PHILIPPINE TUNA FISHERIES PROFILE

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Bureau of Fisheries and Aquatic Resources
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The contribution of various agencies/organizations and the tuna industry are recognised and highly valued in this Project.

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ABBREVIATIONS, ACRONYMS AND SYMBOLS

AAGR	-	Average Annual Growth Rate
APFFI	-	Alliance of Philippine Fishing Federations, Inc.
ASEAN	-	Association of Southeast Asian Nations
BAS	-	Bureau of Agricultural Statistics
BFAR	-	Bureau of Fisheries and Aquatic Resources
CCSBT	-	Commission for the Conservation of Southern Bluefin Tuna
CFVGL	-	Commercial Fishing Vessel and Gear License
CHAINS	-	Chamber of Aquaculture and Ancillary Industries of Sarangani, Inc.
CMM	-	Conservation and Management Measure
CPUE	-	catch per unit effort
DA	-	Department of Agriculture
DFA	-	Department of Foreign Affairs
DTI	-	Department of Trade and Industry
DOST	-	Department of Science and Technology
DOTC	-	Department of Transportation and Communication
EEZ	-	exclusive economic zone
FAD	-	Fish Aggregating Device
FARMC	-	Fisheries and Aquatic Resource Management Council
FAO	-	Fisheries Administrative Order
FFSA-TPPI	-	Fresh Frozen Seafood Association - Tuna Processors Philippines, Inc.
FSP	-	Fisheries Sector Program
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GT	-	Gross tonnage
GSCFC	-	General Santos City Fishport Complex

hp	-	horse power
IATTC	-	Inter-American Tropical Tuna Commission
ICCAT	-	International Commission for the Conservation of Atlantic Tunas
IOTC	-	Indian Ocean Tuna Commission
ICLARM	-	International Center for Living Aquatic Resources Management
IUU	-	Illegal Unreported and Unregulated
IMO	-	International Maritime Organization
kw	-	kilowatt
LGU	-	local government unit
MARINA	-	Maritime Industry Authority
MCS	-	Monitoring, Control and Surveillance
MCSSOC	-	Monitoring Control and Surveillance Coordinating and Operations Center
MPA	-	marine protected area
MSY	-	maximum sustainable yield
MT	-	metric tons
NAFC	-	National Agriculture and Fisheries Council
NCIE	-	National Committee on Illegal Entrants
NFA	-	National Fisheries Authority
NFOP	-	National Fisheries Observer Program
NFRDI	-	National Fisheries Research and Development Institute
NGO	-	non-government organization
NSAP	-	National Stock Assessment Program
NSO	-	National Statistics Office
NTIC	-	National Tuna Industry Council
NTMP	-	National Tuna Management Plan

PAWB	-	Protected Areas and Wildlife Bureau
PCAMRD	-	Philippine Council for Aquatic and Marine Research and Development
PFDA	-	Philippine Fisheries Development Authority
PIC	-	Pacific Island Countries
PNA	-	Parties to the Nauru Agreement
PNG	-	Papua New Guinea
PPA	-	Philippine Ports Authority
PTRP	-	Philippine Tuna Research Project
RFMO	-	Regional Fisheries Management Organization
SFFAII	-	Socsksargen Federation of Fishing and Allied Industries, Inc.
SOCOPA	-	South Cotabato Purse Seiners Association
SPBOTA	-	Southern Philippines Boat Owners and Tuna Association
SPC	-	Secretariat of the Pacific Community
SOCSKSARGEN		South Cotabato, Sultan Kudarat, Sarangani and General Santos
TAC	-	Total Allowable Catch
TCAGS	-	Tuna Canners Association General Santos
TCAP	-	Tuna Canners Association of the Philippines
Tuna Coop	-	Tuna Cooperative of General Santos City
UFLA	-	Umbrella Fish Landing Association
UNDP	-	United Nations Development Programme
VDS	-	Vessel Day Scheme
VMS	-	Vessel Monitoring System
WCPFC	-	Western and Central pacific Fisheries Commission
WCPO	-	Western and Central Pacific Ocean
WPEA-OFMP	-	West Pacific East Asian Oceanic Fisheries Management Project

Executive Summary

This document has been prepared in relation the project entitled "West Pacific East Asia Oceanic Fisheries Management Project (WPEA-OFMP) funded by United Nations Development Programme (UNDP), the Global Environment Facility (GEF), and co-finances from the Australian Government Overseas Aid Program, Japan Trust Fund, Korea's Yeosu Project, Netherlands, National Oceanic and Atmospheric Administration of the USA, and Western and Central Pacific Fisheries Commission (WCPFC). The main objective of this project is to strengthen national capacities and international cooperation on priority transboundary concerns relating to the conservation and management of highly migratory fish stocks in the west Pacific Ocean and east Asia (Indonesia, Philippines and Vietnam). With two (2) project components, namely: i) Monitoring, data enhancement and fishery assessment, and ii) Policy, institutional strengthening and fishery management. The time frame for the implementation of the WPEA-OFM Project by the participating countries is three years, from January 2010 until December 2012.

This profile has been prepared with collaborations from various government agencies/organizations including the tuna industry. These includes: Bureau of Fisheries and Aquatic Resources (BFAR), National Fisheries Research and Development Institute (NFRDI), Bureau of Agricultural Statistics (BAS), Philippine Fisheries Development Authority (PFDA), National Agriculture and Fisheries Council (NAFC), Maritime Industry Authority (MARINA), Philippine Coast Guard (PCG), Socsksargen Federation of Fishing and Allied Industries, Inc. (SFFAII), and Alliance of Philippine Fishing Federations, Inc. (APFFI).

This profile has ten (ten) major components which includes i) executive summary, ii) introduction, iii) tuna fisheries, iv) fisheries infrastructures, v) fisheries socio-economic and marketing, vi) major tuna industry associations, vii) fisheries management, vii) international/regional fisheries management organizations, ix) tuna statistics and research activities, and x) issues , concerns and challenges.

The introduction gives a brief overview of the Philippine fisheries, its maritime boundaries and performance in foreign trade. While the chapter on tuna fisheries discusses the major tuna species, major tuna fishing gears and vessels, fishing grounds and fishing seasons. Fisheries infrastructures details on the major tuna unloading ports and various processing plants. The chapter on fisheries socio-economic and marketing details more on the economic and marketing aspect of hook-and-line, handline and purse seine fisheries including some value chain analysis. The major tuna industry associations chapter gives a brief background of each of the tuna industry associations mentioned including its objectives, goals, mission and vision. The chapter on fisheries management discuss the Philippine policy, legal and institutional arrangements including the various Fisheries Administrative Orders (FAO) relating to tuna fisheries issues by DA-BFAR, national tuna management plan (NTMP), FAD management policy and monitoring control and surveillance activities. The next chapter on regional fisheries management organizations (RFMOs) discusses the various tuna RFMOs were Philippines is a member, cooperating non-member and non-member including Philippine initiatives and policy directions in compliance with Philippine obligations to these various RFMOs. Tuna fisheries and research activities details on the country's activities in relation to tuna statistics data gathering including the various agencies and organizations involved and researches that have been done on the past and recent research activities on tuna fisheries. The last chapter details on the various issues, concerns and challenges faced by the tuna industry ranging from resource management; production, post-harvest, marketing and export; and institutional, policy and regulatory concerns.

1. Introduction

Fishery is an important component of the agricultural sector in the Philippines. Marine fishery is an important source of protein, livelihood and export earnings for the Philippines. In 2010, total marine catch was estimated to 2.4 million tons which accounted for about 48% of the total fisheries production. (BAS 2011).

The increased demand for fish from rapidly growing population and increasing exports has substantially increased fishing pressure on the marine fishery resources in the past two decades. The major key issues facing the fisheries sector are resource depletion and environmental degradation. Declining catch rates and the leveling off of marine landings also supports these conclusions.

Philippines is still one of the top fish producing countries in the world. Over 1.5 million people depend on the fishing industry for their livelihood. Philippines is also considered a major tuna producer in the Western and Central Pacific Ocean (WCPO). The fishing industry's contribution to the country's Gross Domestic Products (GDP) in 2009 was 2% and 2.4% at current and constant prices, respectively *(Philippine Fisheries Profile, 2010)*.

Also in 2010, the foreign trade performance of the fishery industry gave a net surplus of 616 million dollars. With a total export value of 803 million US dollars and import value of 187 million US dollars. Tuna remained as the top export commodity with a collective volume of 106,449 MT for fresh/chilled/frozen, smoked/dried, and canned tuna products valued at US $337.719 million. Canned tuna, though, constitutes bulk of tuna products being exported. In general, tuna export increased by 2% in terms of volume and 3% in terms of value. Major markets for this commodity include USA, UK and Germany. *(Philippine Fisheries Profile, 2010)*.

Chilled/frozen fish comprised the bulk of the total import in terms of value. Tuna, mackerel and sardines are the major import fish commodities in 2010. Tuna has the largest import share of 32% with an import value of US $59.1 million. Chilled/frozen tuna were mostly supplied by Papua New Guinea 8 %; Taiwan (ROC) 10%; Japan 4.3%; Singapore, 1% and Korea, 6%. *(Philippine Fisheries Profile, 2010)*.

The Philippine archipelago consists of more than 7,100 islands. It extends about 2,000 km in the south-north direction, between $4^{o}05'$ and $21^{o}30'$ N latitude, from the northeast coast of Borneo to 150 km of Taiwan (Figure 1). The total territorial water area, including the exclusive economic zone (EEZ), is about 2.2 million km^2. The shelf area, down to 200 m covers 184,600 km^2.

Major large-scale ocean currents of the Pacific affect the waters east of the Philippines. The major current system affecting the Philippines is the North Equatorial Current with flows westward across the Pacific, hits the eastern coast of the country and splits into northward and southward branches. The northward branch flows along the east coast of the Visayas and Luzon, moving to Taiwan and Japan known as the Kuroshio Current. The southward branch becomes the Mindanao Current, moving southward along the east coast of Mindanao.

The country's marine environment is distinctly tropical in character, with relatively warm and less saline waters. Sea surface temperatures are generally above $28^{o}C$ in summer and a few degrees lower during the cold months. Salinity variations are very small that could hardly affect the environmental conditions. Water quality studies in the country are limited to highly localized. Evident in all these

studies is the deterioration of water quality brought about by mine tailings, agricultural run-offs, siltation, domestic sewage and oil spills.

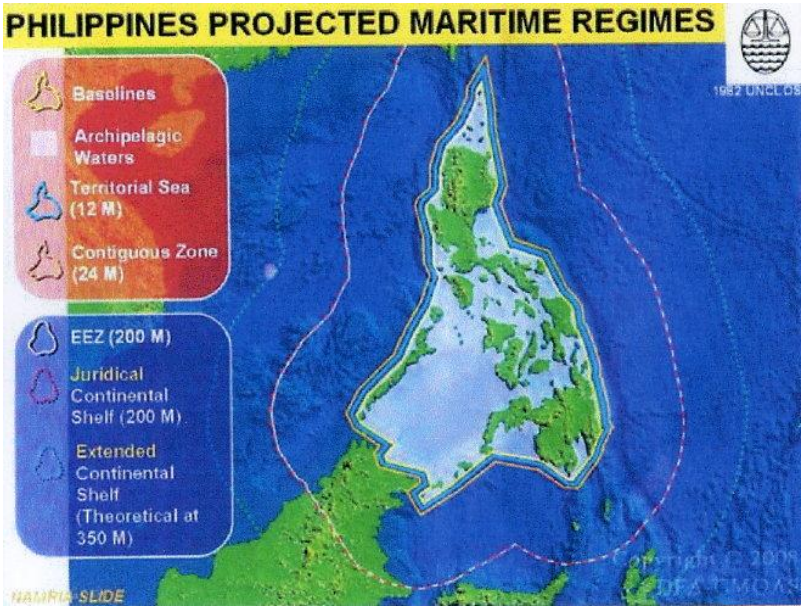


Figure 1. Philippines Protected Maritime Regimes

The Philippine marine fisheries is conventionally subdivided into municipal (small-scale) and commercial fisheries on the basis of vessel gross tonnage. Municipal fisheries include capture operations using boats less than 3 GT and those that do not involve the use of watercraft. A license is issued by the municipality where the boat is registered. Fishing permits are also issued to fishing boats by the municipality where they intend to fish. Commercial fisheries include capture fishing operations using vessels of 3 GT and above. Commercial fishing vessels are required to secure a commercial fishing vessel and gear license from the Bureau of Fisheries and Aquatic Resources (BFAR) before they can operate. With the implementation of the Local Government Code in 1992, the coastal waters within 15 km from the shoreline are now considered as municipal waters and commercial fishing is not allowed within this area.

The commercial sector commonly use bagnets, purse seines and ringnets for catching small pelagics while municipal fishers dominantly use gillnets, beach seines and round haul seines. Roundscads, sardines, anchovies, mackerels and bigeye scad, round herring and fusiliers dominate small pelagic catches in the Philippines. There are six tuna species that dominate the Philippine landings, i.e. yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*), skipjack tuna (*Katsuwanos pelamis*), eastern little tuna (*Euthynnus affinis*), frigate tuna (*Auxis thazard*) and bullet tuna (*Auxis rochei*). The most common gears used by the commercial sector for catching these tuna species are purse seines and ringnets while the municipal fishers use hook-and-line or handline. All these gears are operated jointly with fish aggregating devices (FAD) locally known as *payao*.

2. Tuna Fisheries

Tuna fishing is a long-practiced livelihood activity among Filipino fishers, especially in the southern - part of the Philippines such as Davao, Zamboanga, and Cotabato. Tuna and tuna-related fishing activities dates back in the 1900s during the start of the American rule (1898-1946) in the country. Due to the simple structure of the fishing vessels during those period and with abundant supply of tuna resources, fishing activities were mostly for subsistence purposes and were confined only to the nearshore areas.

During the Japanese occupation in 1942 to1944, commercialized tuna fishing slowly started to gain ground. There were reports from some old fisherfolk mentioning the existence of several tuna longline fishing operations in Davao in the 1940s. These were mostly owned by the Japanese, as most Japanese soldiers were concentrated in the province.

In the 1950s, American fish packers began to explore the possibility of sourcing tuna from the Philippines. Since commercial tuna operations were just in the early stage in the 1950s, few existing fishing firms with limited fleets were not able to come up with regular and substantial volumes of tuna to fill the needs of the American market. In order to fill the gap between supply and demand, there were several attempts by local fishing corporations to venture into tuna fishing to fill up the American demand. However, such attempts were proved to be unsuccessful. In spite of the irregular and oftentimes insufficient supply of tuna from the Philippines, American canneries continued to venture in the local fishing industry.

Commercial fishers and local packers were encouraged to form a network of tuna buying and collecting stations in Mindanao (Basilan and Zamboanga City) and establish partnerships with American packers. Shipping lines with sufficient refrigeration chambers started to dock at the Zamboanga City port, and frozen tuna was exported to the US. These small but regular exports were noted by other American importers, and contracts were signed with Filipino fishing groups. Due to relatively attractive offers from American importers, the incomes of small-scale fishers grew with the export market and it consequently increased the value of tuna in the domestic market (Thomas, 1999). As a result of growing orders from American importers, local fishing corporations with substantial capital started to get organized during the 1960s, and financed small fishers using handliners and trolls in southern Mindanao to catch tuna.

The proliferation of companies that bought tuna for export to the US continued in Zamboanga City until the early 1970s, increasing the total exports from 841 tonnes in 1969 to 11,376 tonnes in 1970 (Thomas, 1999). As shipments to the US grew, so did the volume of rejects. Some US firms alleged that the tuna were 'shore-frozen' instead of frozen or chilled onboard and, consequently, 20-30 per cent of the shipments were rejected by the American packers. The large amount of rejects forced the early shippers, except those with substantial funding, to fold up operations. Thousands of fishers were left without buyers. In an attempt to regain the confidence of the foreign market, the Tuna Producers Exporters Association was formed in November 1973. However, the problem of supply of ice persisted, funds were needed to properly maintain the few freezing facilities in the country (Thomas, 1999).

As the tuna industry in Zamboanga City experienced a lull in business operations due to the closure of several local shippers in the 1970s, General Santos City was gearing up to replace Zamboanga as the next tuna hub in southern Philippines. The tuna boom in General Santos was spurred by the arrival, in the mid-1970s, of Japanese traders looking for new supplies of *sashimi*-grade yellowfin tuna. The hefty price commanded by *sashimi*-grade tuna in the Japanese market encouraged investors to finance tuna fishing ventures, which attracted fishers from other neighboring provinces (Thomas, 1999).

The tuna fisheries became the largest and most valuable fisheries in the Philippines during the mid-1970s when bamboo rafts (or payao, a fish aggregating device), were introduced. The country became the number one (1) producer of tuna in the Southeast Asia in the 1980s. When the catch rates of tuna in Philippine waters started declining in the late 1980s, Filipino fishing companies started to fish in international waters. This made the Philippines one of the distant-water fishing nations in the Pacific, in addition to US, Japan, Korea, Taiwan and China.

Twenty-one species of tuna have been recorded in the Philippine waters but only six are caught in commercial quantity and form the basis of tuna fishing industry. Of the six, only five form the bulk of catches and are listed in Philippine fisheries catch statistics (Figures 2 – 7), namely: yellowfin (*Thunnus albacares*), skipjack (*Katsuwanos pelamis*), eastern little tuna or kawa-kawa (*Euthynnus affinis*), bigeye tuna (*Thunnus obesus*) and frigate tuna (*Auxis thazard*). Tuna-like fishes recorded in

Philippine waters include swordfish, *Xiphias gladius*, and a number of istiophorid fishes. Their catch is relatively low compared to the tuna catch.

Skipjack and yellowfin are found throughout the year in all Philippine waters but are abundant in Moro Gulf, Sulu Sea and Celebes Sea off Mindanao Island. This is indicated by large landings of these species in seaports and other fish landing areas in General Santos City in South Cotabato and in Zamboanga City where a number of tuna canneries are sited. But these days, tunas are coming from other parts of the country and are traded to General Santos City for better price.

There is a difficulty in differentiating bigeye tuna (*Thunnus obesus*) and yellowfin tuna (*Thunnus albacares*) with a size of less than 60 cm. Similar difficulties is observed in differentiating frigate tuna (*Auxis thazard*) and bullet tuna (*Auxis rochei*).

2.1. Major Tuna Species

Yellowfin tuna

Figure 2. Yellowfin tuna

Yellowfin tuna (*Thunnus albacares*) is an oceanic species occurring above and below the thermoclines. They school primarily by size, either in monospecific or multi-species groups. Larger fish frequently school with porpoises, also associated with floating debris and other objects. Feed on fishes, crustaceans and squids. It is sensitive to low concentrations of oxygen and therefore is not usually caught below 250 m in the tropics. Peak spawning occurs during the summer, in batches. Encircling nets are employed to catch schools near the surface. Marketed mainly frozen and canned, but also fresh and smoked. Highly valued for sashimi.

Skipjack tuna

Figure 3. Skipjack tuna

Skipjack tuna (*Katsuwonus pelamis*) is found in offshore waters. Larvae of skipjack tuna is restricted to waters with surface temperatures of 15°C to 30°C. Exhibit a strong tendency to school in surface waters with birds, drifting objects, sharks, whales and may show a characteristic behavior like jumping, feeding, and foaming. Feed on fishes, crustaceans, cephalopods and mollusks. Cannibalism is observed to be common. Preyed upon by large pelagic fishes. Also taken by trolling on light tackle using plugs, spoons, feathers, or strip bait. Marketed fresh, frozen or canned. Also dried-salted and smoked. Spawns throughout the year in the tropics and eggs their released in several portions.

Bigeye tuna

Figure 4. Bigeye tuna

Bigeye tuna (*Thunnus obesus*) occurs in areas where water temperatures range from 13°-29°C, but the optimum is between 17° and 22°C. Variation in occurrence is closely related to seasonal and climatic changes in surface temperature and thermocline. Juveniles and small adults school at the surface in mono-species groups or mixed with other tunas, may be associated with floating objects. Adults stay in deeper waters. Eggs and larvae are pelagic. Feed on a wide variety of fishes, cephalopods and crustaceans during the day and at night. Meat is highly prized and processed into sashimi in Japan. Marketed mainly canned or frozen, but also sold fresh.

Eastern Little tuna

Figure 5. Eastern Little Tuna

Eastern Little tuna (*Euthynnus affinis*) Occurs in open waters but always remains close to the shoreline. The young tuna may enter bays and harbors. Forms multi-species schools by size with other scombrid species comprising from 100 to over 5,000 individuals. A highly opportunistic predator feeding indiscriminately on small fishes, especially on clupeoids and atherinids but also on squids, crustaceans and zooplankton. Generally marketed canned and frozen; also utilized dried, salted, smoked and fresh.

Frigate tuna

Figure 6. Frigate tuna

Frigate tuna (*Auxis thazard*) are epipelagic in neritic and oceanic waters. Feeds on small fish, squids, planktonic crustaceans (megalops), and stomatopod larvae. Because of their abundance, they are considered an important element of the food web, particularly as forage for other species of commercial interest. Preyed upon by larger fishes. Marketed together with other tunas. Marketed fresh and frozen. Also utilized dried, salted, smoked and canned.

Bullet tuna

Figure 7. Bullet tuna

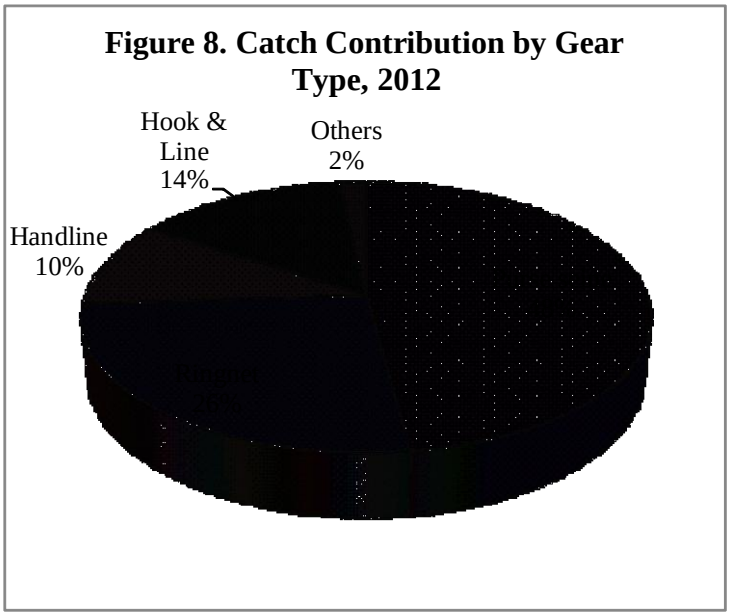
Adult bullet tunas (*Auxis rochei*) are principally caught in coastal waters and around islands. Forms schools. Feeds on small fishes, particularly anchovies, crustaceans (especially crab and stomatopod larvae) and squids. Because of their abundance, they are considered an important element of the food web, particularly as forage for other species of commercial interest. Also caught with encircling nets and troll lines. Marketed fresh and frozen and also dried or salted, smoked and canned.

A table of English and local names of these common tunas are found in Annex 6.

2.2. Major Tuna Fishing Gears

A variety of fishing gears are used to catch tuna (Annex 1). The use of purse seines, ringnets and handlines usually accounts for over 75% of the annual tuna catch. The tuna catches in 2011 were caught by: purse seine, 48%; ringnet, 26%; handline, 10%; hook-and-line, 14% and other gears, 2% (5th Philippine/WCPFC Annual Tuna Catch Estimates Review Workshop, May 2012).

Figure 8. Catch Contribution by Gear Type, 2012



Except for the large commercial purse seine and ringnet boats (250-490GT) that are capable of offshore and deep-sea fishing, most of the tuna fishing fleets operate in the near shore waters. Most of these boats operating nearshore catch young tunas, as well as small pelagic fishes (particularly roundscads, sardines, bigeye scads and moonfishes) which are harvested in the same surface fishing operation using net (Pagdilao et al. 1993; Barut 1999).

The *payao* has been singled out as the important factor that triggered the phenomenal development of the tuna fishing industry. The effectiveness and efficiency of *payao* in attracting tuna (especially yellowfin and skipjack) greatly reduced the time spent in searching and fishing for commercial volumes. Both commercial and municipal fishers use *payao* in attracting tunas

and oftentimes share the same payaos deployed in fishing grounds (Annex 2). The commercial fishing boat operators catch the surface aggregating juveniles, while the municipal fishers, with the use of handlines, catch adult yellowfin (110-150 cm) occupying the deeper water column (Aprieto 1995b).

The extensive use of *payao*, may be removing the undersized tunas from the stocks altering migration and feeding patterns of tunas in the Philippine waters. Moreover, many coastal countries have adopted the *payao* in tuna fishing. Tuna studies in Mindanao waters show that more than 90% of the yellowfin and skipjack tuna landed by purse seine, bagnet and ringnet are less than 12 months old (Aprieto 1995a, 1995b).

2.3. Fishing Vessels

Tuna fisherfolks uses various types of fishing boats ranging from traditional dugout which are propelled by wooden paddles to large steel hulled vessels which are fully equipped with modern fishing equipment for long distance fishing. Traditional boats represent the municipal fishing sector with vessels less than 3 GT in size, and under the jurisdiction of the Local Government Units (LGUs). While the latter comprises the commercial sector with vessels (> 3GT) are required to fish outside municipal waters, beyond 15km off the shoreline and are required to secure commercial fishing vessel and gear license (CFVGL) at the Bureau of Fisheries and Aquatic Resources which is subject to renewal every three (3) years. With the implementation of RA 9379 or the Handline Fishing Law, this gives a separate category for the handline vessels which were formerly considered under the municipal fishing vessels.

Classification of registered Philippine vessels operating in the WCPFC, IOTC and ICCAT Convention areas are shown in Tables 1-3.

Table 1. Classification of Philippine registered vessels in WCPFC.

Type of Vessel	**Number of Vessels Registered/Authorized**			
	<250 GT	> 250GT	>500GT	**Total**
Bunker			1	**1**
Fish Carrier	111	51	26	**188**
Fishing Vessel not specified	8	2	1	**11**
Handline	1			**1**
Longline	7	8	9	**24**
Multi-purpose Vessel	6	1	1	**8**
Purse Seine	64	36	27	**127**
Support Vessel	254	4	4	**262**
Total	**451**	**102**	**69**	**622**

Source: WCPFC Website, as of 1 July 2012

Table 2. Classification of Philippine registered vessels in IOTC.

Type of Vessel	Number of Vessels Registered/Authorized			
	<250 GT	> 250GT	>500GT	**Total**
Longline		9	15	**24**
Purse Seine	14	15	17	**46**
Total	**14**	**24**	**32**	**70**

Source: IOTC Website, as of 11 November 2012

Table 3. Classification of Philippine registered vessels in ICCAT.

Type of Vessel	Number of Vessels Registered/Authorized			
	<250 GT	> 250GT	>500GT	**Total**
Longline		9	16	**25**
Total	**0**	**9**	**16**	**25**

Source: ICCAT Website, as of 11 November 2012

2.4. Fishing Grounds

Tunas are caught throughout the Philippine waters (archipelagic waters, territorial sea and the EEZ) but the most productive fishing grounds are the Sulu Sea, Moro Gulf and waters extending to the north Celebes Sea (Figure 9). However, the latter, is not officially listed as a statistical fishing area.

Over 55% of the total skipjack and yellowfin catch, however, is taken from waters around Mindanao (Aprieto, 1995). Viable tuna fisheries also exist in waters of western Negros, as well as Northwestern and Southern Luzon. Specific locations of tuna fishing grounds are highly guarded trade secrets of fishers. Through the advent and wide use of *payao* (fish aggregating devices) has largely eliminated such secrecy. The location of the *payao* itself is a good indication of a productive tuna fishing ground.

As mentioned in the previous section, when the catch rates of tuna in Philippine waters started to decline in the late 1980s, Filipino fishing companies started to fish in international waters or high seas. This made Philippines, one of the distant-water fishing nations. In 2002, a bilateral access agreement was reached with the Republic of Indonesia, a number of Philippine tuna vessels (75 catcher vessels, 10 single seiners, 20 longliners and support vessels - lightboats and carriers) were allowed access to Indonesian waters and ports, an agreement which expired in December 2005.

When the bilateral access agreement with Indonesia expired, Philippine companies (e.g. RD and Frabelle Fishing companies) also ventured to have access agreements with Papua New Guinea (PNG). In 2010, when the high seas pockets closed more Philippine fishing companies started to negotiate with PNG and other Pacific Island countries to gain fishing access agreements in their waters.

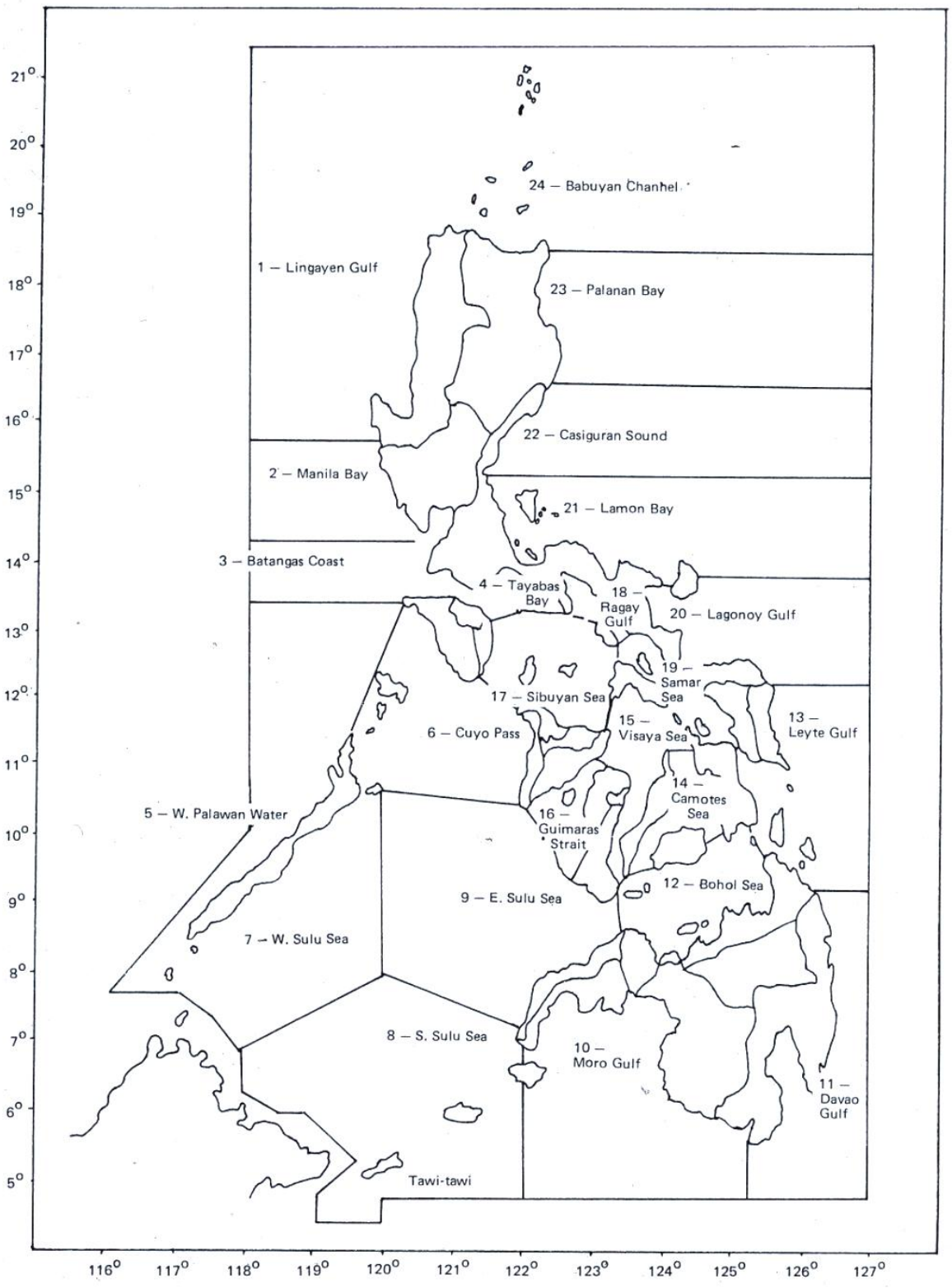


Figure 9. Statistical Fishing Areas

2.5. Fishing Season

Generally, fishing operations are restricted during the monsoon season which usually brings strong winds and heavy rains. The southwest monsoon or *"habagat"* normally starts in May and ends in October. The southwest monsoon coincides with the typhoon season wherein an average of 20 typhoons per year. Some of these typhoons are strong and destructive. While the northeast monsoon or *"amihan"* begins in November and ends in February. In between the two monsoon seasons, there is a quiet period of two months, from March to April.

2.6. Catch and Effort by Fishing Gear

Most of the **municipal** tuna catch is landed as wet fish in thousands of landing sites all over the Philippines. Much of the municipal catch is processed by drying, salting, smoking etc. No data are available on the disposal of the municipal catch after landing, but little of the municipal tuna catch would enter large scale commercial processing, the exception being large handline-caught tuna exported as sashimi and marketed either frozen or smoked, mostly in General Santos City and possibly small amounts of tuna sold as wet fish direct to canneries.

The **commercial** domestic tuna catch of oceanic tunas is increasingly directed towards processing by domestic canneries, based in the Philippines and elsewhere, with lesser amounts to frozen smoked operations. The estimated 150,000MT annual output of the 7 canneries is mostly supplied by landings from Philippine purse seiners and ring netters, both local vessels and via carriers from overseas operations. Overseas operations also supply canneries in PNG (~50,000MT p.a.); some tuna is imported to supplement cannery supply.

2.6.1. Annual Catch

Since 1987, the official fishery statistics for the Philippines have been compiled by the Bureau of Agricultural Statistics (BAS), based on probability (stratified random sampling by data collectors) and non-probability surveys (interviews by regular BAS staff) surveys, supplemented by secondary data from administrative sources e.g. landings sites and ports (Vallesteros, 2002). Annual Fisheries Statistics for commercial, municipal, inland and aquaculture sectors are published for three year time frames, most recently for 2008-2010 inclusive (BAS, 2011), and include volume and value of production by province and by region, information on fish prices and foreign trade statistics.

Catch breakdown by the 31 main marine species is available[1]. Estimates of annual bigeye and yellowfin catches for the past years have been reported as a combined catch (yellowfin/bigeye tuna) but for 2005 BAS started to separate catches for these two species of tunas (Table 4). However, there is still a need to improve the identification of these two (2) species to accurately reflect the actual catch of yellowfin and bigeye.

The annual tuna catch estimates include all the tuna catch unloaded in Philippine ports regardless where they were caught and does not separate those catches from foreign waters or whether it is caught by foreign-flagged vessel.

[1] Around 20% of the municipal catch and 6-8% of the commercial landings are not captured by these 30 species

Table 4. Total tuna catch, by species, for 2007-2011 (in MT)

	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye	**Total**
2007	152,098	82,660	17,325	33,766	51,832	16,891	**354,572**
2008	181,563	116,528	17,174	40,447	51,882	17,967	**425,561**
2009	201,262	91,440	3,701	50,262	60,997	2,034	**409,697**
2010	177,698	85,351	8,575	50,481	61,924	3,070	**387,099**
2011	147,979	68,625	6,022	49,404	54,389	3,591	**330,010**

Source: BAS Annual Fisheries Statistics

BFAR launched the catch documentation scheme which requires purse seine and ringnet operators to submit monthly logsheets report and for the canneries to submit monthly cannery deliveries data. BAS is also in the process of updating the new statistical survey frames and improving themethodologies in order to address the above issue. All these efforts are geared towards improvement of the country's catch estimates.

Philippines started to conduct tuna catch estimates review workshops in consultations with various agencies/organizations including tuna industry to review and validate Philippine catch estimates by species and gear type. Data from different sources, namely, BFAR (NSAP, logsheets, cannery receipts), BAS, PFDA and industry were presented and reviewed. The most recent was the 5th Tuna Fisheries Catch Estimates Review Workshop conducted last 17 – 18 May 2012. Table 5 provides a breakdown of catch by gear and species according to the process undertaken in the workshop with the current 2011 BAS estimates. After removing the foreign-flagged catch landed in the Philippines from the BAS estimate, there was a difference of around 113,000MT. The difference could be due to the difficulties in estimating the diverse municipal fisheries and could be explained as possible bias in the probability surveys due to very low coverage. The workshop participants noted that while the industrial fleet estimates are now becoming more reliable, there is still a major problem in determining and validating the estimates of the small-scale municipal fisheries that needs to be resolved in the near future. One of the activities done to somehow address this issue was the study conducted in Region 8 to determine the likelihood that hook-and-line vessels at nearby landing sites would catch significant amounts of oceanic tuna species. For more details on the workshop outputs and study conducted in Region 8, please refer to the WPEA-OFM project outputs.

Table 5. Reconciliation of 2011 Tuna Catch Estimates by Gear and Species with the 2011 BAS Total Tuna Catch Estimates (in MT)

GEAR/SPECIES	SKJ	YFT	BET	TOTAL
Purse seine	39,733	10,522	929	51,184
Ringnet	21,667	5,677	579	27,923
Handline	62	10,577	225	10,864
Hook-and-line	4,875	9,675	450	15,000
Others	1,149	721	1	1,871
TOTAL	67,486	37,172	2,185	106,842

Source: Fifth Philippine/WCPFC Annual Tuna Catch Estimates Review Workshop Report, May 2012

No other fishing by foreign flag vessels is permitted in the Philippines EEZ, but a considerable amount of IUU fishing, based on the regularity of apprehensions of vessels illegally fishing in Philippine waters, would seem to occur, much of it involving tuna vessels. A desk study carried out in 1995 (PTRP, 1995) concluded that IUU longline catches of up to 10,000MT (40% yellowfin) may have been taken in some years.

Landings/ transshipments by foreign longline vessels are permitted in Davao (Toril) port, where around 2,600 - 6000MT of mostly tuna is landed annually (Table 6). Over half is retained for processing and consumption, with the rest transshipped by air. Most of these retained catch do not pass the export quality standards and import permit is not necessary since the DA Secretary has signed a certificate of necessity. It is also assumed that all of this catch is taken outside Philippine waters. Most of these vessels doing transshipment activities at Davao port are Taiwanese longline vessels unloading yellowfin and bigeye tunas. It has been observed that the number of foreign longline vessels doing transshipment activities have decreased since 2007. This could be due to transfer of transshipment activities to other homeports or due implementation of various conservation and management measures that have been implemented such as high seas pocket closure and others.

Table 6. Vessel Arrivals and Unloading Volumes by Foreign Vessels, Davao Fish Port

Year	Port Calls	Volume of Unloadings (MT)	Transhipped (MT)	Retained (MT)
2007	762	5,928	2,478	3,450
2008	504	3,916	1,552	2,364
2009	420	2,978	1,166	1,812
2010	396	3,514	1,387	2,127
2011	316	2,687	1,273	1,414

Source: PFDA, 2011

Annual Catches in the WCPFC Statistical Area

The fisheries data collection system records all catch landed by Philippine registered vessels including those fish caught outside Philippine waters (e.g. PNG, PIC waters). Recently, it is believed that up to 100,000MT of catch are taken outside the Philippine EEZ. This primarily includes catch by small purse seiners/ringnets and unloads their catch in Philippine ports.

Purse seine catches in the PNG EEZ

Data on the catch by Philippine flag purse seine vessels fishing in Papua New Guinea PNG waters are available from the SPC Regional Database, and are summarized for the period 2007-2011 below.

Table 7. Catch by Philippine flag purse seine vessels in PNG waters, 2007-2011.

Year	No. of Vessels	Catch (in MT)			
		Skipjack	Yellowfin	Bigeye	Total
2007	12	20,866	12,675	677	34,218
2008	14	26,958	21,117	1,801	49,876
2009	25	37,216	22,260	1,851	61,327
2010	22	43,870	27,594	1,966	73,430
2011	25	50,047	29,166	1,599	80,812

Source: SPC Regional Tuna Fishery Database

Official figures for **exports of tuna products** for the period 2007-2011 are tabulated in Table 8. The first category includes chilled sashimi quality fish, frozen whole fish for canning and presumably frozen smoked tuna. The volume of canned exports is somehow fluctuating.

Table 8. Tuna exports by commodity, 2007 –2011.

Tuna commodity, by volume (MT)	2007	2008	2009	2010	2011
Fresh/chilled/frozen	26,854	32,365	23,504	33,688	22,027
Dried/smoked	0.4	17			13,933
Canned	48,284	76,910	83,604	76,801	58,071
TOTAL VALUE (million USD)	218.55	395.94	346.40	359.38	314.507

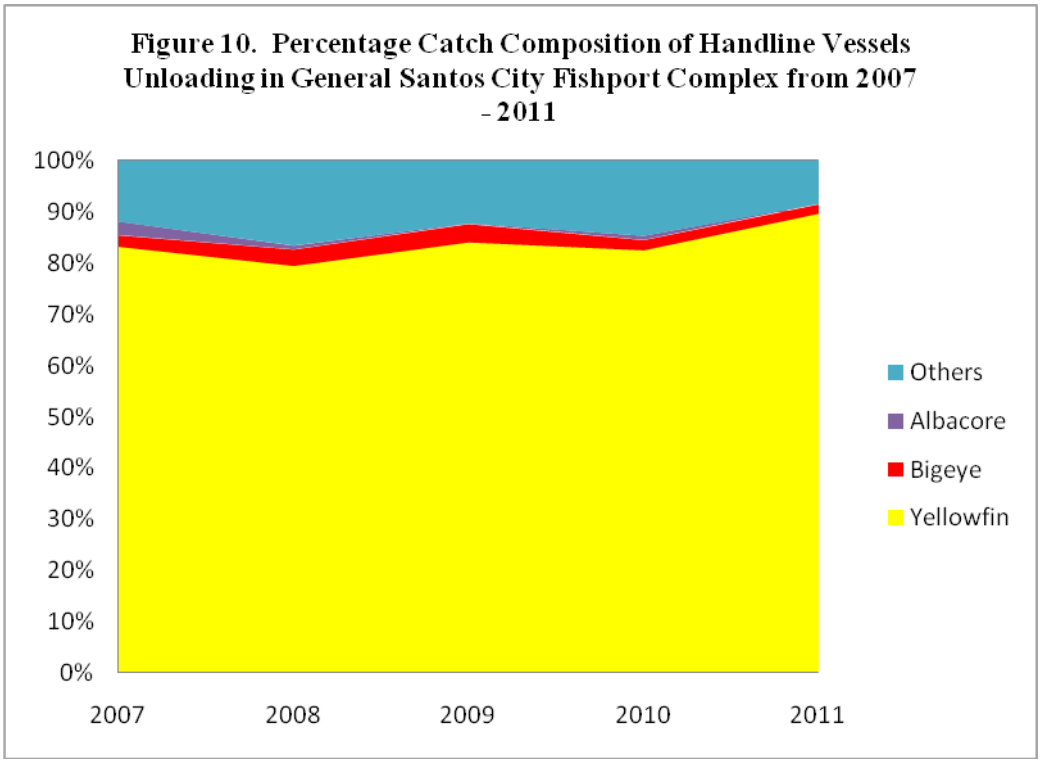
Source: NSO data, in BAS Fisheries Statistics for 2007 – 2011

2.6.2. Catch Composition

Majority of the catches are landed or traded in General Santos City, the tuna capital of the Philippines are coming from Moro Gulf, Sulu Sea and some catches coming from waters of Palawan, Samar and Mindoro. The figures below show the average percentage catch composition of purse seine, ringnet and handline vessels for the past five (5) years (NSAP, 2007 – 2011).

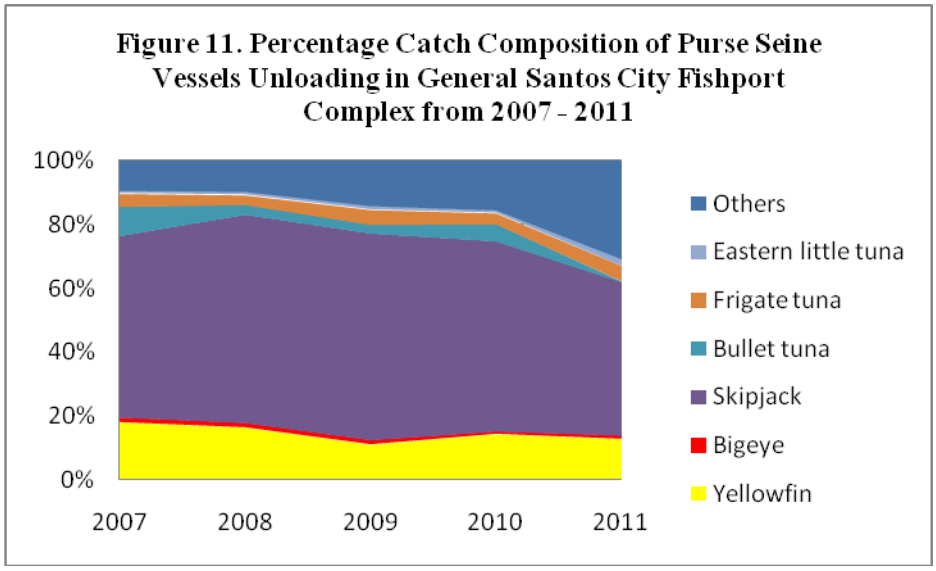
2.6.2.1. Handline

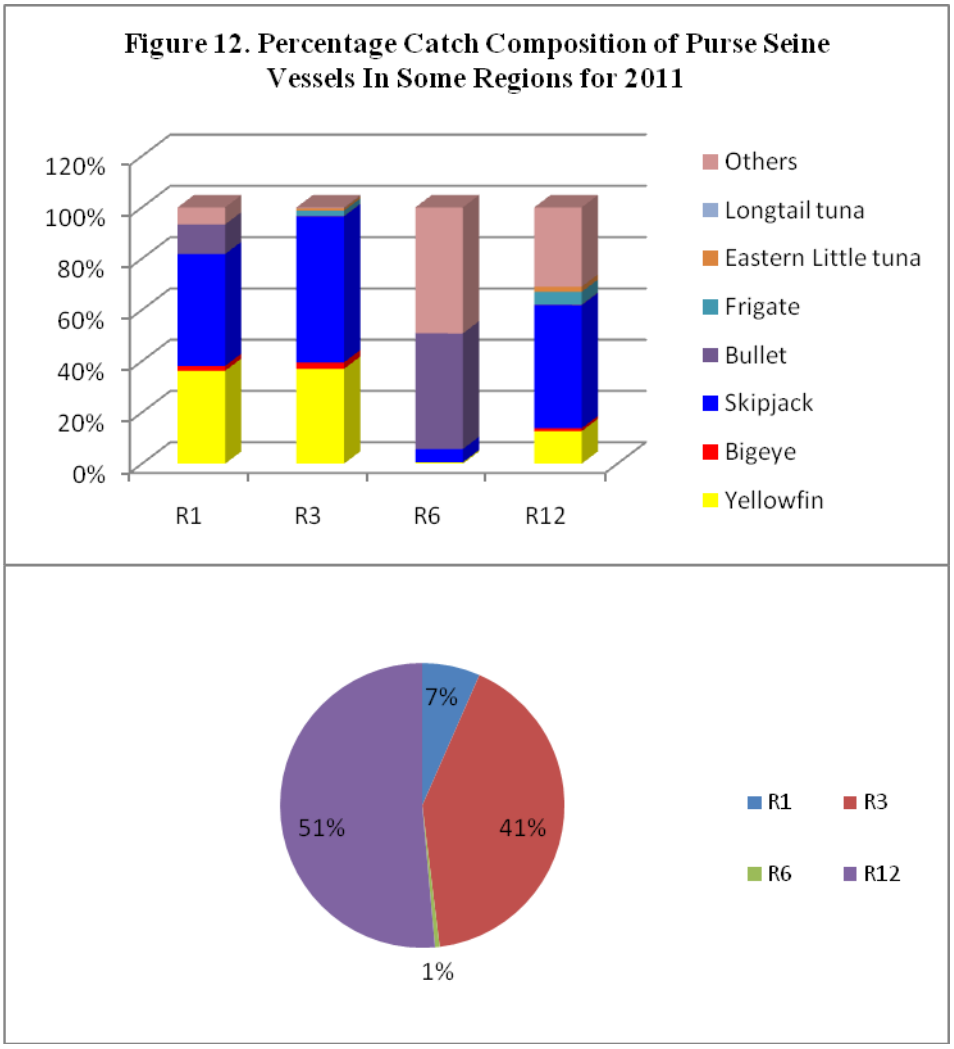
For the handline fishery (Figure 10), yellowfin (*Thunnus albacares*) comprises 80-90% of the total handline catch as observed for 2007 - 2011. The rest of the catch was composed of bigeye (*Thunnus obesus*), 2-3%; albacore (*Thunnus alalunga*), 1-2% and other species, 8-17%. The other species includes marlins (*Makaira mazara* and *Makaira indica*), swordfish (*Xiphias gladius*) and sailfish (*Istiophorus platypterus*). Albacore catch is said to be seasonal usually observed during the first and last quarter of the year.



2.6.2.2. Purse Seine

Catch of purse seines (Figure 11) landed in General Santos City comprise around 51% of the total purse seine catches landed in Philippine ports. Purse seine catches unloaded in GSCFPC is mainly composed of the following: yellowfin (*Thuunus albacares*), 11-18%; bigeye (*Thuunus obesus*), <1 -1.5%; skipjack (*Katsuwonus pelamis*), 48-65%; bullet tuna (*Auxis rochei*), <1-9%; frigate tuna (*Auxis thazard*), 3-5%, Eastern little tuna (*Euthynnus affinis*), <1-2 %; and other small pelagics (*Decapterus sp., Caranx sp.*), 10-31%. Skipjack tuna was the dominant landed catch of purse seines for the past five years.





The figures 12 also shows that catches of purse seine landed in ports of various regions are mainly composed of skipjack tuna (40-55%) followed by yellowfin (12-37%) and other species (20-40%). It should be noted that bigeye tuna represents a small portion of the purse seine catch ranging from 0 – 2%. It should also be observed from the figure that purse in Region 6 mainly targets neritic tunas and other small pelagic fishes.

2.6.2.3. Ringnet

Catches of ringnet (Figure 13) landed in General Santos City comprise the bulk of ringnet cathes in the country. Ringnet catches unloaded in GSCFC is mainly composed of the following: yellowfin (*Thuunus albacares*), 11-16%; bigeye (*Thuunus obesus*), <1-2%; skipjack (*Katsuwanos pelamis*), 36-60%; bullet tuna (*Auxis rochei*), 1-23%; frigate tuna (*Auxis thazard*), 2-9%, Eastern little tuna (*Euthynnus affinis*), <1- 2%; and other small pelagics (*Decapterus sp., Caranx sp.*), 12-37%. Skipjack and bullet tunas are the major species landed by ringnets in General Santos City.

Figure 13. Percentage Catch Composition of Ringnet Vessels Unloading in General Santos City Fishport Complex from 2007 - 2011

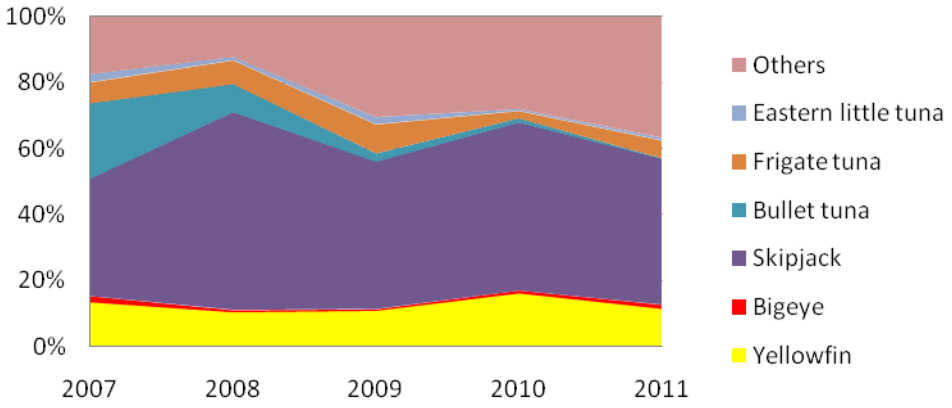
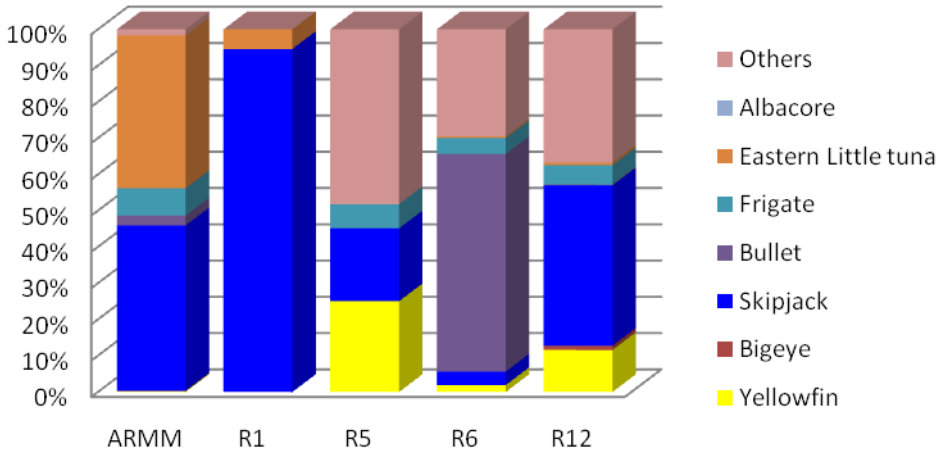
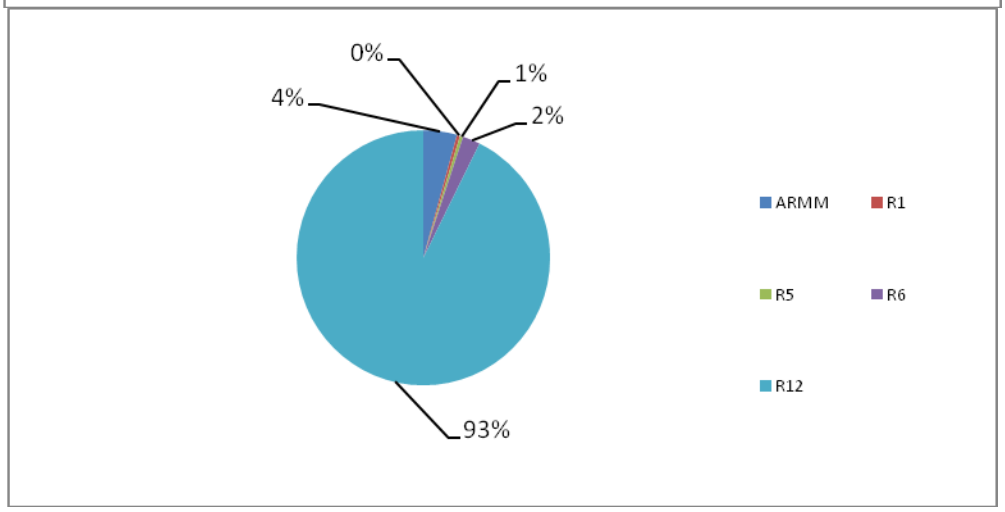


Figure 14. Percentage Catch Composition of Ringnet Vessels in some Regions for 2011





Although there are ringnet catches landed in other parts of the country, this only represents a small portion of the total ringnet catches. It should also be noted from figure 14 that catch composition of ringnet varies from each region.

Based on BFAR- Philippine Fisheries Observer Program Sampling activities for 2010 and 2011 (Figure 15), the catch breakdown is as follows: skipjack (32-42%), yellowfin (17-18%), bigeye (2%) and other species (39-48%). It should be noted that the composition of bigeye tuna only represents a small portion (2%) of the total catch of purse seines or ringnet. It could also be noted that that small pelagic species (scads and mackerels) represents a significant portion of the purse seine and ringnet catch. These observations are comparable to our NSAP sampling catch composition.

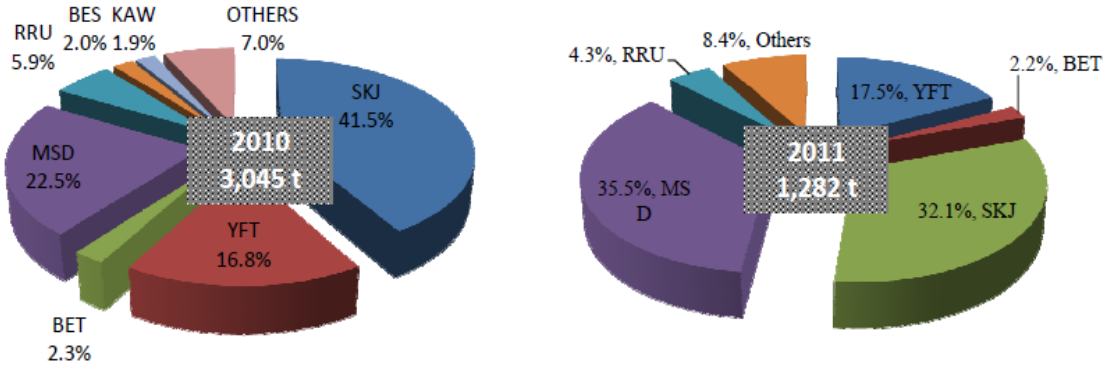


Figure 15. Philippine Fisheries Observer Program Sampling activities for 2010 and 2011.

2.6.3. Trends in Effort and Catch rates

Time series of nominal catch per unit effort (CPUE) can provide a broad indication of the availability of target species to respective fishing gears, and may provide some indication of relative abundance. It is important to note that the interpretation of nominal CPUE can be confounded by various factors, such as changes in fishing strategies amongst vessels and in the overall fleet over time. These factors change the "effectiveness" of effort and therefore need to be accounted for if the CPUE time series are to be interpreted as indices of relative abundance – time series of effort that have been adjusted to account for these factors are termed 'standardized' effort, and where this is applied to catch, 'standardized' CPUE.

The following sections provide a description of the available effort data and looks at trends in nominal CPUE for three (3) key fishing gears in the Philippines domestic fishery, namely, handline, purse seine and ringnet, unloading in General Santos City Fish Port Complex (GSCFC) for 2006 – 2011. At this stage, time series of nominal effort and CPUE are presented only, although an attempt has been made to describe those factors that may be influencing the 'effectiveness' of effort, which may lead to the determination of 'standardized' effort at a later date.

The commercial handline fishery based in General Santos City (GSC) is one of the major fisheries in the Philippines, targeting adult yellowfin tuna aggregating in sub-surface waters

around “payaos”. The commercial ringnet and purse seine fisheries based in General Santos City offer a distinct comparison to the handline fishery as they target juvenile schools of small pelagic fish in surface waters.

2.6.3.1. Handline

The monthly trends in effort and effort rate (days/trip) for the handline fleet based in General Santos City is shown in Figure 16. There were no estimates for months where sampling did not occur and values were taken from the reports generated from the NSAP Database system version 5.1. Here is some information that can be observed from the graph:

- Total effort is generally in the average range of 5,000-10,000 boat days per month. Effort during 2006-2009 appeared to be higher than in more recent year (2010-2011), based on our anecdotal information from the NSAP port samplers in GSC suggest that some vessels tie up during periods of poor catches and only recommence fishing when catch rates improve (hence the drop in effort in recent years, when catch rates were reported to be lower than usual). In 2008, a sharp increase in effort was observed a certain month, which needs investigation.
- Days per trip ranges from 18 – 30 days. This has gradually increased over the years as observed by our port samplers. This is understood to be due to handline vessels traveling further away from port in the hope of obtaining better catch rates.

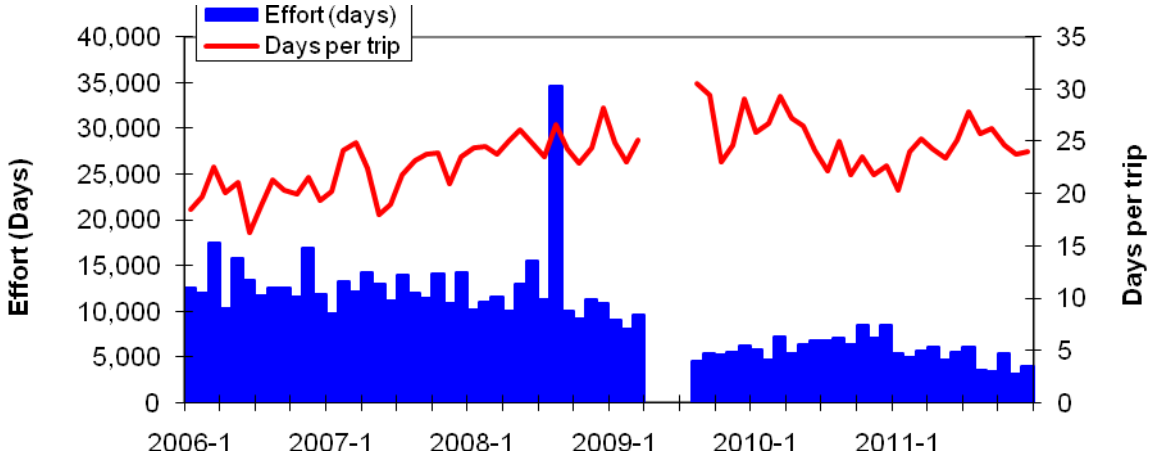


Figure 16. Monthly effort (days) and days/trip for the General Santos City Handline fleet, 2006–2011

The monthly trends in yellowfin tuna catch rates (CPUE) for the handline fleet based in General Santos City is shown in Figure 17. There were no estimates for months where sampling did not occur and values were taken from the reports generated from the NSAP Database system version 5.1. Here is some information that can be observed from the graph below:

- Yellowfin CPUE for the General Santos City handline fleet has fluctuated over the time series, ranging from 40-170 kg/trip-day. This fishery has experienced a decrease in YFT CPUE in 2007 until the end of 2009, although this catch rates are said to be higher compared to the catch rates in the late 1990s.
- The decrease in catch rate over the past years (2007-2009) coincides with increases in days per trip, suggesting that a component of the fleet traveled further to an area in the hope of obtaining better catch rates but not good enough to sustain a higher than average catch rate, despite the longer trip duration.

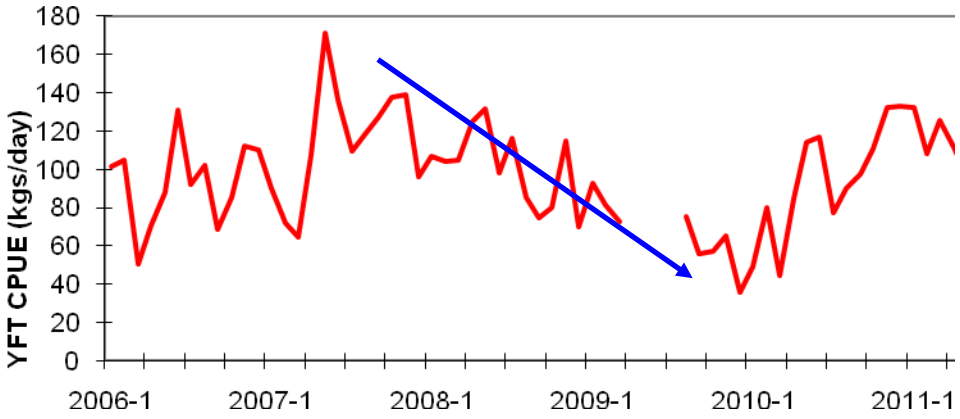


Figure 17. Monthly Yellowfin CPUE for the General Santos City Handline fleet, 2006–2011

2.6.3.2. Purse Seine

The monthly trends in effort and effort rate (days/trip) for the purse seine fleet based in General Santos City is shown in Figure 18. There were no estimates for months where sampling did not occur and values were taken from the reports generated from the NSAP Database system version 5.1. Here is some information that can be observed from the graph below:

- Total estimated effort is generally in the range of 100- 1,200 boat days per month.
- The average monthly trip length tends to be around 3-6 days per trip, although the trip length was in excess of 6 days per trip for one particular month in 2009; further investigation is required on this.

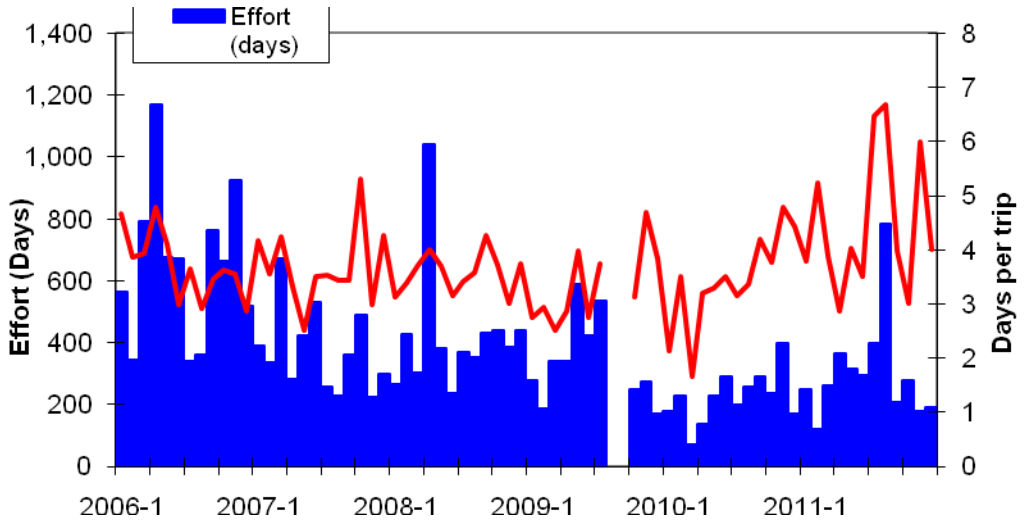


Figure 18. Monthly effort (days) and days/trip for the General Santos City Purse Seine fleet, 2006–2011

The monthly trends in skipjack and yellowfin tuna catch rates (CPUE) for the purse seine fleet based in General Santos City is shown in Figures 19 and 20. There were no estimates for months where sampling did not occur and values were taken from the reports generated from the NSAP Database system version 5.1. Here is some information that can be observed from the graph below:

- The monthly CPUE of skipjack tuna for the General Santos City purse seine fleet has ranged from around 700 to 13,500 kg/trip day. Same as observed in the ringnet, the species composition of catch of these vessels can vary depending on the area fished. The spatial distribution of the fishing effort therefore has some influence on both the species composition and the CPUE.
- The monthly CPUE of yellowfin tuna for the General Santos City purse seine fleet has fluctuated over the time series, ranging from 500 to nearly 3,500 kg/trip day (the average is around 1,250 kg/day).
- Catch rates for both skipjack and yellowfin tuna is on a decreasing trend since 2009 as observed in the time series. With the lowest catch are observed in recent year (2011) ranging from 300-700 kg/trip day for yellowfin and 500 – 2,000 kg/trip day for skipjack tuna.

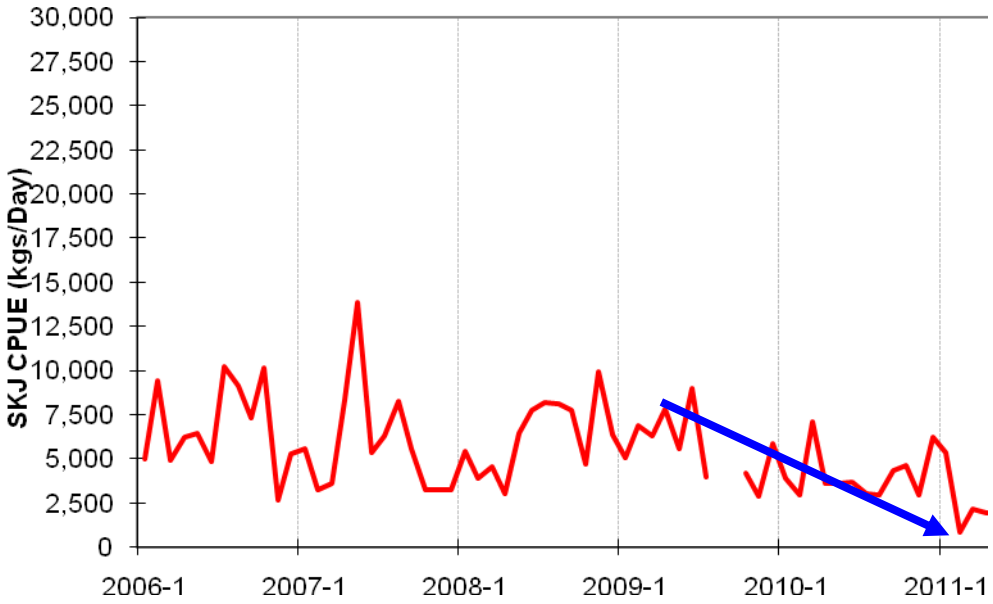


Figure 19. Monthly Skipjack CPUE for the General Santos City Purse Seine fleet, 2006–2011

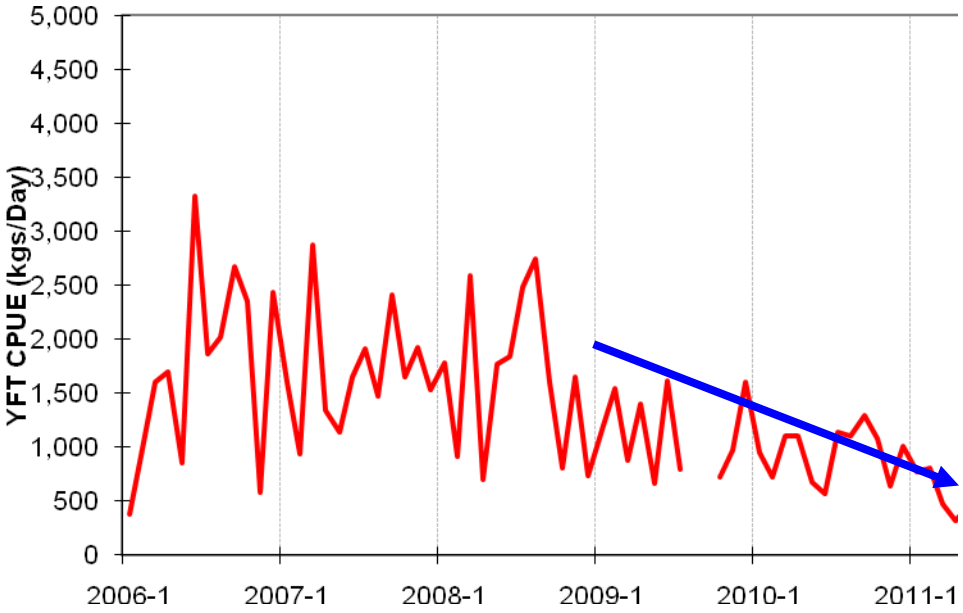


Figure 20. Monthly Yellowfin CPUE for the General Santos City Purse Seine fleet, 2006–2011

2.6.3.3. Ringnet

The monthly trends in effort and effort rate (days per trip) for the ringnet fleet based in General Santos City is shown in Figure 21. There were no estimates for months where sampling did not occur and values were taken from the reports generated from the NSAP Database system version 5.1. Here is some information that can be observed from the graph below:

- Total estimated effort is generally in the range of 200-1,600 boat days per month, although there where at least three months when effort exceeds 1,500 boats days.
- The monthly trip length tends to oscillate around 3 days per trip, although the trip length was in excess of 5 days per trip for several months during the time series.

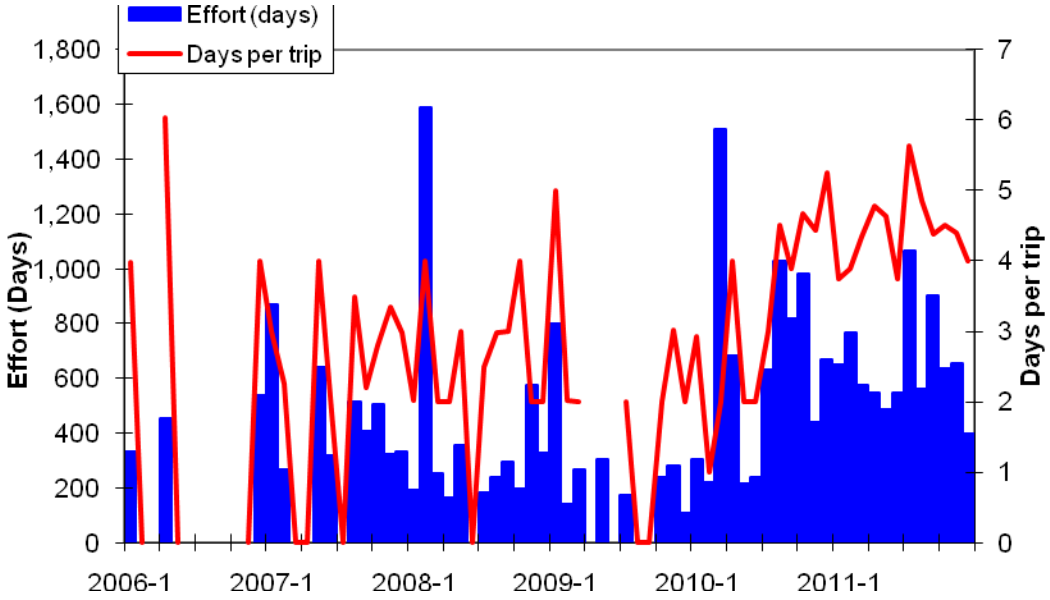


Figure 21. Monthly effort (days) and days/trip for the General Santos City Ringnet fleet, 2006–2011

The monthly trends in skipjack and yellowfin tuna catch rates (CPUE) for the ringnet fleet based in General Santos City is shown in Figures 22 and 23. There were no estimates for months where sampling did not occur and values were taken from the reports generated from the NSAP Database system version 5.1. The following are observations and comments have been drawn from the graphs.

- The monthly CPUE of skipjack tuna for the General Santos City ringnet fleet ranged from around 500 to 7,000 kg/trip day. The species composition of catch of these vessels can vary depending on the area fished, for example, while skipjack are usually the main species in the catch, sets closer to the coast, or in the Davao Gulf or Sarangani Bay, may comprise more neritic than pelagic species of tuna in the catch. The spatial distribution of the fishing effort therefore has some influence on both the species composition and the CPUE.

- The Monthly CPUE of yellowfin tuna for the General Santos City ringnet fleet has fluctuated over the time series, ranging from 100 to nearly 3,000 kg/trip day (the average is around 1,000 kg/day). While yellowfin CPUE may vary markedly from one month to the next, the overall trend in this time series is relatively stable.

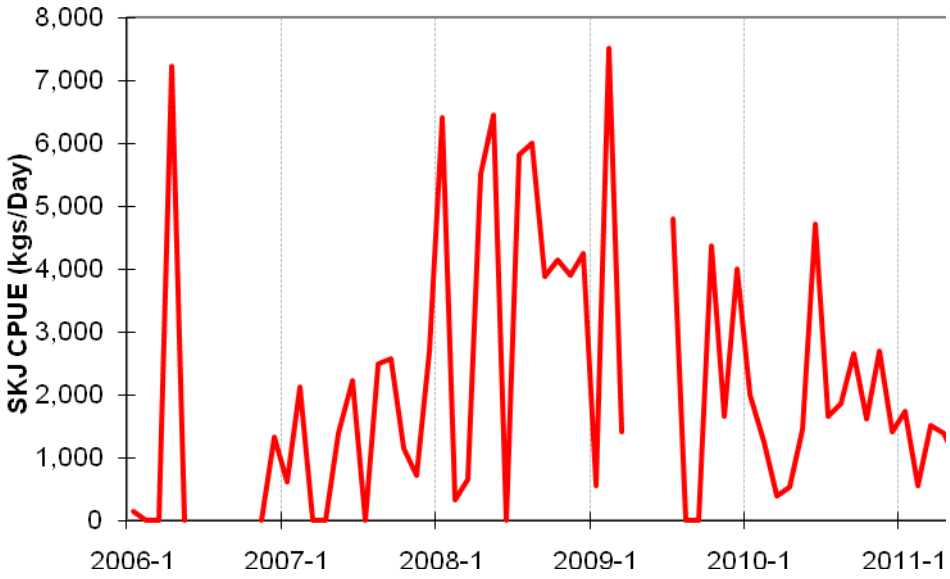


Figure 22. Monthly Skipjack CPUE for the General Santos City Ringnet fleet, 2006–2011

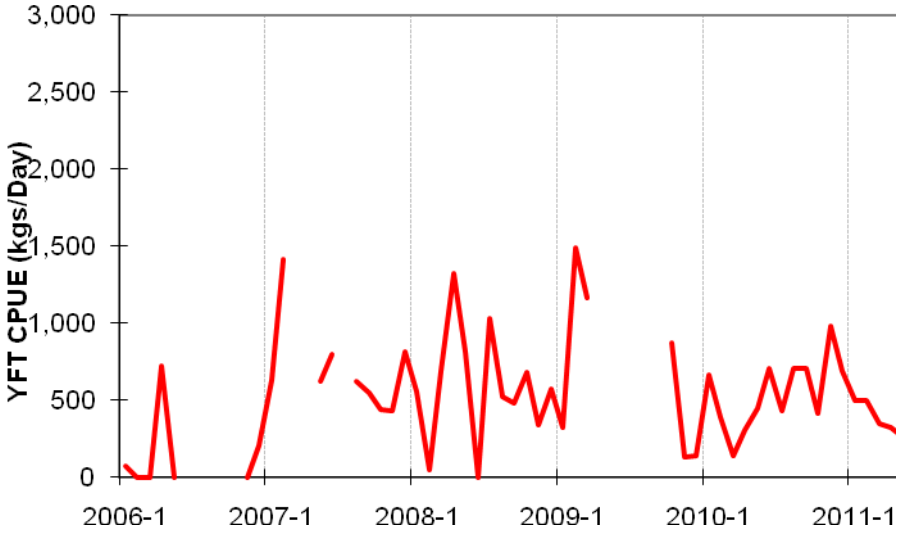


Figure 23. Monthly Yellowfin CPUE for the General Santos City Ringnet fleet, 2006–2011

3. Fisheries infrastructure

3.1. Fish Ports

The General Santos Fish Port Complex (GSFPC), the country's major tuna unloading port, with 143,139 MT total tuna unloading in 2010, has undergone expansion and improvement. Major components of the said expansion/improvement project includes construction of deep wharves, cold storage and processing area, port handling equipment, power substation, waste water treatment plant, water supply system and other ancillary facilities (Annex 3).

The GSFPC has two cold storage plants operating at -35°C with a combined capacity of 3,000 metric tons and a 60 metric ton ice plant. To cater to the landing and trading requirement of its clientele, GSFPC operates four major landing quays/wharves and four market halls.

The operation of GSFPC paved the way for larger and higher quality fisheries production, serving the needs of both large and small fish producers and processors. The port supplies majority of the fish raw material requirement of the six tuna canning factories situated at General Santos City. Equally important, is the operation of a testing laboratory facility inside the complex owned and managed by the Phil Export, a private non-governmental organization, which is utilized specifically for testing the quality of tuna bound for international trade. In support of the activities of the tuna exporters operating at General Santos City, the GSFPC sustain its adherence to the principles of Good Manufacturing Practices (GMP)/Good Handling Practices (GHP) and the Standard Sanitation Operating Procedures (SSOP) to comply with the stringent requirement in food safety of the importing countries such as the EU and the USA.

The Philippine Fisheries Development Authority (PFDA) which manages the GSFPC recognizes the need to improve the facilities in GSFPC in order to maintain the international market of tuna. The authority recognizes that the increasing competition from other ASEAN countries needs to

be addressed through the development of a more efficient port landing and fish certification system that meets international standards.

Likewise, seven other major fish ports situated in strategic places in the archipelago being managed by PFDA are targeted for improvement in the near future. In Metro Manila, the Navotas Fish Port Complex which is the major fish landing port in the metropolis is scheduled for upgrading of its facilities (such as roads, electrical and power system, landing quay and breakwaters).

3.2. Processing plants

3.2.1. Tuna Canneries

Currently, there are seven (7) tuna canneries operational in the Philippines, six (6) in General Santos (Alliance,Celebes, GenTuna, Ocean, Philbest and Seatrade) and one (1) in Zamboanga (Permex Canning Corporation).

There are also two (2) Philippine-owned and operated canneries in Papua New Guinea one in Madang and another one in Lae processing around 50,000MT per year.

Table 9. Tuna Canneries based in General Santos City and Estimated Daily Output

Canning Corporation	Estimated Daily Output (MT/Day)
Alliance	90 – 140
Celebes	75
GenTuna	200
Ocean	45 – 80
Philbest	120
Seatrade	80

Source: Cannery Deliveries Data

3.2.2. Tuna Fresh-Frozen Processing Plants

While most of the handline catch supply fresh and frozen sashimi grade to the export processors and some to the domestic market. There are more than 15 frozen tuna processors in the Philippines, 80% of which are located in General Santos City and supports about 3,000 jobs. Majority of its production is exported to US and European countries.

3.2.3. Tuna Value Adding Factories/Facilities

There are about 40 registered value-adding companies all engaged in micro and small scale production of tuna chorizo, sausages, hotdogs, patties, crackers (chicharon) and dried tuna. The government specifically the Department of Trade and Industry Gensan Office has been supporting the development of this sector through the industry clustering analysis approach.

4. Fisheries socio-economic characters and Marketing

Tuna fishing activities varies from small to large scale fishing operations from financing, sharing systems and marketing (Annex 4). Since 2007, foreign trade for tuna products which are exported mainly as canned, fresh, chilled, frozen, dried or smoked has experienced an average annual growth rate of 9.5%. Domestic demand for both fresh and processed tuna has steadily increased due to increasing public consumption and stronger domestic market. Even international demand for fresh, chilled and frozen tuna fillets in Europe is also rapidly increasing.

4.1. Fisheries socio-economic characteristics

4.1.1. Hook-and-Line

Fishermen usually fish for one to five days at sea. A boat would usually have two to four fishermen per trip. They travel for 10 miles or more out to sea to reach their fishing grounds. A trip usually consumes 50 to 120 liters of petrol and the boat carries about one to five blocks of ice per trip. A single fishing trip would cost about US$ 37 to as high as US$ 357 for longer trips. During good seasons, the average catch is 50 to 100 kilos, and 0 to 20 kilos during lean season. The tuna is normally sold for US$1.5 to US$2.9 per kilo then sold to the nearby municipalities or provinces.

Note: US$ 1.00 = PhP 41.00

Fish catch depends on the season. The peak season is usually during summer months, while lean season is from November to February. A very small quantity of export quality fresh tuna is sold to buyers from General Santos City.

Most of these hook-and-line fishers fish around *payao* which are usually owned by commercial fishing operators. But some fishers deploy their own *payao* that costs about Php40,000 to Php100,000 each depending on the type of material used and depth where the *payao* is deployed.

4.1.2. Handline

Twenty years ago, the average size of handline vessels was less than 40 feet in length. Today, most pump boats are close to 80 feet in length with gross tonnage close to 50GT. A typical modern handline boat is composed of a series of a small pump boats *(pakura)* which are used in catching tuna. The number of small boats and fishermen in every fishing vessel depends on the capacity of the mother vessel.

Pump boats are fitted with surplus truck diesel engines which are converted for marine use. The hull of a pump boat is usually made of wood or fiberglass, composed of one deck, one mast and outriggers. The boat has a narrow central hull, about 10 to 12 feet wide and does not allow for large fish holds, modern equipment, or cabin and crew quarters. It has an engine horse power (hp) of 170 (127kw). This type of boat can accommodate 26 fishermen. The small pump boat or *pakura* usually has 16hp engine. The cost of construction for each *pakura* is around US$976. On the other hand, a 25 gross tons (GT) "mother" boat costs about US$ 29,268 including the construction of small pump boats.

Before fishermen proceed to the fishing ground, preparations are carried out to ensure that they have the supplies necessary for the trip, such as food, water, gasoline, and fishing gears. The fishermen often call this kind of preparation as the *starting* period, and it often involves one to two days of preparation. The fishermen also check if the fishing vessel is seaworthy and free from any damage. Often repairs of handline vessels can take about one to two weeks. Various practices and customs are followed in handline fishing, such as no fishing operations on Fridays and not allowing women on board vessels.

Depending on the scale of the fishing operation, a relatively large amount of capital is involved in a fishing expedition. The biggest cost of the operation is fuel, accounting for about 60% of the total operating cost. Recently, the high cost of fuel has caused some vessel owners and operators to discontinue fishing activities. For larger companies, the rise in fuel costs has resulted in a 20% decrease in the number of their handline vessels.

Handline fishermen schedule their fishing expeditions across the year. A good fishing operation during peak seasons can take three to ten days; however, some trips are longer and can take up to a few weeks. Handline vessels conduct seven to eight fishing trips a year. The search for better fishing grounds often affects the period of fishing operations. The declining catch in the Philippine EEZ has forced handline fishing vessels to fish farther away and for longer periods, which result in the deterioration of fish catch quality. Fish obtained from fishing trips greater than two weeks is generally not suitable for export quality.

About five years ago, there were bigger handline vessels with the capacity of more than 500 blocks of ice. Economic pressures have contributed to the downsizing of handline fishing operations and vessels. The current capacity and manning requirements of individual

handline vessels vary greatly. A vessel carrying 30 to 59 blocks of ice involve 12 or 13 fishermen. A vessel carrying 35 blocks of ice fishing in Sulu fishing grounds would currently need US$ 2,195 to operate and would need to catch 1,500 kilos of tuna to break even. A handline vessel which can carry 120 blocks of ice can cost US$ 6,098 to US$ 6,829 to operate. On the other hand, a vessel carrying 190 blocks of ice going to furthest point in southeast Mindanao waters require about US$ 9,268 in operating cost, and would need to earn at least US$ 19,512 to pay for the cost of fishing. For bigger operations, a handline operator would need to obtain PhP1 million in gross sales in order to be profitable (West, et.al, 2011).

Vessels are owned by either individuals, or by small and large fishing companies. Sometimes the mother vessels and small pump boats or *pakura* are not owned by the same owner. The *pakura* are rented by individual fishermen who enter into a sharing arrangement with the vessel owners and other parties. Some of the bigger fishing companies such as Citra Mina not only process tuna from handline catch, but also build vessels and provide starting capital to fishermen, through joint ventures. Some of these companies also promote the sustainability of fisheries resources and proper handling of catch. They encourage fishers to conduct shorter and more practicable operations to prevent spoilage and degradation of fish caused by long fishing trips.

Fishermen depend on the size of their catch to increase their share in the profit from a fishing operation. Boat captains normally get 25% of the gross profit, while 20% goes to the crew. In general, the income of handline fishermen ranges from US$ 122 to US$ 244 per fishing trip. The most common benefit sharing scheme for handline fishing operation that is being practiced are locally called *lilima* and *sukod.*

a. Lilima sharing system

Lilima literally refers to the share of the fisher, which is equivalent to one fifth or 20 percent of the actual gross sale of his captured tuna for every fishing expedition. If, for instance, a fisher was able to catch four pieces of tuna with an aggregate gross sale of US$500, the fisher's share is US$100 or 20 per cent of the actual sale. The fishers' share used to be equivalent to 25 per cent of the gross sale (called *inupat* in the local parlance) but the escalating costs of fishing operation forced boatowners to reduce the benefits of the fishers to 20 per cent to cover the expenses of the fishing expedition. At present, a fisher gets to take home US$95-150 a month, on average, under the *lilima* benefit sharing scheme. The financier usually gets 10 per cent commission from the gross sales of all captured tuna, while the broker or the one who disposes the fish gets 5 per cent. After the financier and broker get their commission, the incidental expenses incurred in the process of selling the fish like labour costs and port fees will then be subtracted from the gross sales and returned to the boat owner since he/she pays for all these fees. The start-up capital will also be taken from the gross sales and give back to the financier. Once the share of the fishers, commission of financiers and brokers, incidental expenses, and start-up capital are deducted from the gross sales, the leftover money becomes the net sale of the fishing expedition. This net sale will then be divided between the boatowner and the operator. The operator usually gets 15–25 per cent, depending on the turnout of the expedition, while the rest of the money will go to the boat owner. In cases when a *segunda* operator or chief mechanic is also on board, he gets 5 –15% of the net sales (Vera and Hipolito, 2006).

b. Sukod Sharing System

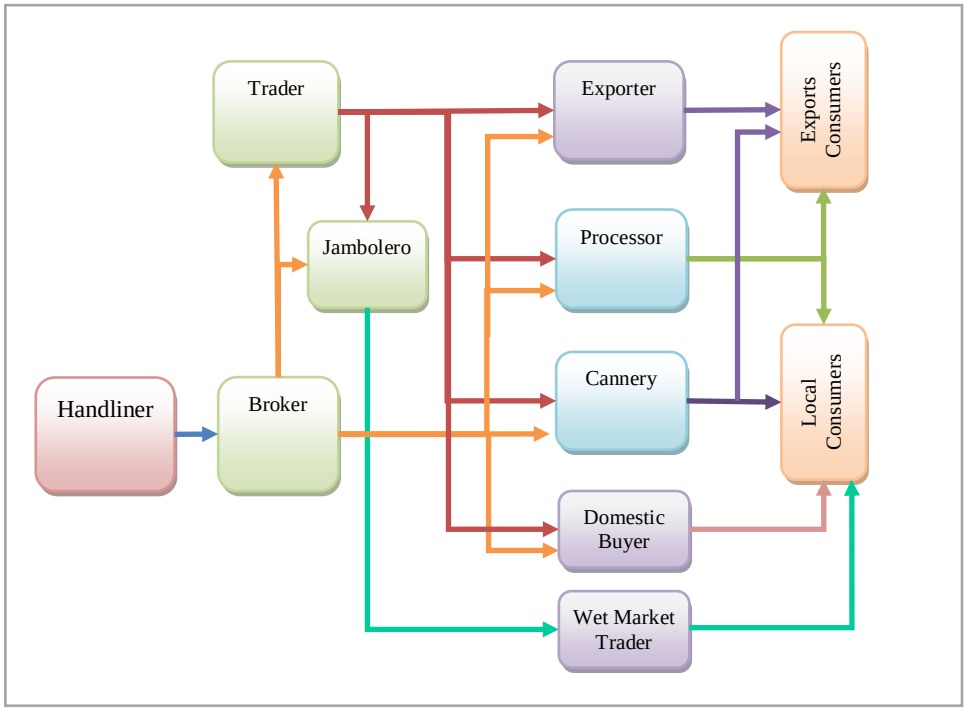
Some schemes allocate as high as 35-40% of the net sales to the operator. This kind of benefit sharing is called *sukod*, which literally means "of equal footing". In a *sukod* set-up, the operator is considered a partner of the boatowner in terms of benefits and costs. Thus, if the fishing expedition loses money, the operator gets to absorb the losses too, like the boat owners. There is no fixed date or duration for the boatowner to pay off his/her financial obligation to the financier, since fishing turnover is highly unpredictable. If the boatowner is lucky, he/she can pay his/her debt in a few months' time, while others take a year-and-a-half to recover. There are also cases when a boatowner becomes so nose-deep in debt that he/she has to give up the boat to the financier as a form of repayment. In cases of losing fishing ventures, the share of the fishers is said to get top priority. The financier usually absorbs the losses until such time that the boatowner has hit a fishing 'jackpot' and recovers from his/her financial setback (Vera and Hipolito, 2006).

Handline Tuna Supply Chain

To have a simplified view on the operations of handline fishing, a map on the flow of goods from catch to end market is shown in Figure 24.

From the fisher (handliner), the tuna are unloaded and goes directly to the display area in Market 1. In this area, the brokers, traders, and *jamboleros* are waiting to dispose, choose and bid for good quality whole tuna. Fishers most of the time entrust their catch to brokers. The broker will be the one to sell the tuna to traders, exporters, canneries, *jamboleros*, domestic buyers and wet market traders according to grades. The tuna that goes to the traders and exporters in Market 1, which passes the export sashimi quality grade, is packed whole in a carton with dry ice and sent immediately to the airport for air transport to Japan, Los Angeles, etc. Fishes that does not pass for sashimi export typically goes to the fresh and frozen processors and canneries. The fresh and frozen processor cuts the whole tuna into their export client's preference and ships them via sea. The canneries uses large fresh tuna for their canned tuna export products. Parts of the whole tuna that the processor considered cuttings, such as the belly, *panga*, *buntot*, and other trimmings, are sold to the local consumers at lower prices. The next grade is for the domestic buyers for local export where the whole tuna is sent to some institutional buyers in Manila, Davao and other parts of the country. What does not pass for the three higher markets which are fishes that they termed *tamimik*, are left behind and bought by wet market traders for the wet markets. Retailers at the wet markets sell the tuna fish per kilo; this is what goes to a typical Mindanaoan dining table (Kho and Romo, 2012).

Figure 24. Handline Tuna Supply Chain in General Santos City



Source: Kho and Romo, 2012

4.1.3. Purse seine

A typical purse-seine fishing expedition needs between PhP 750,000 to 1,500,000 in start-up capital. It is a fleet-based operation composed of a mother-boat supported by service and light boats. The mother-boat and the light boats stay in the open sea for six months to one year. The mother-boat is usually stationary, while the light boats roam the fishing grounds to check the *payaos* and direct the mother-boat to the areas where there are better chances of abundant fish catch. There are purse-seine vessels that fish in other pacific island waters such as PNG and Solomon Islands. A service vessel comes regularly to transport the tuna catch from the fishing ground to the fish landing area. The purse-seine crew can likewise go home every time a service vessel visits the fishing operation. A minimum expense of PhP 100,000 is incurred every time a service boat goes to the open sea to transport tuna and crew and to bring in supplies of food and ice to the fleet. When the cost of fuel was still affordable, purse-seine operators used to send service vessels on a weekly basis to pressure the fishing crew to be more productive. But with the successive fuel hikes and value-added taxes, fleet owners save on fuel costs by sending the service vessels to the fishing ground only if there is an advisory from the purse-seine fleet of a sizeable catch that needs to be transported or in cases when it has to deliver much needed supplies for the fishing expedition.

4.2. Marketing

Tuna catches coming from municipal hook-and-line fishing operations are sold to the fish dealers based in the landing areas or sold directly to the wet market. Prices of tuna normally range from PhP 60 – 120 per kilo depending on the season, on the fluctuations in supply and demand and also on the operating costs.

While marketing of large tuna weighing 35 kilograms and up starts with weighing and classifying of the catch. Grading or classification of fish plays a vital role in tuna marketing. The classifiers meticulously check the external condition of the tuna and then, examines the meat by inserting a metal tube designed to be long enough to reach the different cross sections of the tuna. The extracted tuna meat is examined for its texture, colour, smell and taste. The tuna can then be classified as Grade A, B or C.

The export-quality fish is classified as Grades A or B. Grade A tuna is exclusively sold to the international market and is usually exported whole or with heads and entrails taken out. Grade B tuna is also of export quality, but only its prime meats are exported. Some of it also goes to the high-end buyers in the domestic market like restaurants and hotels. Tuna classified as Grade C are those that go to the local market, while some are bought by canneries and processing plants.

The price of tuna is determined by factors like classification, size, season, fluctuations in supply and demand, and the operating costs. Prior to landing the fish catch, boat owners and traders are already monitoring the market price of tuna both in the local and the international markets. Such information is used as leverage in negotiating for price between buyer and seller. Generally, traders dictate the prices of tuna to the disadvantage of the fishers, who feel that the pricing scheme is cartelized since traders often follow the same pricing cap for tuna products, thereby abolishing competition that could have resulted in higher prices for tuna.

The brokers are the primary actors in the selling of the tuna harvest. They act as the mediator or middleperson between the trader and the producers. There are instances when boat owners have no choice of traders or buyers since their catches are automatically sold to the financiers, who also act as traders. By financing the cost of the fishing operations, the traders are assured of a steady supply of tuna at a price that they can dictate.

Sashimi grade tuna is exported, normally to the USA and Japan; ~20-25% of tuna is sent to processors and exporters as tuna loins; value adding for other tuna products is conducted by processing plants and canneries; and some catches are sold directly in the local market. Market price for tuna sold by handline fishers depend on the grade classification of unloaded fish. Prices of fish for local market range from Php 90 to PhP 120 per kilo and those destined for export may be sold from Php 130 to PhP 250 per kilogram (West, etc al., 2011). Recently, prices for sashimi grade tuna ranges from PhP 350 – 390 per kilo.

Most companies in General Santos City export tuna products (either fresh, chilled, whole, frozen, or processed) by consignment to designated or exclusive overseas importers. It is therefore important for these companies to ensure continuous supply of tuna raw materials. Some tuna processing companies such as Citra Mina and Pescador Trading have expressed concerns on the continuous decline of tuna catch by handline vessels, which result in their failure to meet production and processing demand from export partners.

Similar to most fish ports in the Philippines, General Santos has a unique system of fish marketing and trade involving several stakeholders and intermediaries from fish producers to the consumers. This system shows the unique relationships between fishing vessel owners, producers, fishermen, financiers, processors, brokers, buyers, and consumers. The different systems and processes of how fish is unloaded in GSFPC are shown in Annex 4.

As a practice, canneries buy their tuna raw materials in Markets 2 and 3, where ringnet and purse seine vessels land their catch or from Wharves 1 and 2 of the GSCFC. For purse seine and ringnet operations where small size fish are caught, catches are sold by tub or *banyera*. Each tub contains around 33 kgs of tuna but is sold in them local wet market to a price equivalent to only 30 kg. The remaining 3 kg is considered a free 'allowance' for spoilage or product damage in the course of transporting the tuna from the fish port to the domestic market. This means clear losses on the part of the fish producers. The price per kilo of cannery grade tuna can range from Php 25 – 50 per kilo.

In the case of canneries, however, they pay for the full 33 kg for each tub. This is the primary reason why producers prefer to sell their products to the canneries even if the local wet market offers higher prices for tunas that weigh 300 grams and up. The canneries usually pay after 10-15 days. Boat owners claim that the increasing popularity of *katsubushi*, tuna shavings popularly used in Japanese recipes, has helped maintain demand, and eventually, the price of the purse-seine catch at a competitive level. Buyers from the local market are forced to offer better prices for the catch lest they be outbidded by the *katsubuhsi* buyers (Vera and Hipolito, 2006). Although some producers would also prefer to sell their catch to the wet market because buyers pay the catch outright or after 2-3 days unlike the canneries.

4.3. Foreign Trade

In 2011, the industry has exported around $ 314.49 million (FOB) which is 5.8% of the total agriculture products exported. The values posted a 9.5% average annual growth rate from year 2007. Tunas in airtight containers rank as number 1 in the list of exported fishery products with a volume that grows at 4.7%. Other exported tuna products are: Yellowfin, Skipjack & Atlantic Bonito in airtight container; Fresh or chilled Yellowfin tuna; Fresh or chilled Tuna fillets and frozen Tuna fillets and dried/ smoked tuna. These tuna products were shipped mostly in USA, Germany, UK, Ireland, Italy, Japan, Middle East, ASEAN, China, New Zealand and Australia (MinDA, 2011).

Table 10. Philippine Tuna Exports and Average Annual Growth Rate, 2007-2011

Tuna commodity, by volume (MT)	2007	2008	2009	2010	2011	AAGR (%)
In Airtight container	48,284	76,910	83,604	76,801	58,071	4.72
Fresh/chilled/frozen	26,854	32,365	23,504	33,688	22,027	-4.83
Dried/smoked	0.4	17			13,933	> 100
Total Value (million USD)	218.55	395.94	346.4	359.4	314.59	9.53

Source of basic data: *NSO*

4.4. Demands for Tuna Products

Domestic and International Demand for Tuna products

Local demand for both fresh and process tuna has steadily increasing due to increasing public consumption and stronger domestic market. In Europe, the demand for fresh, chilled and frozen tuna fillets is rapidly increasing. FAO, 2010 cited that commercial *sashimi-sushi* restaurants in France have increased substantially over the past decade with 400 to 500 restaurants now open particularly in the Paris region. Consumption of tuna *sashimi* per restaurant is estimated at between 1 and 30 kg per day. On average, between 80 and 90

sashimi-sushi meals per restaurant are served each day. In the United States, recent tuna imports for non-canning purposes ranged from 60 000 to 90 000 tonnes with an increasing trend, while domestic landing of such products ranges from 20 000 to 30 000 tonnes with a declining trend. Total consumption in the United States is estimated at 80 000 to 110 000 tonnes per year. The increasing public awareness on sustainable fishing has created an increasing worldwide demand for eco-labelled tuna products (MinDA, 2011).

Flexibility and elasticity of demand for tuna products

The demand for raw tuna can be considered to be fairly elastic, which reflects the fact that the ex-vessel market is very competitive and that regional change in tuna catches have a limited impact on market prices because the latter are mostly determined on the demand side. On the other hand, the demand for canned tuna is rather inelastic, which provides opportunities for market power at the retail level (FAO, 2010 as cited by MinDA, 2011).

5. Major Tuna Industry Associations

5.1. Socsksargen Federation of Fishing and Allied Industries, Inc. (SFFAII)

Socsksargen Federation of Fishing and Allied Industries, Inc. a non-government, non-profit organization, established in 1999 as an umbrella organization of 7 associations with over 120 companies involved in fishing, canning, fish processing, aquaculture production & processing and other allied industries. Its membership cuts across the entire value chain from the capture fisheries sector, composed of the hand line group, the small, medium & large commercial ring netters and purse seine operators, to the fish processing sector composed of the big canning operators, fresh chilled and frozen processors, and value adding processors. It is based in General Santos City governed by a Board of 14 Directors with the Executive Director supervising the day-to-day operations and spearheading all advocacy works. The funding for its operations is largely generated from the tuna congress it holds and annual dues from members.

6.1.1 Members

The member-associations include:

6.1.1.1 Southern Philippines Boat Owners and Tuna Association (SPBOTA)
6.1.1.2 South Cotabato Purse Seiners Association (SOCOPA)
6.1.1.3 Umbrella Fish Landing Association (UFLA)
6.1.1.4 Chamber of Aquaculture and Ancillary Industries of Sarangani, Inc. (CHAINS)
6.1.1.5 Tuna Canners Association General Santos (TCAGS)
6.1.1.6 Fresh Frozen Seafood Association - Tuna Processors Philippines, Inc. (FFSA-TPPI)
6.1.1.7 Tuna Cooperative of General Santos City (Tuna Coop)

6.1.2. Vision, Mission, Objectives

The vision-mission of the institution is to be a cohesive federation acting as catalyst towards attaining fishing industry's sustainability and global competitiveness through advocacy work in the local, national and international level." It's leadership exercises democratic and participative means in attaining the federation's objectives which are anchored on its core values of unity, co-opetition, collaboration, equality and social responsibility.

The objectives of the federation are the following:

6.1.2.1. Unite the different fishing associations and allied industries in SOCSKSARGEN to jointly work for a sustainable and globally competitive industry;
6.1.2.2. Serve as the voice of the fishing industry in lobbying for key policy agenda and relevant issues and concerns;
6.1.2.3. Provide a neutral venue for its members to raise specific problems and resolve fundamental issues besetting the industry; and,
6.1.2.4. Serve as a forum to strengthen industry representation and positioning with respect to other players in the world with the end in view of protecting, expanding, and maintaining the country's strategic lead in the tuna industry.

Over the years, SFFAII has been living up to its vision-mission effectively. It has been instrumental to the passing of legislation, policies and regulations in the form of Fisheries Administration Orders by participating in assemblies and public consultations. It has memberships in the policy and advisory bodies of the Department of Agriculture such as the National Tuna Industry Council, National Agriculture and Fisheries Council-Committee on Fisheries and Aquaculture and the National Fisheries and Aquaculture Resource Management Council. SFFAII has been actively participating as part of the Philippine delegation in the Western and Central Pacific Fisheries Commission. Locally, SFFAII has membership in committees of the General Santos City Local Goverment's Committees on Bankability, Competitiveness and Good Governance. Further, it is one of the founding members General Santos Small and Medium Enterprise Development Inc.where it holds a board directorship.

Consistent with the time-honored tradition of advocacy and standing-up for relevant issues and immediate concerns affecting the fishing industry, SFFAII hosts the annual National Tuna Congress that passes for adoption relevant congress resolutions of the Tuna Industry.

5.2. Alliance of Philippine Fishing Federations, Inc. (APFFI)

The Alliance of Philippine Fishing Federations, Inc. (APFFI) is non-government organization which boasts of a different and large membership involved in fishing industry and socio-economic development of the country. It aims to foster a comprehensive knowledge and contribution as an institution in nation building and serves as the center of information.

Presently, it has six (6) regional federations with (8) cities and (20) municipal association members. It shall link with the fisherfolk serviced by its municipal associations. The objectives of the APFFI are:

1. To promote broader public understanding on the nature of the ALLIANCE as an institution of nation building;
2. To foster camaraderie, coordination and cooperation among members federations for optimum impact using available resources;
3. To serve as a lobby group on key issues raised by its members ;
4. To serve as a center of information, education, and communication on fishing industry.

6. Fisheries Management and Policy

6.1. Institutional arrangements

Tuna fisheries management in the Philippines is primarily governed by the national government, through the Department of Agriculture Bureau of Fisheries and Aquatic Resources (DA-BFAR), and the local government. The DA-BFAR is given the responsibility to manage, conserve, develop, protect, utilise, and dispose of all fisheries and aquatic resources beyond municipal waters while municipal and city governments have jurisdiction over municipal waters of up to 15 kilometers from the shoreline.

Aside from the DA-BFAR and local government units, there are other government agencies with fisheries-related functions, which are involved in addressing issues related to tuna fisheries management. These agencies include the Department of Environment and Natural Resources (DENR), Maritime Industry Authority (MARINA), Philippine Fisheries Development Authority (PFDA), Philippine Ports Authority (PPA), Department of Trade and Industry (DTI), and the Department of Foreign Affairs (DFA). The functions of these agencies include the protection of fish habitat, management of fish ports, registration of fishing vessels, regulation of fish trade, and fisheries negotiations. There are also a number of research and policy support agencies, the most important of which include the National Fisheries Research and Development Institute (NFRDI) and Bureau of Agriculture Statistics (BAS). The enforcement agencies given the responsibility to enforce fisheries laws are the Philippine Coast Guard, Philippine Navy, Philippine National Police Maritime Group, and the Philippine Air Force.

Local government units, particularly municipal and city governments, also play a critical role in the management, conservation, development, protection, and utilization of all fish and fishery resources within their respective municipal waters. As part of the Philippine policy of decentralization, local governments are given the autonomy to exercise fisheries functions, including policy formulation and enforcement. Municipal and city governments may enact appropriate ordinances for this purpose and provide regulations on licensing and permits and other fisheries activities. Municipalities have the exclusive authority to grant fishery privileges in the municipal waters and impose rentals, fees or charges. The city government may grant fishery privileges to erect fish corrals, oyster, mussel or other aquatic beds or milkfish fry areas, within a definite zone of the municipal waters; grant the privilege to gather, take or catch milkfish and prawn fry, or fry of other species and fish from the municipal waters by nets, traps or other fishing gears to marginal fishermen; and issue licenses for the operation of fishing vessels of 3 GRT or less. Local governments may also enforce all fishery laws, rules, and regulations as well as fishery ordinances enacted by the municipality or city councils. Through appropriate ordinances, LGUs may penalise fishers for the use of explosives, noxious or poisonous substances, electricity, *muro-ami*, and other deleterious methods of fishing, and prosecute any violation of fisheries laws within their jurisdiction.

A number of coordinating bodies have been established to facilitate the implementation of fisheries management measures. These coordinating mechanisms include the National Agriculture and Fisheries Council (NAFC), Fisheries and Aquatic Resource Management Councils (FARMCs), Philippine Council for Aquatic and Marine Research and Development (PCAMRD), National Committee on Illegal Entrants (NCIE), Monitoring Control and Surveillance Coordinating and Operations Centers (MCSCOCs), *Bantay Dagat* (Sea Watch) Program, and National Tuna Industry Council (NTIC).

The Philippines is committed to strengthening its instrumentalities to promote the effective management and conservation of tuna resources, by implementing an effective registration and licensing system, improving its data collection and analysis, enhancing port State control, and more effective enforcement. The country is also developing mechanisms to increase collaboration

amongst government agencies, and by engaging the industry as partners in the development of the tuna fishery.

Table 11. Summary of key agencies and their functions related to tuna fisheries management.

Agencies	Key function/s related to tuna fisheries management
BFAR	manage, conserve, develop, protect, utilize, and dispose of all fisheries and aquatic resources beyond municipal waters
DENR	protection of fish habitat
DTI	regulation of fish trade
DFA	fisheries negotiations
MARINA	registration of fishing vessels
PFDA, PPA	management of fish ports
NFRDI, BAS	research and policy support agencies
LGUs	manage, conserve, develop, protect, and utilize all fish and fishery resources within their respective municipal waters
Philippine: Coast Guard, Navy, National Police Maritime Group, and Air Force	enforce fisheries laws
NAFC, FARMCs, PCAMRD, NCIE, MCSCOCs, Sea Watch, NTIC	coordinating bodies have been established to facilitate the implementation of fisheries management measures

6.2. List of Policies issued by DA-BFAR

There are various fisheries policies that govern our tuna fishing industry. Below is the list of Fisheries Administrative Orders (FAOs):

FAO 144, s. 1983	Rules and regulations on commercial fishing
FAO 183, s. 1992	Prohibiting the importation of yellowfin tuna and tuna products from certain countries
FAO 188, s. 1993	Regulations governing the operating of commercial fishing boats in Philippine waters using tuna purse seine nets.
FAO 198, s. 2000	Rules and regulations on Commercial Fishing.
FAO 199, s. 2000	Guidelines on Fish Transhipment
FAO 204, s. 2000	Restricting the use of superlights in fishing.
FAO 217, s. 2001	Obstruction to Defined Migration Paths.
FAO 223, s. 2003	Moratorium on the issuance of new Commercial Fishing Vessel and gear License (CFVGL) as part of a precautionary approach to fisheries management
FAO 223-1, s. 2004	Amending Sections 1 and 2 of Fisheries Administrative Order No. 223, s. of 2003, re: Moratorium on the issuance of new Commercial Fishing Vessel

	and gear License (CFVGL)
FAO 224, s. 2004	Establishment of Tuna Productivity Project in Davao Gulf.
FAO 226, s. 2008	Regulation on the Mesh Size of Tuna Purse Seine Nets and Trading of Small Tuna
FAO 227, s. 2009	Rules and Regulations Governing the Export of Fish and Aquatic Products to European Union Member Countries
FAO 228, s. 2009	Rules governing the organization and implementation of official controls on fishery and aquatic products intended for export to the EU market for human consumption
FAO 236 s.2010	Rules and Regulations on the Operations of Purse Seine and Ring Net Vessels Using Fish Aggregating Devices (FADs) locally known as Payaos during the FAD Closure Period as Compatible Measures to WCFPC CMM 2008-01
FAO 236-1 s.2012	Extension of FAO 236 series of 2012: Rules and Regulations on the Operations of Purse Seine and Ring Net Vessels Using Fish Aggregating Devices (FADs) locally known as Payaos during the FAD Closure Period as Compatible Measures to WCPFC CMM 2008-01
FAO 238 s.2012	Rules and Regulations Governing the Implementation of Council Regulation (EC) No. 1005/2008 on the Catch Certification Scheme
FAO 240 s.2012	Rules and Regulations in the Implementation of Fisheries Observer Program in the High Seas
FAO 241 s.2012	Regulation and Implementation of the Vessel Monitoring System (VMS) in the High Seas
FAO 244 s.2012	National Tuna Fish Aggregating Device (FAD) Management Policy
FAO 245 s.2012	Regulations and Implementing Guidelines on Group Tuna Purse Seine Operations in High Seas Pocket Number 1 as a Special Management Area

6.3. Management Plans

6.3.1. National Tuna Management Plan (NTMP)

The Revised Philippine National Tuna Management Plan provides the framework for the sustainable management and equitable use of tuna fisheries in the country, promotion of responsible fishing practices by Philippine-flagged vessels fishing for tuna in areas beyond national jurisdiction, and the development of the fishing industry through responsible trade for tuna products. This Plan implements the *Philippine Fisheries Code* (Republic Act 8550) and all relevant domestic policies, legislation and regulations, including the obligations of the Philippines under international fisheries instruments and regional fisheries agreements to which the country is a party. The Plan has been revised to align management measures with the need for the proper conservation of tuna resources and the aspirations of the Philippines for its tuna industry. The Philippine National Tuna Management Plan

elaborates the objectives, principles, and scope of the Plan, the importance of tuna fisheries in the Philippines, applicable legal, policy and institutional framework, and management and enforcement measures for tuna fisheries in the Philippines.

6.3.2. FAD Management Policy

Pursuant to the Philippine Fisheries Code of 1998 (Republic Act 8550) and in line with the Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fishing, the FAD management Plan was drafted to set policies and guidelines in order to regulate the deployment and number of FADs associated with tuna fishing operations and to impose reportorial requirements on those engaged in its operations, in order to significantly reduce the mortality of juvenile yellowfin and bigeye tuna species and ensure the sustainability of their population in the Western and Central Pacific Ocean (WCPO).

6.4. Monitoring, Control and Surveillance (MCS) Activities

One of the key pillars of fisheries management and enforcement in the Philippines is monitoring, control and surveillance (MCS). An MCS system is established by DA-BFAR in coordination with LGUs, Fisheries and Aquatic Resources Management Council (FARMCs), the private sector and other agencies concerned to ensure that fisheries and aquatic resources in Philippine waters are judiciously and wisely utilized, managed, and conserved for the benefit and exclusive enjoyment of Filipinos.

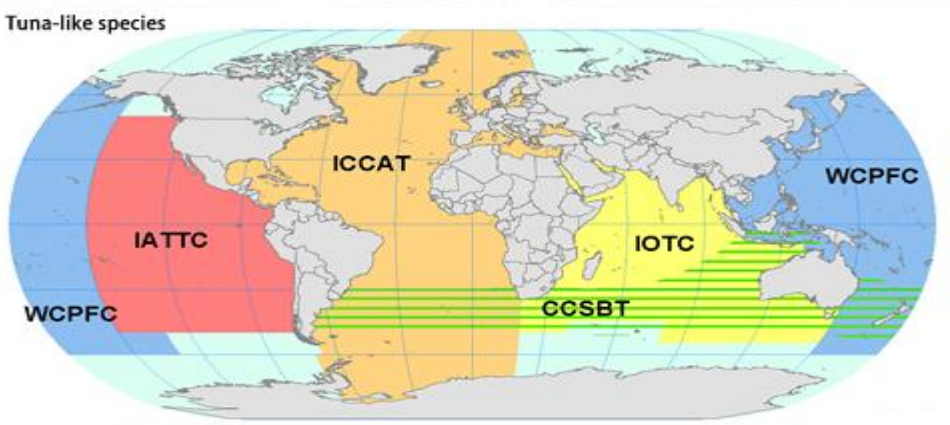
The Philippine MCS system for fisheries has land, sea and air components. The land component involves the acquisition of communication, and vessel tracking equipment for the Vessel Monitoring System (VMS), as well as the establishment of national and regional MCS Coordination and Operation Centers (and Fisheries Monitoring Centers) in strategic fishing areas. The sea component of this MCS system pertains to the deployment of fisheries observers to commercial fishing vessels operating within the Philippine EEZ and in the High Seas and the deployment of patrol vessels in the different regions in the Philippines which has resulted in the successful deterrence and arrest of fisheries offenders. The *Bantay Dagat*, as a form of community-based surveillance, is also an integral part of MCS for fisheries in the Philippines. As for the Offshore MCS, BFAR has strategically deployed and operationalized 14 units patrol vessels which are composed of 10 units 30-meters and 4 units 11-meters to combat IUU fishing.

In 2011, MSC patrol activities apprehended 137 violations under various sections of RA 8550: Philippine Fisheries Code which includes i) unauthorized fishing, ii) use of fine mesh nets, iii) use of active gears in municipal waters and iv) commercial fishing vessels employing unlicensed fisherfolks or crew. There were also 80 apprehensions due to violation of FAO 236: Rules and Regulations on the Operations of Purse Seine and Ring Net Vessels Using Fish Aggregating Devices (FADs) locally known as Payaos during the FAD Closure Period as Compatible Measures to WCFPC CMM 2008-01. MSC patrol vessels also apprehended poachers. The most recent were in 2011, MCS 3007 patrol apprehended one vessel along 24 nautical miles East off Divuisa Point, Palanan, Isabela and in 2012, MCS 3009 apprehended a vessel along vicinity 23 NM West off Pangutarang Group Island of Sulu and MCS 3007 apprehended another vessel along vicinity 16.3 nm East off Babuyan Island.

7. Regional Fisheries Management Organization (RFMOs)

As a member of the Western and Central Pacific Fisheries Commission (WCPFC), the Indian Ocean Tuna Commission (IOTC), and International Commission for the Conservation of Atlantic Tunas (ICCAT); a Cooperating Non-member to the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), the Philippines implements its obligations under the respective regional conventions and conservation and management measures (CMMs) adopted by these organizations. A summary of CMMs adopted by different RFMOs which the Philippine is a member is found in Annex 7. Philippines also recognizes its commitment to cooperate within the framework of other regional organizations and arrangements which may have an impact on tuna fisheries management policies such as the Asia Pacific Fisheries Commission (APFIC), Southeast Asian Fisheries Development Council (SEAFDEC), Asia Pacific Economic Cooperation (APEC), and Regional Plan of Action to Promote Responsible Fishing Practices Including Combating Illegal, Unreported and Unregulated Fishing (RPOA), and the Coral Triangle Initiative (CTI).

Figure 25. Map of showing the area of coverage of different RFMOs.



Source: http://ec.europa.eu/fisheries/cfp/international/rfmo/index_en.htm

7.1. Member

7.1.1. Western and Central Pacific Fisheries Commission (WCPFC)

The Western and Central Pacific Fisheries Commission (WCPFC) was established by the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention) which entered into force on 19 June 2004. The Convention was concluded after six years of negotiation which commenced in 1994. The period between the conclusion of the Convention and its entry into force was taken up by a series of Preparatory Conferences that laid the foundations for the Commission to commence its work.

The WCPF Convention draws on many of the provisions of the UN Fish Stocks Agreement [UNFSA] while, at the same time, reflecting the special political, socio-economic, geographical and environmental characteristics of the western and central Pacific Ocean (WCPO) region. The WCPFC Convention seeks to address problems in the management of high seas fisheries resulting from unregulated fishing, over-capitalization, excessive fleet capacity, vessel re-flagging to escape controls, insufficiently selective gear, unreliable databases and insufficient multilateral cooperation in respect to

conservation and management of highly migratory fish stocks. A framework for the participation of fishing entities in the Commission which legally binds fishing entities to the provisions of the Convention, participation by territories and possessions in the work of the Commission, recognition of special requirements of developing States, and cooperation with other Regional Fisheries Management Organizations (RFMO) whose respective areas of competence overlap with the WCPFC reflect the unique geo-political environment in which the Commission operates.

The Commission supports three subsidiary bodies, namely, the Scientific Committee, Technical and Compliance Committee, and the Northern Committee, that each meet once during each year. The meetings of the subsidiary bodies are followed by a full session of the Commission. The work of the Commission is assisted by a Finance and Administration Committee.

Member countries include Australia, China, Canada, Cook Islands, European Union, Federated States of Micronesia, Fiji, France, Japan, Kiribati, Korea, Republic of Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, **Philippines**, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States of America and Vanuatu.

While the participating territories includes American Samoa, Commonwealth of the Northern Mariana Islands, French Polynesia, Guam, New Caledonia, Tokelau, Wallis and Futuna. Lastly, the cooperating non-members are Belize, Ecuador, El Salvador, Indonesia, Mexico, Senegal, Vietnam, Panama and Thailand.

7.1.2. Indian Ocean Tuna Commission (IOTC)

The Indian Ocean Tuna Commission (IOTC) is an intergovernmental organization mandated to manage tuna and tuna-like species in the Indian Ocean and adjacent seas. Its objective is to promote cooperation among its Members with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks and encouraging sustainable development of fisheries based on such stocks.

Member countries include Australia, Belize, China, Comoros, Eritrea, European Community, France, Guinea, India, Indonesia, Iran, Japan, Kenya, Korea, Madagascar, Malaysia, Maldives, Mauritius, Oman, Pakistan, **Philippines**, Seychelles, Sierra Leone, Sri Lanka, Sudan, Tanzania, Thailand, United Kingdom and Vanuatu.

Cooperating Non-Contracting Parties Mozambique, Senegal, South Africa.

7.1.3. International Commission for the Conservation of Atlantic Tunas (ICCAT)

The International Commission for the Conservation of Atlantic Tunas is responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and adjacent seas. The organization was established at a Conference of Plenipotentiaries, which prepared and adopted the International Convention for the Conservation of Atlantic Tunas, signed in Rio de Janeiro, Brazil, in 1966. After a ratification process, the Convention entered formally into force in 1969.

About 30 species are of direct concern to ICCAT: Atlantic bluefin (*Thunnus thynnus thynnus*), skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacares*), albacore (*Thunnus alalunga*) and bigeye tuna (*Thunnus obesus*); swordfish (*Xiphias gladius*); billfishes such as white marlin (*Tetrapturus albidus*), blue marlin (*Makaira nigricans*), sailfish (*Istiophorus albicans*) and spearfish (*Tetrapturus pfluegeri*); mackerels such as spotted Spanish mackerel (*Scomberomorus maculatus*) and king mackerel (*Scomberomorus cavalla*); and, small tunas like black skipjack (*Euthynnus alletteratus*), frigate tuna (Auxis *thazard*), and Atlantic bonito (*Sarda sarda*).

Through the Convention, it is established that ICCAT is the only fisheries organization that can undertake the range of work required for the study and management of tunas and tuna-like fishes in the Atlantic. Such studies include research on biometry, ecology, and oceanography, with a principal focus on the effects of fishing on stock abundance. The Commission's work requires the collection and analysis of statistical information relative to current conditions and trends of the fishery resources in the Convention area. The Commission also undertakes work in the compilation of data for other fish species that are caught during tuna fishing ("bycatch", principally sharks) in the Convention area, and which are not investigated by another international fishery organization.

The Commission may be joined by any government that is a member of the United Nations (UN), any specialized UN agency, or any inter-governmental economic integration organization constituted by States that have transferred to it competence over the matters governed by the ICCAT Convention. Instruments of ratification, approval, or adherence may be deposited with the Director-General of the Food and Agriculture Organization of the United Nations (FAO), and membership is effective on the date of such deposit. Currently, there are 48 contracting parties.

United States, Japan, South Africa, Ghana, Canada. France, Brazil, Maroc, Korea, Cote D'Ivoire, Angola, Russia, Gabon,Cap-Vert, Uruguay, Sao Tome E Principe, Venezuela, Guinea Ecuatorial, Guinee, United Kingdom, Libya, China, Croatia, European Union, Tunisie, panama, Trinidad and Tobago, Namibia, Barbados, Honduras, Algerie, Mexico, Vanuatu, Iceland, Turkey, Philippines, Norway, Nicaragua, Guatemala, Senegal, Belize, Syria, St. Vincent & the Grenadines, Nigeria, Egypt, Albania, Sierra Leone and Mauritania.

Co-operators

ICCAT can also grant the status of co-operators following the procedures outlined in the 2003 Recommendation by ICCAT on Criteria for Attaining the Status of Cooperating Non-Contracting Party, Entity or Fishing Entity in ICCAT. Currently, this status has been attained by the following:

- Chinese Taipei
- Guyana
- Curaçao
- Colombia

7.2. Co-operating non-member

7.2.1. Commission for the Conservation of the Southern Bluefin Tuna (CCSBT)

The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) is an intergovernmental organisation responsible for the management of southern bluefin tuna throughout its distribution.

The CCSBT's objective is to ensure, through appropriate management, the conservation and optimum utilisation of southern bluefin tuna.

Members of the Extended Commission comprise: Australia, the Fishing Entity of Taiwan, Indonesia, Japan, Republic of Korea and New Zealand.

Cooperating Non-Members comprise: the Philippines, South Africa and the European Union.

7.3. Non-member

7.3.1. Inter-American Tropical Tuna Commission (IATTC)

The IATTC is responsible for the conservation and management of tuna and other marine resources in the eastern Pacific Ocean.

The members of the IATTC are: Belize, Canada, China, Columbia, Costa Rica, Ecuador, El Salvador, European Union, France, Guatemala, Japan, Kiribati, Korea, Mexico, Nicaragua, Panama, Peru, Chinese Taipei, United States, Vanuatu and Venezuela.

Cook Islands is a Cooperating non Party

7.4. Philippine Initiatives and Policy Directions

As a member of the Indian Ocean Tuna Commission (IOTC), International Commission for the Conservation of Atlantic Tunas (ICCAT) and the Western and Central Pacific Fisheries Commission (WCPFC), and a Cooperating Non-member to the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), the Philippines implements its obligations under the respective regional conventions and conservation and management measures adopted by these organizations. As stated in the Revised National Tuna Management Plan (May 2012), the following are Philippine measures and policy directions:

i. **Determination of Catch Limit based on Best Scientific Evidence Available -** The Bureau of Fisheries and Aquatic Resources will prioritize work towards the determination of catch limits based on MSY and other appropriate indicators and reference points (e.g. exploitation rates) for tuna resources in Philippine waters. The determination of MSY and other indicators will assist in the setting of TAC for tuna resources. Setting of TAC will help ensure equitable use of tuna resources in Philippine waters, promote optimal economic and social benefits for the Filipinos, and protect the interests of municipal fisherfolks. If after the MSY or other indicators have been determined there is enough evidence to suggest that tuna stocks are being fished beyond its capacity, the BFAR will adopt additional measures to ensure that fishing effort does not exceed sustainable catch levels.

   Determination of MSY and TAC will help the Philippines move away from an open access regime towards a rights based management for the tuna fishery. This management system

will include the development of a harvest strategy in accordance with target and limit reference points. The Philippines will work towards the determination of these reference points for key tuna fisheries, and in the interim will adopt measures to prevent negative fishing pressures based on existing data and best scientific evidence available. The Philippines will hold workshops on scientific methods to determine appropriate levels of fishing effort and catch limits for the country. It will also collaborate with neighboring States to establish regional assessments for shared tuna stocks.

ii. **Limitation of Fishing Effort and Capacity** - Limitations in fishing effort and capacity of Philippine flagged vessels conducting operations outside national jurisdiction are generally provided under bilateral access agreements, domestic fisheries regulations, and relevant regional fisheries management organizations. For example in ICCAT, the capacity limitation for bigeye tuna fishing by vessels larger than 24 meter LOA is 8 longline vessels. ICCAT also provides that the Philippines may be allowed two additional longline vessels to fish for bigeye tuna in the Convention area only in 2010 and 2011. The total allowable catch for swordfish provided to the Philippines is 50 tons from 2010-2012. For southern bluefin tuna, the CCSBT has provided the Philippines a total allowable catch of 45 tons for 2010 and 2011.

As at 2012, in the western and central Pacific, limit in fishing effort is provided in WCPFC Conservation and Management Measure 2008-01 (extended by CMM 2011-11). For bigeye tuna, the Philippines is required to obtain a 30% reduction in catch from 2004 level or 2001-2004 average. No increase in fishing mortality is allowed for yellowfin tuna beyond 2004 level or 2001-2004 average. Tuna fishing vessels conducting operations in areas beyond national jurisdiction, and in particular the EEZ of Pacific Island States, are required to comply with the Vessel Day Scheme in PNA Countries. The VDS limits total days fished in the EEZ of PNA members to no greater than 2010 levels.

A number of limitations also apply to the access of Philippine vessels on the high seas under CMM 2011-01. The WCPFC High Seas Pocket No 1, an area bounded by the EEZs of the Federated States of Micronesia, Republic of Palau, Indonesia and Papua New Guinea, is open for fishing to traditional fresh/ice chilled fishing vessels operating as a group. The total catch of these vessels shall not exceed the equivalent validated vessel days fished on the high seas. The Philippine vessel limit for this high seas pocket is 36 vessels. Other MCS requirements apply to these vessels as discussed in succeeding sections, such as those with respect to catch reporting, VMS, and observer program.

iii. **Regulation of Transshipment at Sea** -Transshipment activities in high seas areas are generally limited in port in order to prevent laundering of tuna, particularly in ICCAT and WCPFC. However, transshipment at sea is also allowed in areas managed by relevant regional fisheries management organizations subject to a number of conditions.

The CCSBT for example, requires carrier vessels that receive southern bluefin tuna transshipments at sea to be authorized and for a CCSBT observer to be on board the carrier vessel during transshipment. Similarly, the IOTC requires prior authorization for transshipment activities at sea and observers on board vessels to comply with catch documentation scheme. The transshipment programs of IOTC, ICCAT, and CCSBT implement harmonized schemes. An ICCAT or IOTC observers on transshipment vessels authorized to receive southern bluefin are deemed to be CCSBT observers, provided that the CCSBT standards are met.

In the case of the WCPFC, transshipment at sea is permitted but only by existing group seine operations composed of small purse seine boats (fish hold capacity of 600 mt or less) flagged to Papua New Guinea and the Philippines, as long as they meet the following conditions: (a) operate in tandem with freezer carrier boat/s to freeze the catch or if operating closer to base with ice carrier boat/s to store the fish; (b) operate as one group together with their support vessels such as freezer carrier boat/s and/or ice carrier boat/s; and (c) undertake transshipment when refrigerated or other ice carrier boats dock alongside catcher boats and tranship fish from the catcher boats.

iv. **Regional Observer Program -** The Philippines participates in regional observer programs established by regional fisheries management organizations. Vessels on the high seas and those fishing in areas under the jurisdiction of other States are required to accept observers onboard vessels in accordance with the procedures established in relevant regional fisheries management organizations. Philippine flagged vessels are also required to cooperate with the observers in order to ensure that their duties are undertaken in an efficient manner. The rights and obligations of both observers and fishing vessels are clearly provided in regional observer programs established under regional fisheries management organizations. These regional organizations also provide for cross-endorsement or mutual recognition of observers, particularly those with overlapping areas of competence or share similar stocks.

Philippines has established a National Fisheries Observer Program (NFOP) under DA-FAO 240. The NFOP covers all commercial fishing boats/catcher boats that target tuna species operating with major fishing gears and conducting transshipment on the high seas. Under the DA-FAO 240, all purse seine, longline and transshipment vessels conducting fishing operations on the high seas shall not engage in fishing without a duly authorized RFMO or NFOP observer on board.

v. **Vessel Monitoring System (VMS) -** Part of the vessel monitoring system of the Philippines is the requirement for vessels fishing outside Philippine jurisdiction to carry a transponder that complies with the DA-BFAR VMS under DA-FAO 241. In fishing activities conducted under bilateral access arrangements, the installation of a transponder or automatic location communicator, as well as the provision of VMS data is a requirement to obtain an authorization to fish, such as in the fisheries access arrangements with Pacific Island States. Relevant regional fisheries management organizations such as IOTC, ICCAT, CCSBT, and the WCPFC have established vessel monitoring systems which all Philippine-flagged vessels fishing on the high seas are required to comply with.

vi. **Entry and Exit Position Reporting -** In addition to automatic transmission of location under the VMS, vessels fishing on the high seas, particularly the traditional fresh/ice chilled fishing vessels are required to report entry and exit positions to the WCPFC at least 24 hours prior to entry and no more than 6 hours prior to exiting High Seas Pocket No 1. The information may also be transmitted to adjacent coastal States/Territories. Reporting should follow the following format: VID/Entry or Exist: Date/Time; Lat/Long. In view with the fishing operations in the HSP1-SMA, BFAR FMC has developed a dedicated website for commercial fishing operators to log in and to input their fishing vessels request for entry and exit to HSP1-SMA.

vii. **Boarding and Inspection on the High Seas -** The Philippines will cooperate with other States in implementing boarding and inspection regime of relevant regional fisheries management organizations.

viii. **Port State Measures -** Philippine flagged fishing vessels calling into other ports to land, transship and process tuna would need to comply with the requirements of other port States. Since coastal States exercise sovereignty over their ports, it is expected that different measures will apply in various ports. The vessels would need to be aware of and comply with domestic regulations on port State measures. Some of these port State measures include advanced notification of port entry, inspection of safety of fishing vessels, documents, gears and catch, and reportorial requirements. Under international law, port State measures have the right to take enforcement actions for alleged infringement, including by prohibiting the landing of fish and denial of port entry, except in cases of distress or *force majeure*. The Philippines will assist Philippine flagged vessels in understanding and complying with port State measures by publicizing such measures into a language understandable by all relevant stakeholders, particularly vessel masters and crew.

ix. **Charter Vessels -** The Philippines will ensure that all chartering arrangements involving Philippine vessels are notified to relevant regional fisheries management organizations. With the cooperation of MARINA and other relevant authorities, the DA-BFAR will ensure that chartered vessels comply with requirements set by the coastal State and regional organizations. This shall be a key condition in renewing leases and charters of fishing vessels.

x. **Catch and Trade Documentation -** The two regional schemes to document fish and fish products that enter trade are trade documentation and catch certification. The Philippines participates in catch and trade documentation schemes of regional fisheries management organizations. ICCAT, IOTC, and CCSBT have adopted trade documentation programmes and use comparable statistical and trade document forms particularly for bigeye tuna, southern bluefin, swordfish, and other species. It is a requirement for all vessels catching such species to obtain trade documents and have them validated by the Philippines as a flag State and relevant port State authorities. Such regional measures are implemented to identify the source of tuna and ascertain levels of unreported fishing.

The Philippines will continue to implement trade document schemes and work towards the use of electronic catch and trade documents. The establishment of an electronic trade documentation system will be consistent with the relevant provisions of the Electronic Commerce Act of 2000 (RA 8792), particularly on the confidentiality of information.

xi. **IUU Vessel Listing -** Tuna regional fisheries management organizations have adopted similar measures to list vessels engaged in IUU fishing. Vessels, whether flagged under parties or non-parties to regional organizations, may be placed on the IUU Vessel List, if there is sufficient evidence to suggest, (through boarding and inspection, observer program, coastal State monitoring, and port State measures) that they have conducted activities that undermine agreed conservation and management measures. A vessel presumed to have conducted IUU fishing are listed on a Provisional IUU Vessel list and are given the opportunity, through its flag State, to provide evidence that it has not conducted IUU fishing. If it has been established that the vessel has conducted activities contrary to agreed management measures, the onus is on the flag State to prove that it taken sufficient measures to address such breach according to IUU listing procedures and to the satisfaction of the members of the regional fisheries management organizations. In the absence of effective flag State responsibility and sufficient evidence to prove that the vessel has not conducted IUU fishing, such vessel may be listed in the final IUU Vessel List. Regional fisheries management organizations recognize and exchange IUU Vessel Lists to encourage their members and fishing industry not to engage with those involved in IUU fishing.

Vessels on the IUU list are removed from the regional record of fishing vessels and will not be entitled to fish in the area of competence of the regional fisheries management organization. A vessel may only be removed from the IUU Vessel List if there is sufficient evidence that the owner and operator of the vessel no longer has any financial or legal interest in the vessel, if the vessel has been scrapped, and/or if the flag State has taken sufficient measures to address the wrongdoing of the vessel.

One critical measure to be noted is the listing of vessels on the basis of association with IUU vessels by means of ownership. The WCPFC has adopted Conservation and Management Measure 2010-06 which provides for the listing of IUU vessels ("underlying vessels) and any other vessel affiliated with the underlying vessel by reason of ownership. This measure is believed to have a significant economic repercussion to the commercial tuna fishing industry in the event that a Philippine-flagged vessel is placed on the IUU list. To date no Filipino vessel has been included on the IUU Vessel List.

The Philippines will exercise effective control over vessels flying its flag, particularly those fishing in international waters. There will be increased monitoring of Philippine-flagged vessels through observer programs, more effective port State measures, strict implementation of the logbook system, and vessel monitoring system. The Philippines will also cooperate with other States, through regional fisheries management organizations, to combat IUU fishing. In addition to proper monitoring, the Philippines will discharge its responsibility as a flag State by assisting its fishing vessels to comply with regional conservation and management measures, and by facilitating the submission of required fisheries data to the secretariats of the organizations, including necessary evidence to prove that the vessel has not engaged in IUU fishing.

Philippines is also a party to various ASEAN Free Trade Agreements and the country is geared towards enhancing capabilities to improve compliance with international trade agreements and international maritime safety and labor regulations. In relation to Philippine compliance with International Maritime Organization (IMO) Conventions, the 1997 Philippine Merchant Marine Rules and Regulations (PMMRR 97) prescribes that ships flying the Philippine flag which, by their size and type of operation, are covered by international maritime conventions shall remain to be covered by those international maritime. With respect to the fishing sector, the MARINA is pursuing the adoption of the rules, regulation and standards of the Torremolinos Protocol, as amended and the STCW-F Convention.

8. Tuna Fisheries Statistics and Research Activities

8.1. Data Collection Initiatives

8.1.1. Port sampling

The National Stock Assessment Program (NSAP) has continued to collect port sampling data in major tuna landing areas around the country. Increased port sampling coverage was realized through the West Pacific East Asia Oceanic Fisheries Management Project (WPEA-OFMP) which started 2010.

Port sampling data collection on selected tuna landing sites follows the NSAP protocol wherein sampling are being conducted every other two days regardless of Saturdays, Sundays and Holidays. All fishing boats of whatever fishing gear (whether purse seine, ring net, gill

net, handline, etc) unloading their catch were sampled when possible. Data are recorded in prepared NSAP forms which include the following information:

A. Name of fishing ground
B. Landing Center
C. Date of Sampling
D. Name of Boat
E. No. of fishing days of the actual fishing operation (time)
F. Total catch by boat (no. of boxes/bañeras or weight)
G. Catch sample weight
H. Catch composition (scientific names)
I. Name and signature of samplers/enumerators

Data collected are submitted by the Project Leaders / Assistant Projects Leaders of each region to the National Fisheries Research and Development Institute (NFRDI) office. Monthly port sampling reports forwarded to NFRDI are being managed using the NSAP Database System.

8.1.2. Logsheets

Since 2008, the Bureau of Fisheries and Aquatic Resources (BFAR) launched the catch documentation scheme which includes gathering of operational catch and effort logsheet data for purse seine and ringnet vessels. Data gathered from logsheets include the volume of catch by species, type of gear (PS/RN), type of fishing activity, type of fishing set, position (latitude and longitude), country of registration, registration number, fishing permit or license number, time of set (start and end), vessel name and company name of the catcher vessel. TUFMAN Database system is being utilized to process the data collected from logsheets. All these efforts are geared towards improving tuna statistics/data gathering and to comply with WCPFC data requirements.

8.1.3. Philippine Fisheries Observer Program and Vessel Monitoring System (VMS)

Philippines has established its national observer program since 2009 through the Bureau of Fisheries and Aquatic Resources (BFAR). The Bureau regularly conducts observer training twice in a year to recruit new observers. There are currently 135 trained observers ready to board the vessels especially to those vessels intending to fish during the FAD closure period. Last 2010 a total of 48 observers have been deployed covering 117 purse seine and ringnet fishing vessels, in 2011, 39 observers have been deployed ti 80 fishing vessels and in 2012 BFAR have deployed 33 observers to 76 fishing vessels all operating in Celebes Sea, Sulu Sea, South China Sea and the Eastern Pacific Seaboard. There is also observer coverage to those vessels fishing in the PNG EEZ, provided by PNG NFA. PFOP has also conducted the training for Fisheries Observers Debriefer which aims to minimize data errors from the observer data.

Observer data are very valuable source of scientific information. Observers records the following information: vessel details, crew information, daily activity, set and catch details, length measurements, vessel and aircraft sightings, species of special interest and Fish Aggregating Device (FAD) information.

The Bureau of Fisheries and Aquatic Resources (BFAR) has operationalized the national VMS but on a limited scale at the moment. The Bureau is continually in close collaboration

with the private sector to increase VMS coverage. The Fisheries Monitoring Center (FMC) at the MCS Station and Fishing Technology Laboratory in Navotas City holds all the records of commercial fishing vessels both operating in the Philippine EEZ and in the high seas. FMC have also developed databases to store said data. With the opening of the High Seas Pocket Number 1 under CMM 2011-01 and with the implementation of FAO 245, BFAR has been installing transponders and deploying fisheries observers for catcher and carrier vessels operating in the high seas pocket as part of the requirement to conduct fishing operations.

Two (2) Fisheries Administrative Orders were recently approved as basis of its implementation, namely, FAO 240: Rules and Regulations in the Implementation of Fisheries Observer Program in the High Seas and FAO 241: Regulation and Implementation of the Vessel Monitoring System (VMS) in the High Seas.

8.1.4. Catch certification

In 2010, BFAR started to issue catch certificates in compliance with EU export requirements. This initiative was realized to comply with traceability requirements and to help deter Illegal, Unreported and Unregulated Fishing (IUUF) activities. The EU community catch certificate includes information on the validating authority, vessel name, call sign, license number, product description, fishing area, estimated weight, name of fishing master, transhipment details and importer details. Fisheries Administrative Order (FAO) 238: Rules and Regulations Governing the Implementation of Council Regulation (EC) No. 1005/2008 on the Catch Certification Scheme, was recently approved to support this initiative.

8.1.5. Cannery receipts

In 2008, the Bureau of Fisheries and Aquatic Resources (BFAR) also require canneries to submit monthly cannery unloading data. Data gathered from canneries includes details of the unloading vessel (vessel name, gear, flag, registration number); fishing area; unloaded weight by species and state of unloaded catch (fresh, chilled or frozen). PECAN Database system or the MS Excel spreadsheet is being utilized to process the data collected from canneries. All these efforts are geared towards improving tuna statistics/data gathering.

8.1.6. Agencies/Organization involve in Tuna Data Collection

Bureau of Fisheries and Aquatic Resources (BFAR)

The BFAR tuna statistics dates back in 1970 but the methodology of estimating tuna catch in the early years is not well documented. The Bureau published official annual fishery statistics, usually two years after the end of the year concerned.

During the course of the South China Sea Fisheries Development and Coordinating Program, which began in 1974, and the subsequent Indo-Pacific Tuna Development and Management Program (IPTP) in 1980, a sampling program to provide both production estimates and biological data from the fishery was initiated involving four sampling sites in Mindanao, which accounted for a large proportion of the commercial tuna landings at that time. The IPTP continued to publish tuna statistics for the Philippines until 1991.

In 1987, there was an interest of centralizing statistical data collection functions. Decision has been made to transfer the responsibility of fisheries data collection to the Bureau of Agricultural Statistics (BAS).

BFAR remain as a primary oversight agency for the Fisheries Sector Program (FSP) during 1990-1995, when the Philippine Tuna Research Project (PTRP) was carried out as major component of the FSP. The PTRP carried out tuna tagging project leading to stock assessment of oceanic tuna species and statistical monitoring program for tunas at 16 landing sites around the country.

When PTRP ended in 1995, no additional funding was committed to continue these important activities. In 1997, the National Stock Assessment Program (NSAP) started. The aim of the program is to provide scientific information to support sustainable management of aquatic resources in the country, as a response to lack of standardized and continuous information on the fishery resources. The National Fisheries Research and Development Institute (NFRDI) with BFAR implement this program. NSAP involves data collection in all the regions of the country with a Regional NSAP Project Leader in each region to supervise all the activities. Although expected to cover all species of significant commercial importance, some species were selected for detailed study. There are regions that focus their work on small pelagics and tunas, given the relative importance to the fishery. Information on catch and effort by fishing ground and species including the types and number of gear units, total catch by gear and catch trends maybe provided. Biological data including species composition, size distribution, seasonal and spatial distribution and reproductive biology are also covered.

Bureau of Agricultural Statistics (BAS)

The history of BAS involvement in fisheries statistics is well described by Vallesteros (2002). Executive Order 116 transferred the responsibility of generating statistics for the fisheries sector to BAS from BFAR. The Fisheries Division within BAS has the responsibility of fisheries data collection, compilation, analysis and dissemination, for all capture fisheries (marine and inland, municipal and commercial) and aquaculture. Tuna statistics is only part of the overall activity.

In generating estimates of the volume and value of production from the diverse and complex fisheries sector, BAS carries out probability (stratified random sampling by data collectors) and non-probability (interviews by BAS staff) surveys. These are supplemented by secondary data from administrative sources like PFDA landings. Surveys cover commercial and municipal fisheries (landing centers), inland fisheries (fishing households) and aquaculture (farm sites).

Survey data are reviewed initially at the provincial level. Then, reviewed at the regional level on a quarterly basis at the Regional Data Review for Fisheries with the involvement of PFDA, regional BFAR staff and key informants from the sectors. A National Review is also conducted quarterly at the Central Office with the regional BAS Statistical officers.

Quarterly reports are disseminated and an annual handbook with five years time series data is published annually. But due to budgetary constraints, the publication of these data are usually delayed.

The main challenge with the present monitoring system is obviously the lack of adequate resources to properly carry out detailed probability surveys. Even with adequate funding, surveys are carried out for just two to three months per year, usually in the second semester. This raises an issue on how seasonal variations/effects are accounted in the estimates.

Philippine Fisheries Development Authority (PFDA)

Since 1976, PFDA has been mandated to support fishing industry development by providing fish ports, post-harvest facilities, ice plants, cold storage and other facilities, in support to handling and distribution of fishery products. At present, there are eight major ports managed by PFDA and these are located in Navotas, Iloilo, Zamboanga, Camaligan, Lucena, Sual, Davao and General Santos. Data on the volume of catch by species and value are also collected in the PFDA managed ports. These data are useful source of tuna landing data.

PFDA also maintains ongoing involvement with LGUs in the joint operation of some smaller municipal ports around the country. At present we have 86 completed municipal port, 78 have been handed over to LGUs for sole management. Although the extent and quality of tuna landings data obtained from this source is not known.

Maritime Industry Authority (MARINA)

The MARINA is an attached agency of the Department of Transportation and Communications (DOTC). Pursuant to Republic Act (RA) No. 9295 and its Revised Implementing Rules and Regulations (R-IRR), the MARINA is mandated and given the authority to register ships (Section 10.1 of RA 9295). Ships registered under the Philippine flag are issued Certificate of Ownership (CO) and Certificate of Philippine Registry (CPR).

Section 10.6 of the R-IRR requires all ships to comply with the safety standards in accordance with applicable conventions and regulations. The MARINA, upon favorable result of inspection, issue safety certificates to ships complying with the applicable safety standards.

National Statistics Office (NSO)

The National Statistics Office or NSO maintains the official statistics on fishery exports and imports in the Philippines. These are classified by standard categories by species and value. NSO also provides information vital to monitoring product flows and corroborating production figures.

Tuna Canners Association of the Philippines (TCAP)

The Tuna Canners Association of the Philippines (TCAP) maintains and distributes statistics on tuna cannery production. The tuna canneries consume over 250,000 tons of tuna per year, mostly from Philippine vessels operating outside the Philippine waters.

SOCSKSARGEN Federation of Fishing and Allied Industries Inc. (SFFAII)

The South Cotabato, Sultan Kudarat, Sarangani and General Santos (SOCSKSARGEN) Federation of Fishing and Allied Industries (SFFAII) was established in 1999. The main mandate of the federation is to unite the diverse subsectors of the tuna industry, serve as forum to discuss problems and how to resolve them, and to be the key voice of the local tuna fishery in lobbying for policy reforms and other concerns that affect the industry. At present, it is increasingly enjoying wide participation by industry and strategically located at the center of the Philippine tuna industry. The federation is becoming an authoritative voice on the range of issues affecting the industry, whether domestic or international.

The Philippine tuna data collection scheme is summarized in Annex 5.

8.2. Fisheries Researches

There are various research activities done in the past that includes the South China Sea Fisheries Development and Coordinating Program, which began in 1974, and the subsequent Indo-Pacific Tuna Development and Management Program (IPTP) in 1980, a sampling program to provide both production estimates and biological data from the fishery was initiat ed involving four sampling sites in Mindanao, which accounted for a large proportion of the commercial tuna landings at that time. During 1990 – 1995, the Fisheries Sector Program (FSP) carried out the Philippine Tuna Research Project (PTRP) as major component of the FSP. The PTRP also conducted tuna tagging project leading to stock assessment of oceanic tuna species and statistical monitoring program for tunas at 16 landing sites around the country. When PTRP ended in 1995, no additional funding was committed to continue these important activities. But in 1997, the National Stock Assessment Program (NSAP) started which aims to provide scientific information to support sustainable management of aquatic resources in the country, as a response to lack of standardized and continuous information on the fishery resources.

In 2005 – 2007, the Indonesia and Philippine Data Collection Project (IPDCP) was developed to help reduce uncertainty on tuna stock assessments in WCPO. Funding and technical support was committed to Bureau of Agricultural Statistics (BAS) and the National Fisheries Research and Development Institute (NFRDI) in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR). Under this project, BAS conducted additional surveys in 30 sampled landing centers (15 municipal and 15 commercial) and recruited additional data collectors to collect actual unloading observations particularly on key tuna landing areas. With this BAS tried to have a separate data for yellowfin and bigeye in the catch statistics. Also under this project through the National Stock Assessment Programme (NSAP) port sampling data collection was continued (species composition, length frequency and vessel catch and effort information) particularly in key tuna landing sites around the country. As result, NSAP National Reporting System was developed to compare NSAP and BAS data gathered through the IPDCP.

A study on the recalculation of the Philippine tuna production from WCPO was initiated by BFAR and the industry. This study aims to make an independent estimate of the country's annual tuna production, which mainly uses historical catch data from the Philippine tuna industry, previous researches conducted and existing fisheries database like NSAP. The objectives of this study were: 1) to estimate the historical tuna fisheries production of the Philippines and 2) to revalidate the country's tuna production from the WCPO region.

The West Pacific East Asia Oceanic Fisheries Management Project (WPEA-OFMP) officially started its activities in January 2010. The objectives of this project is to strengthen national capacities and international cooperation on priority transboundary concerns relating to the

conservation and management of highly migratory fish stocks in the West Pacific Ocean and East Asia (Indonesia, Philippines and Vietnam). The project includes the following components: catch monitoring, data enhancement, fishery assessment, policy & institutional strengthening and fishery management. Also under this project a tuna data and research inventory was conducted to record and assess available catch/effort data and biological data for the Philippines oceanic tuna fisheries from different sources gathered, managed and stored by various agencies and organizations including tuna researches conducted by academe, research institutes and various agencies/organizations.

The Bureau of Fisheries and Aquatic Resources through the National Fisheries Research and Development Institute (BFAR-NFRDI) in collaboration with the SOCKSARGEN Federation of Fishing and Allied Industries Inc., conducted gonadal maturity studies for major tuna species, namely, yellowfin, bigeye and skipjack. Sampling activities for this project started August 2010 and ended last July 2011.

There are two (2) on-going tuna related research projects funded by the Department of Science and Technology (DOST-Philippines), namely, *i)* Genetic Stock Structures of Yellowfin (*Thunnus albacares*) and bigeye (*Thunnus obesus*) tunas in the Philippines which aims to produce an accurate reference estimate of landed yellowfin and bigeye tunas in the Philippines using genetic markers; determine the genetic structure of yellowfin and bigeye tunas in the Philippines, in the Coral Triangle Region and in the greater Western and Central Pacific Ocean; and correlate genetic structure of yellowfin tuna from bigeye tuna with other data generated by the program including stock assessment and biological data; and *ii)* Technical Assessment of the Effects of Mesh Size and Net Depth of the Catch Composition and Size Structure of Tunas in the Surrounding Nets which aims to assess the size structure and maturity stages of tuna and small pelagic fish captured by surrounding nets; conduct a hydroacoustics assessment of the temporal change in the biomass and size of aggregated fish around payao; determine depth distribution of aggregated fish during capture with ringnet and evaluate the effect of technical modifications of ringnet on the catch composition. This project is also expected to generate selectivity curves of different tuna species, seasonal dynamics of associated fish in payaos and depth setting of ring net to minimize capture of juvenile tunas.

There is another UNDP-GEF funded project which started last year entitled Sulu Celebes Sea Sustainable Fisheries Management Project. This project aims to improve the condition of fisheries and their habitats in the Sulu-Celebes Sea to a sustainable level through an integrated, collaborative and sustainable tri-national management (Indonesia, Malaysia, Philippines).

Another project on Fishery Improvement and MSC-Certification of the Artisanal Hand-Lining Fishery for *Yellowfin Tuna* in the Gulf of Lagonoy and Mindoro Island in the Philippines a project jointly implemented by WWF and Blueyou Consultancy supported by Coop / Bell Seafood (Switzerland) and Seafresh (Netherlands) in Partnership with the German Development Bank DEG aims to realize a better managed fishery rewarded by the Marine Stewardship Council (MSC) within the 4 year period. The long term goal of this initiative is to secure the global market opportunities of artisanal tuna handline fisheries in the Philippines.

The research vessel MV DA-BFAR has also been conducting tuna fisheries surveys including tuna larval studies and exploratory fishing within Philippine EEZ.Recently, BFAR announced to conduct a study on Tuna Migration where they intend to deploy eight (8) Fisheries Observers that will cover areas in Ilocos, Zambales, Mindoro and Eastern Samar.

9. Issues, Concerns and Challenges on Tuna Fisheries

9.1. Resource Management

9.1.1. Declining catch and catch rates
9.1.2. (Negative impact of global warming on spatial distribution of tuna resources)
9.1.3. Need to strengthen fishery management systems
9.1.4. Need for further scientific research regarding tuna species (e.g. biological research including stock identification)
9.1.5. (Fund requirements to sustain and strengthen implementation of resource management and conservation programs & projects)

9.2. Production, Post-Harvest, Marketing and Export

9.2.1. Increasing operational cost and expenses and its impact on the fishing industry. Oil and fuel prices increase drastically through the years
9.2.2. Limited access to fishing grounds outside Philippine national waters
9.2.3. Fishing access agreements with other country's EEZ and its impact on the industry. High fees on fishing activities and catches imposed by some foreign countries. Some fishing restrictions imposed by other nations have implications in the industry.
9.2.4. High tariffs and non-tariff barriers imposed on Philippine tuna products
9.2.5. Decrease in fish catch in the municipal waters and its impact to the industry. Fishermen are driven to go fishing in distant waters/ or venture international waters resulting to a higher operational costs/ expenses and more trouble in obtaining fresh and high-quality tuna
9.2.6.
9.2.7. High competition in the global market. Canadian Market used to sell value-added products, US Market sells easy-to-use tuna products. While other countries (i.e. Latin America, The Middle East, Thailand and China) continue to show so much potential in their tuna industries.
9.2.8. Challenge for the Philippine tuna products to compete in the international market
9.2.9. Challege on the growing awareness on eco-labelling

9.3. Institutional, Policy and Regulatory Concerns

9.3.1. Delayed issuance of the IRR of RA 9379 on Handline Fishing Law of 2007.
9.3.2. Labor category for fish workers in fishing vessels is not specified in RA 8435 (AFMA) and RA 8550; need to conduct consultations with DOLE.
9.3.3. Limited government financial support for industry participation in international fora and trade expositions.
9.3.4. Need to determine the impacts of and prepare for the possible Philippine accession to international maritime safety and labor conventions/agreements, i.e, 1993 Torremolinos Protocol Relating to the 1977 Torremolinos Convention on the Safety of Fishing Vessels and the Convention on Standards for Training Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F Convention).

9.3.5. Need to strengthen the National Tuna Industry Council through issuance of an Executive Order (EO) to integrate all government and private sector initiatives on tuna industry development.

9.3.6. Creation of the Department of Fisheries and Aquatic Resources

9.3.7. The issuance of the Executive Order creating the Philippine Committee for Fisheries Advancement (PCFA) to promote the interest of the fishing industry by representing the Philippines in Regional Fisheries Management Organizations (RFMOs) and forging bi-lateral and multi-lateral agreements with other countries.

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Websites for Relevant Regional Fisheries Management Organizations

International Commission for the Conservation of Atlantic Tunas. www.iccat.es.

Indian Ocean Tuna Commission. www.iotc.org.

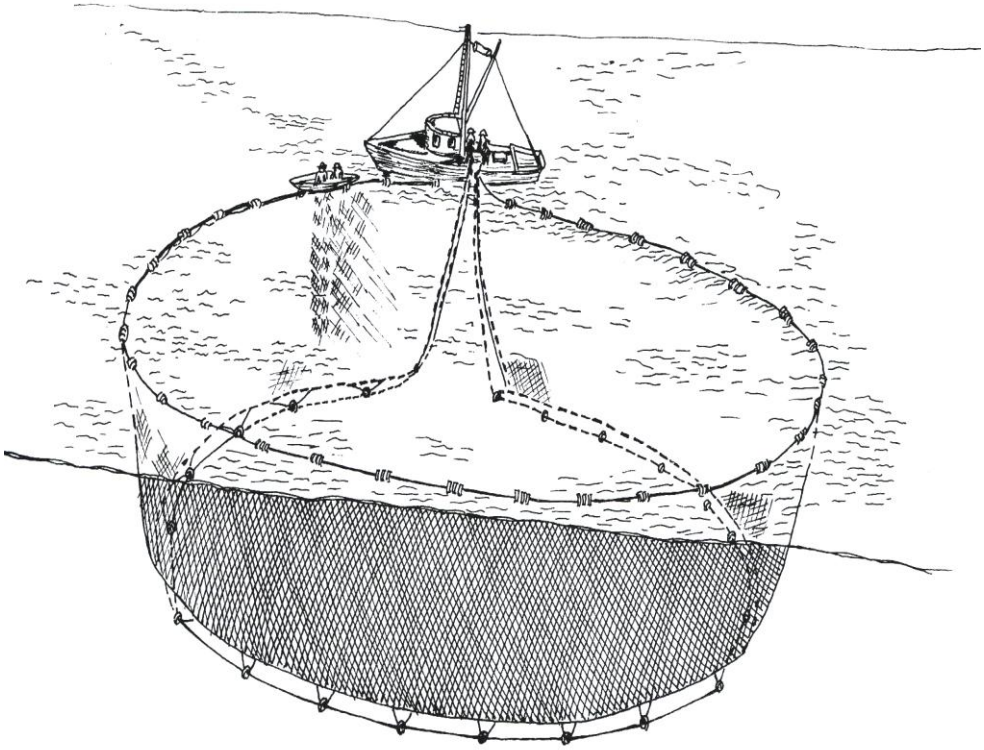
Commission for the Conservation of Southern Bluefin Tuna. www.ccsbt.org.

Western and Central Pacific Fisheries Commission. www.wcpfc.int.

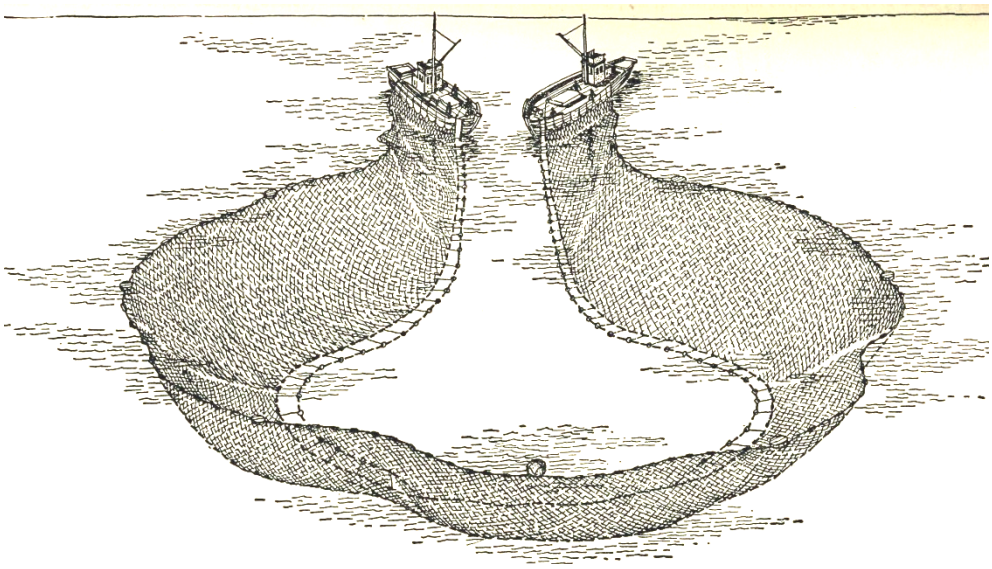
Inter-American Tropical Tuna Commission. www.iattc.org

Annexes

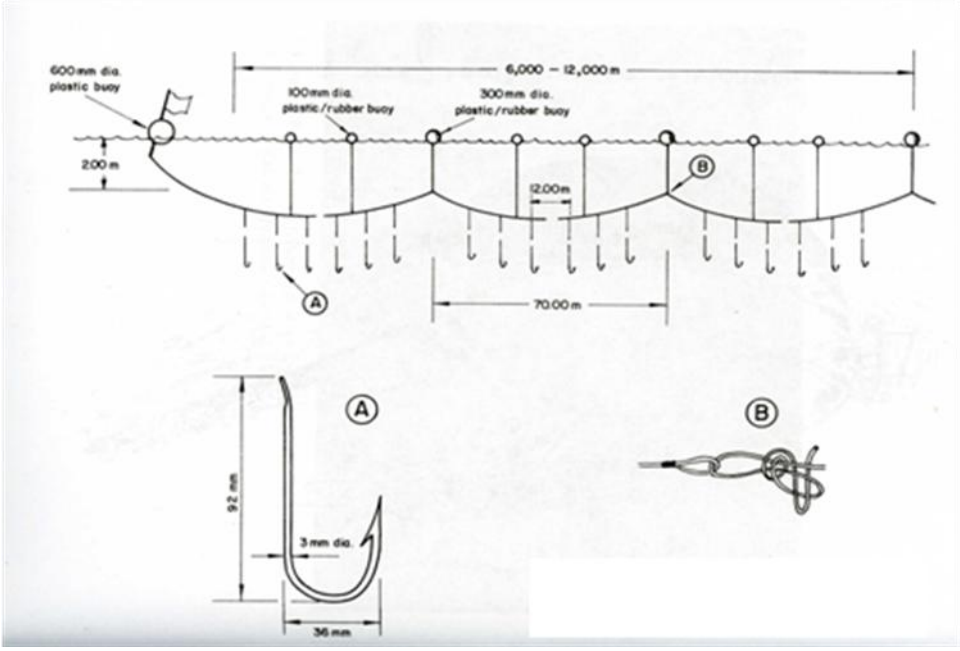
Annex 1. Tuna Fishing Gears



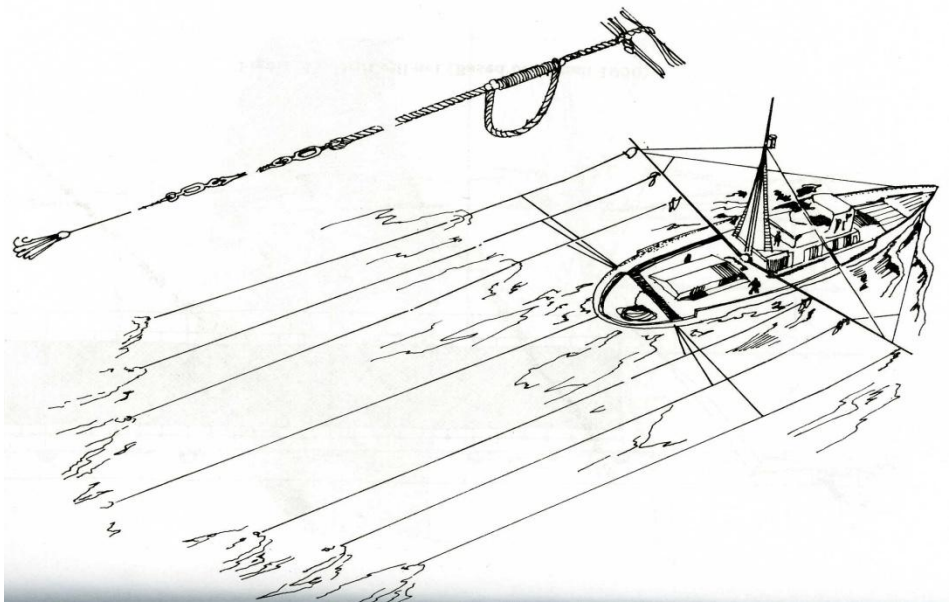
Purse seine (Source: Umali 1950)



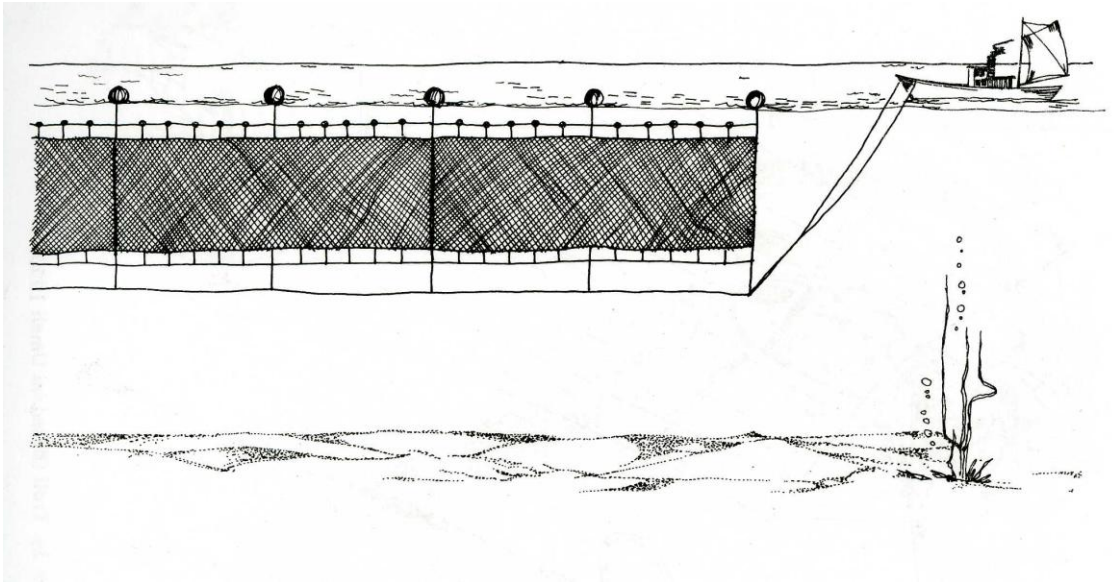
Ringnet (Source: Umali 1950)



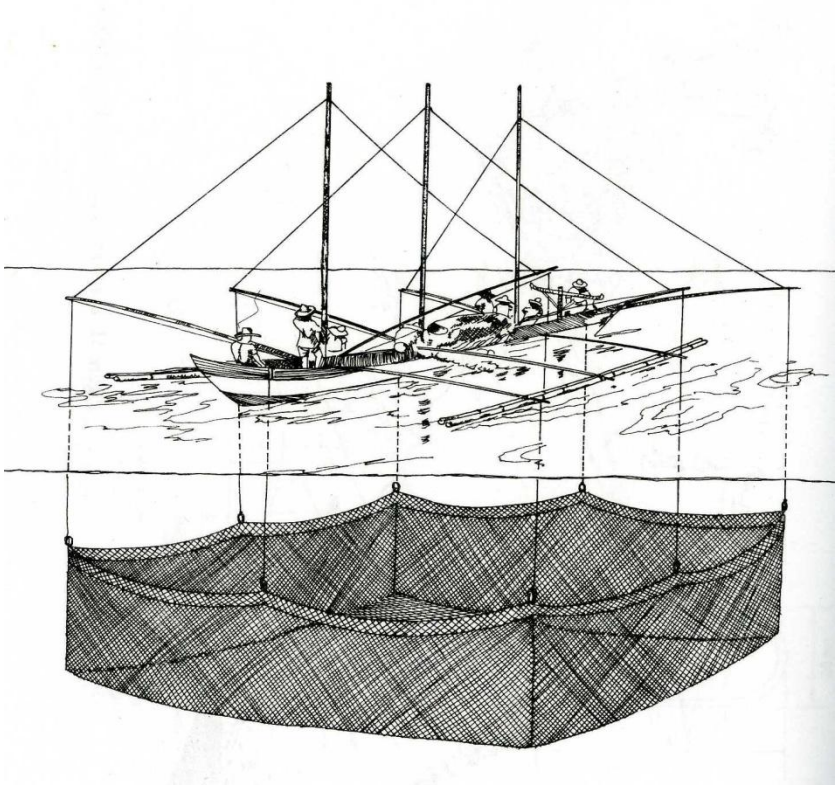
Longline (Source: Umali 1950)



Troll Line (Source: Umali 1950)



Drift Gillnet : Umali 1950)



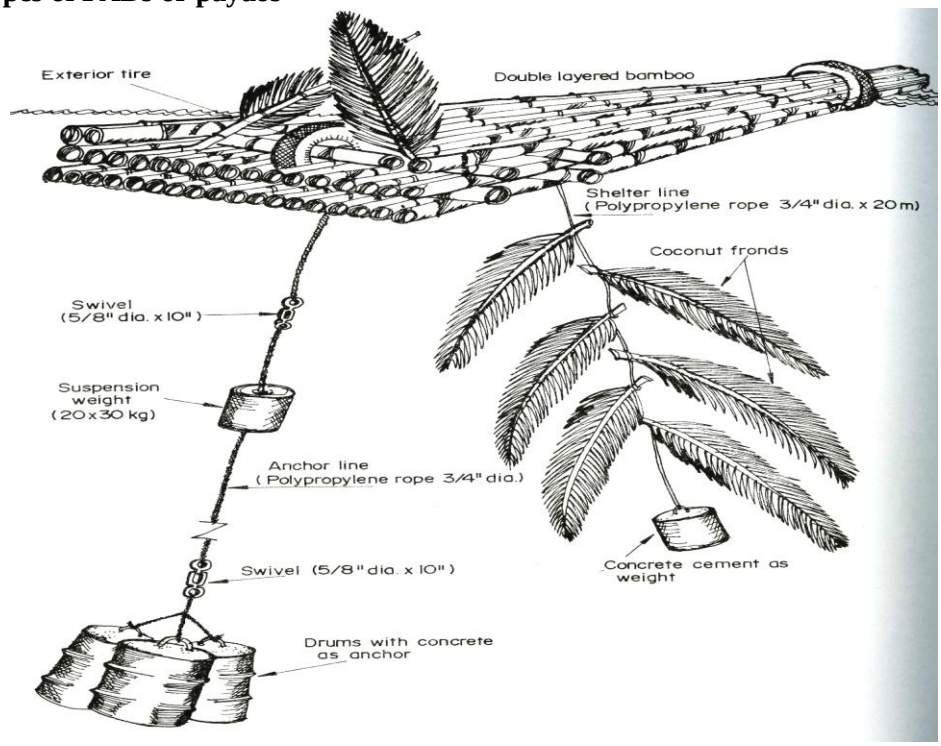
Bagnet : Umali 1950)


Simple Handline that targets large tuna

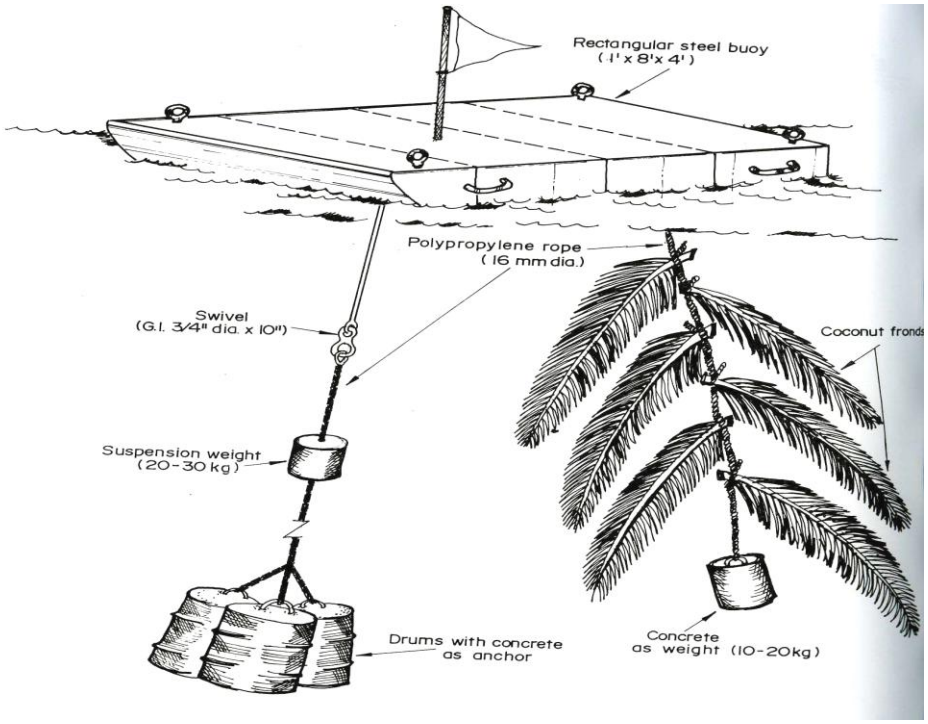
Multiple hook and line

Handline vessel with small boats (‘pakura”)

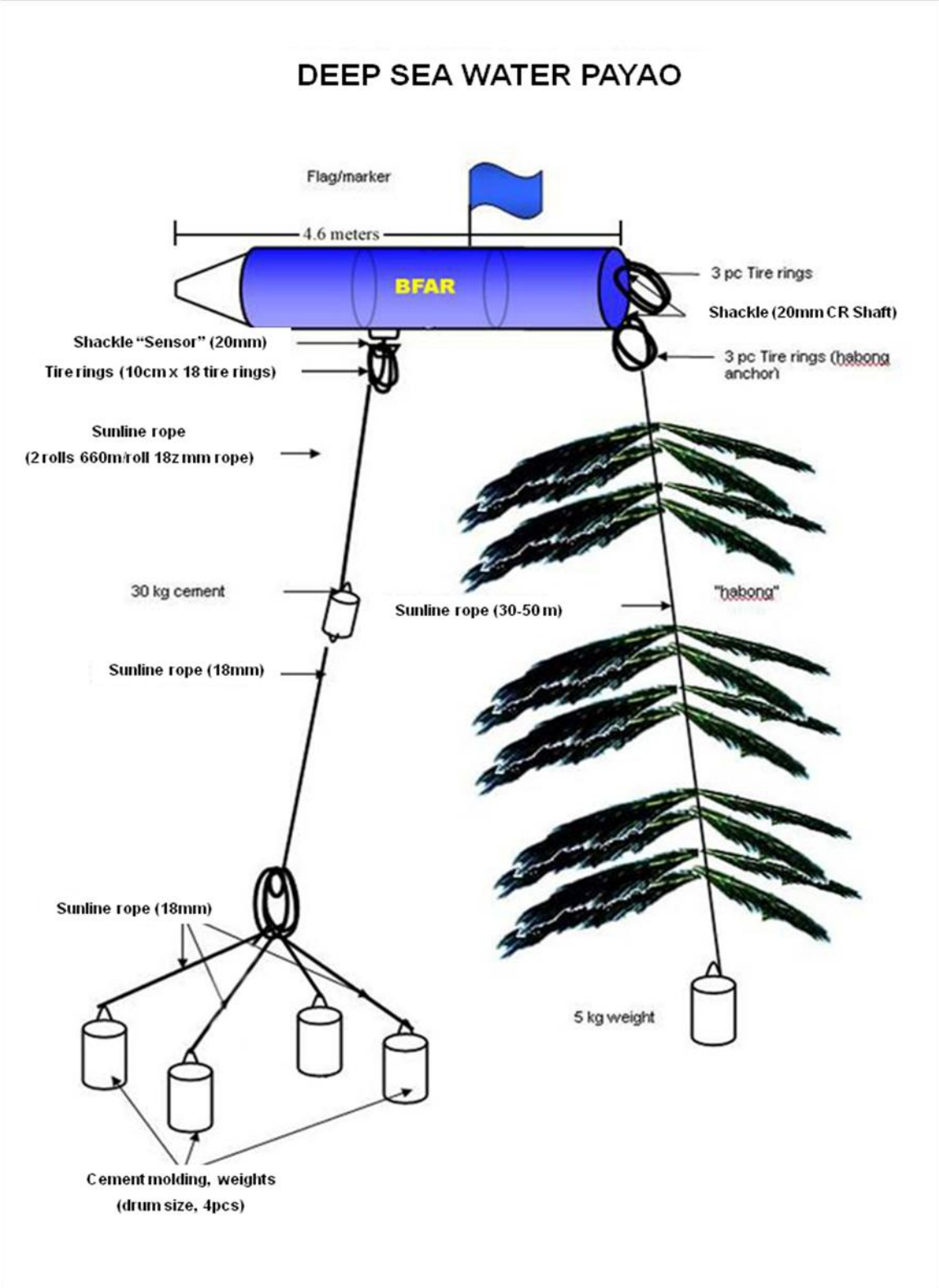
Annex 2. Types of FADs or payaos



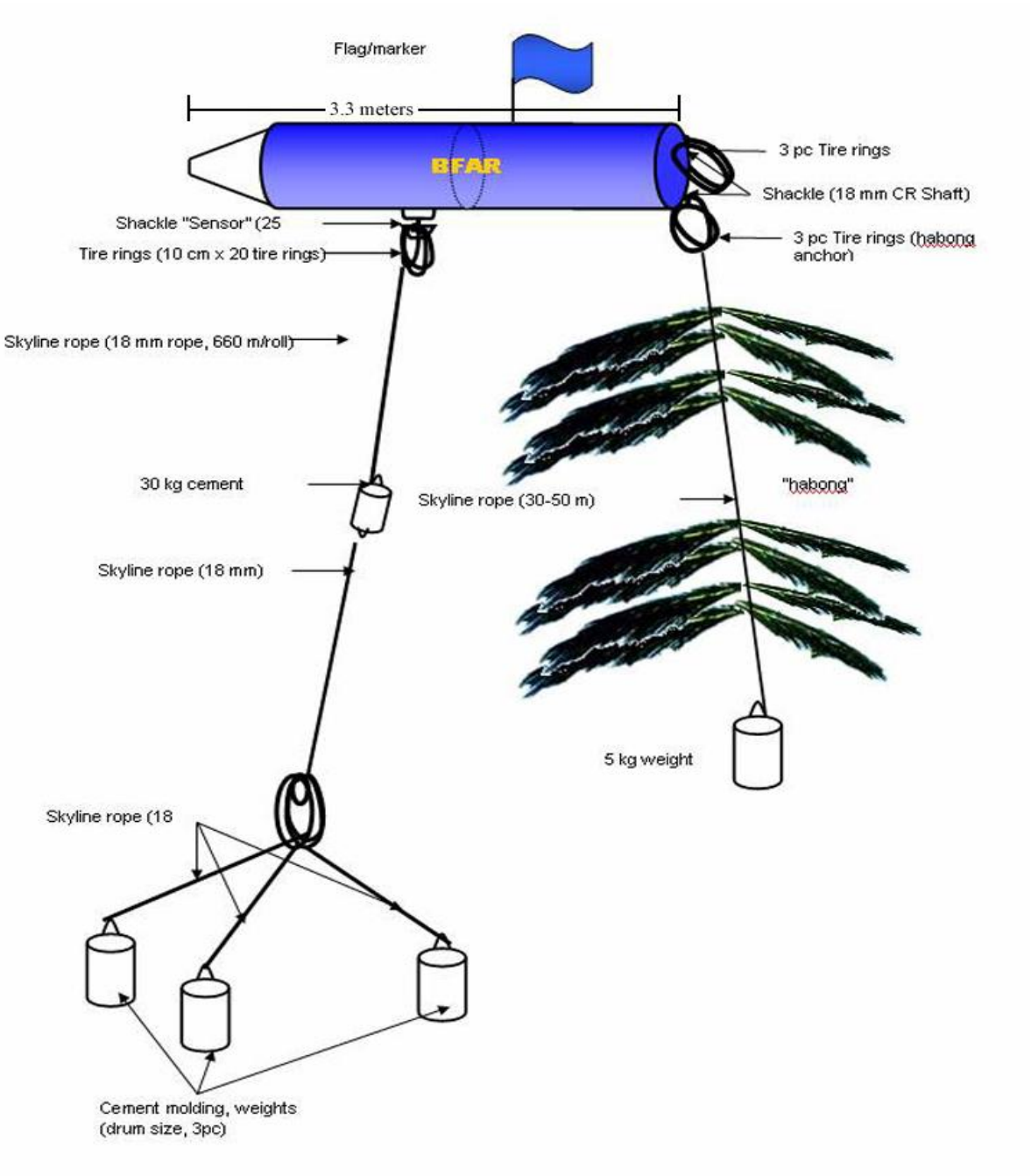
A *payao* made of bamboo (Based on de Jesus 1982)



A steel ponton type of *payao* (Based on de Jesus 1982).

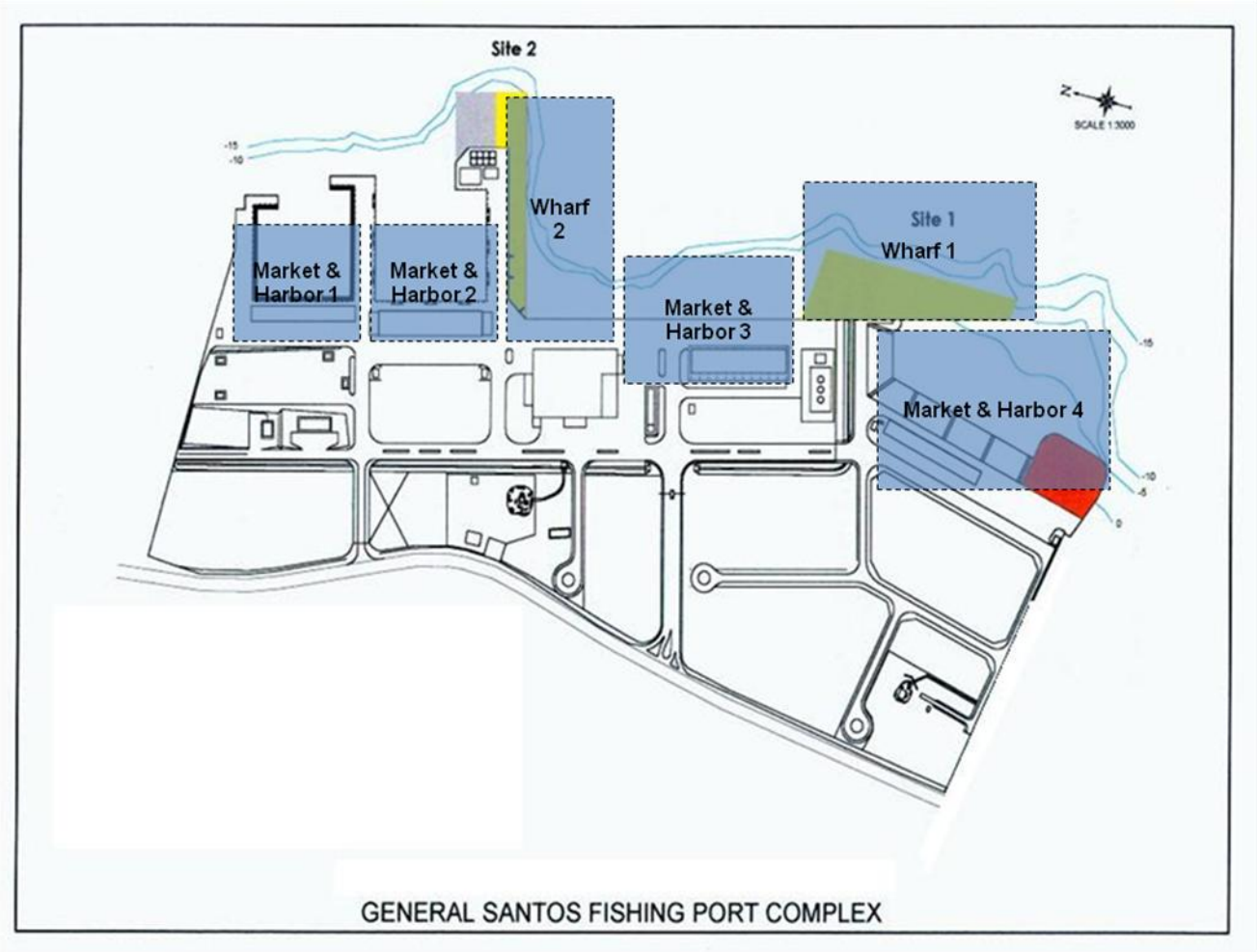


Deep sea water *payao* (Source: BFAR, NMFDC)



Shallow water *payao* (Source: BFAR, NMFDC)

Annex 3. General Santos City Fishport Complex



Annex 4. Fish Unloading Flow Charts

Source: Preliminary Assessment of the Handline fisheries in the Philippines Final Report, 2011

FIGURE 1.

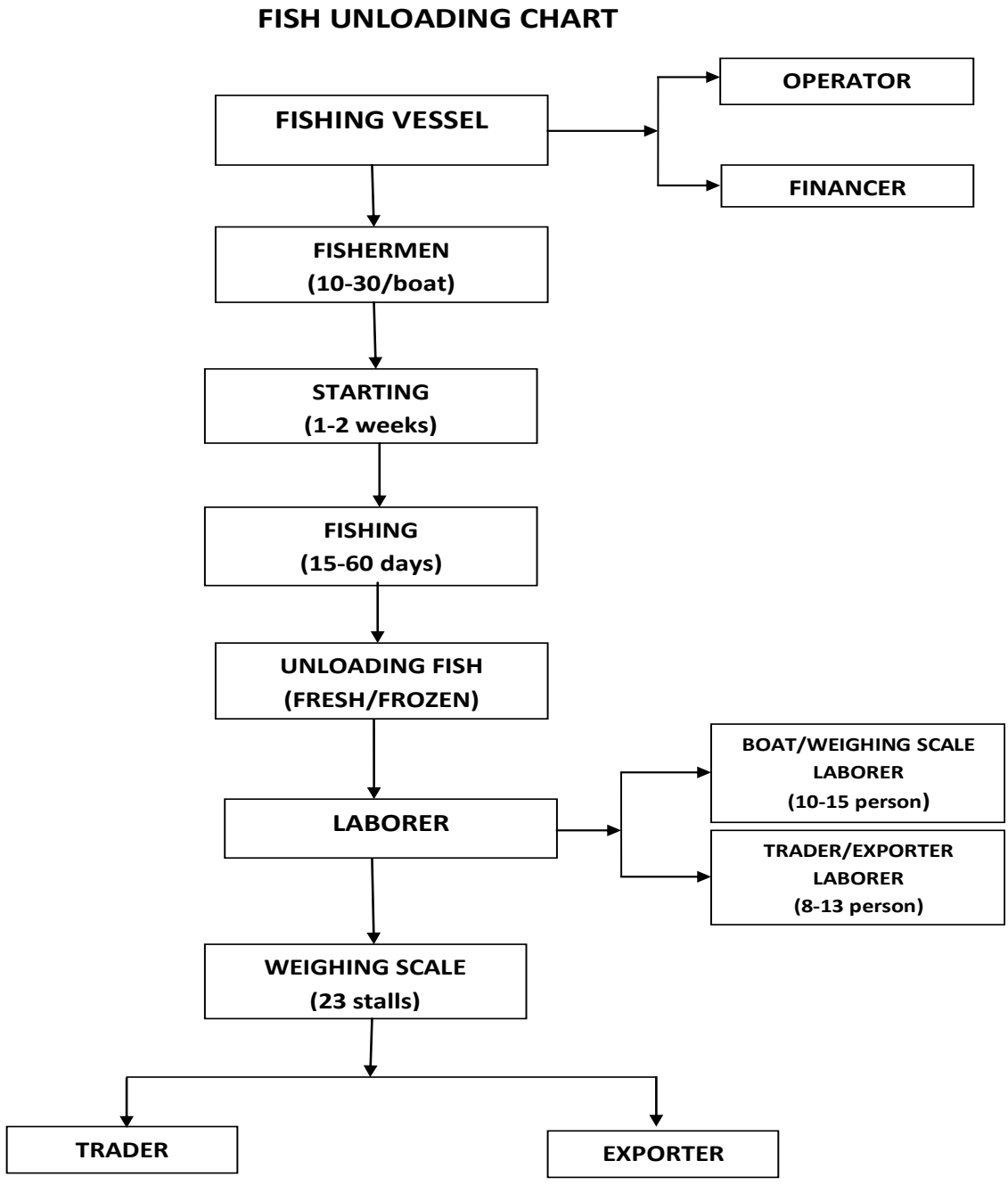


Figure 2.

FLOW DIAGRAM
MARKET OPERATIONS

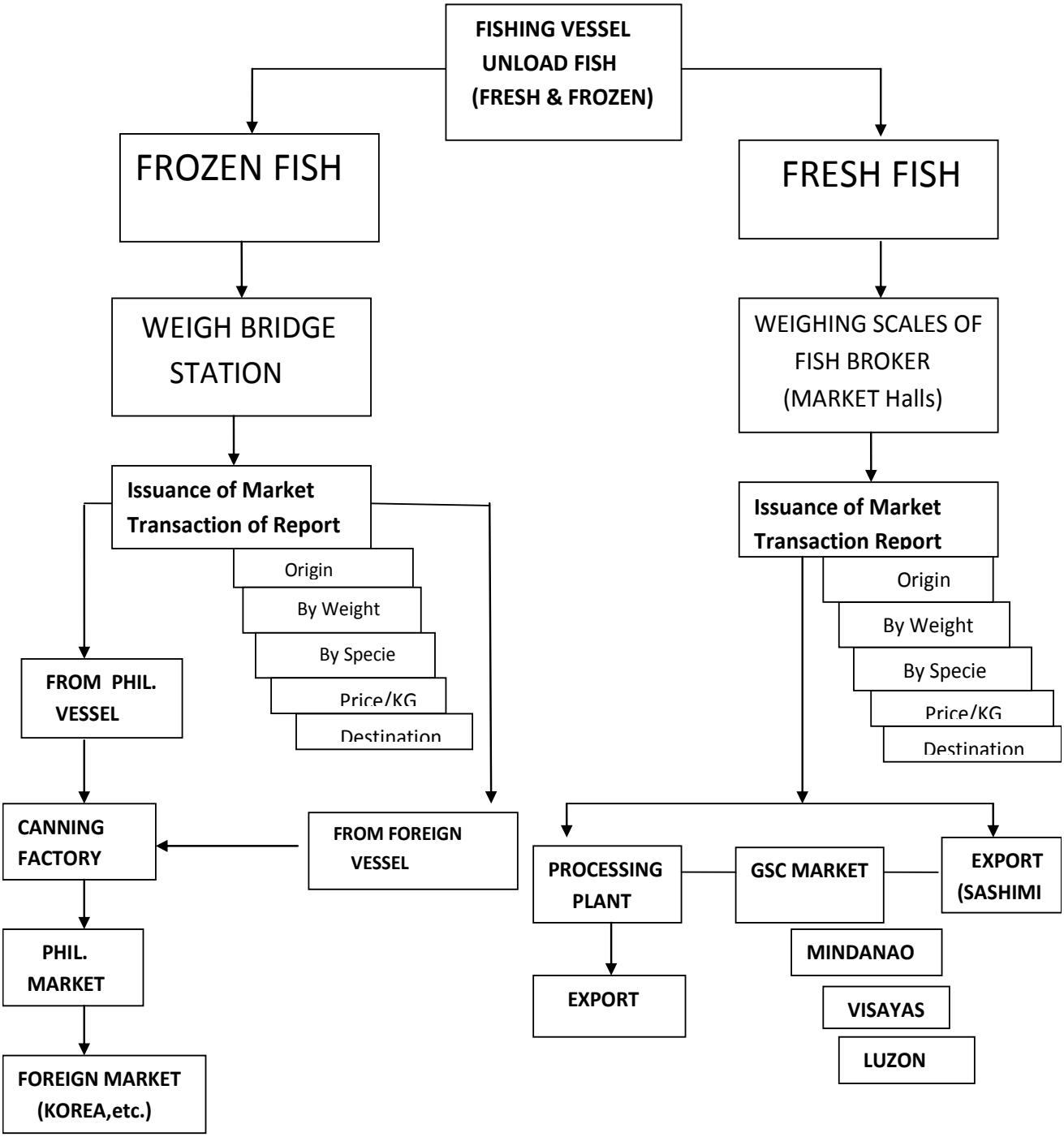
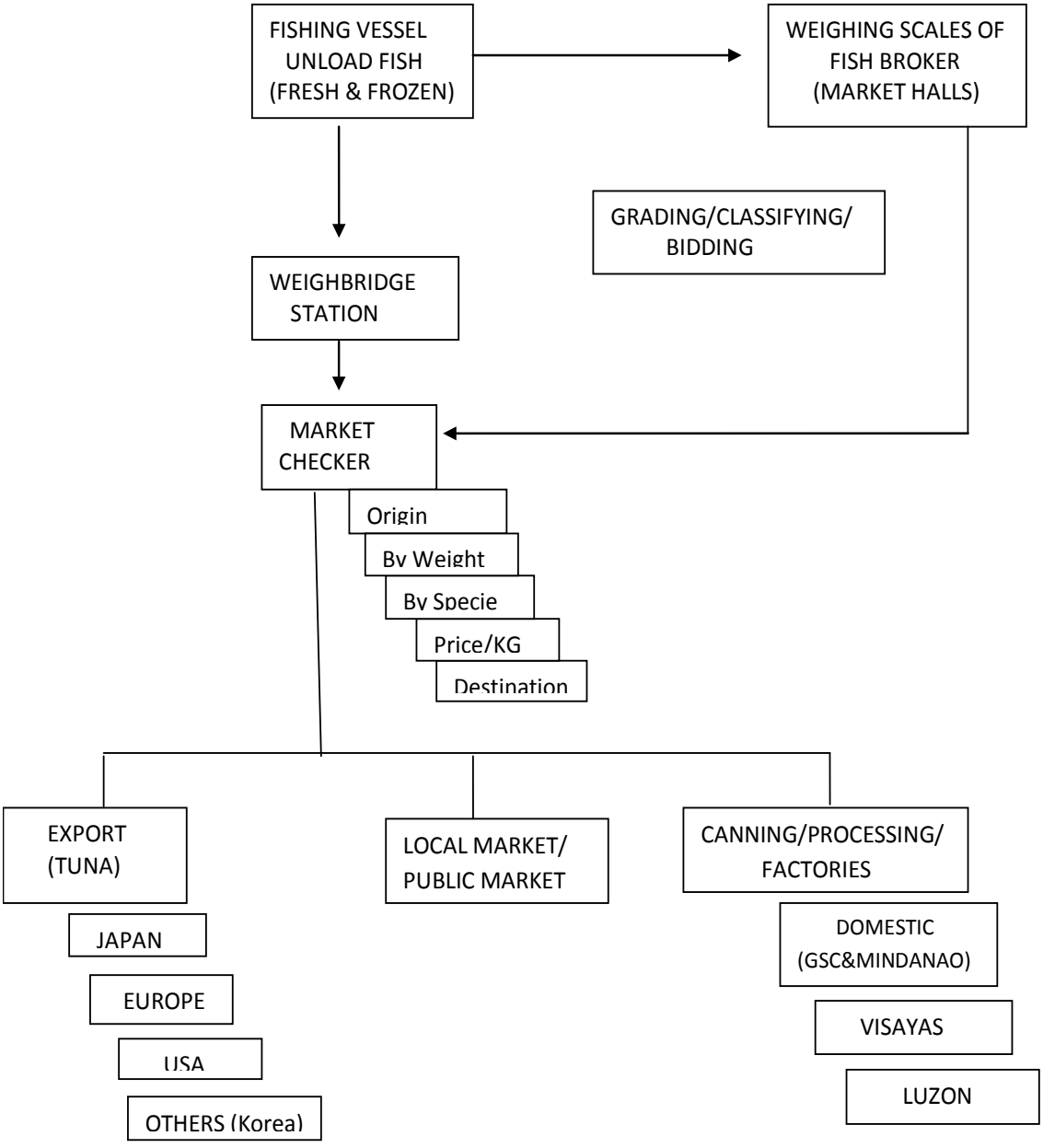
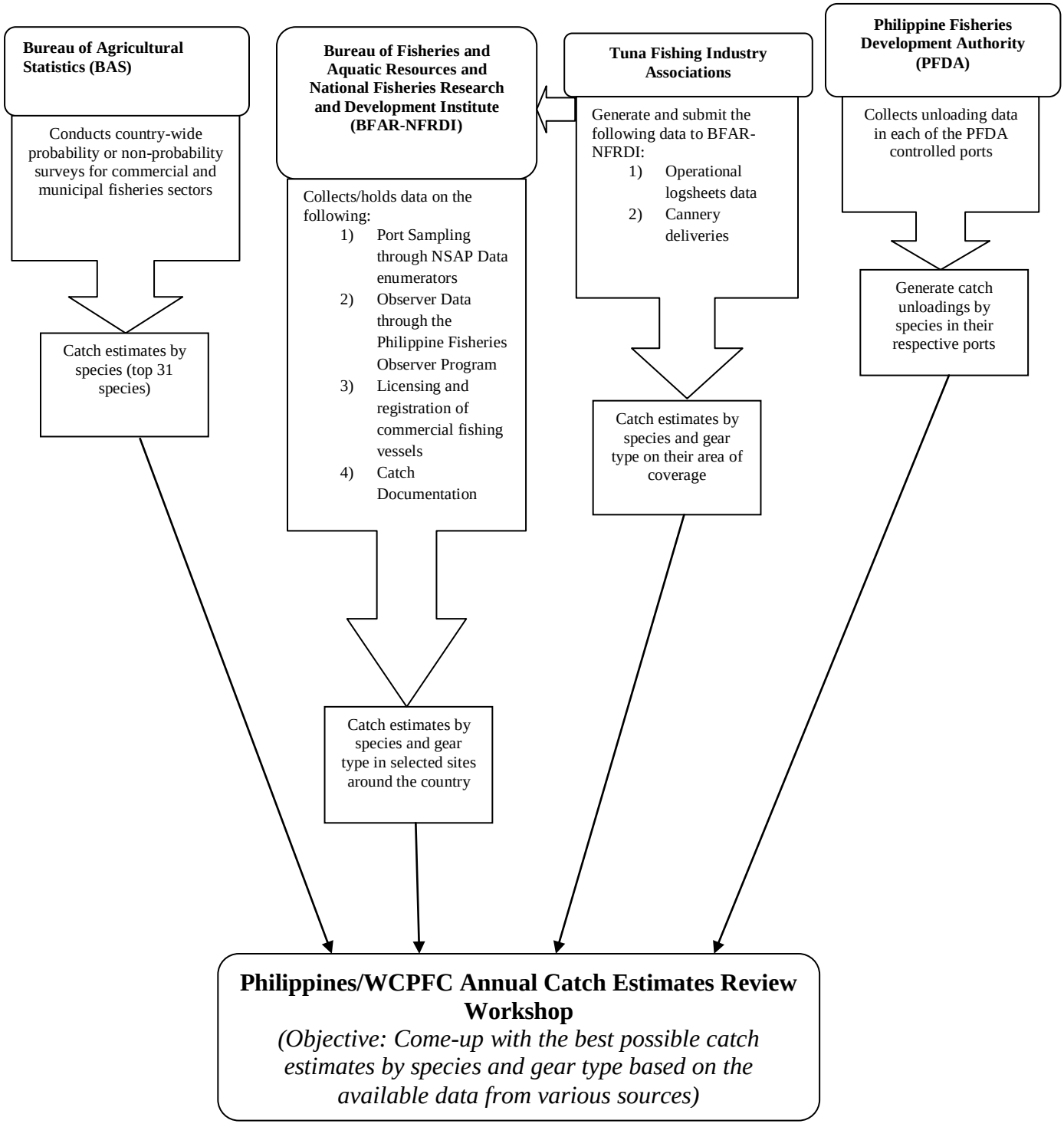


FIGURE 3.

FISH UNLOADING
FLOW CHART



Annex 5. Philippine Tuna Data Collection Scheme.



Note: Other sources of information are used for verification, validation and scoping purposes only (e.g. MARINA – list of Philippine registered vessels, etc)

Annex 6. English and local names of common tunas in the Philippines

Region	Locality	Yellowfin	Skipjack	Bullet tuna	Frigate tuna	Kawa-Kawa
		(*Thunnnus albacares*)	(*Katsuwonus pelamis*)	(*Auxis rochei*)	(*Auxis thazard*)	(*Euthynnus affinis*)
I	Lingayen	Oriles	-	-	Tulingan	Tulingan puti
II	Aparri, Cagayan	Tambakul	Tangi; Simmandya	Tangi	Tangi	Tangi
-do-	Batanes	Tiklaw; Vahuyo	Agtun	Vahuyo	Vahuyo	Tulingan
III	Zambales	Tambakol	Gulyasan	-	Tulingan	Tulingan
IV	Calauag, Quezon	Tambakol	Gulyasan	Buroboto bilog	Buroboto; Lapad;	Reado
-do-	Metro Manila	Barilis	Gulyasan		Tulingan	
-do-	Palawan (Cuyonin)	Tambakol	Golyasan	Tulingan	Tulingan	Tulingan; Katsorita
-do-	Palawan (Cagayanin)	Panit	Tulingan	Pirit	Pirit	Pirit
-do-	Palawan (Agutaynin)	Tambakol	Turingan	Tulingan	Tulingan	Tulingan
V	Bicol	Kikyawon; Bankulis;	Pundahan; Rayado;	Turingan	Turingan	Turingan
		Bronsehan	Batala-an; Panit	Turingan	Turingan	Burawon;
VI	Iloilo	Panit; Batala-an	Barilis			Parupondohan
VII	Cebu	Barilis	Bangkulis; Budlis	Aloy	Turingan	Anturayan
VIII	Catbalogan, Samar	Panit	Bariles	Tulingan	Tulingan	Barilis
-do-	Tacloban City	Baliling; Panit	Poyan	Turingan	Turingan	Buga-ongon
IX	Zamboanga	Panit	Tulingan	Tulingan	Tulingan;	Tulingan; Turingan;
X	Cagayan de Oro City	Carao; Panit; Bariles	Bolis; Budlisan		Turingan	Man; Hasa-hasa
-do-	Misamis Occidental	Tulingan; Bariles;	Budlisan; Sambagon;	Lubak-lubak	Mangkok	Subad
		Pala-pala	Gulyasan	Pidlayan; Buboron	Pidlayan	-
-do-	Misamis Oriental	Panitto(Barelis); Panit	Budlisan	Perit; Pirit;	Perit; Pirit;	Boga-ongon
XI	Davao	Bariles	Puy-yan	Pidlayan	Pidlayan	
XII	Cotabato City	Bariles; Panit; Karaw	Karaw; Puyan; Panit;		(dagho lamugan)	
			Budlisan; Tulingan;	Perit; Pirit	Tolingan;	Tulingan puti;
			Sambagon		Tulingan	Timbongan
CARAGA	Surigao	Bariles	Sambagon; Bariles	Budburon	Budburon	Buga-ongon; Pirit
ARMM	Lanao Sur	Bariles	Gulyangan; Gulya	Bodboron; Pirit;	Tulingan; Pirit	Tulingan puti;
-do-	Maguindanao	-	Gulyaman	Manko; Burot		Pirit
-do-	Tawi-Tawi	Bariles	Gulyaman	Mangko; Pirit	Mangko	Bulis; Panit;
-do-	Jolo, Sulu (Tao-sug)	Bariles; Panit	Gulyaman; Puy-yan	Tulingan; Pirit	Tulingan; Pirit	Pagadparon
					Tulingan; Pirit	Tulingan

Source: Ganaden, S.R. and F. Lavapie-Gonzales, 1999. Common and Local Names of Marine Fishes of the Philippines, BFAR

Annex 7. Conservation and Managements Measures (CMMs) in WCPFC, IOTC and ICCAT

Regional Fisheries Management Organizations (RFMOs)	Western and Central Pacific Fisheries Commission (WCPFC)	Indian Ocean Tuna Commission (IOTC)	International Commission for the Conservation of Atlantic Tunas (ICCAT)
Website	http://www.wcpfc.int/	http://www.iotc.org/	http://www.iccat.int/en/
Commissions CMMs	***Fishing Vessel Regulations***	***Fishing Vessels Regulation***	***Species***
	Marking and identification requirements (04-03)	02/06; 12/07 Record Of Vessels	Bigeye tuna
	Records and authorization requirements (09-01)	06/03 On Establishing A Vessel Monitoring System Programme	Swordfish
	Commission VMS compliance (07-01, 11-02)	11/03 On Establishing A List Of Vessels Presumed To Have Carried Out Illegal, Unreported And Unregulated Fishing	Albacore
	"Blacklisting" (07-03)	99/02 Fishing Activities By Large Scale Longline	Bluefin tuna
	Charter notification (09-08, 11-05)	02/07 Measures To Prevent The Laundering Of Catches By IUU Large-Scale Tuna Longline Fishing Vessels	Billfishes (includes marlin, sailfish and spearfish)
	Act on FFV without nationality (09-09)	***Fishing Operation Regulations***	Bycatch species (sharks, seabirds)
	Special rules for purse seine vessels (09-10)	12/05 Transhipment By Large-Scale Fishing Vessels	***Monitoring and Compliance***
	IUU Vessel List (10-06)	Vessels; 12/12 To Prohibit The Use Of Large-Scale Driftnets On The High Seas In The IOTC Area	General issues: - Joint International Inspection - large-scale pelagic driftnets - minimum size regulations - transhipments and vessel sightings - quotas and/or catch limits - IUU listing - vessel chartering - fishing allocation - VMS - Use of circle hooks - Record of Vessels - Establish Minimum Standards for Fishing Vessel

			Scientific Observer Programs - Penalties Applicable in Case of non-Fulfilment of Reporting Obligations
	Fishing Operation Regulations	01/02 Relating To Control Of Fishing Activities; 12/08 Procedures On A Fish Aggregating Devices (FADs) Management Plan	Sanctions and trade-related measures
	Transshipment restriction (29, 09-06)	01/04 On Limitation Of Fishing Effort Of Non Members Of IOTC Whose Vessels Fish Bigeye Tuna	Statistical Document Programs
	Large-scale driftnet ban (07-04)	12/06 On Reducing The Incidental Bycatch Of Seabirds In Longline Fisheries	
	FAD closure (09-02)	99/01 On The Management Of Fishing Capacity And On The Reduction Of The Catch Of Juvenile Bigeye Tuna By Vessels, Including Flag Of Convenience Vessels, Fishing For Tropical Tunas	
	Closure of specific areas/for specific times (e.g., 09-05)	11/02 On The Prohibition Of Fishing On Data Buoys	
	Catch retention rules (09-02)	10/13 On The Implementation Of A Ban On Discards Of Skipjack Tuna, Yellow Fin Tuna, Bigeye Tuna And Non Targeted Species Caught By Purse Seiners	
	Mitigation measures for seabirds (07-04)	12/13 For The Conservation And Management Of Tropical Tunas Stocks	
	Mitigation measures for sea turtles (08-03)	12/04 On The Conservation Of Marine Turtles	
	Compliance monitoring scheme requirements (10-03, 11-06)	98/03 On Southern Bluefin Tuna	
		05/01 On Conservation And Management Measures For Bigeye Tuna	
	Special Area Management	05/05 Concerning The Conservation Of Sharks; 12/09 On The	

		Conservation Of Thresher Sharks (Family Alopiidae)	
	Eastern high-seas pocket (10-02)	***Data Requirements***	
	VDS (08-11, 11-01)	10/02 Mandatory Statistical Requirements For IOTC Members And Cooperating Non-Contracting Parties (CPC's)	
	Regulations for specific species	01/01 Concerning The National Observer Programmes For Tuna Fishing In The Indian Ocean;	
	South Pacific albacore (05-02, 10-05)	11/04 On A Regional Observer Scheme	
	North Pacific albacore (05-03)	12/02 Data Confidentiality Policy And Procedures	
	Southwest striped marlin (06-04)	12/14 On Interim Target And Limit Reference Points	
	Yellowfin tuna (08-01)		
	Swordfish (09-03)		
	Sharks (09-04, 10-07, 11-04)		
	North Pacific striped marlin (10-01)		
	Pacific bluefin tuna (09-07, 10-04)		
	Cetaceans (for purse seiners) (11-03)		