

# INDONESIA

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## INTRODUCTION

Consisting of a total of 17,500 islands with a coastal length of about 81,000 km, Indonesia has land areas of over 2 million square km and 5.8 million square km of marine waters. Of this, 3.1 million square km is classified as archipelago and territorial waters. The remaining 2.7 million square km is Indonesia's Exclusive Economic Zone (EEZ). About 775,000 sq. km of marine waters are coastal areas of less than 200 meters deep.

With this vast area of inland, coastal and marine

waters, fisheries have been playing an important role in the socio-economic life of Indonesia, in particular in coastal communities. The sector provides employment for more than 4.5 million fishermen/ fish farmers. Currently, while most sectors suffer from the current economic crisis, fisheries have demonstrated its ability to sustain contribution to national economy. In 2000, fisheries generated about US\$ 1.675 billion from more than 500,000 metric tonnes total fish export and in 2002, US\$ 1.7 billion from more than 600,000 metric tonnes.

## Production trends

The fish landing, both marine and cultured, has been increasing consistently from 1996 to 2000. The production in 1996 was 4,452,258 tonnes and in 2000,

4,875,649 tonnes. The average increase is around 3.51% per year. Table 1 shows the fisheries production by sub sector of fisheries, from 1996 to 2000.

**Table 1. Fisheries production by sub sector of fishery, 1996-2000**

Unit: 1000 tonnes

Sub Sector	1996	1997	1998	1999	2000	Annual rate of increase (%)
<b>Total</b>	<b>4,452.258</b>	<b>4,579.766</b>	<b>4,642.209</b>	<b>4,893.060</b>	<b>4,875.649</b>	<b>2.31</b>
Marine fishery	3,383.456	3,612.961	3,723.746	3,682.444	3,807.191	3.03
Inland fishery	1,068.802	966.805	918.463	1,210.616	1,068.458	1.38
- Inland open water	335.707	304.258	288.666	327.627	305.212	-1.96
- Culture	733.095	662.547	629.797	882.989	763.246	3.02
- Brackish water	404.335	370.259	353.750	412.935	430.017	1.99
- Freshwater pond	182.918	171.768	168.478	177.622	214.393	4.53
- Cage	44.630	26.186	17.639	32.323	25.773	-2.75
- Paddy field	101.212	94.334	89.930	94.634	93.063	-1.97

The production comprises marine fish, inland open water fish, brackish water fisheries and freshwater fisheries. In 2000, marine fisheries made up to 78.09% of

total fish landing, inland open water 6.26%, brackish water fisheries 8.82% and freshwater fisheries 6.83%.

### Trade on fishery products

The export of fish products reached its peak in 1998 and declined slightly in the following years. By volume, the average decrease was 2.75% from 1996 - 2000 and by value it decreased by 1.5% (Table 2). The major market for fish products are Asian countries, mostly Japan, followed by EU and US (Table 2). Frozen shrimp is the main product export, followed by tuna and tuna products. By

value, shrimp accounted for 59.83% of the total export value in 2000.

The import of fish products has increased by the average of 20.68% (by volume) or 7.68% (by value) yearly from 1996 - 2000. Fishmeal was the major imported fishery product during this period, mainly from Peru, Chile and Germany.

**Table 2. Trade of fishery products, 1997-2002**

Year	Volume (tonnes)		Value (US\$ 1,000)	
	Export	Import	Export	Import
1997	574,419	151,802	1,686,168	122,369
1998	650,291	61,104	1,698,666	52,491
1999	644,604	115,818	1,605,421	76,291
2000	519,416	179,463	1,675,074	111,476
2001	487,116	162,471	1,631,898	103,616
2002 (Jan to Nov)	525,246	115,169	1,457,052	84,619
Annual rate of increase (%)	-0.011	-0.265	-0.027	0.018

Total export of fish products in 2001 (from Jan to Nov) are presented in Table 3

**Table 3. Total export by country of destination in 2001**

Importer Countries	Volume (kg)	Value US\$
US	54,160,295	318,961,865
EU	83,487,416	190,843,618
Asia	<b>137,647,711</b>	<b>509,805,483</b>
1. Japan	120,702,961	772,616,287
2. Singapore	62,619,589	91,634,726
3. Hong Kong	32,215,039	67,009,952
Canada	2,671,241	9,941,600
Other	131,259,591	180,890,539
<b>Total</b>	<b>487,116,132</b>	<b>1,631,898,587</b>

## Annual fish consumption per capita

The supply of fish for domestic consumption has grown at an average of 5.44% annually and the consumption/ capita yearly at a rate of 4.20% annually from 1997 - 2001 (Table 4). As the national

consumption target for fish consumption is 26.44 kg/ person/ year, the consumption level of fish consumption in 2001 is still 17% below the recommended level.

**Table 4. Fish consumption per capita, 1997-2001**

Unit : Kg

	1997	1998	1999	2000	2001	Annual rate of increase (%)
Total consumption	3,807.20	4,052.52	4,278.55	4,502.68	4,705.79	5.44
Consumption/ capita/ year	19.05	19.98	21.09	21.87	22.44	4.20

## Fish processing industry

Over 50% of the export-oriented establishments produce frozen fish products, while others produced other processed products, such as salted-dried, salted-boiled, smoked, fermented, frozen, canned and

fishmeal (Table 5). The main types of commodities include shrimp, tuna/ skipjack, frog legs, ornamental fish, seaweed and other fish.

**Table 5. Export-oriented fish processing establishments\***

Processing Activity	In 2000	In 2003	Export Destination
Canning (C)	36	36	Asia, Canada, EU, US
Freezing (B)	371	373	Asia, Canada, EU, US
Chilling (A)	68	71	Asia, EU, US
<b>Other processed product (D)</b> (Fish/ shrimp cracker, drying)	36	36	Asia, EU, US
<b>Total</b>	<b>573</b>	<b>578</b>	

\*) The same company may have more than one product

## FISH INSPECTION AND QUALITY CONTROL SYSTEM

### *Historical development of fish inspection and quality control*

Since the enactment of the Foreign and Domestic Investment Acts, the development of industrial fisheries has brought about significant progress to the export fish products. In 1970-1972, frozen shrimp was the

prime fish product for export to Japan, US and Europe. Despite the fact that the export of fish and fish products continued to expand, Indonesia was still unable to take advantage of the export of shrimp, particularly to the

US. Due to inferior quality, Indonesia used to be included in the 'block list' and the import of Indonesian shrimp product was subject to 'automatic detention'.

This market access restriction led government to establish a Memorandum of Understanding (MOU) between the Minister of Health and Agriculture in setting-up jointly a compulsory Fish Inspection and Quality Control Regulation in 1975, based on the Health and Hygiene Acts of 1960 and 1962 respectively. In the MOU, Directorate General of Capture Fisheries (DGCF) took over the responsibility for inspection and quality control of fish and fish products. The fish inspection and quality control programme administered by the DGCF includes development of fishery standards, hygiene and sanitation, of which DGCF adopted the CAC FAO/ WHO - Codes of Practices for infrastructure, environment, facilities, plant personnel and operation of fish processing plant. The programme includes development of standards, fish inspection and certification of fish production facilities in accordance

with Good Manufacturing Practices (GMP), certification of competence and certification of the quality of the final product for export.

Since the issue of promoting quality assurance became a growing concern of several Ministries, the National Council of Standardization was established and it later issued regulations setting forth the Indonesian National Standardization (INS) and its implementation of the system. The regulations require compliance on: (i) Code of practices, (ii) Technical specification, (iii) Method of testing, (iv) Safety and health requirement, (v) Methods of packing, marking and labelling, and (vi) Methods of producing and description.

The INS aims to: (i) provide consumers with safety and health protection, (ii) provide quality assurance, (iii) promote efficiency and productivity of fish processing plant and meet the standard, (iv) promote competitiveness in international trade/ market, and (v) take part in environmental conservation.

## Current legislation and jurisdiction

There are a number of legislative decrees concerned with the regulation of quality control and inspection of seafood products. These are:

- (1) Fisheries Law. No. 9. Year 1985, chapter 19: Government Administration of Fish Inspection and Quality Control
- (2) Government Regulation. No. 102, Year 2000: Laying down the Indonesian National Standardization
- (3) Presidential Decree No. 13/1997 issued on March 26, 1997, Setting Forth the National Standardization Agency
- (4) Decree of Ministerial of Agriculture No. 41/KPTS/IK.210/2/98 as last amended by Decree of Minister of Marine Affairs and Fishery No. Kep. 01/ MEN/2002 issued on Jan 25, 2002 setting forth the HACCP-based Integrated Quality Management System of Fishery Products

- (5) Decree of Minister of Marine Affairs and Fishery (MMAF) No. Kep. 06/MEN/2002 issued on Feb 11, 2002 setting forth the Requirement and Procedure for Fish Quality Control of Fishery Products entering the Republic of Indonesia

- (6) Decree of Director General of Fisheries No. 14128/Kpts/IK.130/XII/98 issued on Dec 17, 1998 setting forth the Implementation Guidelines of HACCP-based Integrated Quality Management System of Fishery Products

Apart from the above legislations, technical guidance under respective jurisdiction of the Ministry concerned are also stipulated.

1. Fish Inspection and Quality Control Supervisory Programme that is under jurisdiction of the Ministry of Agriculture viz. Directorate General of Fisheries.

2. Accreditation program, concerning Laboratories for Fish Inspection and Quality Control that is under jurisdiction of National Standardization Agency.

3. Control of additives used in Handling and Processing of Fish and Fishery Product that is under regulation of Food and Drugs Control Body.

## INSPECTION AND QUALITY CONTROL AUTHORITY

Since Indonesia suffers from economic crisis, the government has placed more emphasis on the development of the fishery sector. The development of fishery sector is currently under the Ministry of Marine Affairs and Fisheries (MMAF). The organizational structure of MMAF is shown in Fig 1.

The Directorate General of Fisheries consists of 2 Directorate Generals, namely Directorate General of Capture Fisheries and Directorate General of Aquaculture Fisheries.

The main objectives of reorganization in fishery sector are:

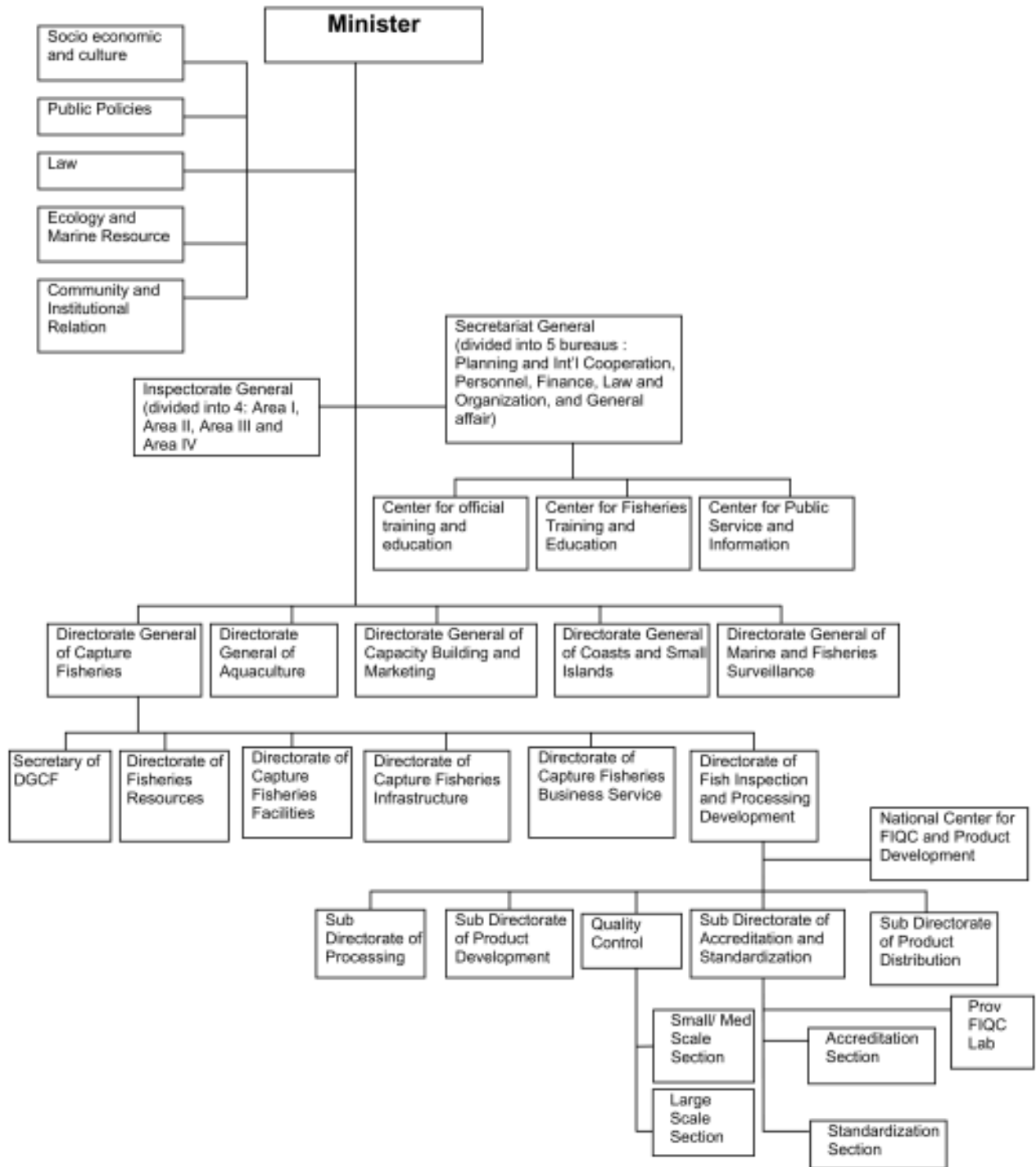
- Optimisation of fishery production in both capture and aquaculture
- Optimisation of fish utilization both for local and international market

- Harmonization with the international regulation as mandated in the Code of Conduct for Responsible Fisheries issued by FAO 1995 and SPS- WTO

The Directorate General of Capture Fisheries is supported by five Directorates and one secretary:

1. Directorate of Fish Resources
2. Directorate of Capture Fisheries Facilities
3. Directorate of Capture Fisheries Infrastructure
4. Directorate of Capture Fisheries Enterprise
5. Directorate of Fish Inspection and Processing Development
6. Secretary Directorate General of Capture Fisheries

**Fig 1. Organizational structure of the Ministry of Marine  
Affair and Fisheries**



The Directorate of Fish Inspection and Processing Development conducts services on fish inspection and quality control. The Directorate is supported by 5 Sub - Directorates, that is:

1. Sub - Directorate of Fish Product Development  
Carries out and provide material for the formulation of technical guidance and policies for product development
2. Sub - Directorate of Fish Processing Supervision  
Provides supervision and guidance on handling and processing technology of fish and fishery products as well as technology packages on fish engineering
3. Sub - Directorate of Fish Inspection and Quality Control  
Acts as the technical coordinator concerning the supervision of Fish Inspection and Quality Control
4. Sub - Directorate of Accreditation and Standardization  
Sets up and monitor the application of Code of Practices and Quality Standard; develop, monitor and control the implementation of HACCP plan; set up, monitor and control the implementation of Good Laboratory Practices (GLP)

5. Sub - Directorate of Fish Distribution

Develops formulation on technical policies and guidance for fish distribution

At the provincial level, the fisheries services are operationally assisted by the Sub-Directorate of Fish Inspection and Quality Control to coordinate local inspectors to conduct supervision, inspection and quality control on a daily basis, whilst the fish inspectors attached to the central office supervise and monitor the conduct of local inspectors and conduct cross-inspection of the processing plants periodically.

The provincial laboratories directly perform the fish quality control, including certification of fishery products for fish inspection and quality control. In total, there are 37 laboratories located in different provinces. The National Center for Fish Quality Control and Processing Development acts as the reference laboratory to provide supervision to the provincial laboratories in terms of analytical methods, processing technology development and training.

## Certification body

Based on the Decree of the MMAF No. Kep. 01/2001 regarding the Organization Structure and Management, the Directorate General of Capture Fisheries is tasked to '*Formulate and Implement policies and Technical Standardization of Capture Fisheries*'. This task also includes the technical standardization for fish and fishery products either aqua-cultured or captured.

The MMAF Decree of Kep.01/MEN/2002 on '*Integrated Quality Management System of Fishery Product*' has appointed the Directorate General of Capture Fisheries as the competent authority on fish inspection and quality control. The Directorate General of Capture Fisheries then developed and implemented

certification systems according to the HACCP-based Integrated Quality Management System.

Technical Guidance for the certification system is referred to the Decree of Directorate General of Fisheries No. 14128/Kpts/IK.130/XII/98 issued on 17 Dec 1998 (formerly under Ministry of Agriculture). The Decree set the procedures of certification for:

1. Prerequisite programme (SSOP & GMP)
2. Implementation of HACCP programme in the processing plants
3. Quality Control supervisor/ personnel
4. Fish and fish products for exports

## IMPLEMENTATION OF HACCP IN THE FISHERY INDUSTRY

### **Fishery industry development policies**

Strategic policies in the development of fishery industry are taken via the agribusiness development approach. The introduction of agribusiness sub-systems comprising stages of pre-harvesting, harvesting, post-harvesting and marketing consistent with implementation of HACCP. This approach is supported with improvement of infrastructure, facilities and human resources.

### **HACCP development program**

The export market of seafood products is becoming more competitive in this global era due to the following reasons:

1. A supply-led approach in the fisheries development policies in most parts of the world tends to outstrip global demand;
2. Growing concern over public health and consumer protection based on food safety in the developed countries which leads to a tightening of requirement by importing countries;
3. Environmental issues, which have been stringently forcing the exporting countries into a difficult position, and has been used by some importing countries to protect their interest. Recent issues are the dolphin issue, antibiotic, pesticides etc

The government and the private sector have to address all the challenges above. As far as quality and safety are concerned, the fishery industry inevitably, has to keep pace with these requirements.

The traditional approach in quality control that emphasizes on the inspection of end product is no longer able to cope with the challenges. It has been replaced by a new approach based on the HACCP principles.

Many plants have used some process control and record keeping procedures similar to those required in HACCP-type programme in term of self-monitoring

quality control. However, government provides more support to establishments in order to disseminate the implementation of the programme nationwide. For this reason, the HACCP supervisory programme in fish industry has been purposed to:

1. Improve seafood quality and safety
2. Improve the Indonesian product reputation in the international market
3. Reduce cost in the quality control and inspection in the Indonesia fish industry
4. Boost efficiency by reducing risk cost
5. Establish self-regulatory quality control in Indonesian fish industry based on HACCP concept

To achieve those objectives, the Directorate General of Fisheries carried out development programmes consisting of:

1. Strengthening the fish inspection and quality control institution by conducting training programme both in country and overseas on HACCP. The target group for training programmes are senior fish inspectors and quality controllers from the DGCF who were trained as trainers (TOT) on the application of HACCP-based programme
2. Training workshop for provincial fish inspectors engaged in both government and private sector. This programme emphasizes the implementation of HACCP in the fish processing industry
3. Supervising the complete implementation of HACCP at selected fish processing plants based on the result from the provincial training workshop
4. Disseminating the implementation of HACCP in the Indonesian seafood industry during pre-harvest, harvest and post-harvest
5. Disseminating the implementation of HACCP in the fish/ shrimp culture
6. Legislative support for the implementation of HACCP



The implementation of the HACCP in the fishery industry needs to be supported with adequate legislation, which will govern the relationship between the government and private sector. The role of the government, in particular fish inspectors and benefits that will be gained by private sector having applied the new system should be clearly identified. This has been outlined clearly in the MMAF Decree No. 01/MEN/2002, and the decree of Director General of Fisheries

(now Directorate General of Capture Fisheries) No. 14128/Kpts/IK.130/XII/1998.

The development of the programme has partly been funded within the auspices of the ASEAN-Canada Fisheries Post Harvest Technology Project Phase II (1992 - 1997) and the US-AID supported Project on Development of Agribusiness.

## PROBLEMS/ DIFFICULTIES ENCOUNTERED

The development of HACCP is hindered by some factors that are mainly due to more technical, social and economic reasons. A number of constraints remain in the way of developing an effective HACCP. Some of the constraints include:

1. Lack of enforcement to comply to the regulation
2. Lack of harmonized basic concept displayed by the regulatory agencies on strategic approach to promote quality assurance for the enhancement of Indonesia's share in the international market
3. Lack of understanding of HACCP by fish processors
4. Lack of effective training method to all levels, from the inspectors to the processors
5. Lack of education and extension on the part of fishermen and traders

6. Lack of budget to develop the system

The inspection and quality control programme carried out by the government personnel, and the 'self-regulatory quality control' carried out by the processor needs to be effectively and efficiently implemented. There is a need to:

1. Empower more skilled and experienced fish inspectors and in-plant quality control personnel
2. Upgrade educational level of fishermen
3. Enhance awareness and understanding to processors with regard to the task of fish inspectors
4. Provide sufficient facilities and equipment for laboratories, fish landings, fish auctions and fishing vessels
5. Empower qualified laboratory analysts

## EXPECTED GOALS IN IMPLEMENTING HACCP

For the recent National Development Plan, concerning fish export markets development, the DGCF has positioned itself to meet these challenges by development of an integrated quality management system in the fish industry. This programme purposed to improve the system that covers all aspects of fish production, both at pre and post-harvest stages, in order to provide high quality assurance of seafood for

consumers. The goal is to enhance seafood safety. To implement the integrated quality management system on fishery products, good practices in all aspects of production are required, that is:

1. Good Farming Practices  
Covers all key hygiene and sanitation aspects, from site selection for farming establishment to the final phase of fish production

2. Good Handling Practices

Includes hygiene and sanitation aspects during harvesting and loading, transportation or handling on-board at fishing vessel before further handling and processing stages

3. Good Manufacturing Practices

Deals with hygiene and sanitation aspects of handling and processing techniques, construction, facilities and equipment, personnel and self-regulatory quality control management in fish processing plant

4. Good Laboratory Practices

Includes laboratory management for conducting quality control of fishery products at

all stages of production. The GLP requires establishment of standardized laboratories

5. Good Inspection Practices

Includes improvement of inspection system. Its implementation does not only apply to government fish inspectors but also to the processing plants in their self-regulatory quality control, to enhance preventive measures at critical control point

6. Improved Standardization System

Under National Standardization Agency, DGF develops standard for fish products and other related measures and procedures and implement the adopted Indonesian National Standards

## IMPLEMENTATION OF HACCP IN SMALL/ MEDIUM SCALE FISH PROCESSING UNIT

Based on inventory of fish processing unit in Indonesia, there were about 12,500 fish processing establishments in 30 provinces in 2002. Of these, 339 are export-oriented, which most of them have adopted pre-

requisite programme (SSOP and GMP). Around 5 - 6% of them have the certificate of sanitation issued by the Head of Provincial Fisheries Services.

## Inspection and Quality Control Supervisory Programme

Within the Ministerial Decree of Marine Affairs and Fisheries, in regard to HACCP-based Integrated Quality Management System on Fish Products, the activities of inspection and quality control supervisory programme cover harvesting, transport, handling, processing, packaging and storage to distribution. This is to ensure the fish and fish products are wholesome and safe for human consumption.

The inspection and supervisory programme are targeted of all stakeholders who deal with fish harvesting, handling, processing, packing, storage, and distribution, at production sites (vessel and pond-sites), auction and landing places, distribution sites, processing plants, fish markets, and cold storage. The stakeholders include fishermen and fish farmers, collectors, traders, processors, quality control personnel and fish inspectors.

They are encouraged to implement good handling, harvesting and manufacturing practices according to prescribed Code of Practices.

To carry out those activities, DGCF have registered another 284 Fish Inspectors who serve fish processing plants in different provinces of Indonesia in 2003. The Fish Inspectors are classified as Provincial Fish Inspectors that is local government-based, and National Fish Inspector that is central government-based.

The activities of Fish Inspectors include (1) assessment of Pre-Requisite of Processing Plant, (2) performing pre-validation, (3) validation, (4) audit and (5) audit verification of the implementation of HACCP. Activities (2) and (4) are conducted by Provincial Fish Inspectors whilst (3) and (5) are by National Fish Inspectors.

The programme is manifested into certification, namely:

1. Certificate of GMP/SSOP issued by Directorate General of Capture Fisheries
2. Certificate of HACCP implementation issued by Directorate General of Fisheries
3. Certificate of Competence Required by Plant Quality Control Supervisor issued by Directorate General of Fisheries

4. Certificate of Quality or Health Certificate for Export Product issued by Provincial Laboratory and Inspection Services

As shown in Table 6, most export-oriented fish processing plants, including canning, freezing, chilling, drying and shrimp/fish cracker processing have implemented SSOP and GMP. In 2003 most export-oriented fish processing plants (339 units) are HACCP-implemented. As compared to 2000, this number is an increase of 13%.

**Table 6. Number of establishments implementing SSOP and HACCP, 2000 - 2003**

	2000	2001	2002	Up to Jun 2003
SSOP/ GMP	481	479	545	578
HACCP	249	204	295	263
Number of fish-processing establishments	±11,281	±11,815	±12,500	±12,500
Export-oriented fish processing establishments	290	305	322	339

## OTHER ISSUES

It is widely anticipated that the international market for seafood will become more competitive. The major issues in the fish industry, environment and safety, have influence on fish trade relation between exporting and importing countries. These issues have been reflected in fish hygiene legislation applied by the importing countries, such as EU Commission Decisions and Council Directives, US Federal Regulation, etc.

To deal with the 'new trend' in the business climate, the government has been making extra effort to establish a cooperation or mutual arrangement with fish importing countries. These include:

1. CD No. 2001/254/EC, Mar 2001 (amended from EU' Commission Decision No. 94/324/EC, dated 19 May 1994) that appointed Ministry of Marine Affairs and Fisheries, Directorate General of

Fisheries to be the Competent Authority in Indonesia for verifying and certifying compliance of fishery and cultured products

2. MOU between DGCF and the Australia Quarantine and Inspection Services
3. MRA between DGCF and the Canadian Government Canadian Fish Inspection Agency (CFIA) on 7 Mar, 2002 regarding Fish and Fish Products Inspection and Control System
4. Initiation of MOU with US-FDA Development of MOU between Indonesia and US, regarding Fish Product Inspection and Certification has been initiated. Progress of the MOU has been achieved, such as side-by side evaluation, exchanges of information (regulation, and procedures) and field visits to fish processing. The results indicate that MOU between the two countries will be achieved in reasonable time

## CONCLUSION

1. As the fishery sector is expected to increase its contribution to the country by generating foreign exchange and fish consumption, the country will cooperate to achieve harmonization or mutual recognition of the national quality and food safety assurance and certification system through exploring possibilities for establishment of a mutual recognition arrangement
2. The Directorate General of Capture Fisheries has made necessary actions to meet all those challenges by making policies that are consistent to HACCP system and other appropriate requirement issued by international body, such as FAO/WHO
3. The Directorate General of Capture Fisheries sets standards for safety and quality assurance and assures that fishery industries effectively applied the standards. Some improvements by strengthening the fish inspection system have been made, such as providing training programme to instructors, fish inspectors, quality control personnel; holding workshops to industries; performing supervision on the application of HACCP and establishment of legislative supports on the application of the HACCP
4. Agribusiness-led approach in the fishery industry development policies is taken, based to the HACCP system, which requires good practices in every sub system of the agribusiness system. The objectives are to maximize the utilization of resources, minimize fish losses during handling and processing and maintain safety in seafood production
5. In the implementation of HACCP system, DGCF as competent authority for fish inspection and quality control consistently performs validation, audit and verification to fishery industries