

Regional Framework for Fishery Statistics of Southeast Asia

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Preparation and Distribution of this Document

The Regional Framework for Fishery Statistics of Southeast Asia was prepared by the Secretariat of the Southeast Asian Fisheries Development Center (SEAFDEC), in close consultation with ASEAN-SEAFDEC Member Countries. The Framework was endorsed by the 40th Meeting of SEAFDEC Council and the 16th Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGF). The document is distributed to SEAFDEC Member Countries, its Departments, concerned institutions and public as reference material to support the improvement of national fishery statistics in the Member Countries, and the preparation of countries' inputs for the Fishery Statistical Bulletin of Southeast Asia.

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Regional Framework for Fishery Statistics of Southeast Asia

I. BACKGROUND AND IMPORTANCE

In Southeast Asia, the importance of fishery statistics has been widely accepted as a tool in providing the basic foundation that is crucial to the formulation of national fisheries policies as well as national management frameworks and actions or even as a basis for understanding the status and condition of the fisheries resources. As basic structures to facilitate development planning and management of fisheries, the fishery statistical items and data set collected by countries could vary based on the priority needs and objectives of the countries. In addition, the complexity or extent of a national fishery statistical system including its framework for collecting the national fishery statistics also depends on the country's available budget, resources and the existing capacity of its fisheries staff.

In order to consolidate the differences in the current national statistical systems of the countries in Southeast Asia, SEAFDEC has exerted efforts to initiate the revision of the framework so that this could better serve as a basic requirement (minimum requirement) that can be achieved by the countries in the region. The need to strengthen and improve the countries' national fishery statistics has been highlighted in the regional policy and direction¹. SEAFDEC therefore considered it necessary to address the common issues, problems and constraints through regional cooperation and collective actions under a regional framework in order that this can serve as basis for development planning and management of fisheries. Thus, the development of a new and improved framework for fishery statistics for Southeast Asia was deemed necessary.

The compilation of fishery statistics in Southeast Asia has been regularly pursued by SEAFDEC since 1978 in the form of the "Fishery Statistical Bulletin for the South China Sea Area". However, the escalating situation in fisheries practices in the region and the new geo-political set-up of the ASEAN, make it necessary to revise the existing framework of the regional fishery statistics and the usage of the Bulletin. In accordance with the policy directives given at the 36th Meeting of SEAFDEC Council in 2004, the SEAFDEC Secretariat organized a series of Regional Technical Consultations (RTC) with the Member Countries to develop a new framework for fishery statistics of Southeast Asia. The draft new Framework was endorsed by the SEAFDEC Council at its 37th Meeting in 2005.

The draft of the new Regional Framework for Fishery Statistics of Southeast Asia developed by SEAFDEC was discussed and supported by the Member Countries at the RTC on Fishery Statistics and Information held in Bangkok in December 2007. The Member Countries also agreed to adopt the new and improved framework as it contains the minimum requirements for collection and production of fishery statistics. The Framework was endorsed by SEAFDEC Council at the 40th Meeting held in Indonesia in April 2008 and also endorsed by the ASEAN Sectoral Working Group on Fisheries (ASWGF) at the 16th Meeting held in Bangkok in May 2008. The new Framework, which includes major changes in the "area of coverage" and "statistical usage" to be consistent with SEAFDEC's areas of competence as well as on the "standard definitions and classifications" to be consistent with the current regional requirements, has also been harmonized with the international standards. The new Framework is envisaged as a regional collaborative framework

¹ Under the Resolution and Plan of Action adopted at the Millennium Conference in 2001, Strengthening of fishery statistics and maximizing their use for fisheries planning and management, as well as development of standard definitions and classifications to facilitate regional fishery statistics and information exchanges, have been identified as areas to be taken into consideration for the development of sustainable fisheries.

on fishery statistics to facilitate wider sharing of data and information, which will also be used as inputs in the compilation of the Fishery Statistical Bulletin of Southeast Asia produced by SEAFDEC in the future.

II. PURPOSE AND USAGE

The SEAFDEC Council at its 36th Meeting in 2004 deemed it necessary to improve the compilation of regional fishery statistics and directed the SEAFDEC Secretariat to revise the framework of the compilation considering the new geo-political set-up of the ASEAN, the changing situation of the region's fisheries as well as the differences in the current national statistical systems. Thus, the new Framework was developed to focus on the basic requirements that can be possibly achieved by the countries in the region without putting much burden on the agencies responsible for the collection and compilation of fishery statistics.

2.1 Minimum Requirement for Fishery Statistics of Southeast Asia

As envisaged, the new Framework would give many benefits to the ASEAN Countries. Since the Framework is considered as the "Minimum Requirement for Fishery Statistics of Southeast Asia", its adoption would be beneficial to the countries in the region as it could be used as guide to facilitate a long-term improvement of their fishery statistics at the national level. The framework could also be used as guidelines to gain better understanding about the importance of compiling fishery statistics at national level, acquire better understanding and clear picture of the fisheries sector specifically in terms of the minimum requirements of fishery statistics, and embrace the harmonized standards and definitions in order to correspond to regional requirements and conform with international standards.

2.2 Framework of Inputs for the Development of International Norms and Standards

Since the new and unified framework contains the minimum requirements for the compilation of fishery statistics as well as the standards embodying the regional requirements, it will also be used in gathering inputs for the international development of norms and standards for fishery statistics. Harmonization of standard definitions and classifications reflecting the multi-species/gear tropical fisheries nature of Southeast Asia will facilitate the sharing of fishery statistics and information in the region as well as contributing to similar development at the global level. Therefore, improvement of the framework as well as the standard definitions and classification of fishery statistics under the new Framework could very well support such activities.

2.3 Facilitate Sharing of Fishery Information

The standardized definitions and classification of fishery statistics under the new framework could facilitate the sharing and exchange of fishery statistics and information among the countries in the region. Many countries in the region have already established their respective national fishery statistical standards. In some countries, such standards may have already been reviewed and improved to conform to the standards as well as definitions and classifications of fishery statistics at the international and regional levels such as those of the FAO and SEAFDEC. However, since this may not be the case for the other countries, harmonization of the varying systems was deemed necessary as this would eventually lead to the continuous sharing of fishery statistics and information in the region thus, contributing largely to the global efforts of establishing the real picture of the fisheries in the whole world.

III. COVERAGE

3.1 Statistical Coverage

- 1) The Framework for Fishery Statistics of Southeast Asia covers the fishery statistics on Production; Fishing Units; Fishing boats; Fishers; and Fish Price. Production (landings) covers fishes, crustaceans, molluscs, and other aquatic animals and plants taken for all purposes (capture fisheries and aquaculture) by all types and classes of fishing units and aquaculture activities operating in marine, brackishwater and freshwater areas, in appropriate geographical categories.
- 2) The reference period unit normally used in fishery statistics that will be compiled annually is the calendar year, the period between 1 January and 31 December.

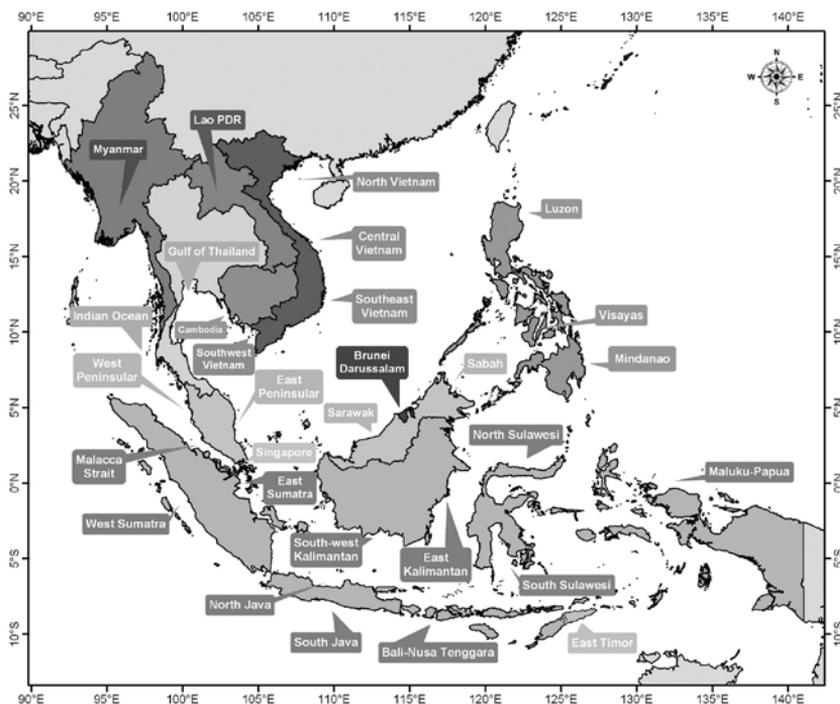
3.2 Geographical Coverage

The data also cover all production by commercial and small-scale fisheries and aquaculture activities in freshwater, brackishwater and marine water designated by FAO Fishing Area 57 (Indian Ocean, Eastern), 71 (Pacific, Western Central), 61 (Pacific, Northwest), and 04 (Asia, Inland Water).

Countries and Sub-areas to be used in marine fishery statistics are shown in the table and map below. Sub-areas used in the Framework are established in consistent with the FAO Fishing Areas, see detailed map and description in **Appendix 1**.

Countries	Sub-areas
a) Brunei Darussalam	
b) Cambodia	
c) Indonesia	West Sumatra
	South Java
	Malacca Strait
	East Sumatra
	North Java
	Bali-Nusa Tenggara
	South-west Kalimantan
	East Kalimantan
	South Sulawesi
	North Sulawesi
	Maluku-Papua
d) Lao PDR	
e) Malaysia	West Coast of Peninsular Malaysia
	East Coast of Peninsular Malaysia
	Sabah
	Sarawak
f) Myanmar	
g) Philippines	Luzon
	Visayas
	Mindanao

h) Singapore	
i) Thailand	Gulf of Thailand
	Indian Ocean
j) Timor Leste	
k) Vietnam	North Vietnam
	Central Vietnam
	Southeast Vietnam
	Southwest Vietnam



Map - Southeast Asian Countries and their sub-areas

3.3 Fishery Structure and Sub-sectors

In line with the structure of fisheries in the Southeast Asian region, the statistics presented in the Framework are divided into two main sectors, such as Capture Fishery and Aquaculture. Capture means an economic activity to catch or collect aquatic organisms which grow naturally in public waters and which do not belong to the property of any person whereas culture means an economic activity to rear the young aquatic organisms such as fry, fingerlings, oyster seeds, etc. to commercial size. Unlike capture, aquatic organisms under culture operations belong to the property of a specific person or a group of specific persons who manage them until they grow to commercial size.

3.3.1 Statistics on Capture Fisheries

With concerns on the different environment of fishery resources and other components of capture fishery, the statistics compiled under this section are classified into two sectors, namely Marine Capture Fishery and Inland Capture Fishery. Statistics on production or catch, fishing gear, fishing boats, fishing units, fishers, etc. will be collected and compiled under each sector.

3.3.1.1 Marine Capture Fishery

a. Coverage and Definition

Marine capture fishery is divided into two sub-sectors: small-scale fishery (including subsistence fishery²/artisanal/traditional) and commercial fishery. As it is not possible to establish common definition of these two categories in the region, the national distinction between small-scale and commercial fisheries of countries in the region is given in **Appendix 2**. The data for marine capture fishery exclude sport fishing, recreation, and research.

b. Marine Capture Production

The statistics for marine capture production represent the statistics on catches and landings of marine and brackishwater species of aquatic organisms, killed, caught, trapped or collected for all commercial, industrial, and subsistence purposes. The statistics in terms of quantity will be used to assess the stock of the marine organisms, to disclose the size of a fishing industry as a whole, and to be used as index showing the status and trend of a fishing industry by annual series of total production. Statistics on production in value will be used for analyzing the real growth of the fisheries industry in monetary terms to adequately compare the economic size of the fisheries industry with those of other industries.

b.1 Unit of Measurement

1) Production in quantity

Production in quantity represents the weight equivalent of the landing. Production in quantity should be reported in metric tons, except those expressed in numbers or in kilogram. If production is reported in kilograms, this should be converted into metric tons estimated by rounding off to the nearest hundredths. The production of ornamental fish and reptiles will be reported in numbers.

There are many instances where the catches on board fishing vessels are gutted, filleted, salted, dried etc. or reduced to meals, oil, etc. The data on the landings of such species and products require conversion by accurate yield rates (conversion factors) to establish the live weight equivalents (nominal catches) at the time of their capture.

2) Production in value

Production in value represents the products' value equivalent of the landings (average monthly weighted value, where available). It is generally estimated by multiplying the quantity of production by the producers' price. In reporting production in value, the amount reported in the national currencies should be converted to US\$.

b.2 Statistics on Marine Capture Production

1) Production by species

Marine capture production covers production from all kinds of commercial and small-scale fisheries broken down by species (at the species, genus, family or higher taxonomic levels into statistical categories called species items).

The standard statistical list of marine species is developed in consistent with the 'International Standard Statistical Classification of Aquatic Animals and Plants' (ISSCAAP) with two-digit group code. Statistics on marine species items or group should be reported

² A fishery where the fish caught are shared and consumed directly by the families and kins of the fishers rather than being bought by middle-(wo)men and sold at the next larger market

by referring to the FAO English name, Taxonomic code in 10 digits, and inter-agency 3-alpha code³, and national/local name. Please refer to **Appendix 3** for the ISSCAAP and the regional list of aquatic animals and plants.

2) Production by type of fishing gear

The production classified under commercial and small-scale fisheries, where possible should be further classified into detailed types of fishing gear for each category.

To complete the statistics on production by type of fishing gear, the Regional Classification of Fishing Gear developed in consistent with the CWP-International Standard Statistical Classification of Fishing Gear (ISSCFG) is shown as **Appendix 4**.

c. Fishing Boat

Fishing boats can also be called in various terms as fishing vessels, fishing fleets, or fishing crafts. Fishing boat means any vessel, boat, ship or other craft and is equipped and used for fishing or in support of such activity. Statistics on fishing boats will be used to clarify the amount of capital invested in a fishery corresponding to the size of fishing boat. Such statistics can also be used as inputs for the economic analysis and measure of the material input productivity of a fishing industry, and as a rough indication of the fishing effort considering the size of the fishing boat.

c.1 Coverage of Fishing Boat

The statistics should cover annual data of fishing boats in marine areas. All boats used in fishing, whether registered with the government or not, should be included.

c.2 Classification of Fishing Boat

Based on the characteristics of marine capture fisheries in the Southeast Asian region, one fishing boat can operate various types of fishing gear as well as catching many target species.

The regional classification of fishing boats is then developed separately from the Coordinating Working Party on Fishery Statistics (CWP) in order to present the specificity of the fisheries situation of the region. In compiling the statistics on fishing boats and fishing units for marine capture fisheries in the region, the Regional Classification of Fishing Boats by Type of Boats has been developed as shown in **Appendix 5**.

Tonnage is expressed uniformly in gross ton. When a unit other than gross tons is used to measure the size of the boat, this should be converted into gross tons. Although the method of measurement of the tonnage of fishing boats varies from country to country, statistics should be based on national measurement standards.

d. Fishing Unit

Fishing unit⁴ means the smallest unit in a fishing operation, which comprises generally a fishing boat, fishers and fishing gears. In cases where two fishing boats are jointly operated in fishing such as the pair trawler or two-boat purse seine, these two fishing boats are regarded as one fishing unit.

³ The 'inter-agency 3-alpha code' was developed by the Coordinating Working Party on Fishery Statistics (CWP) to establish a common system to exchange data among the members and facilitate the reporting of fishery statistics from national correspondents

⁴ Statistics on fishing unit, including number of fishing boats by gear and gross tonnage, should be included in the national statistical system

A fishing boat may be counted as two or more fishing units on the same year if it uses different kinds of fishing gears in separate seasons. For instance, in cases where a fishing boat operates trawl fishing half a year and gill net fishing during the other half of the year, the fishing boat is regarded as two fishing units. Fishing units are generally counted by type of fishing gear. The statistics on fishing unit is mainly used to consider the limitation of the number of fishing units for fisheries management.

d.1 Coverage of Fishing Units

The statistics should cover the annual data of fishing units operated in marine and coastal areas. Fishing units operating without boats or non-powered boats are excluded.

d.2 Classification of Fishing Units

Fishing units are classified by type and size of fishing boats as well as by major types of fishing gears. In cases where a fishing unit operates more than two fishing boats such as the pair trawl and two-boat purse seine, the size is represented by the tonnage of the major single fishing boat from among the boats employed. The type of fishing gear is based on the national classifications. In order to facilitate reporting of the statistics on fishing units, please refer to **Appendix 4** for the details.

e. Fishers

e.1 Coverage of Fishers

The statistics on fishers are generally obtained from the Marine Fishery Census of the Member Countries. The statistics should cover all commercial and subsistence fishers operating in marine and brackishwater areas for catching and landing of all aquatic animals and plants.

This statistics should exclude the fishers operating in freshwater areas and fishers engaged in aquaculture in freshwater, brackishwater and marine areas. The statistics also exclude sport fishers, the crew of state-operated fishery patrol boats, fishery protection boats, and similar types of boats.

e.2 Classification of Fishers

Statistics on the number of fishers by sub-sectors of fisheries and working status should be based on the following two main categories: full-time fishers and part-time fishers. For the detailed classification of the fishers, please refer to **Appendix 6**.

1. Full-time fishers/farmers: fishers/farmers who spend all of their working time in fishing/farming

2. Part-time fishers/farmers: fishers/farmers who spend part of their working time in fishing/farming

3.3.1.2 Inland Capture Fishery

a. Coverage and Definition

Inland Capture Fishery refers to any activity involving the catching or collection of aquatic organisms, which grow naturally in inland water bodies for economic, livelihoods and food security purposes. The statistics cover the annual data of commercial and subsistence operations for catching and collecting, and landing production of all aquatic animals in freshwater areas.

The statistics on inland capture fishery cover all productions and the people involved in fishing designated by FAO Fishing Area 04.

b. Inland Capture Production

The statistics for inland capture production present the catch of freshwater species of aquatic organisms that are killed, caught, trapped or collected for all commercial and subsistence purposes.

b.1 Unit of Measurement

1) Production in quantity

Production in quantity represents the weight equivalent of aquatic organisms caught and collected in inland water bodies. Production in quantity should be reported in metric tons, except those expressed in numbers. If production is reported in kilograms, this should be converted into metric tons estimated by rounding off to the nearest hundredths.

2) Production in value

Production in value represents an estimation of the value equivalent at the first point of sale, indicating seasonal variations in the average total value where available, with estimations including aquatic products caught and collected for subsistence and household purposes. In reporting production in value, the amount reported in national currencies should be converted to US\$.

b.2 Statistics on Inland Capture Production

1) Production by species

Inland capture production covers all aquatic animals and plants in inland waters broken down by species (at the species, genus, family or higher taxonomic levels into statistical categories called species items).

The standard statistical list of freshwater species is developed in consistent with the 'International Standard Statistical Classification of Aquatic Animals and Plants' (ISSCAAP). The statistics of freshwater species items or groups should be reported using in the same format as that for marine species. The regional standard statistical list of aquatic species is given in **Appendix 3**.

2) Production by type of water bodies

Statistics on production from inland capture fishery should be presented in accordance with the following four types of water bodies:

- (a) Lakes: Non-flowing, naturally enclosed bodies of water, including regulated natural lakes but excluding reservoirs
- (b) Rivers: running water body such as rivers, drainage canals, irrigation canals which also cover creeks, streams and other linear water bodies
- (c) Flood plains/rice fields: Seasonally flooded areas including paddy fields
- (d) Reservoirs: artificial impoundments of water used for irrigation, flood control, municipal water supplies, recreation, hydroelectric power generation, and so forth
- (e) Others: Any water bodies other than the above; Peri-urban wetland is included in this category

3) Production by type of fisheries

Inland fisheries is quite diverse in its involvement of different groups of people, the scale of operation and the types of gear/boat used as well as in its seasonal variation. As

available records would allow, the statistics under the Framework should try to reflect such variations.

- (a) Categories of scale
 - commercial
 - family/small scale
 - household occasional fishing
- (b) Categories of application/seasonality/licensing
 - Fishing lots/Leasable fisheries and other types of licensed fisheries and/or areas for (commercial) fishing
 - Dai fisheries (term used to exemplify the national/regional importance of specific type of fisheries)
 - Community fisheries and other rights-based fisheries at village level
 - “On farm” fishing, fishing in rice fields, etc.
- (c) Categories of equipment/gear/boats
 - set nets/traps
 - gear operated from boats
 - mobile gear/hand line/hooks/etc.

c. Fishers

c.1 Coverage of Fishers

The statistics on fishers for inland capture fishery are generally obtained from the respective National Fishery Census (or Agricultural Census). Statistics on fishers cover fishers engaged in inland capture fishery while persons operate fishing in marine area as well as any type of aquaculture should be excluded.

c.2 Classification of Fishers

Fishers in this section are mostly rural people who, in one way or another, seasonally or the whole year, full-time or part/time, are involved in activities related to the catch and collection of aquatic organisms in inland water bodies. Some of the information/statistics related to household occasional fishing could also be found in other sources of statistics that are available at fisheries agencies.

As far as possible, the relative involvement of people in fishing should be reported to reflect the importance of inland fisheries to the countries whether nationally, locally, seasonally as well as for rural livelihood in general. Fishers/people involved in fishing could be classified into:

- a) Full-time
- b) Part-time (including seasonally full-time)
- c) Occasional fishing by household members (which could be a daily exercise)

3.3.2 Statistics on Aquaculture

a. Coverage and Definition

Aquaculture means the farming of aquatic organisms including fish, mollusks, crustaceans, echinoderms, and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding and protection from predators. Farming also implies individual or corporate ownership of or rights resulting from contractual arrangements to, the stock being cultivated primarily for livelihood and business activities. For statistical purposes, aquatic organisms harvested by an individual or corporation, which has owned them throughout their rearing period contribute to aquaculture, whereas aquatic

organisms exploited by the public as a common property resources, with or without appropriate licenses, are the harvest of fisheries.⁵

Considering the different ecology and resources in aquaculture, the statistics on aquaculture could be classified into three sub-sectors, namely: mariculture, brackishwater culture, and freshwater culture. The distinction between these categories should be based on culture environment where the aquatic organism is farmed or cultivated. Considering aquaculture production, some aquatics species can be cultured in various environments, its production then could be reported in more than one sub-sector, e.g. Java barb, tilapia, milkfish, etc.

1) Mariculture

The farming or growing-out of aquatic animals/plants takes place in full seawater. This includes the culture of groupers, milkfish and other marine fishes in sea cages offshore or in coral reef coves; abalone and giant clams in coral reefs; seaweeds in longlines along the sea coasts; oysters in longlines.

2) Brackishwater culture

The farming or growing-out of aquatic animals/plants takes place in estuaries, river mouths, mangrove lagoons or in ponds with seawater. This includes culture of groupers and other fishes in cages; milkfish and penaeid shrimps in ponds; mud crabs in pens in mangroves; oysters, mussels and other bivalves in estuaries.

3) Freshwater aquaculture

The farming or growing-out of aquatic animals/plants takes place in lakes, reservoirs, rivers, rice fields, small farm impoundments or in freshwater ponds. This includes culture of carps, tilapias and other freshwater fish species in reservoirs, lake cages, and ponds; catfishes in ponds; freshwater prawns in ponds.

b. Aquaculture Production

b.1 Unit of Measurement

1) Production in quantity

Production in quantity represents the weight at farm gate. Production in quantity should be reported in metric tons, except those expressed in numbers. If production is reported in kilograms, this should be converted into metric tons estimated by rounding off to the nearest hundredths.

2) Production in value

Production in value represents the producers' price at farm gate. It is generally estimated by multiplying the quantity of production by the farm gate price by species. In reporting production in value, the amount reported in the national currencies should be converted to US\$.

b.2 Statistics on Aquaculture Production

Aquaculture production means the output of farmed aquatic organisms either for final consumption or as raw materials for transformation into other products or for trade. It includes commodities quantified by numbers rather than by weight such as ornamental fishes and hatchery output⁶. The statistics on production could be classified into the following categories:

⁵ SEAFDEC. 2005. Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Aquaculture, p 8

⁶ SEAFDEC. 2005. Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Aquaculture, p 31

1) Production by culture environment

The statistics on production should be based on the culture environments where the aquatic organism was cultivated, such as mariculture, brackishwater culture and freshwater aquaculture. One species can be reported in more than one type of environment depending on its tolerant and the culture status in each country.

2) Production by species

Production from aquaculture could be broken down by species from all types of culture environments in the Southeast Asian region. The list of species is provided in Appendix 3.

3) Production by methods of culture

To facilitate aquaculture management, the production statistics should be reported by methods of culture such as ponds, pens, paddy field or paddy cum fish, etc. The definition of each method is described below.

- (a) Ponds and tanks are artificial units of varying sizes constructed above or below ground level capable of holding and interchanging water
- (b) Pens refer to water areas confined by net, mesh and other barriers allowing uncontrolled water interchange and distinguished by the fact that enclosures occupy the full water column between substrate and surface; where pens and enclosures will generally enclose a relatively large volume of water
- (c) Cages refer to open or covered enclosed structures constructed with net, mesh, or any porous material allowing natural water interchange. These structures may be floating, suspended, or fixed to the substrate but still permitting water interchange from below
- (d) Paddy fields refer to paddy fields used for the culture of rice and aquatic organisms; rearing them in rice paddies to any marketable size
- (e) Others refer to methods other than the above; Rafts, ropes, stakes are included in this category

c. Artificial Seed Production

The statistics on artificial seed production is presented in order to assess the recruitment in aquaculture and facilitate management purpose. Production could be reported by species in terms of the number of larvae, fingerlings, juveniles, etc. used that focuses on two main objectives, such as for wild stock enhancement⁷ and aquaculture practices. As part of wild stock enhancement, production covers both the number released to a controlled environment and to the wild whereas production for aquaculture practices covers seed stocks for mariculture, brackishwater culture and freshwater culture.

d. Aquaculture Unit

Aquaculture unit refers to a management unit, which operates aquaculture in marine, brackishwater and freshwater areas. The term covers both economic units (companies) and households conducting activities in culturing aquatic organism. In Southeast Asian countries, the use of this term varies from country to country, e.g. fishing establishments in Indonesia, farms in Singapore and Thailand.

e. Area under Culture

Area under culture can be referred to as the net area (water surface area) and gross area. Net area refers to the areas of the culture facilities but limited to the water surface area, whereas

⁷ Maintaining or sustaining the production from marine and freshwater bodies through restocking of seed stocks, habitat improvements, setting up of sanctuaries or protected areas, introduction of new species or environmental engineering, where found necessary or feasible

gross area refers to the areas of the culture facilities including not only the water surface area but also the area of the dike surrounding the water area. For ponds and cages, the area under culture will be reported both in net area and gross area while for the other culture methods this could be reported only as net area. The number of culture facilities should also be reported in order to facilitate aquaculture management.

f. Fish Farmers

Fish farmers (or aquaculture workers) under this item, refer to persons who are engaged in aquaculture activities such as people working in farms, hatcheries, and employed in shellfish culture operations, maintenance of aquaculture facilities, water supply, feeding, etc. As the number of fish farmers engaged in aquaculture often varies according to the season such as harvesting or construction of the aquaculture facilities, only the fish farmers who are engaged full-time in aquaculture are counted in reporting the statistics on the number of fish farmers.

3.3.3 Statistics on Fish Price

a. Coverage

Statistics on fish price cover aquatic organisms in the form of fresh fish only, which includes marine and freshwater species but excluding processed fish.

b. Definition of Price

Statistics on price refer to products' price, considered as average weighted price which is realized at wholesale markets or in landing centers where producers sell their catches (applicable in some countries in the region). The price is determined (there) by means of auction, negotiation between producers and wholesalers and middlemen, etc., which can also be used to estimate the total production in value.

c. Unit of Price

The products' price should be given in US\$ per kilogram of fresh fish by species. The figure should include two digits after the decimal point by rounding off to the nearest hundredths.

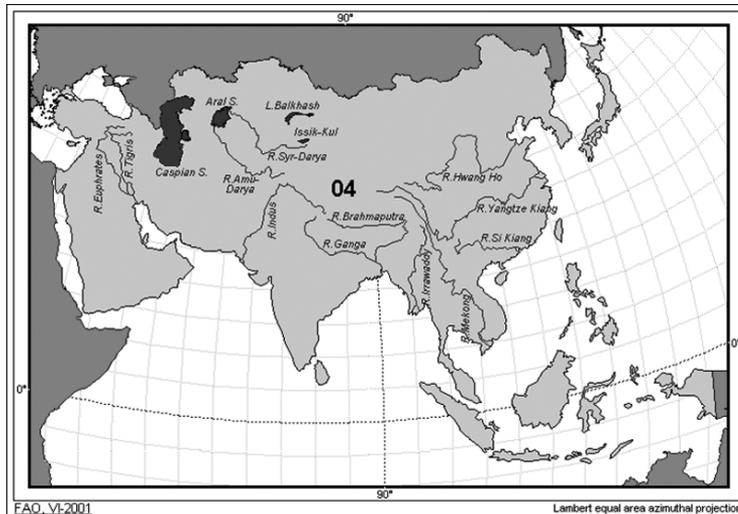
CLASSIFICATION OF FISHING AREAS

The fishing areas of the Southeast Asian region, established for fishery statistical purposes, consist of inland and marine fishing areas, which is consistent with the definition and classification of capture fishery. These are standardized in accordance with the FAO Major Fishing Areas, the boundaries of which were determined in consultation with international fishery agencies taking into account various considerations, including:

- (i) the boundary of national regions and the natural divisions of oceans and seas;
- (ii) the boundaries of adjacent statistical fisheries bodies already established in inter-governmental conventions and treaties;
- (iii) existing national practices;
- (iv) national boundaries;
- (v) the longitude and latitude grid system;
- (vi) the distribution of the aquatic fauna; and
- (vii) the distribution of the resources and the environmental conditions within an area.

1. Inland Fishing Areas

All inland waters of Southeast Asian countries are identified under the Area 04 (Asia, Inland Water). There is no sub-area for Asia (Fishing Area 04) that is recognized for the collection of catch and effort data for the Southeast Asian region. The data presented by Lao PDR, which is the sole landlocked country in the region, are therefore reported under Area 04 only.



Area 04, Asia-Inland Waters

2. Marine Fishing Areas

The marine fishing areas of the Southeast Asia countries are identified under Area 57 (Indian Ocean, Eastern), Area 71 (Pacific, Western Central) and Area 61 (Pacific, Northwest). Countries and their sub-areas to be used in marine fishery statistics are as follows:

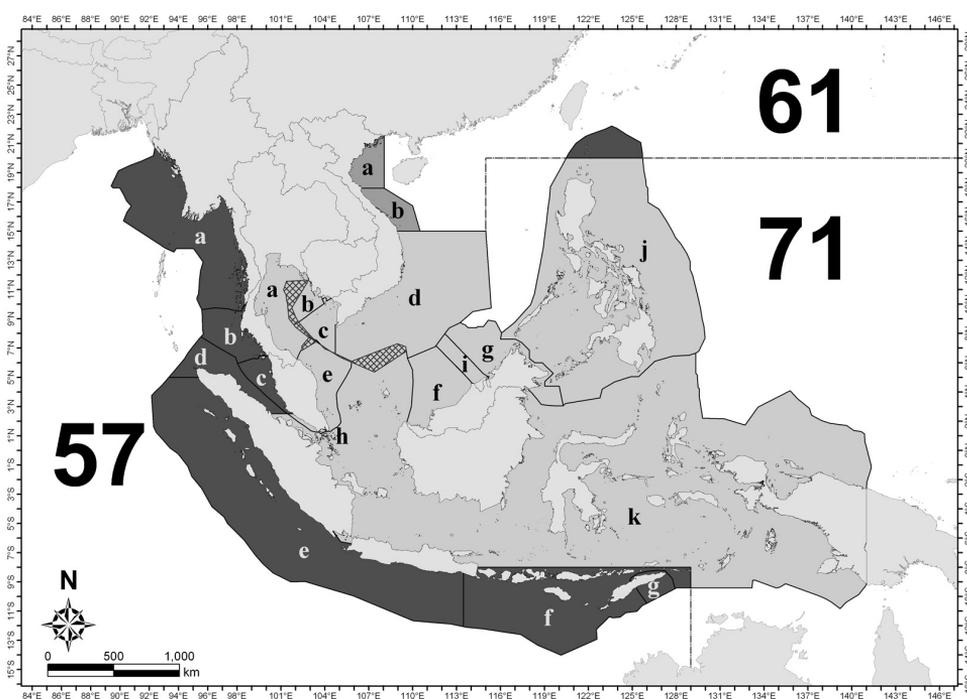
Countries	Sub-areas for marine fishery statistics	FAO Marine Fishing Area	SEAFDEC Sub-areas
a) Brunei Darussalam		71	71 i
b) Cambodia		71	71 b
c) Indonesia		57, 71	
	West Sumatra	57	57 e
	South Java	57	57 e
	Malacca Strait	57, 71	57 d, 71 k
	East Sumatra	71	71 k
	North Java	71	71 k
	Bali-Nusa Tenggara	57	57 f
	South-west Kalimantan	71	71 k
	East Kalimantan	71	71 k
	South Sulawesi	71	71 k
	North Sulawesi	71	71 k
	Maluku-Papua	71	71 k
d) Malaysia		57, 71	
	West Coast of Peninsular Malaysia	57	57 c
	East Coast of Peninsular Malaysia	71	71 e
	Sabah	71	71 f
	Sarawak	71	71 g
e) Myanmar		57	57 a
f) Philippines		71	71 j
	Luzon	71	71 j
	Visayas	71	71 j
	Mindanao	71	71 j
g) Singapore		71	71 h
h) Thailand		57,71	
	Gulf of Thailand	71	71 a
	Indian Ocean	57	57 b
i) Timor Leste		57	57g
j) Vietnam		61,71	
	North Vietnam	61	61 a
	Central Vietnam	61	61 b
	Southwest Vietnam	71	71 c
	Southeast Vietnam	71	71 d

Area 57 (Indian Ocean, Eastern)

Under fishing area 57, marine fishery statistics such as production, species, fishing gear, fishing vessel, fishing units, etc. will be collected and reported within the Exclusive Economic Zone⁸ (EEZ) of each country.

To facilitate the reporting fishery statistics by each country, the fishing area in the Southeast Asian region can be divided into 6 sub-areas, which correspond to the existing EEZs of Myanmar, Thailand, Malaysia and Indonesia. The sub-areas under area 57 are as follows.

- Sub-area 57 a: Marine fishing area of Myanmar
- Sub-area 57 b: Marine fishing area of Thailand (Indian Ocean)
- Sub-area 57 c: Marine fishing area of Malaysia (West Coast of Peninsular Malaysia)
- Sub-area 57 d: Marine fishing area of Indonesia (Malacca Strait)
- Sub-area 57 e: Marine fishing area of Indonesia (West Sumatra and South Java)
- Sub-area 57 f: Marine fishing area of Indonesia (Bali-Nusa Tenggara)



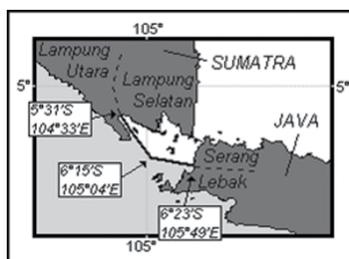
Fishing areas 57, 71 and 67, with the respective Sub-areas

⁸ Exclusive Economic Zone (EEZ) is

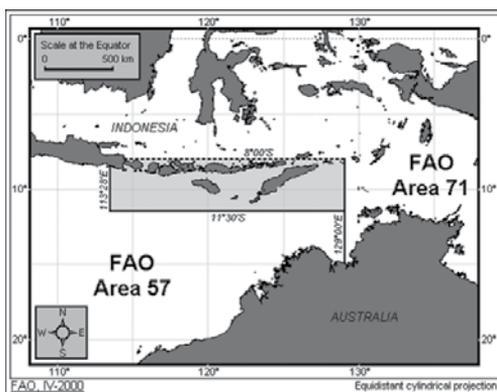
1. A zone under national jurisdiction (up to 200-nautical miles wide) declared in line with the provisions of 1982 United Nations Convention on the Law of the Sea, within which the coastal State has the right to explore and exploit, and the responsibility to conserve and manage the living and non-living resources.
2. The area adjacent to a coastal State which encompasses all water between (a) the seaward boundary of that State, (b) a line on which each point is 200 nautical miles (370.40 km) from the baseline of which the territorial sea of the coastal State is measured (except when other international boundaries need to be accommodated), and (c) the maritime boundaries agreed between that State and the neighboring states.

Boundary between Areas 57 and 71

1. At the Strait of Malacca, the areas bounded by a line commencing from East Sumatra and across the strait at 2°30'N latitude to meet the West Coast of Peninsular Malaysia.
2. At marine waters between Sumatra and Java, the areas bounded by a line commencing on the coast of Sumatra at the boundary between the District of Lampung Utara and the District of Lampung Selatan at 5°31' S latitude, 104°33' E longitude. The boundary is running along a rhomb line between Cape Tjuku Redak on the mainland of Sumatra and Cape Batu Kebucing on the Island of Tebuan to the position 6°15' S latitude, 105°04' E longitude; then along a rhomb line between Cape Parat on the Island of Panaitan and the southeastern tip of the Island of Rakarta to the western coast of Java at the boundary between the District of Lebak and the District of Serang at 6°23' S latitude, 105°49' E longitude.
3. At marine waters of Java and Bali-Nusa Tenggara, the areas bounded by a line commencing from 8°00' S latitude starting the coast of South Java at Surabaya and running east to meet at 129°00' E longitude; thence running due south until meet Northern coast of Australia. The area under the line is recognized as the fishing area 57 whereas the other above the line accepted as fishing area 71.



Boundary line for the Area 57 and 71 at the marine waters between Sumatra and Java



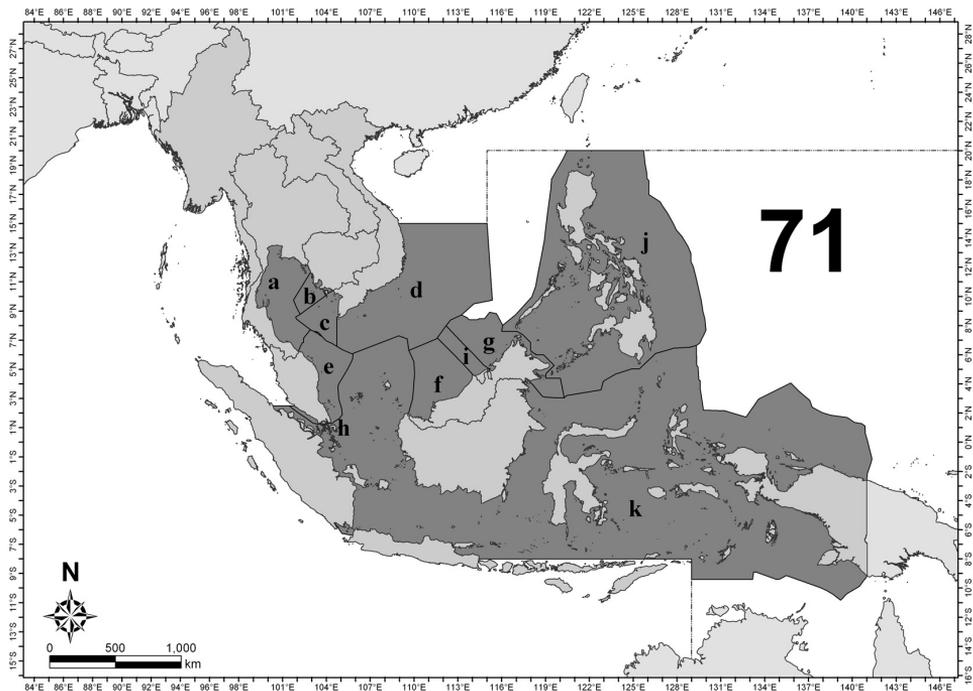
Boundary line for the Area 57 and 71 at the marine waters of South Java and Bali-Nusa Tenggara

Remark:
 Present boundary line
 — Former boundary line

Area 71 (Pacific, Western Central)

Under fishing area 71, marine fishery statistics such as production, species, fishing gear, fishing vessel, fishing units, etc. will be collected and reported within the Exclusive Economic Zone (EEZ) of each country. There are 8 Southeast Asian countries identified under fishing area 71 covering Brunei Darussalam, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam. To facilitate reporting fishery statistics by each country, the fishing area can be divided into 11 sub-areas for the region, corresponding to the existing EEZ of these countries. The sub-areas under area 71 are as follows.

- Sub-area 71 a: Marine fishing area of Thailand (Gulf of Thailand)
- Sub-area 71 b: Marine fishing area of Cambodia
- Sub-area 71 c: Marine fishing area of Vietnam (Southwest Vietnam)
- Sub-area 71 d: Marine fishing area of Vietnam (Southeast Vietnam)
- Sub-area 71 e: Marine fishing area of Malaysia (East Coast of Peninsular Malaysia)
- Sub-area 71 f: Marine fishing area of Malaysia (Sabah)
- Sub-area 71 g: Marine fishing area of Malaysia (Sarawak)
- Sub-area 71 h: Marine fishing area of Singapore
- Sub-area 71 i: Marine fishing area of Brunei Darussalam
- Sub-area 71 j: Marine fishing area of Philippines (Luzon, Visayas, Mindanao)
- Sub-area 71 k: Marine fishing area of Indonesia (East Sumatra, North Java, Bali-Nusa Tenggara, South-West Kalimantan, East Kalimantan, South Sulawesi, North Sulawesi, Maluku-Papua)

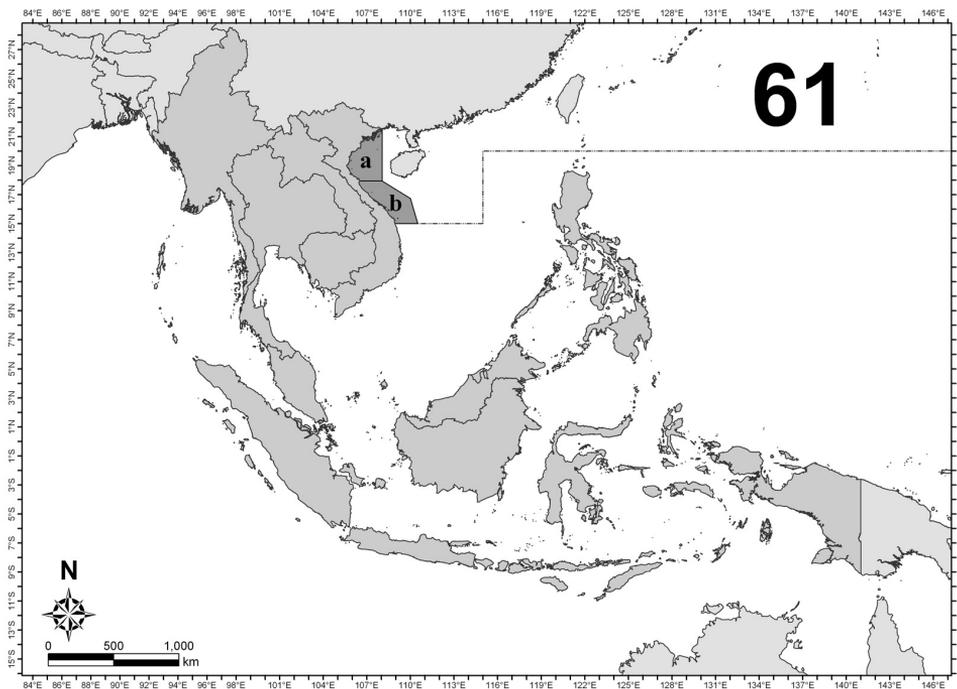


Sub-areas of the Fishing Area 71, Pacific, Western Central

Area 61 (Pacific, Northwest)

Under fishing area 61, the marine fishery statistics such as production, species, fishing gear, fishing vessel, fishing units, etc. will be collected and reported within the Exclusive Economic Zone (EEZ) of each country. There is only one country identified under fishing area 61, which is Vietnam. The fishing area can be divided into 2 sub-areas as follows:

- Sub-area 61 a: Marine fishing area of Vietnam (North Vietnam)
- Sub-area 61 b: Marine fishing area of Vietnam (Central Vietnam)



Sub-areas of the Area 61, Pacific, Northwest

Appendix 2

CLASSIFICATION OF SMALL-SCALE AND COMMERCIAL FISHERIES

Due to different legal definitions used by each country, the following table shows the classification of small-scale and commercial fisheries of countries in the region.

Countries	Small-scale Fisheries	Commercial Fisheries
Brunei Darussalam	Small-scale/artisanal fisheries: Operating in all zones but concentrating in Zone 1. (0-3 nm)	Trawlers, purse seiner, or long liner a) <60 GT; <350 Hp operating in Zone 2 b) 60.1-150 GT; 351-600 Hp operating in Zone 3 c) 151-200 GT; 600-800 Hp operating in Zone 4
Cambodia	Coastal fisheries: small-scale fisheries with/without engine (from 5-50 Hp) operating in Zone 1.	Commercial fisheries: more than 50 Hp operating in Zone 2.
Indonesia	Fisheries that its operation without using boat, using non-power boat, using outboard motor size < 5 GT, or inboard motor size < 5 GT	a) Fisheries that its operation using outboard motor size 5 GT - 30 GT or inboard motor size 5 GT - 30 GT b) Fisheries that its operation using outboard motor size ≥ 30 GT or inboard motor size ≥ 30 GT
Lao PDR	-	-
Malaysia	Traditional fisheries: small-scale fisheries using traditional fishing gears (i.e. other than trawls and purse seines) with vessels less than 40 GRT operating in all zones concentrating in Zone A.	Commercial fisheries: Medium and large-scale fisher- ies using commercial fishing gears such as trawls and purse seines. a) With vessels less than 40 GRT operating in Zone B. b) With vessels from 40-70 GRT operating in Zone C. c) With vessels above 70 GRT operating in Zone C2.
Myanmar	Coastal fisheries: vessels of less than 30 ft or using less than 12 Hp engine operating in Zone 1.	Industrial fisheries: vessels more than 30 ft or using more than 12 Hp engines operating in Zone 2.
Philippines	Municipal fisheries: small-scale fisheries with vessels of less than 3 GT operating in Zones 1 and 2.	Commercial fisheries: a) Small-scale commercial fisheries: from 3.1-20 GT vessels operating in Zone 2; can also operate within 10.1-15 km (within Zone 1) if authority is grated by the concerned local government unit (LGU). b) Medium-scale commercial fisheries: from 20.1-150 GT operating in Zone 2; can also operate within 10.1-15 km (within Zone 1) if authority is granted by the concerned local government unit (LGU). c) Large-scale commercial fisheries: more than 150 GT operating in Zone 2.
Singapore	Small-scale fisheries with vessels of less than 3 GT operating in Zone 1	Small-scale commercial fisheries: Inboard engine less than 50 GT or 380 Hp operating in Zone 2
Thailand	Small-scale fisheries: vessels of less than 5 GT operating in Zone 1.	Large-scale fisheries: vessels of more than 5 GT operating in Zone 2.
Vietnam	Small-scale fisheries: vessels with no engine and with engine but less than 40 Hp.	Large-scale fisheries: vessels with engine more than 40 Hp.

Reference: Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fishing Operation
page 11-13.

Fishing Zones of Countries in Southeast Asia

Countries	Fishing Zone 1	Fishing Zone 2	Fishing Zone 3	Fishing Zone 4
Brunei Darussalam	From shore line to 3 nm	From 3 nm to 20 nm	From 20 nm to 45 nm	From 45 nm to EEZ limit
Cambodia	From shore line to 20 m depth	From 20m depth to EEZ limit		
Indonesia	From shore line out to 4 nm	From the outer limit of first fishing zone to 12 nm from shore	From the outer limit of second fishing zone to EEZ limit	
Malaysia	From shore line to 5 nm	From 5 nm to 12 nm	From 12 nm to 30 nm	From 30 nm to EEZ limit
Myanmar	From shore line to 5 nm in the northern area, 10 nm in the southern area	From outer limit of first fishing zone to EEZ limit		
Philippines	From shore line to 15 km	From 15 km to EEZ limit		
Singapore	From shore line to within Port Limits	From 12 nm to EEZ limit		
Thailand	From shore line to 12 nm	From 12 nm to EEZ limit		
Vietnam	From shore line to 30-m depth in Northern and Southern areas, to 50-m depth in Central area	From 30 to 50-m depth to the EEZ limit		

Appendix 3

LIST OF AQUATIC ANIMALS AND PLANTS

For the statistics on production for capture fishery and aquaculture in the Southeast Asian region, broken down into species, the International Standard Classification of Aquatic Animals and Plants (ISSCAAP) developed by CWP will be used as basis to develop the Regional Standard Statistical List of Aquatic Species, which focused on the species available and their distribution in the region.

For capture production, since some aquatic animals particularly diadromous species may be caught in both marine and inland waters, the statistics will be reported in two parts of capture fisheries. Regarding aquaculture production, since some aquatic species can be cultured in more than one culture environment, production can then be reported based on where the species are cultured.

The International Standard Classification of Aquatic Animals and Plants (ISSCAAP) applied for the region is as follows:

Code	Group of Species
1	Freshwater fishes
11	Carp, barbells and other cyprinids
12	Tilapia and other cichlids
13	Miscellaneous freshwater fishes
2	Diadromous fishes
24	Shads
25	Miscellaneous diadromous fishes
3	Marine fishes
31	Flounders, halibuts, soles
33	Miscellaneous coastal fishes
34	Miscellaneous demersal fishes
35	Herring, sardines, anchovies
36	Tunas, bonitos, billfishes
37	Miscellaneous pelagic fishes
38	Sharks, rays, chimaeras
39	Marine fishes not identified
4	Crustaceans
41	Freshwater crustaceans
42	Crabs, sea-spiders
43	Lobsters, spiny-rock lobsters
45	Shrimps, prawns
47	Miscellaneous marine crustaceans

Code	Group of Species
5	Molluscs
51	Freshwater molluscs
52	Abalones, winkles, conch
53	Oysters
54	Mussels
55	Scallops, pectens
56	Squids, cuttlefishes, octopuses
57	Miscellaneous marine molluscs
7	Miscellaneous aquatic animals
71	Frogs and other amphibians
72	Turtles
73	Crocodiles and alligators
76	Sea-urchins and other echinoderms
77	Miscellaneous aquatic invertebrates
8	Miscellaneous aquatic animal products
81	Pearls, mother-of-pearl, shells
82	Corals
83	Sponges
9	Aquatic plants
91	Brown seaweeds
92	Red seaweeds
93	Green seaweeds
94	Miscellaneous aquatic plants

Appendix 4

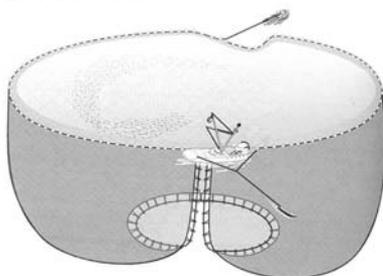
CLASSIFICATION OF FISHING GEARS

For the statistics on fishing units and marine production, breakdown into types of fishing gear, the Regional Classification of Fishing Gear, will be used as follows:

Major Group	Minor Group	Standard Abbreviation	ISSCFG ¹ Code
1. Purse seine		PS	01.1.0
2. Seine Net		SX	02.9.0
	Boat seines	SV	02.2.0
	Beach seine	SB	02.1.0
3. Trawl		TX	03.9.0
	Beam trawl	TBB	03.1.1
	Otter board trawl	OT	03.4.9
	Pair trawl	PT	03.5.9
4. Lift net		LN	05.9.0
5. Gill net		GN	07.9.1
6. Trap		FIX	08.9.0
	Stationary trap	-	-
	Portable trap	-	-
7. Hook and lines		LX	09.9.0
8. Push/Scoop net		-	-
9. Shellfish and seaweed collecting gear		-	-
10. Others		MIS	20.0.0

Remark

¹ International Standard Statistical Classification of Fishing Gear (ISSCFG)

Types of Fishing Gears and Definitions**1. Purse seine**

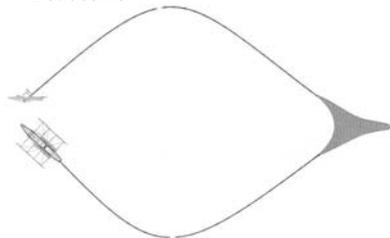
A net roughly rectangular in shape without a distinct bag is set vertically in water, to surround the school of fish with purse line, generally of pelagic nature.

Actually, this group of fishing gear called 'Surrounding Net', which is sub-divided into three major groups, such as a) one boat purse seine; b) two-boat purse seine; and c) surrounding net without a purse line. However, in term of fishery statistics, no countries in the region collect the data in such individual groups. Thus, purse seine is the only gear of surrounding net which collect data without detail in one or two-boat operations.

2. Seine net

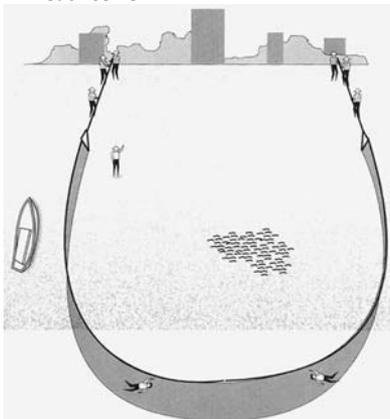
A bag shaped net with two wings, normally; the wings are larger than those of trawl nets. The net is pulled towards a stationary boat or onto a beach. A seine net of primitive nature sometimes does not have a bag. Insofar as the net is pulled towards a stationary boat or beach, it is included herein. The seine net is sub-divided into two minor groups: a) boat seine and b) beach seine.

Boat seine



Boat seine consists of two wings, a body and a bag, which is similar to that of trawls. Operated from a boat, they are generally used on the bottom, where they are hauled by two ropes, usually very long, set in the water so as to ensure that as many fish as possible are driven or herded towards the opening of the net. Danish seine is also included herein.

Beach seine



Beach seine is a simple fishing gear; one end of the wing is held by a group of fishermen on the shore, the net is first set at right angles to the seashore and the direction of the net setting turns gradually towards the shore. After setting all the net, the towing line of the wing is laid out and the boat runs toward the shore providing a certain distance between the landing and setting points. Then, from the two ends of the wings, the buoy line and the sinker line are hauled to catch the fish.

3. Trawl

A conical bag shaped-net with two or more wings, pulled by one to two boats for a period of time, to catch mainly fish or other aquatic animals that live directly on or stay near the sea bed. When such a gear is used in mid-water with the same catching mechanism, the mid-water trawl is included under this group. The trawl is also sub-divided into three minor groups: a) beam trawl; b) otter board trawl; and c) pair trawl.

Beam trawl

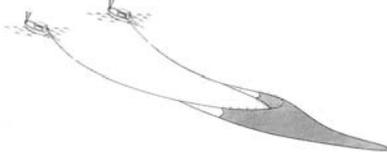
The main feature of this trawl is a beam, mostly made of iron. Its purpose is to spread the netting. Sometimes a heavy beam is supported by steel shoes at each end which run over the sea bed. A ground rope and a head rope are joined together to the cement ski that works as a bobbin. The principal catch of beam trawl are shrimps, therefore the mesh size is relatively small. The mesh size of beam trawl also depends on the catch.

Otter board trawl



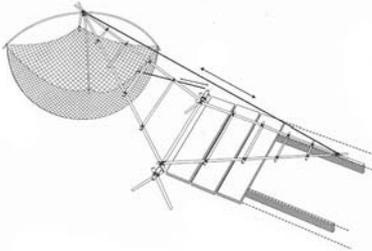
Otter boards are used for horizontal spreading of the net mouth. Most otter trawl nets consist of two panels; this is called a 'two-seam net'. The mouth is oval-shaped when viewed from front. Two wings stretch out to increase the swept area and to guide the fish in the net's path down to the cod-end.

Pair trawl



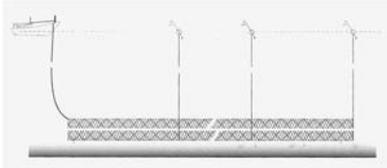
Pair trawl means the net is towed by two boats. In pair trawling, the net mouth is kept open by outward towing of the two boats, which always try to keep the same distance between them during operation. The otter boards are not necessary, the arrangement of gear has been simplified, the warp is connected directly to the sweep lines the other is joined to a triangular iron frame at the end of Gridles from each wing of the net.

4. Lift net



A sheet of net, usually square, but may sometimes be conical, is stretched by several rods, ropes, or a frame and is set either at the bottom or in mid-water for some time and then lifted to trap the fish swimming above it. Both stationary lift nets and portable lift nets are included herein.

5. Gill net

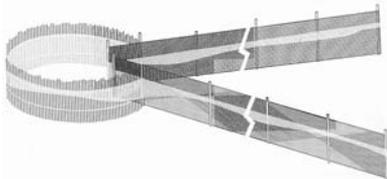


A net wall, with its lower end weighted by sinkers (or heavy net, as in drift gill net) and the upper end raised by floats, is set across the path of migrating fish. Fish trying to make their way through the net wall are gilled or entangled in the mesh. The trammel net with two to three wall nets is also included herein. The migrating fish are entangled between two layers of nets and not in the mesh where a combination of different types of nets are used.

6. Trap

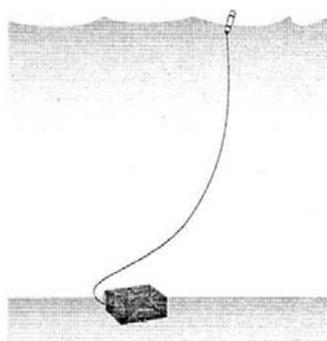
Trap referred to a gear that is set or stationed in the water for a certain period, regardless of the kind of material used for their construction. The fish when caught are naturally confined in a collecting unit from which escape is prevented by labyrinths and/or retarding devices such as gorges, funnels, etc. without any active fishing operation taking place. Trap is also sub-divided into two minor groups: a) stationary trap; and b) portable trap.

Stationary trap



Considering its operation, this group of trap is stationed in the water for long period at least until the end of fishing season. Most of stationary gear is operated in relation to water current. Stationary trap covers bamboo stake trap, bamboo fence trap, set net, bag net, etc.

Portable trap



Trap is portable, designed in form of cages or basket. It can be made of various materials such as wood, bamboo, metal rods, wire netting, etc. It is used with or without bait depending on the target species. Fish trap, crab trap, shrimp trap are included herein.

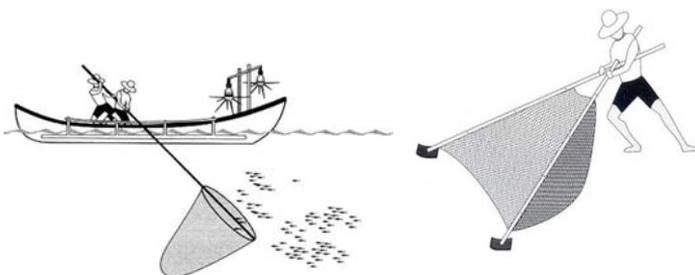
7. Hook and lines



This gear generally consists of line(s) and hook(s) where natural or artificial baits are hooked to attract fish or other aquatic animals. Unbaited hook or a jig may also be used.

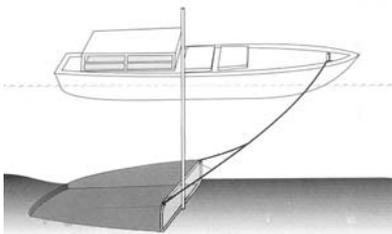
8. Push/Scoop net

A bag net with a fixed or variable opening is operated in shallow waters or from boats. Some large scale scoop nets are operated from a motorized boat such as the boat push net.



9. Shellfish and seaweed collecting gear

All manual gears and complex devices which are used for collecting shellfish and seaweeds, regardless of the type of materials used for their construction. While the manual gear are operated by an individual, some of the more complex devices such as cockle dredge, clam dredge, etc. need a motor boat for their operation.



10. Others

This group of fishing gear covers the great variety of other fishing gears and methods which are not specified elsewhere, including cast net drive-in-net, muro ami, harpoon, etc.



Appendix 5**CLASSIFICATION OF FISHING BOATS**

To compile the statistics on the fishing units considering the existing fishing operations in the region, the Regional Classification of Fishing Boats by Type of Boats is referred to provide figures of the fishing vessels as follows:

Regional Classification of Fishing Boats by Type of Boats

Boat Type		Size of Boat
First level	Second level	
1. Non-powered boat		
2. Powered boat		
	2.1 Out-board powered boat	
	2.2 In-board powered boat	Less than 5 tons
		5 - 9.9 tons
		10 - 19.9 tons
		20 - 49.9 tons
		50 - 99.9 tons
		100 - 199.9 tons
		200 - 499.9 tons
		More than 500 tons

Appendix 6**CLASSIFICATION OF FISHERS AND FARMERS**

To compile statistics on the number of fishers by sub-sectors of fisheries and working status, the Classification of Fishers and Farmers will be used as follows.

Regional Classification of Fishers and Farmers

Main Category	Working Area	Working Status
1. Fishers (engaged in fisheries)	1.1 Marine capture fisheries	Full-time fishers
		Part-time fishers
	1.2 Inland capture fisheries	Full-time fishers
		Part-time fishers
		Occasional fishing by household members
	2. Farmers (engaged in aquaculture)	2.1 Mariculture
2.2 Brackishwater culture		
2.3 Freshwater culture		

ASEAN NETWORK ON FISHERY STATISTICS**List of ASEAN Network on Fishery Statistics (as of December 2010)**

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