Tadahiro Kawata for their support to the project, as well as all participants for their contributions to the Meeting. The Meeting was held in the traditional spirit of SEAFDEC's co-operation and cordiality.

Annex 1: Participant list

| Country | Name | Official Designation |
|-------------------|---|--|
| Brunei Darussalam | Mrs. Aqilah Haji Junaidi (KPL) | Fisheries Officer, Head of Fish Culture Section, Seafood Processing Development Division, Department of Fisheries, Ministry of Industry and Primary Resources, Brunei Darussalam |
| | Mrs. Wanida-Wati Tamat | Fisheries Officer, Head of Quarantine and Inspection Section, Biosecurity Division, Ministry of Industry and Primary Resources, Brunei Darussalam |
| Cambodia | Mr. <u>Bun</u> Chantrea (KPL) | Acting Chief of Freshwater Aquaculture Division, FiA |
| | Mr. <u>Net</u> Chantha | Vice-Chief of Quality and Safety Control Division, FiA |
| Indonesia | Dr. Reza Shah Pahlevi (KPL) | Deputy Director for Residue Control, Directorate of Fish Health and Environment, Directorate General of Aquaculture, MMAF Republic of Indonesia |
| | Mr. Nasrul Efendi Hasibuan | Assistant Deputy Director for Technology Application in Brackishwater and Marine Aquaculture, Directorate General of Aquaculture, MMAF Republic of Indonesia |
| Lao PDR | Mr. Oudone <u>Khounsavan</u> | Fisheries Officer (Fisheries Division / DLF) |
| | Mr. Souksakhone <u>Chanthaphone</u> | Technician (Namxuang Aquaculture Development Center / DLF) |
| Malaysia | Mr. Mohd. Ghazali Bin <u>Abdul.Manap</u> (KPL) | Head of Audit and Certification Section, Fisheries Biosecurity Division, Department of Fisheries Malaysia Putrajaya |
| | Mr. Matlan Bin Thaufeck | Fisheries Officer of Fisheries Department of Sabah, Malaysia |
| Myanmar | Mrs. Aye Aye <u>Thein</u> (KPL) | Fishery Officer, Head of Freshwater Research Section, Aquaculture Division, Department of Fisheries, Myanmar |
| | Mrs. Khaing Khaing Oo | Assistant Fishery Officer, Freshwater Aquaculture Research Section, Aquaculture Division, Department of Fisheries, Myanmar |
| Philippines | Ms. <u>Somga</u> , Sonia Sebastian (KPL) | Senior Aquaculturist Fish Health Management and Quality Assurance Section (FHMQAS) |
| | Ms. Carolina C. Lopez | Chief, Fish Health Unit, BFAR VII |
| | Ms. Ligaya P. Cabrera | Aquaculturist II, Regional Fish Health Officer, BFAR-IV-A |
| Singapore | Mr. <u>Tan</u> Yit Wee | Senior Manager of Aquaculture Technology Department (Aquaculture Section), Technology & Industry Development Group, Agri-Food and Veterinary Authority of Singapore (AVA) |

| Country | Name | Official Designation |
|----------|--|---|
| Thailand | Mr. Somboon <u>Laoprasert</u> (KPL) | Fishery Biologist, Senior Professional Level, Marine Shrimp Culture Research and Development Institute, Coastal Fisheries Research and Development Bureau |
| | Ms. Proyrat Chaowajaroenpong | Fishery Biologist, Practitioner Level, Marine Shrimp Culture Research and Development Institute, Coastal Fisheries Research and Development Bureau |
| Viet Nam | Mrs. Nguyen Thi Bang Tam (KPL) | Expert of Aquaculture Department Senior official of Aquaculture Department (Ministry of Agriculture and Rural Development) |
| | Mr. Nguyen Thanh Binh | Expert of Science Technology and International Cooperation Department, Directorate of Fisheries, Ministry of Agriculture and Rural Development |

Annex 2: Provisional Agenda

5 November 2013, Tuesday (Day 1)

- | | |
|-------------|--|
| 0900 – 0915 | Registration |
| 0915 – 1000 | Opening of the Meeting <ul style="list-style-type: none"> • Welcome remarks by the Chief of MFRD Programmes • Opening remarks by Dy Sec-Gen SEAFDEC • Introduction and Adoption of Agenda |
| 1000 – 1030 | Coffee Break and Group Photograph |
| 1030 – 1130 | Lecture on General and Technical Requirements for Traceability |
| 1130 – 1200 | Lecture and demonstration on TraceShrimp |
| 1200 – 1230 | Discussion (on the lectures of the morning) |
| 1230 – 1330 | Lunch Break |
| 1330 – 1500 | Breakout Session 1 - Group discussion and presentation: Development and Implementation of Traceability System for Aquaculture Shrimp –guidelines/requirements |
| 1500 – 1530 | Coffee Break |
| 1530 – 1700 | Breakout Session 1 - Group discussion (cont.) |

End of Day 1

6 November 2013, Wednesday (Day 2)

- | | |
|-------------|---|
| 0730 – 1230 | Trip to Chachengsao Province (<i>Includes travelling time</i>) <ul style="list-style-type: none"> • Visit to Chachengsao Coastal Research and Development Center for Manual Documentation Traceability |
| 1230 – 1330 | Lunch Break |
| 1330 – 1730 | Visit to Private Shrimp Farm in Chachengsao <ul style="list-style-type: none"> • Observe traceability in farm |

End of Day 2

7 November 2013, Wednesday (Day 3)

- 0730 – 1230 Trip to Samutsakorn Province (Includes travelling time- to and fro Bangkok)
- Visit to Shrimp Processing Plant – Observe traceability in processing plant
- 1230 – 1330 Lunch Break
- 1330 – 1500 Breakout Session 2 - Group discussion and presentation:
 Development and Implementation of Traceability System for Aquaculture Shrimp (follow-
 after site visits)
- Generic Guidelines for Traceability Systems for Aquaculture Products in the ASEAN region
- 1500 – 1530 Coffee Break
- 1530 – 1700 Breakout Session 2 (cont.) - Group discussion and presentation:
 Development and Implementation of Traceability System for Aquaculture Shrimp (follow-
 after site visits)
- Generic Guidelines for Traceability Systems for Aquaculture Products
- 1700 – 1730 Closing

~END~

Annex 3: Fry Movement Document (FMD)

แบบ จ.ส.น. 2

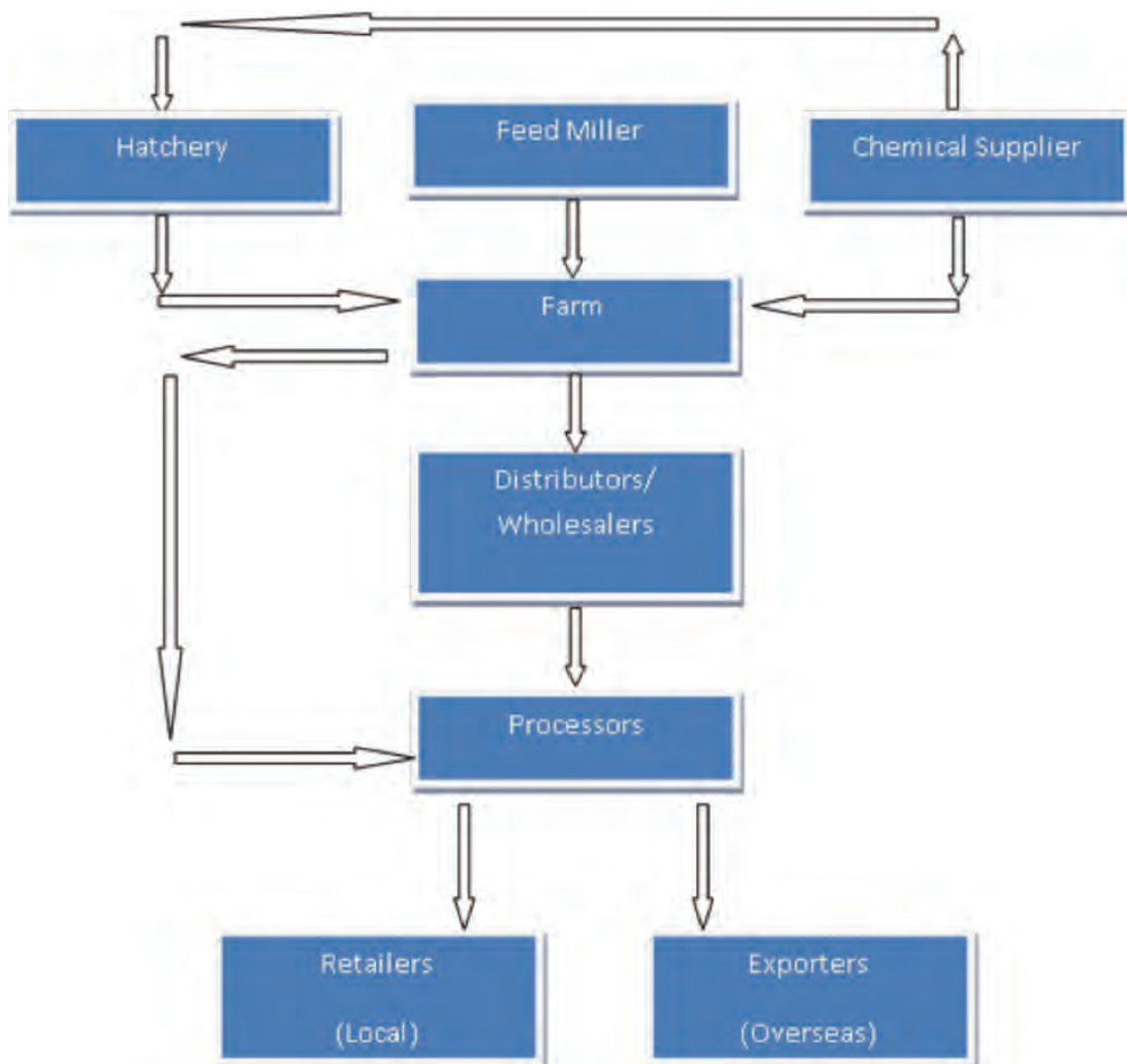
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|---|---|--|
|  | หนังสือกำกับการจำหน่ายลูกพันธุ์สัตว์น้ำ (AQUATIC ANIMAL FRY MOVEMENT DOCUMENT) | |
| | กรมประมง (DEPARTMENT OF FISHERIES) | |
| เลขที่ (Ref. No.) 24-202-011156-0012 - | ลำดับที่ (No.) 03823 | |
| ออกโดย (Issued by) ศพท. ระยอง | ออกวันที่ (Issued Date) 1/11/2556 | |
| รายละเอียดผู้เพาะและอนุบาล (Farmer) : ชื่อผู้เพาะและอนุบาล (Name) นางสาวจันทร์วิภา ยึดแก้ว เลขที่บัตรประจำตัวประชาชน (ID. Card No.) 3-1102-00691-40-0 ที่อยู่ผู้เพาะและอนุบาล (Farmer's Address) 33/4 หมู่ที่ 4 ตำบลเทพราช อำเภอบ้านโพธิ์ จังหวัดฉะเชิงเทรา เลขที่ทะเบียนฟาร์ม (Register No.) 24-02-011425 <input type="checkbox"/> CoC <input type="checkbox"/> GAP <input type="checkbox"/> อื่นๆ ระบุ _____ ที่ตั้งฟาร์มเพาะและอนุบาล (Farm's Address) หมู่ที่ 4 ตำบลเทพราช อำเภอบ้านโพธิ์ จังหวัดฉะเชิงเทรา เลขที่มาตรฐานฟาร์ม (Farm Certificate No.) _____ ชื่อสัตว์น้ำ (Common Name of Aquatic Animal) กุ้งกุลาดำ ระยะ (Stage) P5-P9 จำนวนที่จำหน่าย (Number of Fry) 2,700,000 ตัว, Inds. (สองล้านเจ็ดแสนตัว) วันที่จำหน่าย (Date of Harvest) 1/11/2556 <div style="text-align: right;">ลงนามผู้เพาะและอนุบาล (Signature of Farmer)</div> | | |
| รายละเอียดผู้ซื้อ (Buyer) : ชื่อผู้ซื้อ (Name) นางสมศรี พิมพ์แก้ว เลขที่บัตรประจำตัวประชาชน (ID. Card No.) 3-2401-00770-49-8 เลขที่ทะเบียนฟาร์ม (Register No.) 24-01-245844 ที่ตั้งฟาร์ม (Farmer's Address) - หมู่ที่ 3 ตำบลกิโลมแก้ว อำเภอกองเคี่ยน จังหวัดฉะเชิงเทรา จำนวนที่ซื้อ (Number of Purchase) 2,700,000 ตัว, Inds. (สองล้านเจ็ดแสนตัว) ป้ายส่งอนุบาล/เลี้ยง ปอที่ 1 จำนวน 2,700,000 ตัว, Inds. (สองล้านเจ็ดแสนตัว) ปอที่ _____ จำนวน _____ ตัว, Inds. (ปอที่ _____ จำนวน _____ ตัว, Inds. (วันที่ซื้อ (Date of Purchase) 1/11/2556 <div style="text-align: right;">ลงนามผู้ซื้อ (Signature of Buyer)</div> | | |
| พนักงานเจ้าหน้าที่ (Officer Authority) (นายวิชาญ ธรรมดี) นักวิชาการประมงชำนาญการ  | | |

ต้นฉบับ

(สำหรับผู้ซื้อ ให้ยื่นขอหนังสือ จ.ส.น. 3 หรือยื่นขอให้กรมประมงตรวจสอบคุณภาพลูกพันธุ์สัตว์น้ำ)

Annex 4: Movement Document (MD)

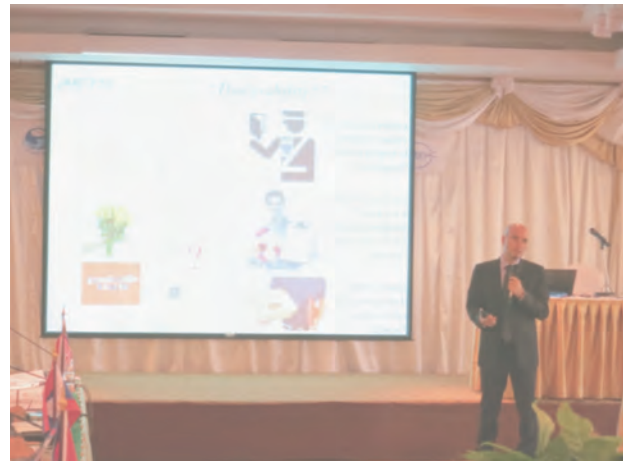
[illegible]

Annex 5: Flow diagram of a typical supply chain for facilitation of breakout session 2

Annex 6: Photo Documentation



Picture 1: Group photograph on Day 1.



Picture 2: Invited resource speaker, Mr Vincent Andre delivering his lecture on topic “General and Specific requirements to Traceability in fishery value chain”



Picture 3: First breakout session on 5 November 2013



Picture 4: Field visit to Chachengsao Coastal Research and Development Center under DOF



Picture 5: Field visit to Charoen Pokphand Foods (CP) Private Shrimp Farm in Chachengsao province



Picture 6: Field visit to Charoen Pokphand Foods shrimp processing plant in Samutsakorn province



Picture 7: Second breakout session on 7 November 2013



Picture 8: Closing of the event by Chief, MFRD programmes

Annex 4

JAPANESE TRUST FUND V TRACEABILITY SYSTEMS FOR THE AQUACULTURE PRODUCTS IN THE ASEAN REGION

SECOND ON-SITE REGIONAL TRAINING WORKSHOP ON TRACEABILITY BANGKOK, THAILAND

26-27 August 2015

End-of-Project Meeting Report

I. INTRODUCTION

1. The Japanese Trust Fund V End-of-Project Meeting on “Traceability Systems for Aquaculture Products in the ASEAN Region” was organized by the Post-Harvest- Technology Department (PHTD) of the Agri-Food & Veterinary Authority of Singapore (AVA) as the SEAFDEC Collaborating Center for MFRD Programmes and held from 26 - 27 August 2015 in Singapore.
2. The Meeting was attended by representatives from all ASEAN-SEAFDEC member countries except Brunei Darussalam, Deputy Secretary-General of SEAFDEC, Director of Post-Harvest-Technology Department (PHTD) of the Agri-Food & Veterinary Authority of Singapore (AVA), Deputy Director of Supply Chain Section, PHTD of AVA and other staff from PHTD. The Chief of MFRD Programmes sent his apologies as he was unable to attend the meeting due to urgent personal matters. A total of 18 participants attended the End-of-Project Meeting. The list of participants was as in Annex 1.

II. AGENDA 1 - OPENING OF THE MEETING

3. The Director of Post-Harvest Technology Department (D/PHTD), Ms Khoo Gek Hoon, welcomed the participants to the End-of-Project Project Meeting and delivered the Welcome Remarks on behalf of the Chief of MFRD Programmes, Mr Yeap Soon Eong.
4. The Deputy Secretary-General (DSG) of SEAFDEC, Mr Hajime Kawamura, delivered his Welcome Remarks to the participants of the Meeting.
5. The Director of Post-Harvest Technology Department (D/PHTD), Ms Khoo Gek Hoon, delivered her Opening Address to the participants of the End-of-Project Meeting.
6. The Chairperson, who was the MFRD JTF V project manager, Ms Felicia Loh, presented on the Agenda of the Meeting and the Agenda was adopted. The Agenda appears in Annex 2.
7. The Chairperson also presented on the project overview, which includes the project background and rationale, overall project objectives, past project activities and objectives of the End-of-Project (EOP) Meeting.
8. All delegates of the Meeting, as well as PHTD staff then introduced themselves. The Meeting then proceeded for a group photography session.

III. AGENDA 2 – FINAL COUNTRY REPORT PRESENTATION

9. Chairperson reported that Brunei Darussalam had informed that they were unable to attend the End-Of-Project Meeting with apologies.

Cambodia

10. Mr Chin Da presented on Cambodia’s final country report and reported that they were currently in progress of implementing the traceability systems for aquaculture products.
11. In Mr Chin Da’s presentation, he informed the Meeting that several national activities/programs such as the Good Aquaculture Practices (GAqP) and research activities had been implemented for the traceability systems for aquaculture products. He reported that one of the challenges faced was difficulty for medium to large scale production companies to apply GAqP.
12. In response to Indonesia’s query on which authority was responsible for providing application form for the aquaculture activity in Cambodia, Cambodia replied that the responsibility was under the Department of Aquaculture Development. In reply to Indonesia’s query, Cambodia explained that the database of the collective application forms was managed by the Fisheries Administration but the process of data collection was difficult.
13. Indonesia enquired on the species targeted in the traceability system, to which Cambodia replied was *Pangasius*.
14. Cambodia stated that the registration for aquaculture activities was currently voluntary and the certification for Good Aquaculture Practice (GAqP). Philippines suggested that the certification could be renewed annually.
15. D/PHTD enquired if GAqP was part of their traceability programme with specific guidelines, to which Cambodia explained that the GAqP was just being implemented this year for small scale aquaculture farming catering to domestic consumption and it was supported by the European Union (EU).
16. DSG enquired if Cambodia exported their aquaculture products to other ASEAN member countries and overseas, to which Cambodia replied that they exported *Pangasius Hypophthalmus* species to Viet Nam. In response to DSG’s query if there was any requirement from Viet Nam for the export of aquaculture products, Cambodia explained that

trade regulations were imposed. Cambodia also feedback that Viet Nam could provide some technical guidance in their processing activities as there was a lack of technology in terms of aquaculture product processing.

17. Viet Nam informed the Meeting that all private sectors from Cambodia must be registered and satisfy the requirements from the Viet Nameese authority before the companies could export aquaculture products to Viet Nam.

Indonesia

18. Dr Reza Shah Pahlevi presented on Indonesia's final country report and he reported that the implementation of traceability systems was currently in progress.
19. In Dr Reza Shah Pahlevi's presentation, he informed the Meeting that Indonesia had developed Movement Documents (MD) for their Traceability programme, and MD exists as 5 hardcopy documents which were colour-coded, to be completed by specific stakeholder along the aquaculture supply chain. He added that there was insufficient budget for Indonesia to complete the traceability system for aquaculture products.
20. Chairperson enquired if Indonesia had implemented the National Residues Monitoring Plan (NRMP) prototype in their states or provinces, Indonesia replied that the system had been fully implemented since 2014 and covered all provinces including big farmers in Sumatra.
21. D/PHTD enquired if the data in the NRMP system was aligned with those in the hardcopy documents, Indonesia replied that the data in the hard copies were linked to their online system. Indonesia also added that the data input into the online system by the provincial authority was obligatory and that the data could be viewed in real time. D/PHTD suggested opening up the online traceability system to the stakeholders.
22. Philippines enquired if the system can be accessed by the industry and if the industry were agreeable about their information being published in the online system. Indonesia explained that the NRMP system was password protected and unauthorised personnel would not be able to access the data but only view the brief summary of the information.

23. Indonesia clarified that the "customer" printed on the hardcopy document referred to the middlemen or wholesalers who bought the aquaculture products from the farmers, upon query by DSG. Indonesia also explained that "processors" referred to the final buyers who were usually the exporters of aquaculture products. Information from retailers was not recorded in the system, and it only traced up to the point of middlemen.
24. DSG enquired if there was a presence of tracking number on the hardcopy of the document, to which Indonesia explained there was a unique district code number based on the postal code. DSG suggested that the system should also capture the lot/batch number for identification of the aquaculture products along the supply chain, apart from the tracking number of the farm and hatchery.
25. In response to the query from DSG on the types of documents that processors had to provide upon exporting aquaculture products to other countries, Indonesia stated that the hardcopy traceability documents were currently used as a basis of export requirement.
26. Indonesia stated that the hardcopy movement document tracked each transaction of aquaculture products upon Viet Nam's query. Indonesia also clarified that the aquaculture products from each farm/pond usually originated from one hatchery source and the traceability system was for the purpose of monitoring residue sampling.
27. D/PHTD commended Indonesia on the online NRMP prototype.

Lao PDR

28. Mr Oudone Khounsavan presented on Lao PDR's final country report on traceability system for aquaculture products. He reported that they were currently in the pipeline of developing national programmes and pre-requisites for implementation of the traceability system.
29. In Mr Oudone Khounsavan's presentation, he reported that Lao PDR would be prioritising the farms to implement the traceability systems for aquaculture products. He informed the Meeting that their future works include the development of technical standards on food safety for aquaculture products as well as to promote the implementation of the traceability systems in Lao PDR.

Malaysia

30. Madam Noor Affizah presented on Malaysia's final country report and reported that they had implemented the traceability systems for aquaculture products in Malaysia.
31. In Madam Noor Affizah's presentation, she informed the Meeting that their traceability system for aquaculture shrimps was fully developed in 2012 while their live fish traceability system was developed in 2014. She added that Malaysia's web-based traceability system covered all aspects of the supply chain and it was currently in the progress of improvement prior to implementation.

Myanmar

32. Mrs Aye Aye Thein presented on Myanmar's final country report and reported that Myanmar had been implementing the traceability system for aquaculture products.
33. In Mrs Aye Aye Thein's presentation, she informed the Meeting that the Department of Fisheries of Myanmar had implemented the GAqP for fish and shrimp farming since 2011 while the NRMP had been initiated since 2014 for several targeted species. She added that Myanmar's future works include training of GAqP implementation for inspectors and improvements on the implementation of GAqP and NRMP.
34. Regarding the top 10 species of fishery products for export, Myanmar clarified that live eel exported were from wild source and not from aquaculture, upon queried by DSG.

Philippines

35. Ms Somga, Sonia Sebastian, KPL of the Philippines presented on Philippines' final country and reported that Philippines had implemented the traceability system for aquaculture products.
36. In Ms Somga, Sonia Sebastian's presentation, she informed the Meeting of the relevant regulations in line with the traceability systems for aquaculture products such as the BFAR Administrative Circular No. 251. She added that one of the future works of Philippines was to continue with awareness promotion campaign, seminars and trainings for stakeholders.
37. D/PHTD enquired if the administration circular on traceability system provides all criteria to control the system, to which Philippines replied that

the traceability system contained all information within the guideline publication. Philippines added that most participants who developed the Guidelines were already implementing them at the regional level.

38. Philippines clarified that the traceability system in practice could also address seafood frauds such as misrepresentation of species, in response to Malaysia's query. Philippines updated that the traceability laws developed and approved was in line with the requirements to prevent illegal, unreported and unregulated fishing (IUUF). Philippines also informed the Meeting that they were required to develop a traceability system on wild catch as EU had issued them a yellow card previously. Philippines further updated that EU had already lifted the yellow card after the amendment of fishery laws. Stakeholders in the Philippines also had to be aware of the export requirement to avoid high penalty for violation of the laws.
39. Philippines informed the Meeting that their traceability system could differentiate between wild and aquaculture products, upon query from Malaysia. Philippines also stated that live fish were exported to other ASEAN countries while processed fish were exported to EU. Philippines added that the traceability system for aquaculture products easier to control than that of wild caught. DSG commented that the starting points between captured fishery and aquaculture were different and was more complex.

Singapore

40. Mr Tan Yit Wee presented on Singapore's final country report and it was noted that the implementation of traceability systems for aquaculture products was currently in progress.
41. In Mr Tan Yit Wee's presentation, he reported Singapore's efforts to promote traceability through encouraging farms to digitise records for traceability purposes and educating farmers to stock traceable hatchery produced fry or fingerlings. He added that the consumer's unwillingness to pay a higher price for traceable products was one of the issues faced in the implementation of the traceability system and the future work of Singapore was to promote the uptake of GAqP for fish farming among farms.
42. In response to Indonesia's query on the method to trace back the aquaculture products rejected from other countries such as EU, Singapore informed the Meeting that not many Singapore farmers export seafood to EU, hence it would

be easy to identify the source if the products were rejected. D/PHTD added that AVA would issue export certification for export to EU. DSG commented that countries which were already exporting seafood to EU were considered having a good traceability system. DSG also reminded the Meeting to stay focus on the traceability system within ASEAN region.

43. Indonesia further explained that they faced difficulty tracing back the source of shrimps rejected by EU due to the presence of banned chemicals. DSG highlighted the needs to establish an effective traceability system to address such issue, especially in the case of a food recall.
44. Philippines shared that their traceability system could trace products from farm by assigning a unique identification number for each farm by location regardless of the change of operators/owner. D/PHTD also shared that each Singapore farm had a unique farm license number for traceability purpose.
45. Indonesia explained that the fish farmers were more interested in the traceability system to facilitate their trades to EU as compared to traceability system to ensure food safety. Indonesia also reported that traceability system was also imposed in small scale fishery industry catering for local consumption as consumers were concerned about the source of fish.

Thailand

46. Mr Somboon Laoprasert presented on Thailand's final country report and reported that Thailand had implemented the traceability systems for aquaculture products.
47. In Mr Somboon Laoprasert's presentation, he reported Thailand's strategies to control farms, hatcheries, feed and fishery products and that Thailand utilises manual and computerised systems for traceability. He added that their future plans include initiating the MD application on smart phone in October 2015 as well as testing and operating the computerised traceability system on black tiger shrimp clusters due to its short supply chain.
48. DSG enquired on the methods to secure the data in the e-traceability system accessible from mobile devices, to which Thailand acknowledge the importance of data confidentiality and would work on the data security.
49. To D/PHTD's query regarding the Movement Document (MD), Thailand clarified that the

MD were issued by government as well as farmers and companies with permission from Department of Fisheries (DoF).

50. In reply to D/PHTD's query on the challenges Thailand faced to implement traceability system and MD, Thailand stated that some middlemen would falsifying data in the MD, and they would be prosecuted if found guilty.
51. Regarding the self-certification of MD by companies, DSG enquired about the control of such system by DoF. Thailand explained that there would be auditors to audit those with permission to certify MD and added that the companies that practise self-certification were mostly big organisation/associations. Thailand also reported that such products were accepted by EU and EU officers would check the data of DoF annually. There were also annual audits conducted by EU.
52. In response to Viet Nam's query on the scheme owner of GAP certification to fish farms in Thailand, Thailand clarified that DoF was the Certification Body (CB) and National Bureau of Agricultural Commodity and Food Standards (ACFS) was the Accreditation Body (AB). Thailand added that both CB and Identification body (IB) must be accredited by ACFS.
53. Thailand informed the Meeting that each farmer had a registration number and each farm would have a unique identification number, in response to Indonesia's query regarding the registration of farmer who owned more than one farms in Thailand.
54. Thailand explained the details of the components in the manual traceability form, upon Indonesia's request.
55. Indonesia raised concern about the control of the activities of collector and pre-processor and if they operated separately. Thailand acknowledged that it was difficult to control their activities and they would educate the farmers to sell their products directly to processor and bypass the middlemen/collectors.
56. Indonesia consulted Thailand on the main technical problems faced in the process of developing computerised traceability system. Thailand reported that they faced similar difficulties when establishing the movement document, i.e. the server cannot be accessed on weekends when DoF officers were not on duty. Thailand also shared that the system could be infected by bugs in the computer programme.

57. DSG expressed concerned on the HACCP certification for the shrimp processor when the pre-processor were not HACCP certified. Thailand explained that only GMP was imposed for the pre-processors as the major problem faced by the pre-processors was in terms of labour but not product quality. Thailand also clarified that pre-processor was only involved in peeling off the shrimp shells while the main shrimp processing were carried out by processors. Thailand also added that such certification standards for pre-processor and processor were implemented upon consultation with EU.

Viet Nam

58. Ms Nguyen Thi Bang Tam, KPL of Viet Nam presented on Viet Nam's final country report and reported that the country had implemented the traceability systems for aquaculture products.

59. In Ms Nguyen Thi Bang Tam's presentation, she informed the Meeting of the Viet Nam's national activities implemented for the traceability systems, such as setting up of a website to manage VietGAP certified producers. She added that the one of the future plans of Viet Nam was to continue implementing the VietGAP program for catfish, shrimp and tilapia.

60. DSG commented that the traceability system in Viet Nam was similar to those of other Member Countries. He added the traceability system not only required the effort from the government, but also the involvement of private sectors to ensure effective implementation.

IV. AGENDA 3 – DISCUSSION ON TECHNICAL COMPILATION

61. Chairperson briefed all Member Countries on the contents of the Technical Compilation and requested on further comments from each Member Country.

62. Chairperson thanked all Member Countries for the updates and requested all Member Countries which have amendments/updates to submit their country reports with updated information by 14 September 2015, as the Technical Compilation had to be finalised and submitted at the SEAFDEC Programme Committee Meeting (PCM) in November 2015.

63. Indonesia recommended including updated information presented during the final country report presentation provided and suggested changing the time frame of the Technical Compilation from '2011 - 2014' to '2011 - 2015'.

DSG agreed to Indonesia's suggestions and commented that the section of "List of country report" in the Content page should include a note "updated 27 Aug 2015".

64. Singapore queried on the scope of the "Conclusion" section in each country report, to which Chairperson replied that it should be a conclusive note based on the country report, not just the activities implemented throughout the project in each country. D/PHTD suggested to include the conclusion as a "way forward" for this project in the End-Of-Project Meeting report.

65. Thailand and Viet Nam suggested including an overall summary/ way forwards for the ASEAN region in the Technical Compilation by collecting inputs from all ASEAN Member Countries. D/PHTD agreed to include a section at the end of the Technical Compilation to summarise the way forward for traceability implementation and the draft would be circulated for member countries' review.

66. Thailand and Singapore suggested combining Sections 4, 5 and 6 into one section for easy reporting for the Member Countries. Indonesia proposed to change the format of the Technical Compilation by including another section to capture the progress of each Member Countries before and after year 2014, to which DSG recommended updating the progress of each Member Countries from the beginning of the project in the existing country report, hence omitting two separate reports before and after year 2014.

67. After discussion amongst the Member Countries, Chairperson and D/PHTD clarified that the format of the Technical Compilation was adopted from past SEAFDEC/MFRD Technical Compilation. However, MFRD have considered the countries' suggestion to include an overall summary/ way forward of the project to be captured in the End-Of-Project Meeting report.

68. D/PHTD explained that unlike SEAFDEC Regional Technical Consultation (RTC) project, the implementation of traceability system was entirely the decision of each Member Countries as the objective of this project was to develop a Technical Guideline. She also informed the Meeting that the drafted Regional Guidelines would be submitted to PCM for endorsement.

69. Indonesia suggested the Meeting to focus on the discussion of the content of the Regional Guidelines as it would be endorsed by PCM. Malaysia proposed to include another item

in the adopted agenda for the discussion of overall summary/way forward at the end of the Meeting. The Meeting and DSG agreed Malaysia's proposal and Agenda 6: Discussion on Summary/Way Forward was added to the Meeting.

70. MFRD would be receiving updated reports from all ASEAN-SEAFDEC member countries, except for Brunei Darussalam, for the Technical Compilation by 14 September 2015.

V. AGENDA 4 – DISCUSSION AND ADOPTION OF TRACEABILITY GUIDELINES

71. Thailand proposed going through the Guidelines page by page instead of country by country for accurate and meaningful inputs. Chairperson accepted Thailand's suggestion and proposed to run through the document section by section, which was agreed by the Meeting. She also explained that the SEAFDEC National Coordinators of all Member Countries were invited to this Meeting to adopt the content of the Regional Guidelines before submission for endorsement at PCM.
72. Chairperson and D/PHTD informed the Meeting that the Regional Guideline was previously circulated to all Member Countries for comments and inputs prior to the Meeting. Chairperson went through the Regional Guidelines to seek for further inputs and amendments from the Meeting. Minor changes were corrected on the spot and major changes would be noted and reviewed by MFRD before being circulated to all Member Countries for their final adoption and subsequent escalation to the Project Committee Meeting (PCM) in November 2015.
73. The Meeting removed some definitions in Section III, Acronyms, Terms and Definitions, which were irrelevant and not mentioned in other sections of the document.
74. Viet Nam suggested to remove the different international definitions of 'aquaculture', to which Chairperson explained that those definitions were cross-referenced to other overseas Traceability Guidelines and should be retained as 'aquaculture' might be interpreted differently by different organisations/individuals. All Member Countries arrived at the consensus to retain the definitions.
75. Upon removal of the definitions of IUUF, Indonesia reminded all Member Countries to be mindful of the source of fish meal.

76. In response to Indonesia's suggestion to expand the scope of the Guideline to include other aquaculture species, Chairperson informed the Meeting that the generic supply chain of the Guideline was developed based on the consultation of all ASEAN-SEAFDEC member countries from the two on-site training workshops conducted for this project and that the two training workshops focused on fish and shrimp. Hence, it was agreed that the document/generic supply chain should be specifically referred to the aquaculture of fish and shrimps.
77. Viet Nam and DSG requested to merge the reference in Section III, Acronyms, Terms and Definitions, with those in Section XIII, Reference, of the Regional Guideline. DD/PHTD suggested using footnotes to account for the reference in of each definition in Section III, in which the Meeting was agreeable to this suggestion.
78. Chairperson went through the amendments made in the earlier discussions to the Meeting after lunch before continuing the discussion for Agenda 4. The Meeting had confirmed the amended changes as such.
79. Thailand suggested to include the definition of each traceability principles in Section V, Traceability Principles. Lao PDR also proposed numbering the information in Section V, Traceability Principles, to which DD/PHTD replied that MFRD would refine the flow of information in that section.
80. Thailand enquired if traceability implementation was required by law for export of aquaculture products to EU and US. The Meeting and Chairperson confirmed that it was not required by law but as a trade requirement for exportation to the mentioned region.
81. Cambodia disagreed with Viet Nam's suggestion removing Section VIII, Traceability Implementation Status in the ASEAN Region, as Viet Nam opined that the information was not related to the Guidelines. Cambodia explained that Section VIII provided a linkage to the information raised in Section IX, Issues and Challenges. Chairperson informed the Meeting that MFRD would condense the content in Section VIII and put it as an introductory paragraph in Section IX, in which the Meeting agreed to this suggestion.
82. During the discussion on Section IX, Issues and Challenges, DSG requested the clarification of 'presence of too many best practices'. D/PHTD explained that there were many traceability standards available and farmers face difficulties

- to select the most appropriate one. DSG commented that ASEAN should adopt one standard that was most suitable for the region.
83. Indonesia commented that the document served as general Guidelines for each Member Countries to set up rules and regulations, as well as procedures to implement traceability system.
 84. To Viet Nam's suggestion to only retain Section I, II, III, IV, V, VII, XI, XII and XIII of the document, Chairperson explained the format of the documents was adopted from previous SEAFDEC Guideline publications. She further added the content of the document was written in a flow for easy understanding by non-technical individuals; as such the format should not be further modified. All Member Countries agreed with the format and the content of the document after the discussion.
 85. During the discussion on the generic supply chain for the aquaculture of fish and shrimp, Chairperson informed the Meeting that the supply chain was agreed upon by all Member Countries during the two on-site training workshops. She added that the generic supply chain was agreed to be a generic one, at the same time, keeping the critical components/ stakeholders of the supply chain, while acknowledging that each Member Country might have different variations of the supply chain for aquaculture products in their respective country.
 86. The Meeting discussed and amended some of the terms and information to be noted from the records to be maintained in Section XII.
 87. In the section of "Middlemen" in Section XII, Indonesia proposed for the information on middlemen ID to be included as they opined that it was information critical for traceability. Viet Nam responded that it would be more important to note the information required to trace the product back to the farm. To which, the Chairperson concurs with Viet Nam and queried the Member Countries for consensus to include middlemen ID as one of the information to be noted in the records maintained. D/ PHTD suggested changing "supplier name" to "middlemen ID".
 88. During the discussion on "Exporter" of Section XII, DSG commented that the use of "hailed" in the sentence may suggest wild caught instead of aquaculture products. He added that the words "trawlers" and "tugboats" should also be deleted and queried the Member Countries on the information required from the exporter. Singapore enquired if information of the farm was still required if the exporters were to get their products from the processor. Chairperson responded that the section on "Exporter" requires fine-tuning and critical information from the processor should be noted (e.g. lot/ batch no.) instead of information on the source of origin. Information should also be obtained from the middlemen for the export of live fishes in this section.
 89. DSG explained that the exporter could buy aquaculture products from processors and middlemen. The information required from processors includes processor ID, lot/batch no. and other information such as quantity and processing date. Similar information might also be required from the middlemen. Chairperson responded for the information required to be drafted in 2 sections namely, the exporter and middlemen. She concurred that the information as discussed by DSG was critical and would include them in the Guidelines for circulation.
 90. Lao PDR suggested separating the section on Acronyms from Terms and Definitions of Section III. Chairperson replied that the various sections of this Guideline was written with reference to the format from past SEAFDEC publications and asked for consensus from the Member Countries to separate Section III, as per Lao PDR's suggestion. All Member Countries agreed to retain the current format.
 91. DSG explained that the purpose of Annex I was to provide a point of contact for the readers if they have any queries. Cambodia added a second contact point to the list. Indonesia, Malaysia, Philippines, Thailand and Viet Nam informed the Meeting that they would email the changes to Annex I by 28 August 2015.
 92. DSG queried on the purpose of Annex II and proposed for it to be removed from the Guidelines. Annex II was removed.
 93. The proposed changes made to the Guidelines were agreed unanimously by all Member Countries. Chairperson informed the Meeting that all relevant information/ outcomes of the discussion would be documented and the revised Guidelines would be circulated to all Member Countries by 14 September 2015. DSG opined for the revisions to be circulated to all Member Countries' delegates who attended the End-of-Project Meeting as well as National Coordinator of Brunei Darussalam.

VI. AGENDA 5 – SUMMARY OF DISCUSSION / WAY FORWARD

94. Viet Nam suggested to develop a protocol for the adoption of the Guidelines and proposed for SEAFDEC to mobilise funds / resources in year 2016/2017 for the ASEAN-SEAFDEC Member Countries to address the gaps in the traceability system, if possible. DSG queried on the specific kind of support required and responded that each Member Country had different situations and legal framework, thus different gaps in their implementation status. He added the SEAFDEC could provide assistance, such as training for the Member Countries in the near future if necessary.
95. Chairperson agreed that the way forward could include the future activities following this project to address the gaps. To which, DSG suggested for a protocol to fulfil the gaps of the traceability system implementation, with support from SEAFDEC.
96. Lao PDR queried if one of the Member Countries should be a leader to bring this Guidelines up for endorsement during the next PCM Meeting. To which, the Chairperson responded that there was no need to name a country. The Meeting agreed that it was not necessary to appoint a leader for the escalation of the Guidelines to the upcoming PCM.

VII. AGENDA 6 – FINAL REMARKS AND CLOSING OF MEETING

97. D/PHTD informed the Meeting that MFRD would send the End-of-Project (EOP) Administrative Report to the Member Countries and requested for the Member Countries to send their updated final country report to MFRD by 14 September 2015. DD/PHTD requested for the Member Countries to send their inputs/comments on the EOP Administrative Report to MFRD by 21 September 2015.
98. DSG and D/PHTD thanked the participants for their hard work and contributions during the Meeting and proceeded to end the Meeting with their Closing Remarks respectively.
99. The Chairperson delivered her Closing Remarks and also thanked the participants for their time and effort for the preparation of the progress reports and presentations.
100. The Meeting was held in the traditional spirit of SEAFDEC co-operation and cordiality.

Annex 1: Participant list

| Country | Name | Official Designation | Details |
|-----------|-------------------|--|--|
| Cambodia | Dr. Em Puthy | National Coordinator for Cambodia And Deputy Director of Department of Planning, Finance and International Cooperation, Fisheries Administration, Ministry of Agriculture Forestry and Fisheries | Mailing Address (Office): Fisheries Administration, #186 Preah Norodom Blvd., Chamcar Mon, P.O. Box 582, Phnom Penh, Cambodia Email Address: emputhy@yahoo.com; drputhy@gmail.com Tel: +855 16850003 (Mobile) Fax: +855 23215470 |
| | Mr. Chin Da | Deputy Director of Department of Aquaculture Development, Fisheries Administration, Ministry of Agriculture Forestry and Fisheries | Mailing Address (Office): Fisheries Administration, #186 Preah Norodom Blvd., P.O. Box 835, Phnom Penh, Cambodia Email Address: chinda77@yahoo.com Tel: +855 23 996 380 Fax: +855 23 996 380 |
| Indonesia | Ms. Aniza Suspita | Head of Sub Division for ASEAN Cooperation, Secretariat General, Ministry of marine Affairs and Fisheries (MMAF), Republic of Indonesia | Mailing Address (Office): Ministry of marine Affairs and Fisheries (MMAF), Republic of Indonesia, Jl. Medan Merdeka Timur No. 16, Gedung Mina Bahari 1, 1st Floor, Jakarta Email Address: asuspita@yahoo.com Tel: +62 81806561532 (Mobile) Fax: +6221 3864293 |

| Country | Name | Official Designation | Details |
|-----------|--------------------------|---|---|
| Indonesia | Dr. Reza Shah Pahlevi | Deputy Director for Residue Control, Directorate of Fish Health and Environment, Directorate General of Aquaculture, MMAF Republic of Indonesia | <p>Mailing Address (Office): Ministry of Marine Affairs and Fisheries, Jl. TB Simatupang, Kav 1, Menara 165, 15th and 16th floor, Jakarta, Indonesia</p> <p>Email Address: pahlevi.reza.nrm@gmail.com ; multilateralmmat@gmail.com</p> <p>Tel: 62 813 1743 2328 (Mobile)</p> <p>Fax: 62 21 29407200</p> |
| Lao PDR | Mr. Vannaphar Thammajedy | Deputy Director of Namxouang Aquaculture Development Centre, Department of Livestock and Fishery | <p>Mailing Address (Office): NamXouang Aquaculture Development Center, Department of Livestock and Fisheries, Ministry of Agriculture and Forestry.</p> <p>Email Address: vannaphar@gmail.com</p> <p>Tel: (+856-20) 55606866</p> <p>Fax: -</p> |
| | Mr. Oudone Khounsavan | Deputy Head of Aquaculture Management Section, Department of Fisheries, Department of Livestock and Fishery | <p>Mailing Address (Office): Division of Fisheries Department of Livestock and Fisheries (DLF), Ministry of Agriculture and Forestry</p> <p>Email Address: Oudone_kh@yahoo.com</p> <p>Tel: 856-21 217869 (Office), 856-20 55994775, (+856-20) 55994775 (Mobile)</p> <p>Fax: -</p> |

| Country | Name | Official Designation | Details |
|----------|---------------------------------------|--|---|
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| | Madam Noor Affizah Binti Bujang Saili | Fisheries Officer | <p>Mailing Address (Office): Fisheries Biosecurity Division, Department of Fisheries Malaysia, Level 3, Podium 4G2, Wisma Tani, Precinct 4, Federal Government Administrative Centre, 62628 Putrajaya, Malaysia</p> <p>Email Address: affizah@dof.gov.my</p> <p>Tel: +603-8870 4687 (Office), +6017-930 2511 (Mobile)</p> <p>Fax: +603-8890 3794</p> |
| Myanmar | Ms. Aye Aye Thein | Deputy Director, Department of Fisheries | <p>Mailing Address (Office): Mya Khwar Nyo Road, Industrial Zone, Thar Kay Ta Township, Yangon, Myanmar</p> <p>Email Address: ayeayethein36@gmail.com ; irnp.dof@gmail.com</p> <p>Tel: 95 67 418536, +95 9 420029947</p> <p>Fax: -</p> |

| Country | Name | Official Designation | Details |
|-------------|----------------------------|---|---|
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| Philippines | Mr. Magdaug, Robert Loy | Fishing Regulations Officer II BFAR Regional Office 6 | <p>Mailing Address (Office): Bureau of Fisheries and Aquatic Resources (BFAR), Regional Office 6, MuelleLoney St., Iloilo City, Philippines</p> <p>Email Address: robmdg@yahoo.com</p> <p>Tel: 63-33-5099002 (Office), 63-927-510-1557 (Mobile)</p> <p>Fax: 63-33-5099002</p> |
| | Ms. Somga, Sonia Sebastian | Senior Aquaculturist Fish Health Management and Quality Assurance Section (FHMQAS) Bureau of Fisheries and Aquatic Resources (BFAR) | <p>Mailing Address (Office): PCA Bldg., Elliptical Road, Diliman, Quezon City, Philippines</p> <p>Email Address: soniasomga@yahoo.com</p> <p>Tel: 63-2-4485432 (Office), 63-9988697078 (Mobile)</p> <p>Fax: 63-2-4115017</p> |

| Country | Name | Official Designation | Details |
|-----------|--------------------------|--|--|
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| | Mr. Tan Yit Wee | Senior Manager of Aquaculture Section, Aquaculture Technology Department, Technology & Industry Development Group, Agri-Food and Veterinary Authority of Singapore (AVA) | Mailing Address (Office): Sembawang Research Station, Lorong Chencharu Singapore 769194 Email Address: Tan_Yit_Wee@ava.gov.sg Tel: +65 67519853 (Office), +65 97575191 (Mobile) Fax: - |
| Thailand | Mrs. Malinee Smithrithee | National Coordinator for Thailand And Director of Fisheries Foreign Affairs Division, Department of Fisheries, Thailand | Mailing Address (Office): Fisheries Foreign Affairs Division, 50 Kaset Klang, Chatuchak, Bangkok 10900, Thailand Email Address: malinee_pom@hotmail.com Tel: +662 579 8215 (Office), +668 5911 2038 (Mobile) Fax: +662 579 8215 |

| Country | Name | Official Designation | Details |
|----------|----------------------------|--|---|
| Thailand | Mr. Somboon Laoprasert | Director of Marine Shrimp Culture Research and Development Institute, Coastal Fisheries Research and Development Division, Department of Fisheries, Thailand | <p>Mailing Address (Office): Marine Shrimp Culture Research and Development Institute, Coastal Fisheries Research and Development Division, 50 Kaset Klang, Chatuchak, Bangkok 10900, Thailand</p> <p>Email Address: somboonl49@yahoo.com ; somboonl@fisheries.go.th ; somboonl49@yahoo.co.th</p> <p>Tel: +662 579 3682 (Office), +668 6711 0659 (Mobile)</p> <p>Fax: +662 561 0786</p> |
| Viet Nam | Ms. Nguyen Thi Trang Nhung | National Coordinator for Viet Nam And Deputy Director of Department of Science, Technology and International Cooperation, Directorate of Fisheries, Ministry of Agriculture and Rural Development (MARD) | <p>Mailing Address (Office): No. 10-12 Nguyen Cong Hoan Street, Ba Dinh, Hanoi, Viet Nam</p> <p>Email Address: trangnhungicd@gmail.com</p> <p>Tel: +84 912153865 (Mobile)</p> <p>Fax: -</p> |
| | Ms. Nguyen Thi Bang Tam | Senior Official of Department of Aquaculture, Directorate of Fisheries, Ministry of Agriculture and Rural Development (MARD) | <p>Mailing Address (Office): Directorate of Fisheries, Ministry of Agriculture and Rural Development. No 10 Nguyen Cong Hoan str, Ba Dinh district, Hanoi, Viet Nam</p> <p>Email Address: bangtam291@gmail.com</p> <p>Tel: +84 982 365546 (Mobile)</p> <p>Fax: -</p> |

| Country | Name | Official Designation | Details |
|---|---------------------|--|--|
| SEAFDEC Secretariat | Mr. Hajime Kawamura | Deputy Secretary-General, and Japanese Trust Fund Program Manager | <p>Mailing Address (Office): P.O Box 1046, Kasetsart Post Office, Bangkok 10903, Thailand</p> <p>Email Address: dsg@seafdec.org</p> <p>Tel: +66 2 9406326 / +66 2 9406331</p> <p>Fax: +66 2 9406336</p> |
| Post-Harvest Technology Centre (PHTC) / MFRD Programmes | Ms. Khoo Gek Hoon | Director of Post-Harvest Technology Department, Technology & Industry Development Group, Agri-Food and Veterinary Authority of Singapore (AVA) | <p>Mailing Address (Office): 2 Perahu Road, Singapore 718915</p> <p>Email Address: Khoo_Gek_Hoon@ava.gov.sg</p> <p>Tel: +65 67907968 (Office)</p> <p>Fax: +65 6861 3196</p> |
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| Country | Name | Official Designation | Details |
|---|-------------------|---|--|
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| Country | Name | Official Designation | Details |
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Annex 2: Provisional Agenda of End-Of-Project Meeting

26 August 2015, Wednesday (Day 1)

- 0845 – 0900 Registration
- 0900 – 0945 *Agenda 1: Opening of the Meeting*
- Welcome Remarks by Chief of MFRD Programmes
 - Welcome Remarks by DSG
 - Opening Address by Director of PHTD/ TIDG
- Introduction and Adoption of Agenda
- 0945 – 1015 Group Photograph and Coffee Break
- 1015 – 1215 *Agenda 2: Final Country Report Presentation*
(Presentation: 20 mins; Q&A: 10 mins)
- 1015 – 1045: Cambodia
1045 – 1115: Indonesia
1115 – 1145: Lao PDR
1145 – 1215: Malaysia
- 1215 – 1330 Lunch Break
- 1330 – 1500 *Final Country Report Presentation (Cont.)*
(Presentation: 20 mins; Q&A: 10 mins)
- 1330 – 1400: Myanmar
1400 – 1430: Philippines
1430 – 1500: Singapore
- 1500 – 1530 Coffee Break
- 1530 – 1630 *Final Country Report Presentation (Cont.)*
(Presentation: 20 mins; Q&A: 10 mins)
- 1530 – 1600: Thailand
1600 – 1630: Viet Nam

- End of Day 1 -

27 August 2015, Thursday (Day 2)

- 0900 – 1015 *Agenda 3: Discussion on Technical Compilation*
- 1015 – 1045 Coffee Break
- 1045 – 1200 *Agenda 4: Discussion and adoption of Traceability Guidelines*
- 1200 – 1330 Lunch Break
- 1330 – 1530 Discussion and adoption of Traceability Guidelines (cont.)
- 1530 – 1600 Coffee Break
- 1600 – 1630 *Agenda 5: Final Remarks and Closing of Meeting*

- END -

Notes

Notes
