

**REVIEW OF FISHERY INFORMATION AND DATA COLLECTION SYSTEMS  
IN CHINA**



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## **REVIEW OF FISHERY INFORMATION AND DATA COLLECTION SYSTEMS IN CHINA**

by

**Guo, Zhijie**

China Fishery Society

**Xie, Yingliang**

East China Sea Fisheries Research Institute

**Zhang, Xiangguo**

Fisheries University of Shanghai

**Wang, Yong**

Fishery Office of Hubei Province

**Zhang, Daobo**

Marine Fisheries Research Institute of Zhejiang Province

**Shunji Sugiyama**

FishCode STF project

FAO Fisheries and Aquaculture Department

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## **PREPARATION OF THIS DOCUMENT**

This FAO Fisheries Circular is based on the working paper presented at the second FAO/China Society of Fisheries Workshop on Chinese Fishery and Aquaculture Statistics held in Kunming, Yunnan Province, China in September 2006. The workshop was jointly organized by the FAO Fisheries and Aquaculture Department, the FishCode-STF project and the China Society of Fisheries, in collaboration with the East China Sea Fisheries Research Institute, with the aims of reviewing requirements for Chinese fishery and aquaculture statistics and of discussing how they could best be provided in the future.

This review of the national fishery information and data collection system in China constitutes a part of the global review of national fishery information and data collection systems that has been undertaken by the FAO FishCode STF Project. This activity is within the framework of promoting the FAO's "Strategy for improving information on status and trends of capture fisheries" (Strategy STF). The FishCode STF Project supports implementation of the Strategy STF globally with special emphasis on capacity building in developing countries and regions. Support for the project has been provided through contributions to the FishCode Trust (MTF/GLO/125/MUL) by the governments of Norway, Japan and Sweden.

This Circular was written by Mr Guo Zhijie (Chinese Society of Fisheries), Mr Xie Yingling (East China Sea Fisheries Research Institute), Mr Zhang Xiangguo (Fisheries University of Shanghai), Mr Wang Yong (Hubei Province), Mr Zhang Daobo (Marine Fisheries Research Institute of Zhejiang Province) and Mr Shunji Sugiyama (Information and Liaison Officer of the FAO FishCode STF Project).

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### ABSTRACT

This review applies a structured approach to describe the national fishery information and data collection system in China and focuses on critical dimensions of the system – namely why fishery information is needed; what data items are currently collected; how these are collected; and who does this. It contains the following information:

1. General information related to fisheries: this includes information that has implications for fishery data collection (e.g. the geographical characteristics of coastal areas, administrative divisions and ethnicities/cultures/ traditions of fisheries communities).
2. The structure of the fisheries sector: this section is concerned with the structural characteristics of the fisheries sector that are key factors to consider in designing a fishery information system.
3. Fishery policy and management objectives: these are important as they determine fishery information requirements.
4. Current status of statistical reporting: this consists of a) fishery statistics reported to FAO and b) fishery statistics reported at the national level.
5. Fishery information and data collection system: this describes the key elements of the system including a) the objectives of fishery data collection, b) the main institutions involved in fishery data collection and c) the legislative framework for fishery data collection.

Fishery and aquaculture statistics in China are compiled mainly through 18 standard reporting forms that are annually submitted by 31 local administrative units (provinces, autonomous regions and municipalities under direct control of the central government). The reporting forms cover a variety of subject areas including: i) production, ii) structure of the sector, iii) marketing and supporting industry, iv) processing, v) employment, vi) socio-economic aspects of fishing households, vii) investment in the fishery sector and viii) damage and loss caused by disaster in the sector. These sets of data are analysed and reported in the *China Fisheries Yearbook*, an annual publication of the Bureau of Fisheries, Ministry of Agriculture.

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**ACRONYMS AND ABBREVIATIONS**

BOF	Bureau of Fisheries, Ministry of Agriculture
CSF	China Society of Fisheries
CNY (RMB)	Chinese Yuan or Renminbi (the official currency in China)
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
NBS	National Bureau of Statistics
RFV	Register of fishing vessels of the People's Republic of China



## 1. INTRODUCTION

The need for good information on the status and trends of fisheries is stated in the Code of Conduct for Responsible Fisheries and in other international instruments concerning fisheries. Accurate and appropriate knowledge of fisheries and fishery resources, including the socio-economic aspects, is a prerequisite for sound policy-making and for responsible fisheries management and governance.

The fisheries sector is a complex and dynamic production sector. Those in charge of data collection in fisheries are required to pay due attention to changing information needs. A shift in fishery policy or a structural change in the sector framework for example, certainly requires an adjustment in the fishery information system. As such the periodic review of the fishery information system is needed to maintain its relevance, validity and effectiveness. A clear description of the system, together with the provision of related information, will provide a good basis in the process of reviewing and re-designing the national fishery information system.

This review was originally prepared and presented at the second FAO/China Society of Fisheries Workshop on Chinese Fishery and Aquaculture Statistics held in Kunming, Yunnan Province, China in September 2006. It aimed to review the requirements for Chinese fishery and aquaculture statistics and to discuss how these could best be provided in the future. It applies a structured approach to describe the national fishery information and data collection system in China and focuses on the critical dimensions of the system – namely why fishery information is needed; what data items are currently collected; how these are collected and who does this. It contains the following information

1. General information related to fisheries: this includes information that has implications for fishery data collection (e.g. the geographical characteristics of coastal areas, administrative divisions and ethnicities/cultures/traditions of fisheries communities).
2. The structure of the fisheries sector: this section is concerned with those structural characteristics of the fisheries sector that need to be taken into account in the design of a fishery information system. The information includes the national categories of the sector, target resources, the fishing methods and gears used, operational characteristics (fishing zones, landings and major markets, etc.), size of fleet (when available); and the existence of management measures/plans.
3. Fishery policy and management objectives: these are important as they determine fishery information requirements.
4. Current status of statistical reporting: this consists of a) fishery statistics reported to FAO and b) fishery statistics reported at the national level.
5. Fishery information and data collection system: this describes the key elements of the system including a) the objectives of fishery data collection, b) the main institutions involved in fishery data collection and c) the legislative framework for fishery data collection.

## 2. GENERAL INFORMATION RELATED TO FISHERIES

China has vast sea areas with a total continental coastline of over 18 000 km. Chinese territory and territorial waters range from temperate zones to tropical zones and include four major seas (the Bohai Sea, the Yellow Sea, and the East and South China Seas). The Bohai Sea is found on the northeastern coast of China and forms an inner gulf to the Yellow Sea. Both the Bohai and the Yellow seas have shallow waters and a relatively flat bottom on the wide continental shelf. They provide favourable spawning and nursery grounds for many aquatic organisms. The East China Sea is highly productive because of the rich nutrient runoff from many large rivers – including the Yangtze River. The South China Sea is a deep, closed sea basin with a complex terrain. All Chinese sea areas are almost semi-closed, epi-continental seas. These form characteristic marine fishery resources. Many fish stocks in

the area are independent and closed. This means that there are relatively fewer numbers of oceanic migratory species and that the fauna of Chinese marine resources are complex and diverse.

China also has rich inland water resources distributed across the country. There are over 1 500 rivers that have a drainage area of over 1 000 km<sup>2</sup>. Major rivers include the Yangtze River, the Yellow River, the Pear River and the Heilongjiang River. There are also many lakes – more than 120 of which have a surface area of over 100 km<sup>2</sup>. In addition there are numerous mid- to large-scale reservoirs and tens of millions of hectares of paddy-fields and low-lying saline and alkali wastelands.

China has over 2 500 fish species. Of these 1 700 are marine fish species and 800 are freshwater fish species. Crustaceans, molluscs, cephalopod and seaweeds are also used in China and there are thousands of aquatic animals and plants with economic value. China's unique natural environment provides important habitats for rare aquatic species like the Yangtze River dolphin (*Lipotes vexillifer*), the Chinese sturgeon (*Acipenser sinensis*), the Chinese paddlefish (*Pesphurus Gladius*) and the finless porpoise (*Neophocaena phocaenoides*), among others.

Administratively, China is divided into 31 provinces, autonomous regions and centrally administered municipalities<sup>1</sup>. Eleven of these areas are coastal, and fall under the following three management areas:

1. **Bohai and the Yellow Sea:** Liaoning, Hebei and Shandong Provinces and Tianjin city
2. **East China Sea:** Jiangsu, Zhejiang and Fujian Provinces and Shanghai city
3. **South China Sea:** Guangdong and Hainan Provinces and the Guangxi municipality

Inland fisheries are mainly distributed in the drainage areas of the Yangtze River and the Pear Rivers which extend to Hubei, Jiangsu, Guangdong, Anhui, Jiangxi, Hunan, Zhejiang and Sichuan Provinces.

Fishing is traditional in China and 56 ethnic groups are involved in the production of aquatic resources and/or the processing of fish and fishery products. Traditional fishers are mainly settled along the coast, rivers and lakes. The culture related to fishing is very rich and has a profound influence on rural livelihoods. For example traditional cultural festivals associated with fishing are often held in local communities and many fisher groups use modes of fishery production that have been handed on from generation-to-generation. With socio-economic development and adjustments to the structure of the fishery sector however, traditional fishers have recently started to move gradually away from capture fishery production towards aquaculture and other industries.

### 3. STRUCTURE OF THE FISHERIES SECTOR

In the 1980s the Chinese government reviewed its fishery development policy. It placed a priority on aquaculture so that natural aquatic resources could be rehabilitated and utilised in a sustainable manner. To this end, the government made strategic adjustments to the traditional structure of the fisheries sector, shifting the main modes of production from capture fisheries to aquaculture. The aim of this was to fully utilize inland water areas and underutilized coastal waters and beaches for aquaculture development. This is to ensure the continuous supply of fish and fishery products and to reduce the pressure on coastal fishery resources. China has also implemented its own fishery development which has rapidly enhanced the capacity of fishery production and increased fishery outputs. This led to an improved supply of fishery products and a steady increase in the income of the fishers. By 2005 the total Chinese fishery production had reached 51 million tonnes<sup>2</sup>. While fishery resources declined globally, Chinese fisheries have maintained a stable development by relying on the strategic development of aquaculture.

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<sup>1</sup> Excluding China, Hong Kong and Macao Special Administrative Regions and Taiwan Province of China.

<sup>2</sup> Unless otherwise stated, the source of statistical information cited in this review is the China Fisheries Yearbook 2005.

Adjustments to the structure of the sector have been implemented gradually. The production-area of inland fisheries and aquaculture has been extended from the delta areas of the Yangtze and Pear Rivers towards the Central region, the North region and the Northeast region and has now reached all the inland areas of China (including the Northwest region). The areas of marine fishery operations have been gradually extended from traditional coastal waters to the Yellow/Bohai Seas, the East China Sea and the South China Sea. They have now been further extended to the distant-waters (see section 3.2)

### **3.1 Marine capture fisheries**

Marine capture fisheries are a traditional production sector in China. With the development of fishing technology and methods and changes in the status of fishery resources, the sector has experienced major changes. While the sector was steadily developed from the 1950s to the 1970s and achieved very rapid growth in the 1980s, the Chinese government began to guide the sector towards the effective utilization and management of fishery resources in the 1990s. This was done by introducing control-measures on fishing capacity and effort and since 1999 marine capture production has been stabilized. In 2002 the Ministry of Agriculture introduced a new regulation on fishing licences which prompted fishers to withdraw from fishing. This effectively reduced the number of fishing vessels and the actual capacity of fishing. By November 2004 a total of 7 850 fishing vessels had been decommissioned and 40 000 fishers had left the industry. During this period 22 000 fishers were given occupational training to prepare them for the withdrawal.

In November 2003 the Ministry of Agriculture issued further regulations for the control of fishing vessels and set the following quantitative targets:

- Marine fishing vessels to be reduced from 222 000 in 2002 to 192 000 in 2010.
- The total engine power of fishing vessels to be reduced from 12.7 million kW to 11.4 million kW.

This means a yearly reduction of 3 750 fishing vessels and 159 000 kW. In addition, a closed summer fishing season has also been enforced. Although the length of this season and the kind of fishing gears prohibited varies, the use of fixed fishing gear is generally prohibited for more than two months in all fishing areas. The provincial authorities decide the details of the closed season.

#### ***3.1.1 The distant-water fishery***

The distant-water fishery started operation in 1985. The fleet is not large because of quota management. The distant-water fishery operates within the exclusive economic zone (EEZ) of more than 30 countries and on the high seas of the Pacific, Indian and the Atlantic oceans. At present the target-species include horse mackerel, Spanish mackerel, pomfret, large and little yellow croakers, white croaker, conger eel, seabream, tuna, squid, cuttlefish, octopus, and prawn/shrimp. The main fishing methods used are squid-jigging and tuna longline fishing. The distant-water fishing catch accounted for eight percent of the total catch of marine capture fisheries in China in 2005.

In June 2003, the Ministry of Agriculture issued regulations for the management of the distant-water fishery. These are in compliance with international, bilateral and multilateral fishery agreements.

#### Number of fishing vessels

In 2005 there were 1 976 distant-water fishing vessels.

### Landing sites and markets

About 65 percent of distant-water fishing production is landed at major landing sites such as Dalian, Yantai, and Zhoushan, Shanghai and Guangzhou and supplied to domestic markets. The rest is sold locally.

### **3.1.2 Marine capture fisheries in the Yellow Sea and the Bohai Seas**

The Yellow Sea and the Bohai Sea are semi-closed seas located in the temperate zone. They provide good spawning and feeding grounds as well as migration pathways for many aquatic organisms. These areas are important both for traditional coastal fisheries and for the aquaculture of high-value species. The catch in these fishing areas accounts for 31 percent of the total catch of national marine capture fisheries in 2005. The main species produced include Japanese anchovy, Japanese pilchard, so-iuy mullet, Spanish mackerel, pomfret, little and large yellow croaker, spiny head croaker, sandlances, mullet, largehead hairtail, akiami paste shrimp, fleshy prawn, squilla, swimming crab, squid, cuttlefish, octopus and jellyfish, among others. The main types of fishing are trawl, gill-nets, stow-net and line-fishing. Management-measures in place in the area include:

1. the establishment of a conservation zone to protect the habitat of aquatic animals;
2. the enhancement and re-stocking of the main commercial species of the Yellow Sea and the Bohai Sea;
3. a closed season for fishing from 1 July to 16 September for trawling and sail stow-net operations;
4. a year-round fishing ban for trawling in the Bohai Sea.

### Number of fishing vessels

Fishing vessels in the Yellow and Bohai Seas are registered with the local fishery authority. In 2005 there were 58 952 fishing vessels. These included distant-water fishing vessels.

### Landing sites and markets

Landing sites and markets for marine capture fisheries in the Yellow Sea and the Bohai Sea include fishing ports and fish markets along the coasts of Dalian, Yingkou, Qinwangdao, Tianjin, Yantai, Qingdao, Qidong, and Liaoning, and the Hebei and Shandong provinces.

### **3.1.3 Marine capture fisheries in the East China Sea**

The East China Sea has always been a main fishing area in China; and the Zhoushan fishing ground is the largest near-shore fishing ground in China. Historically this area teems with the four major species: large yellow croaker, little yellow croaker, largehead hairtail and cuttlefish (sometimes known as the “famous four”). The area produces more than 40 species including Chinese herring, Spanish mackerel, conger eel, Pacific mackerel, pomfret, grouper, swimming crab, shrimps and cephalopod, among others. In recent years, because of bilateral fishery agreements with Japan and Korea, the effective size of the fishing ground has been reduced, as has the catch. Although the area has seen the continuous decline of fishery resources, the capture production of the East China Sea still constitutes more than a third of the total marine capture production of China. The main fishing methods are trawling, purse seine, gillnet, stow-net and line-fishing.

Management-measures in place in the area include:

1. the establishment of a conservation zone to protect the habitats of the main commercial species;
2. a closed season for fishing from 16 June to 15 September for trawling and sail stow-net operation; from 1 June to 1 August for trawling and sail stow-net south of N 26°30' in the East China Sea and from 16 June to 15 July for shrimp trawling.

Number of fishing vessels

In 2005 there were 75 865 fishing vessels in the East China Sea. These included distant-water fishing vessels.

Landing sites and markets

Fishing ports and fish markets for the marine capture fisheries of the East China sea are found along the coasts of Qidong, Shandong, Zhoushan, Ningbo, Xiangshan, Wenzhou, Ningde, Lianjiang, Fuzhou, Xiamen, and for Jiangsu, Zhejiang and Fujian Provinces.

**3.1.4 Marine capture fisheries in the South China Sea**

The South China Sea is situated in the tropical and sub-tropical zones. It has a vast water area and contains a variety of aquatic species; yet fishing grounds are rather scattered. Main target species are conger eel, Chinese herring, Japanese pilchard, Pacific herring, groupers, seabreams, round scad, white croaker, mi-iuy croaker, large yellow croaker, largehead hairtail, tilefish, threadfin breams, so-iuy mullet, Pacific mackerel, pomfret, filefish, akiami paste shrimp, fleshy prawn, swimming crab, squid, cuttlefish, octopus and seaweeds, among others. The main fishing methods are trawling, purse seine, gill-net, stow-net and line-fishing. In 2005 the catch from the capture fisheries in the South China Sea accounted for 26 percent of the total marine catch. A closed season for fishing is implemented from 1 June to 1 August for all fishing gears except gillnet, line-fishing and cage-capture.

Number of fishing vessels

In 2005 there were 79 315 registered fishing vessels in the marine capture fisheries of the South China Sea. These included distant-water fishing vessels.

Landing sites and markets

Fishing ports and fish markets for the marine capture fisheries of the South China Sea are found along the coasts of Xiamen, Shantou, Shenzhen, Guangzhou, Zhuhai, Zhanjiang, Beihai, Haikou, and the Fujian, Guangdong and Hainan Provinces; and the Guangxi Chuang Municipality.

**3.2 Inland capture fisheries**

There are an enormous number of inland fisheries in China and they can be found almost everywhere except Beijing. Provinces with significant inland fisheries are Jiangsu, Anhui, Hubei, Jiangxi and Hunan. In 2005 it was reported that 670 000 people were engaged in fishing in inland waters throughout China. They catch fish, crustaceans, molluscs, reptiles (e.g. terrapin), amphibians and aquatic plants. Fishing areas cover all rivers, large and middle-lakes and reservoirs.

In the early 1950s, Chinese inland capture fishery went through a period of rapid development. As a result of various development activities (e.g. hydroelectric and irrigation projects and road construction), together with the continuous expansion of urban areas, the sector has followed a stable or a declining trend since the 1960s. In addition, many inland fishers left the industry to become aquaculture farmers. In recent years the inland capture fisheries have been in a stable condition as conservation and restoration measures are implemented. Inland capture production makes up about 11 percent of the total inland production and five percent of the total national fisheries production.

Management-measures for inland capture fisheries are stipulated by Chinese fishery law, by local fishery regulations and the rules and management regulations for large lakes and reservoirs. The management institutions include the Bureau of Fisheries Management and Fishing Port Superintendence, the Bureau of Fishing Vessel Registration, the Departments of Fisheries Management and Fishing Port Superintendence at different administrative levels and the Fisheries

Resources Management Committee of the Yangtze River, among others. For large lakes and reservoirs there are field offices of the local government in charge of fisheries management.

A fishing licence system is implemented in the inland fisheries sector. A closed season for fishing has also been introduced in a number of areas. (For example a spring closed season in the Yangtze River and the Hanjiang River and a spring-summer closed season at large lakes and reservoirs.) During the closed season, management authorities carry out re-stocking for the enhancement of wild fish stocks. In 2006 the action plan for the conservation of aquatic resources was put into effect. This plan included the establishment of conservation zones (such as spawning areas and other critical habitats), the restoration of spawning areas and the control of water pollution.

### **3.2.1 River fisheries**

River fisheries are mainly found in middle to large rivers such as the Yangtze River, the Pearl River and the Songhuajiang River. The catch from the Yangtze River is particularly significant as it constitutes over 70 percent of the total production of river fisheries. Fish and crustaceans are mainly caught. The Yangtze River teems with various commercial species such as black carp, grass carp, silver carp and bighead carp (known as the “four major family fishes”); as well as common carp, crucian carp, catfish, yellow headed catfish, Chinese longsnout catfish and Japanese eel.

#### Fishing vessels

The majority of fishing vessels used for river fishing are motorized boats with engines of around 44 kW, though some have bigger engines (45–440 kW). Some of these boats are solely engaged in river fishing.

#### Landing sites and main fish markets

Landing sites and fish markets are to be found along rivers at naturally-formed landing places and at constructed fishing ports.

### **3.2.2 Lake fisheries**

There are many lakes in the Yangtze River basin. These include lakes in Jiangsu, Hubei, Hunan, Anhui, Jiangxi and Zhejiang provinces. Fishing activities are concentrated in the large and middle lakes, where fish, crustaceans, shellfish and aquatic plants are caught.

#### Fishing gears and fishing vessels

Fishing boats used for lake fisheries are small motorized boats (engines below 44 kW) and non-motorized wooden boats.

#### Landing sites and main fish markets

Landing sites and fish markets are located at naturally-formed fishing ports and at constructed fishing ports. In large lakes professional fish-traders purchase the catch on board the boats.

### **3.2.3 Reservoir capture fishery**

There are large and middle-sized reservoirs throughout China. Fish are mainly caught in these.

#### Fishing vessels

Reservoirs are similar to lake fisheries in that small motorized boats (below 44 kW engines) and non-motorized wooden boats are used.

### Landing sites and main fish markets

Landing sites and fish markets are located at designated sites along the coast of the reservoirs.

## **3.3 Mariculture**

Mariculture in China initially began with seaweed farming. It has gradually been extended to the farming of shellfish, fish and crustaceans. This sub-sector is the most rapidly developed among fishery sub-sectors and China began to implement a licence system for mariculture in the 1980s. Different levels of local government formulate and implement working plans to enforce the culture system and a licence system for coastal aquaculture. Mariculture produces 27 percent of the total Chinese fishery production. Total mariculture production in 2005 was made up of fish (4.8 percent), crustaceans (6.0 percent), shellfish (77.1 percent), aquatic plants (10.9 percent) and others (1.3 percent).

Fish-farming has developed rapidly in recent years. In 2005, the total fish-farming production reached 659 000 tonnes; and more than 30 species are currently being cultured. The main fish species being farmed are seabass, left-eyed flounders, large yellow croaker, red drum, sea bream, groupers, cobia, puffer fish, amberjack and right-eyed flounders. The annual production of these ten main fish species was about 419 000 tonnes in 2005, accounting for 60.3 percent of the total mariculture fish production.

Main production areas: Guangdong, Fujian, Shandong, Liaoning, Guangxi, Zhejiang and Jiangsu provinces (91 percent).

Culture systems: net cage-culture, pond-culture and industrialized-culture.

### **3.3.1 Crustacean culture**

International and domestic demand for crustacean products has increased continuously with socio-economic development. As a result of technical improvement in disease prevention the culture area for shrimp has rapidly expanded and shrimp species have become a “hot” culture species for farmers who want to be rich. The main species cultured are whiteleg shrimp, black tiger prawn, fleshy shrimp and kuruma prawn. These four species make up 92 percent of the total Chinese shrimp-culture production. Swimming crab and mud crab are also important species in this group.

Main production areas: Guangdong, Guangxi, Hainan, Zhejiang, Fujian, Shandong and Jiangsu provinces (94 percent).

Culture systems: pond-culture.

### **3.3.2 Shellfish culture**

Shellfish farming predominates mariculture. The main shellfish species cultured are oysters, Japanese carpet shell, scallops, sea mussels, constricted tagelus, cockles, sea-snails, abalone and pen shells. The yield of these nine species makes up about 91.6 percent of the total mariculture shellfish production.

Main production areas: Shandong, Fujian, Guangdong, Liaoning, Guangxi, Zhejiang and Jiangsu provinces (98 percent).

Culture systems: beach culture

### 3.3.3 *Seaweed culture*

Seaweed farming is traditional in China, and has shown stable development in the last ten years. The main species cultured are Japanese kelp, wakame, warty gracilaria, laver, eucheuma seaweeds, fusiform sargassum, dark green nori, and Japanese isinglass. These eight species account for 86.2 percent of the total seaweed production. The species are mostly distributed throughout the bays and shallow waters of the Yellow and Bohai Seas, but since the 1950s this distribution has gradually been extended to the coast of the East China Sea.

Main production areas: Shandong, Fujian and Liaoning provinces (92 percent).

Culture systems: raft-culture.

### 3.3.4 *Other species cultured*

Other species cultured in sea-water include low-yield but high-value species such as sea cucumber, sea urchin, sea pearl and jellyfish. In 2005 the annual output of these four species was 126 918 tonnes. The main culture area for sea cucumber is concentrated along the coasts of Shandong and Liaoning provinces. This represents 95 percent of the total sea cucumber production in China. Almost all production of sea urchin (99 percent) comes from Guangdong and Shandong provinces, while most pearl culture is found along the coasts of Guangdong and Guangxi provinces. Jellyfish culture is mainly distributed along the coasts of Liaoning, Shandong and Guangdong provinces.

Culture systems: bottom-planting and pond-culture.

## 3.4 *Inland aquaculture*

Inland aquaculture can generally be found all across China. The main production areas however, are the drainage areas of the Yangtze River and Pear Rivers; which cover the Hubei, Guangdong, Jiangsu, Anhui, Jiangxi, Hunan, Zhejiang and Sichuan provinces. The main species cultured consist of fish, crustacean, shellfish, aquatic plant and others. Main culture systems are pond-culture, enclosure, pen-culture and net-cage culture. Paddy-field culture and industrialized-culture is also practiced. Pond-culture production makes up about 70 percent of total inland-culture production. The production from inland aquaculture is mainly sold to domestic fish markets and processing plants while some is exported.

Aquaculture practices are nationally regulated and managed by fishery law and locally by fisheries management regulations. Detailed rules of enforcement are issued by local authorities. Other regulations and management-measures are:

- the management regulation of the fishery-product wholesale market;
- the Food-Hygiene Act;
- the implementation opinion on the epidemic prevention of aquatic animals;
- the Animal Epidemic Prevention Act;
- a licence scheme for beach-culture;
- a scheme for non-harmful aquaculture.

### 3.4.1 *Fish-farming*

There are more than twenty-six fish species cultured in the freshwater environment. These include grass carp, silver carp, common carp, bighead carp, black carp, crucian carp, white amur bream,



channel catfish, swamp eel, mandarin fish, tilapia, seabass and Chinese snakehead. Among these species, the production of grass carp, silver carp and common carp is particularly high. These species are cultured in all provinces/municipalities in China.

Culture systems: pond-culture, pen-culture, enclosure and net-cage culture; as well as paddy-field culture and industrialized-culture.

### **3.4.2 Crustacean culture**

The main species of crustacean cultured are giant freshwater prawn, oriental river prawn, red swamp crawfish, whiteleg shrimp and Chinese river crab. The main culture areas are the middle- to lower-basins of the Yangtze River (Jiangsu, Anhui, Hubei and Jiangxi provinces).

Culture systems: pond-culture, enclosure-culture, pen-culture and paddy-field culture.

### **3.4.3 Shellfish culture**

The main species cultured are swan mussel, snails and corbicula. The main culture areas are the middle- to lower-basins of the Yangtze River (Jiangsu, Anhui, Hubei, Jiangxi, Zhejiang and Hunan provinces).

Culture systems: pond-culture and pen-culture

### **3.4.4 Aquatic plant culture**

*Spirulina nei* is the only species categorized in this segment. The main production areas for *Spirulina nei* are Fujian and Jiangxi provinces.

Culture systems: pond-culture.

### **3.4.5 Other species**

Other species cultured are tortoises, turtles, frogs and pearls, which constitute 1.59 percent of the total inland aquaculture production.

Culture systems: pond-culture and industrialized-culture in glasshouses.

## **4. FISHERY POLICY AND MANAGEMENT OBJECTIVES**

Chinese policy for fishery production is to develop aquaculture, capture fisheries and the fishery-processing sectors simultaneously with a special emphasis on aquaculture. Each of these sub-sectors is to have its own priorities according to local conditions.

In line with this, fishery sector structures will be adjusted in order to:

1. strengthen aquaculture;
2. extend distant-water fisheries;
3. promote recreational fisheries;
4. optimize the processing industry;

5. improve the national capabilities for resource conservation, ecological restoration and the sustainable development of fisheries;
6. secure the supply of fishery products;
7. guarantee the continuous increase in fishers' income;
8. promote a rise in fishery economy that does not aim to expand in quantity, but to improve in quality;
9. facilitate the harmonious development of fishery society;
10. establish responsible fisheries that are sustainable, environmentally-friendly and utilize fishery resources in a reasonable way.

#### **4.1 Aquaculture**

The state shall:

- Develop aquaculture and implement a united plan for the utilization of water-areas. This plan will demarcate water-areas and tidal-flats for the purpose of aquaculture.
- Encourage integrated aquaculture practices that save water, land-areas and other resources. It will do this by promoting culture practices that are standardized, concentrated, intensified and industrialized. Resource-intensive and environmentally-harmful methods of aquaculture will gradually be eliminated.
- Promote the development of deep-water cage-culture and re-circulating aquaculture systems limit the scale of near-shore cage-culture; and prohibit the use of ground-water for aquaculture.

#### **4.2 Capture fisheries**

The state shall:

- Encourage and support the development of offshore and deep-sea fisheries.
- Make rational arrangements for the capacity of inland and inshore capture fisheries according to sustainable yields of fishery resources.
- Decide the total catch allowed and enforce fishing quotas according to the principle that fishing-effort should be below the recruitment levels of fishery resources. The National Fishery Administrative Authority is in charge of the survey and assessment of fishery resources; and provides a scientific basis for the enforcement of the fishing-quota system.
- Put fishing licence regulations into practice for marine and inland capture fisheries. All fishing companies and individual fishers must operate within the licence regulations including the fishing type, the site of operation, the time limit, the number of fishing gears and the catch quota. They must comply with the regulations on the conservation of fishery resources and fill-in fishing log-sheets for large- and middle-size fishing vessels.
- Promote fuel-efficient fishing vessels and selective fishing gears and methods that will reduce the catch of juvenile and low-value fish.
- Fully implement an action-programme for fishery resource conservation and enforce closed areas and seasons for fishing. It will strengthen management-measures and promote the legalization and standardization of these closed areas and seasons for fishing. The national action-program on the conservation of aquatic life resources in China (issued by the State Department) has defined dual control measures on the number of fishing vessels and the fishing effort; together with the fishing licence system.
- Actively carry out the effective enhancement of aquatic life resources and promote the establishment and management of natural conservation zones.

### 4.3 Post-harvest

The state shall support the fishery processing sector to raise the levels of industrialization, organization and standardization. It encourages the development of the seaweed chemical industry and pharmaceutical and health-product processing. International cooperation and competition will also be encouraged to promote the steady and healthy development of aquatic-product processing.

## 5. STATUS OF STATISTICAL REPORTING IN CHINA

### 5.1 Chinese fishery statistics reported to FAO

FAO promotes the international classification and the standardization of data submission procedures. This is to ensure that statistics collected are comparable across countries and allows for summation and analyses at a regional and a global level. Wherever possible, fishery statistics obtained from national reporting offices are verified from other sources. Estimates are produced when there is a lack of data or when data is considered unreliable.

Figure 1: The total fishery production of China by sub-sector, uses data generated by FAO statistical databases to show trends in Chinese fishery production by sector. Since the early 1990s, China has been the world's largest producer of both capture fisheries and aquaculture products. Although capture production has leveled off with the introduction of the zero-growth policy in 1998, aquaculture production has continued to grow strongly.

**Figure 1: The total fishery production of China by sub-sector**

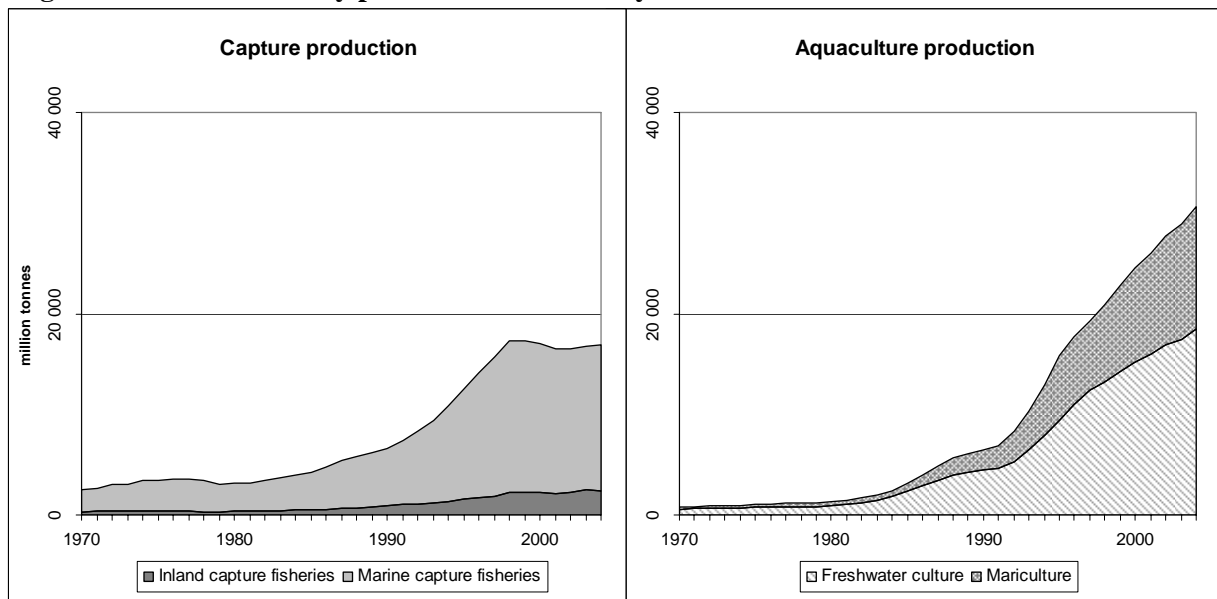


Table 1: Details of species items reported from China (below), shows the disaggregation by species in the Chinese fishery production statistics as reported to FAO. Marine capture production shows a good species breakdown, with more than 60 species/species-group items. The rate of unidentified production was 22.9 percent of the total marine capture. Because of the massive scale of Chinese capture production the total volume of unidentified production is still as high as 3.3 million tonnes.

The inland capture production report was not as detailed as that of the marine capture fisheries; and the rate of unidentified production is notably high.

Aquaculture production statistics however, were reported with a better species breakdown. Most of the production can be disaggregated to the species level and the rates of unidentified production are significantly lower than those of marine capture production.

**Table 1: Details of species items reported from China**

Species group	Level of disaggregation
<b>Inland capture production</b>	
Fishes	Species items = 01 (00 species + 01 higher levels)
Crustaceans	Species items = 03 (03 species + 00 higher levels)
Molluscs	Species items = 01 (00 species + 01 higher levels)
Others	Species items = 01 (00 species + 01 higher levels)
Unidentified production <sup>3</sup>	<b>87.3 %</b> in 2004
<b>Marine capture production</b>	
Pelagic marine fish	Species items = 24 (19 species + 05 higher levels)
Demersal marine fish	Species items = 27 (15 species + 12 higher levels)
Crustaceans	Species items = 10 (05 species + 05 higher levels)
Molluscs	Species items = 01 (00 species + 01 higher levels)
Cephalopods	Species items = 06 (02 species + 04 higher levels)
Others	Species items = 04 (01 species + 03 higher levels)
Unidentified production	<b>22.9 %</b> in 2004
<b>Freshwater culture</b>	
Fishes	Species items = 27 (23 species + 04 higher levels)
Crustaceans	Species items = 06 (04 species + 02 higher levels)
Molluscs	Species items = 04 (03 species + 01 higher levels)
Others	Species items = 03 (03 species + 00 higher levels)
Unidentified production	<b>3.3 %</b> in 2004
<b>Mariculture/brackish water culture</b>	
Fishes	Species items = 11 (04 species + 07 higher levels)
Crustaceans	Species items = 09 (05 species + 04 higher levels)
Molluscs	Species items = 10 (06 species + 04 higher levels)
Others	Species items = 03 (02 species + 01 higher levels)
Unidentified production	<b>9.1 %</b> in 2004

## 5.2 Chinese fishery statistics reported at the national level

As in many other countries, data and information about the Chinese fishery sector is regularly compiled and made available at the national level. Three types of fishery statistics are reported monthly, bi-annually and annually and the statistical information is disseminated regularly through national statistical bulletins, the China Fisheries Yearbook, the Web site of Chinese fisheries and the newspaper of Chinese Fisheries, among others.

<sup>3</sup> This refers to the production that is not identified at the species, family, or order level, including freshwater fishes nei, freshwater molluscs nei, marine fishes nei, marine crustaceans nei, and marine molluscs nei.

### 5.2.1 *Fishery statistical information reported annually*

Statistical information reported in the Chinese Fishery Yearbook covers an analysis of the status of the national fishery economy and the main statistical indicators and their trends. These are reported from 31 provinces/autonomous regions/municipalities, the National Fishery Technology Extension Centers and the China Agriculture Development group of companies.

**Table 2: Types of fishery information reported annually**

<b>1) Capture fishery and aquaculture production</b>
<ul style="list-style-type: none"> <li>• Inland capture fishery production by species</li> <li>• Marine capture fishery production by species, by sea-area, by fishing gears</li> <li>• Inland aquaculture production by species, by farming water-area, or by culture system</li> <li>• Marine aquaculture production by species, by farming water-area, by culture system</li> </ul>
<b>2) Distant-water fisheries</b>
<ul style="list-style-type: none"> <li>• Distant-water fishery production by category, by species</li> <li>• Number, gross-tonnage and gross-power of distant fishing vessels</li> <li>• Quantity of fish and fishery products landed at home and abroad</li> <li>• Business revenue of distant-water fisheries abroad</li> </ul>
<b>3) Area of aquaculture</b>
<ul style="list-style-type: none"> <li>• Cultured area (hectares) of freshwater aquaculture by area and culture system</li> <li>• Cultured area (hectares) of mariculture by species, by area and culture system</li> </ul>
<b>4) Aquaculture production per unit of area (yield/ha)</b>
<ul style="list-style-type: none"> <li>• Yield per unit (yield/ha.) Of inland aquaculture by environment and culture system</li> <li>• Yield per unit (yield/ha.) Of marine aquaculture by category, by species, by area and culture system</li> </ul>
<b>5) Production of aquaculture fingerlings</b>
<ul style="list-style-type: none"> <li>• Quantity (number or volume) of fingerlings produced by species</li> <li>• Quantity stocked by species</li> </ul>
<b>6) Fishery processing</b>
<ul style="list-style-type: none"> <li>• Number and capacity of processing enterprises</li> <li>• Number and capacity of fishery cold-storage</li> <li>• Quantity of fishery products produced by type of products</li> </ul>
<b>7) Fishery economy</b>
<ul style="list-style-type: none"> <li>• Production value of marine and inland capture fisheries and their annual increment</li> <li>• Production value of marine/inland aquaculture and fingerlings and their annual increment</li> <li>• Value generated by fishery supporting industry; by types and their annual increment</li> <li>• Value generated by fishery marketing and services; by types and their annual increment</li> </ul>
<b>8) Market prices of fish and fishery products</b>
<ul style="list-style-type: none"> <li>• Market prices of fishery products</li> <li>• Market prices of marine and freshwater fishery products</li> </ul>
<b>9) Fishing vessels</b>
<ul style="list-style-type: none"> <li>• Number, tonnage and power output of motorized fishing vessels by power output category, by type and by fishing methods</li> <li>• Number and tonnage of non-motorized fishing vessels</li> </ul>

<b>10) Fishery population and labour force</b>
<ul style="list-style-type: none"> <li>• Number of fishing town, village, household</li> <li>• Fishery population and labour forces</li> <li>• Number of full-time labour forces by sub-sector</li> <li>• Number of part-time labour forces</li> </ul>
<b>11) Income and expenditure of fishing households</b>
<ul style="list-style-type: none"> <li>• Gross income of business a year</li> <li>• Income of fishery activity and other business in the gross income</li> <li>• Gross expenditure of business a year</li> <li>• Expenditure of fishery production cost and other cost in the gross expenditure</li> </ul>
<b>12) Investment of fishery capital assets</b>
<ul style="list-style-type: none"> <li>• Quantity of investment from the central, local and other financing sources</li> <li>• Quantity of investment by category (capture fisheries, aquaculture, processing, marketing, law enforcement, fishing port, research and education, fisheries extension, product inspection, conservation of fishery resources, fingerling production)</li> </ul>
<b>13) Fishery technical extension</b>
<ul style="list-style-type: none"> <li>• Number of fishery technical extension institutions</li> <li>• Personnel composition and number</li> <li>• Number of persons to be trained</li> <li>• Quantity and area of experimental bases in aquaculture</li> <li>• Social effect of projects of technical extension</li> </ul>
<b>14) Impact of disasters</b>
<ul style="list-style-type: none"> <li>• Quantity and value of fishery products lost/damaged by type of disaster</li> <li>• Number and values of fishery facilities and fishing vessels lost/damaged by type of disaster</li> <li>• Number of fisher/farmer's life lost by type of disaster</li> </ul>

### **5.2.2 Fishery statistical information reported biannually**

The biannual analysis of the status of the fishery economy is based on statistical information provided from 31 provinces/autonomous regions/municipalities. The statistical information includes the:

- total value and increment of the fishery economy;
- value and increment of marine and inland capture fisheries;
- value and increment of marine and inland aquaculture and fingerlings production;
- value and increment of the fishery industry and the marine construction industry;
- value and increment of fishery marketing and ancillary services;
- gross output of fish and fishery products;
- production of marine and inland capture fisheries;
- production of marine and inland aquaculture;
- production by species (some species only);
- production of fingerlings and stocked amount;
- area (ha.) of marine and inland aquaculture;
- area (ha.) by culture system and by species;
- area and economic loss caused by natural disasters;
- integrated exchange price at fish market;
- integrated exchange price of sea and freshwater foods.

### 5.2.3 *Fishery statistical information reported monthly*

Some main statistical indicators are reported monthly from 20 provinces/autonomous regions/municipalities. These indicators are the:

- gross output of fish and fishery products;
- production of marine capture fisheries;
- production of marine and inland aquaculture;
- integrated exchange price at fish market;
- integrated exchange price of sea and freshwater foods.

## 6. DESCRIPTION OF FISHERY INFORMATION AND DATA-COLLECTION SYSTEMS

### 6.1 Objectives of fishery data collection

China sets the following objectives for national fishery data collection:

- 1) to understand the basic status of fishery production and the economic performance of the sector;
- 2) to assess the status of fishery resources;
- 3) to provide a basis for the development of strategies for sustainable fisheries development, the revision of fisheries law and the formulation of fishery policy.

These data collection objectives define the requirements of fishery information and data in China, which are summarized in Table 3 below.

**Table 3: Objectives of data collection and information requirements**

Objectives	Indicators and data variables collected
To understand the current status of the fisheries sector	<ul style="list-style-type: none"> <li>• Output quantity and value of fish and fishery products</li> <li>• Catch by area and by species</li> <li>• Number and power of fishing vessels by type</li> <li>• Area of culture by culture system</li> <li>• Quantity of fingerlings produced by species</li> <li>• Production of aquaculture by species</li> <li>• Capacity of aquatic product processing</li> <li>• Output of processed fishery products by type</li> <li>• Number of fishery villages</li> <li>• Number of fishers (full-time fishers and part-time fishers)</li> <li>• Population of fishery households</li> <li>• Fishery disasters</li> <li>• Value and annual increments of fisheries</li> <li>• Investment sum of fishery capital assets and sum of newly increased capital assets</li> </ul>
To assess the fishery resource status	<ul style="list-style-type: none"> <li>• Catch by area and by species</li> <li>• Number of fishing vessels by type</li> <li>• Area of culture by culture system</li> <li>• Yield per unit of aquaculture by region, by water area, by type and by species</li> <li>• Fishery disaster</li> </ul>

To formulate strategic policy and the revision of fishery law	<ul style="list-style-type: none"> <li>• Catch by area, by species and by type of fishing gear</li> <li>• Number and power of fishing vessels by type</li> <li>• Area of culture by culture system</li> <li>• Quantity and value of trade by species</li> <li>• Value and increment of fishery sector; investment sum of capital assets of fishery sector, sum of newly increased capital assets</li> <li>• Number of fishers (full-time and part-time)</li> <li>• Income of fishers</li> </ul>
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## 6.2 Main institutions involved in fishery data collection

### 6.2.1 *The Bureau of Fisheries, the Ministry of Agriculture (Bureau of Fisheries Management and Fishing Port Superintendence)*

The Bureau of Fisheries (BOF) in the Ministry of Agriculture is the national line-agency for fishery administration. It is internally known as the Bureau of Fisheries, but externally it is called the Bureau of Fisheries Management and Fishing Port Superintendence, the People's Republic of China.

The main functions of the BOF are to:

- study and formulate fishery developmental strategies;
- develop fishery programmes and plans;
- implement measures to promote technical progress measures and related legislation;
- recommend important fishery policy and regulations and implement them;
- take charge of the management of the fishery sector;
- provide guidance on the adjustment of the sector structure;
- manage fishery resources, the ecosystem environment, and fishery processing;
- execute the law in terms of fishery administration;
- manage the standardization of fisheries, safety at sea; and the prevention of aquatic animal and plant diseases;
- take charge of international communication and cooperation in fisheries
- compile and disseminate fishery statistics and information.

### 6.2.2 *The Register of fishing vessels of the People's Republic of China*

The Register of fishing vessels (RFV) of the People's Republic of China is intended to implement the inspection of fishing vessels. It carries out its inspection and monitoring function on behalf of the government.

The main functions of the RFV are to:

- implement Chinese law and regulations; as well as international agreements;
- ensure the safety of life and property of the fishers;
- guarantee that fishing vessels are properly equipped for safe navigation and fishing operation;
- prevent fishing vessels from polluting the aquatic environment.



### **6.2.3 *The National Bureau of Statistics of China***

The National Bureau of Statistics (NBS) of China is an institution that falls directly under the State Department in charge of national statistics and accounting for the national economy. Its main functions cover:

- 1) the statistical analysis, forecasting and control of the status of the national economy, progress in science and technology; and social development;
- 2) the provision of statistical information and advice/consultation for the Central Committee of the Communist Party, the State Department and other departments concerned;
- 3) the unified examination, management and announcement of the national basic statistical data;
- 4) the regular dissemination of statistical information on the national economy and social development;
- 5) the development and management of the automated system of national statistical information and the national statistical database system;
- 6) the formulation of basic standard and operational regulations of the statistical database network at different levels of the administration.

### **6.2.4 *The General Administration of Customs of the People's Republic of China***

The General Administration of Customs of the People's Republic of China supervises the import and export of cargo, freight, baggage, parcel-post and other goods; and compiles custom statistics.

### **6.2.5 *The State Administration for Industry and Commerce***

The State Administration for Industry and Commerce falls directly under the State Department. It is in charge of the superintendence of the market and it executes laws related to administration. Its main functions are to organize and supervise the market, competition and trading activities; to investigate and take care of illegal economic activities; to monitor the quality of commodities and to enforce standard management orders at all markets.

### **6.2.6 *Fishery research institutions***

The Chinese Academy of Fishery Sciences is at the central level. Beneath it are three regional marine fisheries research institutes. These take charge of fisheries research in three major seas. They are the East China Sea Fisheries Research Institute, the Yellow Sea Fisheries Research Institute and the South China Sea Fisheries Research Institute. Inland water fisheries research institutes are responsible for fisheries research in major rivers and their drainage areas. These are the Pear River Fisheries Research Institute, the Yangtze River Fisheries Research Institute and the Heilongjiang River Fisheries Research Institute. Some of the provinces also have their own fisheries research institutions. These research institutes take charge of collecting data on, *inter alia*, fishery resources, fishery environments and fishing effort. They do this using fishery research vessels and/or fishing vessels for monitoring fishery resources.

### **6.2.7 *Others***

Provincial fisheries departments in 31 provinces/autonomous regions/centrally administered municipalities; take charge of collecting regional data according to the framework of fishery statistical indicators provided by the BOF.

The National Fishery Technical Extension General Station takes charge of collecting the data related mainly to the fishery extension, including:

- the number of fishery technical extension activities at different administrative levels;
- the number of extension persons;
- funds to support fishery extension and projects of inland aquaculture.

The China Agriculture Development Group Company mainly takes charge of the collection of data on the number of distant-water fishing vessels, the number of crew, the fishing production and the sale value of its enterprises.

### 6.3 The legislative framework for fishery data collection

The *Statistics Law of the People's Republic of China* deals with statistical investigations in China. Relevant articles in the Statistics Law are as follows:

- State organs, public organizations, enterprises, institutions, and self-employed industrialists and businessmen that are under statistical investigation must provide truthful statistical information according to the law. They may not enter false information or conceal data, they may not refuse to submit data; and they are not to submit reports or report data late. Giving false data or tampering with it is prohibited. It is the duty of autonomous mass-organizations at the grass-roots level and citizens to provide truthful information for state statistical investigations (Article 3).
- If the units to be investigated lie within their jurisdiction then statistical investigation is to be done by departments themselves and reported to the National Bureau of Statistics, or to a statistics institution of a local people's government at the same level (Article 9).
- According to Statistics Law, fishery statistics are items for departmental investigation. Hence the BOF draws up a plan for fishery statistical investigation and reports this to the NBS. Based on the actual situation of fishery production in China, the BOF has adopted the statistical reporting-form system and designed the contents of the forms (i.e. the indicators). The forms are then sent to the basic units to be filled in step-by-step and are returned to the BOF for compilation. The forms are reviewed and revised every two years so that they are responsive to the development levels of the fishery sector and meet the requirements of policy-makers.

Based on the State Statistics Law and other relevant legislations, the Ministry of Agriculture has issued the *Operational regulations of the national fishery statistics*. These regulations stipulate the basic tasks of fishery statistical work, the data sources of fishery statistics, the reporting processes and supervisory institutions, the evaluation methods and procedures for fishery statistics and the administration of fishery statistical personnel and their duties and responsibilities.

### 6.4 Data collection systems and their components

The Chinese fishery statistical system uses a set of statistical reporting-forms. These forms cover almost all the indicators required by the fishery line agencies at the different levels of the Chinese administration. There are 18 different forms (see **Table 4**) and these can be grouped into 12 data-collection sub-systems based on their subject areas and data sources.

Each reporting form is filled in at the lowest administrative level (the village or town) by enumerators. (A total of 40 565 enumerators collect data at the village/town level) They are then submitted to the higher levels for compilation (the county – city – province). At this next level, the data recorded on the paper forms is entered into computers using word-processing or spreadsheet software. All the data

**Table 4: List of fishery statistical reporting forms**

No.	Subject areas	Main data items
Form 1	Basic status of fishery production	Production by sub-sector Total number, tonnage of fishing fleets
Form 2	Production of marine capture fisheries by species	Quantity of landings for 44 commercially important species and species groups
Form 3	Production of marine capture fisheries by area and by gear type	Production by 4 major seas and other areas and by 5 major gears and others
Form 4	Distant-water fisheries	see item 2) of <b>Table 2</b>
Form 5	Production and area of mariculture by species	Production and culture area for 43 commercially important species and species groups
Form 6	Production and area of mariculture by environment and by culture system	Production and culture area for 3 environments and 3 culture systems
Form 7	Production of inland capture fisheries by species group	Quantity of landings for 8 commercially important species and species groups
Form 8	Production of inland aquaculture by species	Production of 47 commercially important species and species groups
Form 9	Production and area of inland aquaculture by culture system	Production and culture area for 6 environments and 3 culture systems
Form 10	Production of aquaculture fingerlings by species group	Quantity of production for 17 species and species groups; quantity stocked
Form 11	Fishery storage and processing	see item 6) of <b>Table 2</b>
Form 12	Fishery vessels	see item 9) of <b>Table 2</b>
Form 13	Fishery labour force	see item 10) of <b>Table 2</b>
Form 14	Fishery economy	see item 7) of <b>Table 2</b>
Form 15	Investments in the fishery sector	see item 12) of <b>Table 2</b>
Form 16	Impacts of natural disasters on fisheries	see item 14) of <b>Table 2</b>
Form 17	Income and expenditure of fishing households (sample households)	see item 11) of <b>Table 2</b>
Form 18	Estimation of the average income of fishers	Average income of fishers

compiled at the provincial level will be sent to the Data Base Management System of the BOF, via the internet (the Web site of the BOF).

Most of the data items are collected directly by the administrative systems of the BOF however exceptions can be found in:

- The market prices of fish and fishery products at the selected fish markets: This data is collected by the Fishery Society of China.
- The production prices and the consumer prices of fish and fishery products: These are collected by the NBS.

- The import and export value and the quantity of fish and fishery products: These are collected by the General Administration of Customs of the People's Republic of China.

#### **6.4.1 System component 1: Fishery production**

This component is mainly concerned with data-collection on marine and inland capture production by species and it monitors the fluctuation of fishing efforts by gear type. It also collects data on marine and inland aquaculture production by species, and it monitors the production-capacity of the aquaculture sector and changes in species cultured.

Medium to large-size fishing vessels<sup>4</sup> are required by fishery regulations to record their catch (and other information) on fishing log-sheets. These are submitted to the local fishery line-agency and provide production data for medium to large size vessels.

Production data for small-scale fishing vessels is collected by the enumerators at the village/town level. The data recorded on the paper forms is compiled step-by-step from the lower administrative levels (e.g. town) to a higher administrative level (e.g. the county). Once the data has been compiled at the provincial level it will be sent to the Database Management System of the BOF via the internet (through the website of the BOF). Aquaculture production data is also collected by the enumerators using the procedure described above.

#### **6.4.2 System component 2: Aquaculture**

This component collects data on inland and coastal aquaculture and monitors farming-capacity by culture-system for each culture-species. It also collects data about the way that water surface areas are utilized. Aquaculture is a licensed activity in China and aquaculture farmers must get a licence to operate. Structural information about aquaculture activities is therefore collected from the licence documents.

#### **6.4.3 System component 3: Distant-water fisheries**

This component mainly collects data about Chinese enterprises and vessels that are engaged in distant-water fishing; the volume of fishing catch from foreign EEZ waters and the high seas. It monitors the fishing catch by fishing types and the fluctuation of fishing efforts.

Distant-water fisheries are administered by the central and provincial fishery authorities. All vessels and crew members of distant-water fisheries must register with the BOF and obtain a fishing permit. They must also submit a record of their production activities through fishing log-sheets. Most data in this system is collected through these registration/permit mandatory reporting schemes.

#### **6.4.4 System component 4: Fishery processing**

This component is mainly concerned with the number of enterprises engaged in fish processing in China and the quantity of their output. The system also monitors the production capacity of the processing plants/enterprises and the production trends. The BOF collects sales records directly from fish processing enterprises. In 2004, 8 745 processing plants/enterprises were operating nationwide.

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<sup>4</sup> Large size fishing vessels are over 441 kW (600 hp) and middle size fishing vessels are 44–440 kW (61–599 hp).

#### **6.4.5 System component 5: The total output value of the sector and its annual increment**

This component collects and compiles the value data of fishery production, processing, marketing and ancillary industries; and their annual increments. It also monitors the economic status and economic trends of fisheries.

Trade records are collected from individual fishers, from fishing companies and from market operators. This is done by enumerators from selected wholesale markets. The data recorded on paper forms is compiled and then reported to the BOF on the internet (through the Web site of the BOF).

#### **6.4.6 System component 6: Fishery vessels**

At the end of the year, the component collects the number, power and tonnage of all kinds of fishery vessels (including motorized and non-motorized fishing vessels, supporting vessels and vessels for aquaculture). It also monitors the changes in the size of the national fishing capacity.

The registration of fishing vessels is done by the Register of Fishing Vessels of the People's Republic of China. The data in this system is obtained from the vessel registration records.

#### **6.4.7 System component 7: The impacts of natural disasters on fisheries**

This component collects and compiles data on the damages and losses caused by disasters; and their impact on human resources, products, facilities and other properties in the fishery sector. It also monitors economic losses in the sector.

#### **6.4.8 System component 8: Fishery population and labour force**

This component mainly enumerates the number of fishing towns, villages and households; as well as the fishing population and the labour force. It also monitors structural changes in the fishery sector and any changes in the population engaged in capture fisheries and aquaculture. BOF administers a fisher register and structural information about the fishing population comes from the fisher registration records.

Statistics show that in 2004, China had approximately 7.0 million full-time fishers/aquaculture farmers and 6.1 million part-time fishers/farmers. There were 8 048 fishing villages and 4.95 million fishing households.

#### **6.4.9 System component 9: Investment in the fishery sector**

This component mainly measures the levels of investment from the central, local and other financing sources in the fishery sector. It also monitors the national status and trends in sector investment.

The component relies on mandatory reporting from fishery enterprises. The data is collected from investment budgets and final accounts of each project by fishery-line agencies at different administrative levels. The data is compiled and reported to a higher administrative unit.

#### ***6.4.10 System component 10: The income and expenditure of fisher households***

This component collects economic information about fisher households in the whole of China. This includes the number of fishing households, the total annual household income, income from fishing activities, income from other economic activities, total annual expenditures, the cost of fishing operations, the cost of other economic activities, tax expenditures, net annual income, capital asset expenditures, living expenditure, the number of household members and the household labour force. It also monitors changes in the economic situation of the fishery sector.

To survey the income and expenditure of fishers /farmers, a total of 10 000 fishing/aquaculture households in 29 provinces are sampled. The data is collected by enumerators through a structured interview. The number and selection of sampled households is determined by comprehensive factors such as fishery production, geographical distribution, the type of fishing operation, the culture-system and the culture-area.

#### ***6.4.11 System component 11: Fish consumption, fishery-product price index and market prices***

This component mainly collects data on the sale prices of fish at fish-markets; and on the household consumption of fish and fishery products in the whole country. It also monitors the price index of fish and fishery production.

This price-related data is collected through interviews with market operators at fish markets selected by the BOF. Data that relates to the price-index of fish and fishery products and the consumption of fish and fishery products is collected by the NBS.

#### ***6.4.12 System component 12: The import and export of fish and fishery products***

This component mainly collects data on the import and export of all kinds of fish and fishery products. It also monitors the status and trends of the import and export of fish and fishery products in the whole country. This data is collected by the General Administration of Customs of the People's Republic of China.

## **7. CONCLUSION**

The work related to fishery statistics is an important function of the Bureau of Fisheries as these statistics provide a basis for the development of strategies for sustainable fisheries development, the revision of fishery law and the formulation of fishery policy. It is also important for the BOF to understand the basic status of fishery production and the economic performance of the sector so that it can provide the sector with the appropriate guidance.

The Chinese fishery statistics system has been successfully implemented for a long time and describes the actual situation of fishery development in China. It has provided the basis for the formulation of an adequate fishery development policy, as well as for improved fishery management and scientifically based decision-making. It is apparent that fishery statistics play an important role in the sustainable, stable and healthy development of Chinese fisheries.

The current fishery statistical system is based on a complete enumeration of the target population by means of statistical reporting forms, which contains 361 statistical-data items and covers all the activities of fishery production as well as the economic activities of the secondary and the tertiary

industries. These statistical reports are submitted from lower administrative levels to higher ones and are compiled step-by-step so they could also meet the needs of fishery development at the different administration levels of China.

To improve the timeliness of statistical reporting, local governments have established a system by which statistical-data is electronically compiled and reported using statistical-data spreadsheet software. The sections in charge of fishery statistics at the different administrative levels are closely coordinated with the statistical section of the central government for the verification of statistical data. The BOF has placed due importance on the fishery statistical works and has set up a consultation system and an expert working-group for national fishery statistics. This expert group meets annually to evaluate statistical-data, to verify and revise data and to feed back the results of their assessment to the relevant parties.

At present the fishery statistics system relies almost entirely on statistical investigations by enumerators in the field. Recently, when some pilot sample-based surveys were run, it was noted that there is a very low rate of compliance with the fishing log-sheet scheme. Fishers tend to record only the value of their catch and do not accurately record production-related data. This is because local fishers simply supply what the enumerators require. As a result, enumerators calculate the volume of fishery production from the value-data; and the average price of the fish. This significantly affects the quality of the statistical data.

Another problem is the shortage of funds. Many enumerators have other jobs as well as their data collection work, which makes it hard to maintain the levels of technical competency of the fishery statistics teams. Furthermore, most of the reporting forms have to be filled in manually because fishing villages do not have computers. It is also difficult to ensure that the fishery statistical-data is reliable because there is no effective monitoring/supervising system.





**Annex**

## **EXPLANATORY NOTES ON FISHERY STATISTICAL INDICATORS<sup>1</sup>**

**CHAPTER 1: FISHERY PRODUCTION****Article 1 The characteristics of fishery products and the statistical coverage of fishery production**

Fishery production refers to the final products of fishery activities (capture fisheries and aquaculture). These are characterized as follows:

- I) The output of fishery production activities; the output of fishery production efforts as well as the objects of fishery production efforts. These include marine and freshwater fish, crustacean (shrimp and crab), molluscs, cephalopod, seaweed and other fishery products; but exclude freshwater aquatic plants.
- II) The final output of fishery production activities. Intermediate products such as fries, fingerlings, blood-stocks, stocked fish, deposit fish and production for feed are not considered as final products so they shall not be calculated in the output of fishery production.
- III) The effective final output of fishery production activities. Fishery production that is decomposed/denatured, inedible or processed into other products before landing shall not be calculated in the fishery production.

**Article 2 The statistical year and the coverage of jurisdiction**

- I) The annual fishery production is calculated according to the calendar year. This means that all products harvested from aquaculture farms and landed from fishing vessels within the period 1 January to 31 December shall be calculated in the annual fishery production. Vessels which belong to an administrative unit, but are landed at ports outside the area of the administrative unit and/or products transshipped at sea shall also be included in the production of the administrative unit.
- II) Administrative units will be responsible for compiling statistics within their areas of jurisdiction. For example, when vessels from the area sell their catch outside the area, these catches should be calculated in the local production. Other administrative units should not include this production in their calculations. Similarly administrative units should not include the production landed by outside vessels at ports in the area. This avoids double-counting.

**Article 3 Standards to measure production**

- I) Fishery production shall be measured on an original, live-weight basis with the exception of jellyfish and aquatic plants. Jellyfish are measured as finished products processed three times with alum. Aquatic plants are measured as dry weight.

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<sup>1</sup> This reference document was prepared by the BOF to promote a clear understanding of the definitions and concepts of fishery statistical terms and indicators used in the national data collection system.

#### Article 4 Principles to differentiate aquaculture production from capture fisheries production

- I) Aquaculture production refers to artificially-farmed production while capture fishery production refers to naturally grown and captured aquatic products.
- II) The production from inland waters that are stocked, fed and managed should be included in the inland aquaculture production.
- III) The production from marine waters that are stocked, fed and managed should be included in the mariculture production.
- IV) Aquatic products farmed and harvested from rice fields are included in the inland aquaculture production.

#### Article 5 The classification of aquatic products

Aquatic products are classified into two major groups; a) Marine-products and b) Inland products. Marine products a) consist of marine capture production (**Table A**) plus mariculture production (**Table B**).

**Table A: Marine capture production (fishes, crustaceans, molluscs, aquatic plants, cephalopods and other species)**

Groups	Local name	English name	Scientific name
Fishes (鱼类)	海鳗	Conger pike	<i>Muraenesox cinereus</i>
	鳊鱼	Chinese herring	<i>Ilisha elongata</i>
	鳀鱼	Japanese anchovy	<i>Engraulis japonicus</i>
	远东拟沙丁鱼	Japanese pilchard	<i>Sardinops melanostictus</i>
	鲱鱼	Pacific herring	<i>Clupea pallasii</i>
	鳕鱼	Pacific cod	<i>Gadus macrocephalus</i>
	石斑鱼	Groupers	<i>Epinephelus</i> spp.
	鲷	Sparoids	Sparidae
	蓝圆鲹	Blue mackerel scad	<i>Decapterus maruadsi</i>
	白姑鱼	White croaker	<i>Pennahia argentatus</i>
	黄姑鱼	Yellow croaker	<i>Nibea albiflora</i>
	鲉鱼	Brown croaker	<i>Miichthys miiuy</i>
	大黄鱼	Large yellow croaker	<i>Larimichthys crocea</i>
	小黄鱼	Little yellow croaker	<i>Larimichthys polyactis</i>
	梅童鱼	Spiny head croaker	<i>Collichthys lucidus</i>
	方头鱼	Tilefishes	<i>Branchiostegus</i> spp.
	玉筋鱼	Pacific sand lance	<i>Ammodytes personatus</i>
	带鱼	Largehead hairtail	<i>Trichiurus lepturus</i>
	金线鱼	Threadfin breams	<i>Nemipterus</i> spp.
	梭鱼	Redlip mullet	<i>Liza</i> spp.
	鲐鱼	Pacific mackerel	<i>Scomber japonicus</i>
	鲭鱼	Spanish mackerel	<i>Scomberomorus</i> spp.
	金枪鱼	Tuna	<i>Thunnus</i> spp.
	鲳鱼	Butterfishes	<i>Pampus</i> spp.
	马面鲀	Filefishes	<i>Thamnaconus</i> spp.
	竹荚鱼	Japanese horse mackerel	<i>Trachurus japonicus</i>
	鲮鱼	Flathead grey mullet	<i>Mugil cephalus</i>
	其它	Marine fishes nei	<i>Osteichthyes</i>

Groups	Local name	English name	Scientific name
Crustaceans (甲壳类)	虾	Prawns and shrimps	
	对虾	Penaeus shrimps nei	<i>Penaeus</i> spp.
	鹰爪虾	Trachypenaeus shrimps nei	<i>Trachypenaeus</i> spp.
	毛虾	Akiami paste shrimp	<i>Acetes</i> spp.
	虾蛄	Squillids nei	<i>Oratosquilla</i> spp.
	其它虾	Natantian decapods nei	<i>Natantia</i>
	蟹	Marine crabs	
	梭子蟹	Portunus swimcrabs nei	<i>Portunus</i> spp.
	青蟹	Mud crab	<i>Scylla</i> spp.
	蟳	Charybdis crabs nei	<i>Charybdis</i> spp.
	其它蟹	Marine crabs nei	<i>Brachyura</i>
Molluscs	贝类	Marine molluscs nei	Mollusca
Seaweeds	藻类	Algae (dried)	
Cephalopods (头足类)	墨鱼	Cuttlefish, bobtail squids nei	Sepiidae, Sepiolidae
	鱿鱼	Various squids nei	Loliginidae, Ommastrephidae
	章鱼	Octopuses, etc. nei	Octopodidae
	其它头足	Cephalopods nei	<i>Cephalopoda</i>
Miscellaneous aquatic animals (其它品种)	海蜇	Jellyfishes	<i>Rhopilema</i> spp.
	其它		

**Table B: Mariculture production (fishes, crustaceans, molluscs, aquatic plants, and other species)**

Groups	Local name	English name	Scientific name
Fishes (鱼类)	鲈鱼	Seabass	<i>Lateolabrax</i> spp.
	石斑鱼	Groupers	<i>Epinephelus</i> spp.
	美国红鱼	Red drum	<i>Sciaenops ocellatus</i>
	军曹鱼	Cobia	<i>Rachycentron canadum</i>
	鲷鱼	Amberjacks nei	<i>Seriola</i> spp.
	鲷鱼	Porgies, seabreams nei	Sparidae
	大黄鱼	Large yellow croaker	<i>Larimichthys croceus</i>
	河鲀	Puffers	<i>Takifugu</i> spp.
	鲆鱼	Left-eyed flounders	Bothidae
	鲽鱼	Right-eyed flounders	Pleuronectidae
	其它	Marine fishes nei	Osteichthyes
Crustaceans (甲壳类)	虾	Prawns and shrimps	
	对虾	Penaeus shrimps nei	<i>Penaeus</i> spp.
	南美白对虾	White-leg shrimp	<i>Penaeus vannamei</i>
	斑节对虾	Giant tiger prawn	<i>Penaeus monodon</i>
	中国对虾	Fleshy prawn	<i>Penaeus chinensis</i>
	日本对虾	Kuruma prawn	<i>Penaeus japonicus</i>
	其它虾	Natantian decapods nei	<i>Natantia</i>
	蟹	Marine crabs	
	梭子蟹	Gazami crab	<i>Portunus trituberculatus</i>
	青蟹	Indo-Pacific swamp crab	<i>Scylla serrata</i>
	其它蟹	Marine crabs nei	<i>Brachyura</i>
Molluscs (贝类)	贝类	Marine molluscs	
	牡蛎	Flat and cupped oysters nei	<i>Ostrea</i> spp. and <i>Crassostrea</i> spp.
	鲍	Abalones nei	<i>Haliotis</i> spp.
	螺	Snails	Gastropoda

Groups	Local name	English name	Scientific name
	蚌	Arc and Anadara clams nei	<i>Arca</i> spp. and <i>Anadara</i> spp.
	贻贝	Sea mussels nei	Mytilidae
	江珧	Pen shells nei	<i>Pinna</i> spp.
	扇贝	Scallops nei	Pectinidae
	蛤	Clams	<i>Venerupis</i> spp.
	蛭	Constricted tagelus	<i>Sinonvacula constricta</i>
	其它贝类	Marine molluscs nei	Mollusca
Seaweeds (藻类)	藻类	Algae (dried)	
	海带	Japanese kelp	<i>Laminaria japonica</i>
	裙带菜	Wakame	<i>Undaria pinnatifida</i>
	紫菜	Nori nei	<i>Porphyra</i> spp.
	江蓠	Gracilaria seaweeds	<i>Gracilaria</i> spp.
	麒麟菜	Eucheuma seaweeds nei	<i>Eucheuma</i> spp.
	石花菜	Japanese isinglass	<i>Gelidium amansii</i>
	羊栖菜	Fusiform sargassum	<i>Sargassum fusiforme</i>
	苔菜	Dark green nori	<i>Enteromorpha prolifera</i>
其它藻	Other aquatic plants	<i>Plantae aquatica</i>	
Other cultured aquatic animals (其它海水养殖 产品)	海参	Japanese sea cucumber	<i>Stichopus japonicus</i>
	海胆(公斤)	Sea urchins (kg)	<i>Hemicentrotus pulcherrimus</i>
	海水珍珠(公斤)	Pearl oyster shells nei (kg)	<i>Ex Pinctada</i> spp.
	海蛰	Jellyfishes	<i>Rhopilema esculenta</i>
	其它	Others	

Inland production b) consists of inland capture production (Table C) plus inland aquaculture production (Table D)

**Table C: Inland aquaculture production (fishes, crustaceans, molluscs, aquatic plants and other species)**

Groups	Local name	English name	Scientific name
Fishes (鱼类)	鲟鱼	Sturgeons	<i>Acipenser</i> spp.
	鳗鲡	Eel	<i>Anguilla</i> spp.
	青鱼	Black carp	<i>Mylopharyngodon piceus</i>
	草鱼	Grass carp	<i>Ctenopharyngodon idellus</i>
	鲢鱼	Silver carp	<i>Hypophthalmichthys molitrix</i>
	鳙鱼	Bighead carp	<i>Aristichthys nobilis</i>
	鲤鱼	Common carp	<i>Cyprinus carpio</i>
	鲫鱼	Crucian carp	<i>Carassius auratus</i>
	鳊鱼	White amur bream	<i>Parabramis pekinensis</i>
	泥鳅	Pond loach	<i>Misgurnus anuillicaudatus</i>
	鲶鱼	Amur catfish	Siluridae
	鲟鱼	Channel-catfish	Ictaluridae
	黄颡鱼	Yellow catfish	<i>Pelteobagrus fulvidraco</i>
	鲑鱼	Salmonoids nei	Salmonoidei
	鳟鱼	Rainbow trout	<i>Oncorhynchus mykiss</i>
	河鲀	Puffers	<i>Takifugu</i> spp.
	池沼公鱼	Pond smelt	<i>Hypomesus olidus</i>
	银鱼	Freshwater icefishes	Salangidae
	短盖巨脂鲤	Pirapatinga	<i>Piaractus brachypomus</i>
	长吻鲢	Long snout catfish	<i>Leiocassis longirostris</i>

Groups	Local name	English name	Scientific name
	黄鳝	Swamp eel (lai)	<i>Monopetrus albus</i>
	鳊鱼	Mandarin fish	<i>Siniperca chuatsi</i>
	鲈鱼	Seabass	<i>Lateolabrax maculatus</i>
	乌鳢	Chinese snakehead	<i>Channa argus</i>
	尼罗罗非鱼	Nile tilapia	<i>Oreochromis niloticus</i>
	观赏鱼	Ornamental fishes	
	其它	Freshwater fishes nei	Osteichthyes
Crustaceans (甲壳类)	虾	Prawns and shrimps	
	罗氏沼虾	Giant freshwater prawn	<i>Macrobrachium rosenbergil</i>
	青虾	Oriental river prawn	<i>Macrobrachium nipponensis</i>
	克氏原螯虾	Red swamp crawfish	<i>Cambarus clarkii</i>
	南美白对虾	White-leg shrimp	<i>Penaeus vannamei</i>
	其它虾	Freshwater prawns, shrimps nei	Palaemonidae
	蟹	Freshwater crabs	
	河蟹	Chinese river crab	<i>Eriocheir sinensis</i>
Molluscs (贝类)	其它蟹	Other crabs	
	贝类	Freshwater molluscs	
	河蚌	Freshwater mussel shells	Unionidae
	螺	Chinese mystery snail	<i>Cipangopaludina chinensis</i>
	蚬	Asian clam	<i>Corbicula</i> spp.
其它贝类	Freshwater molluscs nei	Mollusca	
Seaweeds (藻类)	藻类	Algae (dried)	
	螺旋藻	Spirulina nei	<i>Spirulina</i> spp.
	其它藻	Other aquatic plants	<i>Plantae aquatica</i>
Other cultured aquatic animals (其它)	甲鱼	Soft-shell turtle	<i>Trionyx sinensis</i>
	龟	River and lake turtles nei	<i>Testudinata</i>
	蛙	Frogs	<i>Rana</i> spp.
	珍珠	Pearl oyster shells nei	<i>Ex Pinctada</i> spp.
	其它	Others	

**Table D: Inland capture production (fishes, crustaceans, molluscs, aquatic plants and other species)**

Groups	Local name	English name	Scientific name
Fishes	鱼类	Freshwater fishes nei	Osteichthyes
Crustaceans	虾	Freshwater prawns, shrimps nei	Palaemonidae
	蟹	Freshwater crabs	
Molluscs	贝类	Freshwater molluscs	Mollusca
Seaweeds	藻类	Aquatic plants	Plantae aquaticae
Other aquatic animals	丰年虫	fairy shrimps	Chirocephalidae
	其它	Aquatic invertebrates nei	Invertebrata

## Article 6 The classification of marine capture production

### I) Production by fishing area (Bohai Sea, Yellow Sea, East China Sea and South China Sea)

1. Bohai Sea: the area divided by the Yellow Sea on the east, with the line from the west corner of Laotie Mountain, Liaoning Province, through the Miaodao Islands to Penglai Corner.

2. Yellow Sea: the area divided by the East China Sea on the south, with the line from the north corner of the Yangtze River mouth to the southwest of Jeju Island, Korea; and the adjoining Korean Peninsular and Korean Strait on the east.
3. East China Sea: the south boundary is the line from the boundary between Fujian and Guangdong to the south of Dongshan Island and then to Maobitou on the south of Taiwan Island. The East boundary is a line from the Tsushima Strait, the Ryukyu Islands and Taiwan Province, China.
4. South China Sea: the area divided by the Bashi Channel, the Balintang Channel, the Phillipine islands and the Pacific Ocean on the east; Kalimantan on the south; and the Indochina Peninsular and Malay Peninsular on the west.
5. Other areas: areas not included above.

II) Production by fishing type:

1. Trawl fishing includes otter-trawling and pair-trawling.
2. Purse seine fishing includes single-boat seiners, two-boat seiners and multi-boat seiners.
3. Gillnet fishing includes fixed gill-net, drift-net, surrounding gill-net, and dragging gillnet.
4. Swing (stow)-net fishing includes frame swing-net, two-stick swing-net, multistick swing-net, single-anchor stow-net, two-anchor stow-net, boat swing-net, wall swing-net and paratactic stow-net.
5. Line-fishing includes drift longline, set longline, troll-line and vertical-line (e.g. squid jiggling)
6. Other fishing types include beach seine, lift-nets, duck-nets, falling-gear, traps, rakes and pricks, baskets and pots, among others.

## **Article 7 The classification of mariculture production**

- I) Marine aquaculture: aquaculture practiced from the low waterline and onward.
- II) Tidal flat aquaculture: aquaculture practiced within the tidal zone.
- III) Land-based aquaculture: aquaculture practiced at constructed facilities on land including pond culture, industrialized culture and warm-water raceway culture.
- IV) Intensive aquaculture:
  1. Deepwater cage culture: cage culture using large cages stationed in seas deeper than 20 metres. Presently there are three kinds of deep-water cages in China: the gravity cage with polyethylene net, the floating cage and the plate-shaped cage. The cage sizes ranges from hundreds of cubic meters to thousands of cubic meters.
  2. Ordinary cages: these are cages with synthetic fiber net (e.g. nylon, PVC) installed in the frame. The surface area ranges from several square meters to dozens of square meters. Cages are usually installed in coastal areas or bays.
  3. Industrialized-culture: this type of culture uses a continuous flow of water with an automated control of the quality and temperature to keep the conditions best for the growth of cultured species. This system can operate throughout the year and can achieve high efficiency and a high rate of growth in the production of species.

## **Article 8 The classification of inland aquaculture production**

Inland aquaculture refers to the production of fry/fingerlings and the rearing of aquatic species in fresh water. Inland aquaculture can be divided into six systems according to the type of water area – namely pond-culture, lake-culture, reservoir-culture, river-culture, paddyfield-culture and others.

D) Intensive-aquaculture:

1. Enclosure: aquaculture practiced in an enclosed area in lakes, reservoirs, and rivers.
2. Industrialized-culture: intensive aquaculture practiced in constructed facilities.
3. Cage-aquaculture: aquaculture practiced in cages.

## CHAPTER 2: AREA UNDER AQUACULTURE

The aquaculture area refers to the water surface area that is regularly used for the culture of aquatic animals and plants. The area under culture is expressed in hectares and includes mariculture and inland aquaculture.

### Article 9 Area under mariculture

This refers to the water surface area that is used for the culture of marketable aquatic animals and plants such as fish, crustaceans, molluscs and aquatic plants at the sea-surface, tidal-flat, and/or land-based facilities. The area under aquaculture should be reported regardless of whether the production is completed/not completed within the reporting period. However, the tidal-flat areas where no fry/fingerlings are released; or only a small amount of fry/fingerlings are released, should not be included.

D) Classifications for the area under mariculture:

1. Area under marine aquaculture: aquaculture practised from the low-water line and onward.
2. Area under tidal-flat aquaculture: aquaculture practised within the tidal-zone.
3. Area under land-based aquaculture: aquaculture that is practised at the constructed facilities from the low-water line and inward.
4. Intensive aquaculture:
  - Deepwater-cage culture: the actual volume of water occupied by cages
  - Ordinary-cage culture: the actual surface area of water under culture
  - Industrialized-culture: the actual volume of water used for aquaculture

II) Calculation methods for the area under aquaculture:

1. For marine, tidal-flat and land-based aquaculture, calculate the actual areas that are currently used.
2. For intensive aquaculture, the volume ( $m^3$ ) of water is calculated for industrialized and deepwater-cage culture; and the surface area ( $m^2$ ) is calculated for ordinary cage culture.

### Article 10 Area under inland aquaculture

The area under inland aquaculture refers to the actual area being used for aquaculture in bodies of water such as ponds, lakes, reservoirs and rivers. The area under paddy-field culture shall not be counted. For intensive aquaculture, the surface area ( $m^2$ ) is calculated for enclosure aquaculture and cage aquaculture; while for industrialized aquaculture, the volume ( $m^3$ ) of water is calculated.

Principles used in calculating areas under inland aquaculture:

1. Large rivers and lakes where fry/fingerlings are released, but only the general management of water-bodies and the protection of resources are conducted, shall not be counted.

2. Lakes, reservoirs and rivers where water-body managers are stationed; and where fry/fingerlings are released but the production from the released stocks is under 30 percent of the total capture production, shall not be counted. (Such production shall be counted as capture production.)

## **CHAPTER 3 THE TOTAL ECONOMIC VALUE OF THE FISHERIES SECTOR**

### **Article 11 The total economic value of the fisheries sector**

This refers to the total value of all fishery-related economic activities and their outputs expressed in the currency term. It includes all the fishery-related activities of the production sector, the ancillary industries and/or services, the construction sector and the trade and marketing sector.

### **Article 12 The total value of fishery production**

The total value of fishery production refers to the total value of capture production, aquaculture production and hatchery production expressed in terms of the currency. It includes the value of farmed aquatic animals and plants; and the value of wild aquatic animals and plants harvested during the reporting period. It is therefore the sum of the values of marine and inland aquaculture production, and marine and inland capture production.

Method of calculation: the value of marine and inland aquaculture products is generally calculated on a live-weight basis, except for the value of aquatic plants which is calculated based on the dry weight. These weights are then multiplied by the price of the respective products. For marine and inland capture production, the production value is calculated in the same manner.

The value-added in fishery production is the total output of all fishery production activities (in the whole society) in the reporting period, expressed in terms of the currency.

Method of calculation: the value of intermediate inputs is subtracted from the total production value. The data relating to the total production value and the added-value can be obtained from the National Bureau of Statistics (NBS).

The total value of hatchery production is calculated from the sales value and the value-added. It is the amount of the total hatchery production subtracted from the value of the intermediate investments for hatchery production.

### **Article 13 Total value produced by the fishery processing, manufacturing and construction industries**

This includes the total production value of: a) the fishery processing sector, b) the fishing gear and equipment manufacturing industry, c) the fishery feed industry, d) the fishery pharmaceutical industry, e) the fishery construction industry and other ancillary industries.

The total production value of: a) the fish-processing industry is the sum of output-values produced by all processing enterprises (in the whole society) during the reporting period, which is expressed in terms of the currency. The data is mainly obtained from statistics which are produced annually by the management of each enterprise.



The production value of: b) the fishing gear and equipment manufacturing industry is the sum of the output-values of fishing vessel construction, fishing rope/net manufacture and the manufacture of other fishing equipment. The “factory method” is used to calculate the total production value. The value-added calculation is based on the related indicators obtained from the Industry Yearbook published by the NBS using the table titled: “Total production values of large scale industrial enterprises”.

The “factory method” is also used to calculate the total production value of c) the fishery feed industry. The annual increment shall be calculated from the total production value multiplied by the average growth rate of large-scale companies.

The total production value of: d) the fishery pharmaceutical industry shall be calculated by obtaining the relevant data from the annual statistics reported from the pharmaceutical companies. The annual increment shall be calculated from the total production value multiplied by the average growth rate of large-scale companies.

The total production value of: e) the fishery construction industry is a sum of the output values produced by all relevant companies (in the whole society) during the reporting period, expressed in terms of the currency. The total production value shall be calculated based on the costs of construction obtained from the owners of the facilities. The value-added in the category needs to be estimated, since the data related to intermediate investments in the fishery construction industry is missing from the national economic statistics. This means that the rate of value-added in the (general) construction industry has to be adopted as the rate of value-added in the fishery construction industry. This can be estimated from the data given in the “Table of gross domestic production” published by the NBS.

#### **Article 14 The total value produced by the fish trade and supporting service industries**

This includes those fishery-related industries other than fishery production, fishery processing and the manufacturing and construction industries. The total production value of this category takes into account a wide range of sub-industries such as: a) trade and marketing, b) storage and transportation, c) recreational fisheries, d) fisheries education and e) fishery-related scientific and technological activities, among others.

The total production value of: a) the fishery trade and marketing sector shall be calculated from the value of turnover. The value-added can be estimated by applying the rate of the value-added in the wholesale and retail marketing sector. The total production value of b) the storage and transportation industry is the total turnover value of the industry. The value-added can be estimated in the same way as that of the construction industry (see above, Article 13).

Total production value of: c) the recreational fisheries shall be calculated from the value of turnover. The value-added refers to the value newly generated during the reporting period, which can be estimated from the rate of value-added in the tourism industry.

The total production value of: d) fishery culture, and e) the education, science and technology sector can be estimated from the relevant data obtained from the “Itemized budget account table” published by the Ministry of Finance.

#### **Article 15 Prices used to calculate the total production value**

This calculation is done using the average selling prices from the reporting year which are worked out from the prices at the first point-of-sale at various marketplaces. The prices of aquatic products will

be based on the average price when the products first come into the market. For industrial products, factory prices will be counted and retail prices will be taken for commercial products.

## **CHAPTER 4 THE FISHERY FLEET**

### **Article 16 Motorized fishery vessels**

This refers to fishery production vessels that are equipped with an engine/s and are engaged in fishery production. Fishery production vessels refer to those vessels that are directly engaged in capture fishery production or aquaculture activities. Those engaged in capture production are called capture fishing vessels and those engaged in aquaculture are called aquaculture vessels.

The vessels of the fishery fleet are classified according to: 1) Engine power over 600 hp, 61 to 599 hp and less than 60 hp; 2) Type of fishing - trawl fishing, purse seine fishing, gill-net fishing, swing-net fishing, line-fishing and others (see Article 6).

Fishery auxiliary vessels refer to those vessels engaged in fish processing, fish storage, transport, fishery supply, law enforcement and other supporting activities. They include fishery mother ships, fishery factory ships, fish carriers, fishery supply vessels, live fish transport-vessels, fishery guidance vessels, law-enforcement vessels, rescue vessels, fishery research vessels and fishery training vessels among others. Included in these fishery auxiliary vessels are vessels engaged in transporting the catch, in cold storage and in the supply of fuel and equipment. These are called production supporting service vessels.

#### The units for classification

1. The term vessel is a unit of calculation. Those vessels that belong to a mother-ship fishing system shall be counted separately.
2. The units used for the classification of fishery vessels are gross tonnage (GT) and kilo watt (kW).
3. The gross tonnage is the total volume of a vessel and 1 GT is 2.83 m<sup>3</sup>.
4. Kilowatts are used to express the productive capacity of an engine. 1 hp is 0.735 kW. The productive capacity of turbo-charged engines is calculated based on a pressure-charged condition.

### **Article 17 Non-motorized fishery vessels**

These are fishery vessels that are not equipped with an engine; such as sailing boats and rowing boats.

## **CHAPTER 5 FISHERY DISASTERS**

### **Article 18 Fishery disasters**

This refers to all kinds of loss and damage to fishery products, fishery facilities, properties and the lives of fishers; caused by natural disasters.

1. The loss of fishery products refers to the volume and value lost due to diseases, drought, pollution (e.g. red tide), typhoon and/or other natural disasters.

2. The loss and damage of fishery facilities refers to the quantity and value lost and/or damaged due to natural disasters including vessels sunk, damaged and/or lost aquaculture facilities, pumping stations, drainage/sluices, wharves, shore-protection and break-waters, etc.
3. Casualty refers to economic loss and the number of people who died or were injured by natural disasters.

## **CHAPTER 6 FISHERY POPULATION AND LABOUR FORCE**

### **Article 19 Fishing townships and villages**

Townships and villages are regarded as “fishing townships and villages” when more than 60 percent of the full-time labour force of a township or a town is engaged mainly in fishery production, fishery management and supporting services. Those townships or villages that do not meet the above criteria can still be regarded as fishing townships and villages if the township or village considers that fishery-related activities are the main economic activities in the area; and the higher administrative unit approves this classification.

### **Article 20 Fishing households**

The term “fishing household” refers to those households in a fishing township or village whose main activity is fishery production. This includes households in which the majority of the labour force spend more than 50 percent (6 months) of the year in fishery production; or which earn more than 50 percent of their net-income from fishery production.

### **Article 21 Fishery population**

The fishery population refers to people who are directly engaged in fishery activities. This includes:

1. People who are directly engaged in capture fisheries, aquaculture, fishery management and fishery-related services.
2. People who engage in fishery activities on a part-time basis (three months or more in accumulation each year) or who earn more than 50 percent of their net-income from fisheries.
3. Dependents in fishing households.
4. The proportional number of people supported by the fishery-generated portion of the total household income in households where fishery and non-fishery labour coexist.

Among fishery population, those who live in fishing townships and villages are referred to as “traditional fishers”.

### **Article 22 The fishery labour force**

The fishery labour force is number of people who are actually engaged in fishery activities and who earn income from these activities in kind or cash. The fishery labour force is made up of 1) the able-bodied force, 2) the semi-able-bodied labour force.

The able-bodied force refers to men aged from 18 to 50 and women aged from 18 to 45 who are able to work on a regular basis. Disabled people in these age ranges are not included.

The semi-able-bodied labour force refers to men aged from 16 to 17 from 51 to 60; and women aged from 16 to 17 and from 46 to 55 who have the physical capability to work. Those who are outside these age ranges, but who usually work are included. Children under 12 and disabled people are not included. **Table E**, below, gives a more detailed classification of the fishery labour force.

**Table E: Classification of the fishery labour force**

<b>Fishery labour force</b>	<b>Male</b>	<b>Female</b>
1. Able-bodied labour force 2. Semi-able-bodied labour force	Age: 18–50 Age: 16–17 and 51-60	Age: 18–45 Age: 16–17 and 46–55
Full-time fishery labour force – Full-time in capture fisheries – Full-time in aquaculture – Others	– Engaged in capture fishing for more than 6 months (inclusive) – Engaged in aquaculture for more than 6 months (inclusive) – Engaged in other fishery-related activities for more than 6 months (inclusive)  When one person is engaged in more than one of the categories above, the category in which the person spends longer hours should be chosen.	
Part-time fishery labour force	Is engaged in fishery-related activities for more than three months but less than six months.	

## CHAPTER 7 INVESTMENT OF FIXED ASSETS

### Article 23 Total amount of investment

This refers to the amount expressed in the currency term invested on the construction, purchase, renewal and renovation of fixed assets in fisheries. That is the accumulated amount of capital investment completed during the period of 1 January to 31 December.

### Article 24 Investment by source of capital

- I) Central investment: funds appropriated from the central government and the construction funds of the relevant ministries.
- II) Local investment: funds appropriated from the construction funds of local administrative units (province, city or county).
- III) Self-financed funds: funds sourced by the construction unit through loans from domestic or foreign financial institutions. These include:
  - Domestic loans: domestic investment loans borrowed from the bank by the construction unit.
  - Foreign investments: foreign capital invested for fixed assets.
  - Other funds: funds invested from other sources mentioned above.

## **Article 25 Investment by purpose**

Investment for the purpose of capture production, aquaculture production, fishery processing, marketing, law-enforcement, fishing-port construction, research, development and education, the promotion of technology, fishery inspection, the conservation of resources, fingerling production and other purposes. Among these categories capture production includes distant-water fisheries; aquaculture production and processing and investment from foreign sources. Fishery inspection includes environmental monitoring and quality examination.

## **Article 26 Newly increased fixed assets**

This refers to the total value of newly-built projects that have become operational; and the investment in equipment, tools and instruments that meet the criteria of fixed-assets, which include the associated costs incurred. This is an integrated indicator that is expressed in terms of value for the outputs generated by the investment.

## **CHAPTER 8 DISTANT-WATER FISHERIES**

### **Article 27 Production and fleet**

Production by distant-water fisheries: this refers to fishery production made outside the Chinese EEZ (that is in the EEZ of other countries or the high seas) by distant-water fishing companies and/or individual production units. The distant-water fishing vessels are organized under the management regulations for Chinese distant-water fisheries. Where fishing is conducted under joint-ventures or co-operation agreements, only the portion that belongs to the Chinese party (in terms of the agreement) shall be reported as Chinese production.

Distant-water fishing vessels: this refers to those vessels that regularly or seasonally operate under the regulations and agreements mentioned above.

### **Article 28 The principles applied to the statistics of distant-water fisheries**

- I) The production statistics follow the principle of “along with the management of the vessel”. This means that the unit responsible for the management of the vessel shall report the production statistics of the vessel to the local government unit in the area.

Case 1: In Company A in Province A, assigns Company B in Province B to operate a distant-water fishing vessel for the company; and when Company A only pays a managing-fee but maintains the managing-accounts of the vessel; the production of the vessel shall be reported by Company A to Province A.

Case 2: If Company B leases the vessel but is responsible for the managing-accounts of the vessel, the production shall be reported by Company B to Province B.

- II) The statistics of the number of distant-water fishing vessels and crew shall be compiled in accordance with the above principle.

### **Article 29 Employment in distant-water fisheries**

This refers to those people engaged in the production, management and other related tasks of distant-water fisheries more than three months of the reporting year.

### **Article 30 Total income, profit/loss made by the overseas management**

The total income of overseas management refers to all the income (expressed in US\$) made from distant-water fishery activities. The profit/loss of overseas management is the balance between the total income and the expenses incurred (production costs, fees and taxes).

## **CHAPTER 9 HATCHERY PRODUCTION**

### **Article 31 Fry/fingerling**

Fish fry: fries are at the stage when yolk-bags have almost disappeared and swimming bladders have been charged so that they can take food actively. This includes fries that are artificially incubated and wild fries that are caught.

Fish fingerling: fries grow into fingerlings, on which scales are developed on the entire body and the fins are extended. They have the basic characteristics of juvenile fish. Usually, fingerlings are of 1.7 to 23.3 cm long. Because of the differences in the harvest season and the breeding period, fingerlings have local names like Xiahua, Dongpian, Cunpian, Qiupian, Zaikou and Laokou.

Juvenile crab: After a series of moltings, baby crabs develop in a similar shape to adult crabs. After another 4-5 month growing period, they will grow into juvenile crabs of 100 to 200 grams.

### **Article 32 Principles applied for the statistics of hatchery production**

Production statistics shall be reported by the production units. When the purchase of fry/fingerlings is made from other production units, they shall not be included in the production statistics.

## **CHAPTER 10 FISHERY PROCESSING**

### **Article 33 Fishery processing enterprises**

Processed fishery products refer to those products that are treated with food technologies and craftsmanship for the purpose of preserving the quality, maintaining the original nutritious properties and flavours, or meeting various consumption/utilization needs. Those enterprises that are engaged in the processing of fishery products are called fishery processing enterprises. The processing capacity refers to the annual processing capacity by design at the point of construction of the plants. If the capacity of the plants has been increased, this shall be included.

### **Article 34 Cold storage**

Cold storage refers to those facilities that freeze or refrigerate aquatic products, or make ices. Usually, the number of low-temperature refrigerated storage units means the number of cold-storage units. The

freezing capacity, refrigerated storage capacity and ice-making capacity refers to the designed capacity of those facilities. The total capacity of refrigerated storage and ice-making refers to the sum of capacities of those units operational in the reporting period.

### **Article 35 Processed fishery products**

#### **I) Frozen products**

This refers to the practice of freezing farmed/captured fish, crustaceans, molluscs and aquatic plants to maintain their freshness. This includes;

1. frozen fresh fish, fishmeals, fillet and roe
2. frozen shrimp, shellfish and other fishery products
3. frozen aquatic plants

#### **II) Surimi, dried and cured products**

This refers to the practice of making fish-meal, dried-fish and salted- fish. These do not include canned products but do include:

1. fish meat, fish sausage, fish ball, dried fish floss and prawn slices
2. various types of dried fishes, shrimps, shellfishes and other seafood
3. roasted fish fillet, shredded jellyfish, shredded squid, and dried shrimps
4. processed kelp, laver and other aquatic plants
5. salted fish, jellyfish and aquatic plants
6. pickled aquatic products
7. condiments made from aquatic organisms

#### **III) Canned products**

1. Canned fish, shrimp, shellfish and other aquatic products in hard and soft packages
2. Onboard processing of canned products

#### **IV) Feed products**

This refers to the practice of processing fishbone, shrimps, shellfish and other aquatic products for feed. This includes:

1. fishmeal, shrimp meal, shell powder, etc.

#### **V) Fish oil**

This refers to the practice of extracting oil and fat from fish or fish livers. This includes:

1. crude and refined lipids, crude and refined fish oils, crude fish-liver oil and the fat from marine mammals.

#### **VI) Other processed products**

1. The processing of pearls.
2. The processing of aquatic products not mentioned above.

## **CHAPTER 11 SURVEY OF THE INCOME AND EXPENDITURE OF FISHING HOUSEHOLDS**

### **Article 36 Fishing households**

See the Article 20 on page 40 above.

**Article 37 Total annual income**

The total income of the household in the reporting year, earned from fishery and non-fishery activities. (This does not include the income from money-lending and other incomes such as those earned by a member of the household member residing elsewhere, the wages of civil servants, allowances received from the government, relief-funds, scholarships and grant from relatives).

**Article 38 Fishery income**

The income from fishery production made individually or collectively (gross income), wages earned from fishery production and interests earned from fishery investments (net income). When calculating the gross income of a household, all the production (both for commercial and subsistent purposes) shall be counted. The value of the sold products shall be calculated based on the actual selling prices and the value of the household consumption shall be calculated according to the average market prices at the time of sufficient supply.

**Article 39 Other income**

The income from non-fishery activities such as plant growing, animal husbandry, manufacturing, construction, commerce, trade and transportation, among others (gross income) and wages earned from non-fishery activities and interests earned from non-fishery investments (net income).

**Article 40 Other income from non-economic activities**

This refers to income from non-economic activities.

**Article 41 Annual total expenditures**

Expenditure on the management of household production in one year including operation costs, taxes and miscellaneous expenses, contractual fees and others. (This does not include expenses on fixed-assets and subsistent expenses.) It shall not include loan-payments, grants given to household members residing elsewhere, grants given to relatives and friends, party or league membership fees and various penalties and compensations.

**Article 42 Fishery production costs**

The expenditures incurred in the process of fishery production such as the purchase of fries, feed, materials, fuels, fertilizers/chemicals/medicines and small fishing gears; the cost of repair, depreciation of fixed assets and the partial payments for large fishing nets and gears.

Each year the depreciation of fixed assets shall be accounted according to a certain depreciation rate and the payment for large fishing-nets and gears shall be accounted proportionally.

**Article 43 Other production costs**

The expenditures incurred in relation to non-fishery production activities.



**Article 44 Taxes**

Taxes levied on the household.

**Article 45 Contract fees**

This refers to the collective payment of contract fees.

**Article 46 Miscellaneous payments**

Various payments made by the household to the relevant authorities.

**Article 47 Other expenditures for non-economic activities**

Other expenditures not mentioned above

**Article 48 Annual net incomes**

The surplus income after total annual expenditure has been deducted from the annual total income. These can be spent on economic and non-economic activities as well as to fulfil other needs.

**Article 49 The purchase of productive fixed assets**

Money spent on the purchase of productive fixed assets. The value of fixed- assets shall be calculated based on the book-value at the time of purchase. Fixed-assets shall be worth more than 200 Chinese Yuan (RMB) per unit and have more than one year of product life.

**Article 50 Living expenses**

These are living expenses used to meet the material, living and spiritual needs of daily life. They include food, clothes, daily necessities, stationery, recreational articles, medicine, housing, subsistence-fuel and other articles. Cultural and living costs include school-fees (book and stationery expenses are not included), child-care expenses, medical expenses (the cost of medicine are not included), entertainment costs (expenditure on recreational materials is not included), transportation, post and telecommunication costs; and travel, etc.

**Article 51 Population of fishing households**

This refers to those people who live in the household for more than six months each year and are integrated in the socio-economic activities of that household. The members who live in the household for less than six months a year but contribute as a major income-earner and are integrated in the socio-economic activities of the household can also be counted as permanent members of the household. The state employees and retirees who live in the household shall be included. However, active members of the military forces, students at a higher level than secondary education and people who regularly reside elsewhere, with stable occupation and residence shall not be included in the item.

**Article 52 Household labour force**

Those household members who meet the statistical criteria of the labour force.

**Article 53 Validation of statistical-data on fishing household income**

This method is used to correct errors that inevitably occur during surveys in order to make fishing household income statistics more representative. Generally, provincial fishery line-agencies check and ratify the fishing household income of a province according to the number of surveyed households and overall or representative income of several regions.





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