



(REBYC-II CTI; GCP/RAS269/GFF)

SOCIO-ECONOMIC STUDY OF TRAWL FISHERIES IN SAMAR SEA, PHILIPPINES

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ACRONYMS

BFAR	Bureau of Fisheries and Aquatic Resources
BoatR	Municipal Fishing Boat Registration
CPUE	catch per unit effort
CTI	Coral Triangle Initiative
CY	calendar year
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DTI	Department of Trade and Industry
EAFM	Ecosystems Approach to Fisheries Management
EO	Executive Order
FAO	Food and Agriculture Organization of the United Nations
FARMC	Fisheries and Aquatic Resources Management Council
FELIS	Fishing Vessels Electronic Licensing System
FR	footrope
GSI	gonado-somatic index
GT	gross tons
HP	horsepower
HR	headrope
IFARMC	Integrated Fisheries and Aquatic Resources Management Council
JTED	juvenile and trashfish excluder device
LGU	local government unit
MARINA	Maritime Industry Authority
MTE	Mid- term Evaluation
NFRDI	National Fisheries Research and Development Institute ,
NGO	non-government organization

NMFDC	National Marine Fisheries Development Center
NSAP	National Stock Assessment Program
NSO	National Statistics Office
PA	polyamide
PE	polyethylene
PhP	Philippine Peso
PSA	Philippine Statistics Authority
RA	Republic Act
REBYC	Reduction of Bycatch
RFU	Regional Facilitation Unit
SEAFDEC	Southeast Asian Fisheries Development Center
SSFMP	Samar Sea Fisheries Management Plan
SSU	Samar State University
TWG	Technical Working Group

ABSTRACT

Samar Sea is one of the major fishing grounds in Northwestern Samar with abundant pelagic and demersal fishery resources. In order to holistically manage the area, the Alliance of Local Government Units in Samar Sea planned to collectively manage the fishery resources using the concept of Ecosystem Approach to Fisheries Management (EAFM). However, the absence of socio-economic data as baseline for assessing and monitoring socio-economic impacts of proposed management actions is one of the important missing information. Therefore, a socio-economic study of trawl fisheries in the Samar Sea was conducted to gather baseline information for the formulation, implementation, monitoring and evaluation purposes of the proposed fishery management measures and contribute to the Samar Sea Fisheries Management Plan (SSFMP) to address its impact on affected fisher folks.

The socio-economic survey covered both commercial trawls (fish and shrimp trawls) and smaller-scale municipal trawls (shrimp and squid trawls) with a total of 517 respondents and examined age composition, participation of female fishers, and also education. Majority of the respondents were male (99% in commercial fish trawls and 92.5% in commercial shrimp trawls). Most of the fishermen were between 25 to 44 years of age. In general, fishers' education was inadequate with many only with elementary level education.. Most respondents were not members of any organization but those that were listed as part of an organization were members of fisherfolk association which is the most common type. Extended families exist among the respondents. In all types of trawling households, both commercial and municipal, the son, daughter and wife are the primary household members who stay with the respondents.

Fishing was the most dominant source of livelihood of household members. Farming, teaching, carpentry, overseas work, fish processing, aquaculture, livestock rearing, fish brokering and ancillary fishing related occupations were among the household members' livelihood sources. Access to credit is very low and correspond with the low membership in associations. There is a need for training on basic safety at sea as in general very minimal life-saving equipment and materials are onboard.

The municipal trawler with a 10-16 hp engine seems to be operate more profitably than the municipal trawler with a 80 hp engine, considering operational costs vs. net profit derived from their operations as well as the income for fishermen.

I. INTRODUCTION

The REBYC-II CTI “Strategies for Trawl Fisheries Bycatch Management” project aims to contribute to more sustainable use of fisheries resources and healthier marine ecosystems in the Coral Triangle and Southeast Asia waters by reducing bycatch, discards and fishing impacts by trawl fisheries. The project assumes that this can be achieved through the implementation of trawl fisheries bycatch management plans in each pilot site in the five participating countries namely: Thailand, Viet Nam, Indonesia, the Philippines and Papua New Guinea. The pilot project site in the Philippines is Samar Sea and a Samar Sea Fisheries Management Plan (SSFMP) is being developed under the project.

The importance of socio-economic data and information cannot be over-emphasized in planning, implementation, monitoring and evaluation of the SSFMP. Understanding the mechanism and dynamics between biophysical, socio-economic as well as cultural and political realities are critical to rationalize and implement practical strategies in managing a complex environment like the Samar Sea. To date, socio-economic details including relevant gender information have not been readily accessible.

Furthermore, in the project mid-term evaluation (MTE) report, it was noted that little effort had been given so far to crucial socio-economic data collection to understand the role of trawl fisheries, the role of bycatch, and implications of management measures on income, employment, livelihoods and food security. It was also concluded that gender had not been adequately addressed in the project, neither in the design, nor during implementation.

It is recognized that the socio-economic aspects of fisheries are important components in the formulation of the SSFMP to take into account the human well-being component of the Ecosystem Approach to Fisheries Management (EAFM) as it impacts on the fisheries of Samar Sea.

1.OBJECTIVES OF THE STUDY:

- a) Generate baseline information on the demography and socio-economic condition of Samar Sea trawl fisheries sector as indicator for monitoring and evaluation of proposed fishery management measures; and
- b) Determine potential impact of the Samar Sea Fishery Management Plan (SSFMP) and provide measures to address its impact on affected fishers.

II. OVERVIEW OF MARINE CAPTURE FISHERIES

1. BRIEF DESCRIPTION

a) *Administrative Classification*

Capture fisheries in the Philippines is administratively divided according to the vessel’s gross tonnage. As defined under Republic Act (RA) 8550, otherwise known as the Philippine Fisheries Code of 1998 and as amended by RA 10654, commercial fisheries include all fishing operations that use vessels of over 3.1 gross tons (GT). Municipal fisheries, on the other hand, involves the

use of vessels of 3 GT or less as well as fishing operations that do not use fishing boats (*Ramiscal and Dickson, 2010*).

Under the Philippines National law, commercial fishing is further sub-classified according to the following:

- a) Small scale commercial fishing - fishing with passive or active gear utilizing fishing vessels of 3.1 gross tons (GT) up to twenty (20) GT;
- b) Medium scale commercial fishing - fishing utilizing active gears and vessels of 20.1 GT up to one hundred fifty (150) GT; and
- c) Large scale commercial fishing - fishing utilizing active gears and vessels of more than one hundred fifty (150) GT.

Municipal fisheries roughly translate to traditional, artisanal, subsistence or small-scale fisheries while the commercial fisheries corresponds to the industrial or large-scale type fisheries.

b) ***Production***

Overall, commercial capture fisheries provided the most significant contribution (Figure 1) to fisheries production in the Philippines with 47% while municipal capture contributed 44%. Inland fisheries contributed 9% of the total produce (Philippine Statistics Authority, PSA).

Total production slightly increased from CY 2005 till 2008 reaching the highest in 2009. It was however observed to slightly decrease from thereon until 2012 and again slightly increase in 2013 till 2014.

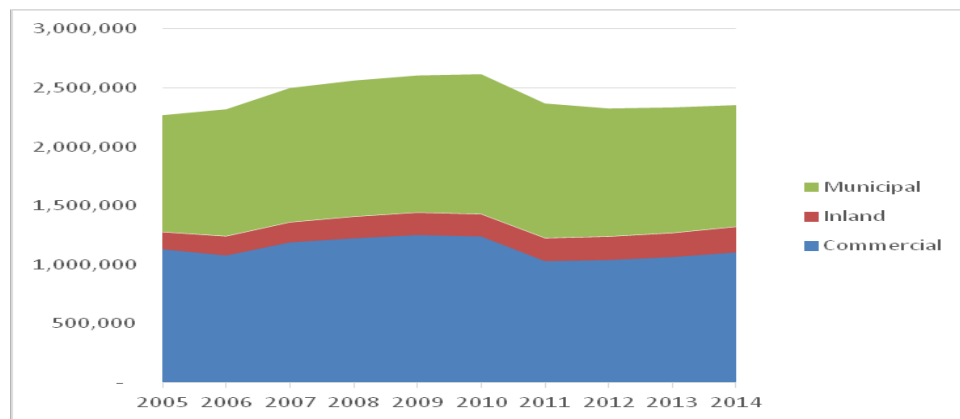


Figure 1. Fisheries production (in tonnes) in the Philippines in 2005-2014 (Philippine Statistics Authority).

c) ***Fishing fleet***

As of May 2016, commercial fishing fleet comprised of 3,483 catcher vessels that are licensed by the Bureau of Fisheries and Aquatic Resources (BFAR). However, considering the unofficial list from various organizations and local government units, there are more than the official number as many vessels remain unregistered. Major commercial fishing gears used are ring net, trawl,

handline, purse seine, bag net and longline. Trawl is used by about 14% of the total number of registered commercial fishing vessels (Table 1).

Table 1. Number of registered commercial fishing boats in the Philippines.

FISHING GEARS	TYPE			GRAND TOTAL
	LARGE	MEDIUM	SMALL	
Ring Net		348	429	777
Trawl		156	338	494
Handline		128	229	357
Sardine/Mackerel/ Scad Purse Seine	58	221	15	294
Tuna Purse Seine	86	64	3	153
Bag Net	1	28	103	132
Longline	24	23	68	115
Push Net		9	39	48
Beach/Drag Seine	1	14	20	35
Gill Net		6	22	28
Paaling/Drive-In Net	18	8	1	27
Round Haul Seine	1		1	2
Others	31	435	545	1,011
Grand Total	220	1,440	1,813	3,473

Source: Bureau of Fisheries and Aquatic Resources - Fishing Vessels Electronic Licensing System (BFAR-FELIS)

In order to facilitate municipal fishing boat registration, BoatR was launched by BFAR in 2015 to obtain a more realistic inventory of fishing boats in the country. As of May 2016, there are a total of 178,000 registered municipal fishing boats in the Philippines. The most common fishing gears used in municipal fisheries are hook-and-line, gillnets, cast nets, traps/pots, beach seine and fish corral.

d) **Employment**

The fisheries sector provides employment to 1,614,368 fishing operators nationwide, 85% (1,371,676) of which are from the municipal fisheries and 1% (16,497) from the commercial sector. The aquaculture sector employed 14% (226,195 operators) (NSO 2002 Census for Fisheries).

2. THE TRAWL FISHERIES INDUSTRY

Following the general administrative classification of fishing boats based on the size of the vessel, trawling boats are correspondingly classified as municipal and commercial.

a) ***Municipal trawlers***

Municipal trawlers are fishing boats that are 3 gross tons or less and are made of wooden dugout. Popularly called as "*banca*," they commonly measure about 5 to 12 meters long, powered by inboard gasoline engines and fishing is manually operated. The smallest trawler is referred to as *mini-trawl* and is a simple dugout powered by 10 hp or smaller engine and is usually used to catch sergestid shrimps (*Acetes*) and anchovy. It is operated by 1 to 2 fishermen. On the other hand, *baby trawl* is an outriggered banca propelled by 10-16 horsepower gasoline or diesel engine and operation also requires 1 to 2 crew. These boats are small and categorized as municipal fishing boats. Operation is limited in shallow and nearshore areas with short fishing trips normally leaving late in the afternoon and returning the following morning.

Many trawlers considered as municipal are however under-measured or inaccurately classified with actual size exceeding 3 gross tons, thus actually qualifying as small commercial trawlers. These boats are more than 12 meters powered by 80-130 horsepower 'marinized' truck (diesel) engines and operated by 2-5 fishermen. Short daily trips are also usually done. However, trips lasting more than one day are also common as they are able to reach more distant fishing grounds.

b) ***Commercial***

Trawling using more than 3 gross ton boats are classified as commercial and is further classified as 1) small-commercial (3.1 to 20 GT); 2) medium-commercial (20.1 to 150 GT); and, 3) large-commercial type (> 150 GT). The over-all length usually exceeds 12 meters and boats are driven by 80-500 horsepower engines. In general, the boats are mechanized where winches and pulleys are rigged for hauling. Fishing trips lasting 2-4 days are common but shorter trips are also done in areas when target fishing grounds are close to fish ports or fish landing centers. Fish finders are common on medium-commercial boats and some take on 5-7 days fishing trips.

c) ***Gear designs***

Two basic trawl net designs are employed depending on the target catch. The V-type net is a low-opening trawl that is intended to principally catch shrimp. The German two-seam type (Herman Engel) trawl is widely used to catch squid, sergestid shrimp and anchovy and high opening fish trawl to catch not only demersal but also small-pelagic fishes. Boats commonly change gear types depending on the area of operation and target species.

The size of net used is related to the size or power of the boat. For example for a baby trawler using 10 hp gasoline engine, the typical head rope (HR) of the V-type net measures 4-6 m and the foot rope (FR) 7-10 m; for boats powered by 80 hp engine, 11-18 m HR and 16-25 m FR. High-opening net used by medium commercial trawler measures 30-32 m HR and 35-39 FR.

d) ***The trawl fleet***

Trawling has been in use in the Philippines since the early part of 20th century and were popularized after the Second World War when American surplus marine engines were readily available (Umali 1950; Thomas 1998). Exploratory surveys in the 1950s demonstrated the potential of trawling in the country and it became widespread by the 1960's (Thomas 1998). In 1967, 600 commercial trawling units were reported to be in operation (Encina 1976). By the early

1980s, the number increased to about 700 to 900 units that peaked in 1983 when the total number of registered vessels was 932 boats (BFAR Fisheries Statistics 1981-1988).

Meanwhile, the expansion of commercial trawlers subsequently effected adoption in smaller boats. Locally called as “baby trawl” outriggered boats powered by 10-16 horsepower engines use small nets that are dragged in the shallow coastal area to catch shrimps. This also evolved into the larger outriggered trawler boats fitted with surplus diesel (truck) engines of about 80 horsepower to fish in the deeper portions of the bays and gulfs. Because of the size of the boats, baby trawls are classified as municipal while larger version of outriggered bancas are also commonly classified as municipal. However, the size of the boats are in fact more than 3 gross tons making them as small commercial vessels. While these municipal trawls are evidently widespread in bays, gulfs and coastal areas, their actual number has generally been indeterminate, much less registered or licensed.

Declining catch, at the same time increasing cost of operations mainly by the increase in the price of fuel oil, conflicts with other users and restrictions resulted in the decline of the commercial fleet (Armada 2004; Thomas 1999; de Jesus 1988; Dickson 2004). By 1997, the registered trawlers numbered 445 units and further reduced to 398 units a decade later (2007). It was, however, noticeable in major trawl fishing grounds that many commercial trawlers continue to operate but remain unregistered and unlicensed.

The decrease in the number of trawlers was replaced with the gear that similarly catches demersal species. The local Danish seine is a modified version of the original Danish seine in the northern regions of Europe by using heavy “tom” weight to close the scare lines. Registered commercial modified Danish seine in 1988 was only 59 units that increased to 672 vessels in 2007. Similar situation is also apparent in municipal boats in many coastal areas.

e) ***Trawl fishing grounds***

Trawl fishing is conducted in relatively flat, muddy/sandy bottom and in shallow to moderate depths usually not exceeding 100-150 meters along coastal areas, bays, gulfs and inlets. The major trawl fishing grounds in the Philippines are Samar Sea, Visayan Sea, San Miguel Bay, Lingayen Gulf, Ragay Gulf, Carigara Bay, Guimaras Strait and Manila Bay.

Despite the consequent closure of the greater parts of these major trawl fishing areas due to the expansion of municipal waters to 15 km, trawlers have persisted and maintained their uncontrolled operations in these areas. While there has been a decline in the officially registered and licensed commercial trawlers in recent years, the actual number of operating vessels is perhaps higher considering that many have remained unregistered/unlicensed. This same situation is more apparent in the municipal fisheries sector.

f) ***Fishes caught and status of stocks***

Major fish species landed are roundscads, Indian sardine, frigate tuna, bigeye scad, fimbriated sardines, slipmouths, squids, anchovies, eastern little tuna and Indian mackerel. Small pelagics (scads, sardines, herrings, mackerels, small tunas) and demersal fish stocks are considered overfished and exploited beyond MSY levels (Dalzell et al. 1987; Zaragoza et al. 2004; Barut et al. 2004; Armada 2004).

Overfishing brought about by increased number of fishers and the general open access to fisheries is common to both municipal and commercial fisheries. Commercial fishing boats continued operations in municipal waters and the use of destructive fishing methods (i.e., dynamite, cyanide fishing and the use of fine mesh net fishing gear) have also contributed to the rapid decline of fish stocks and habitat degradation.

g) *National policy framework*

Fisheries policy and regulatory framework are primarily founded on three important legislations – the Fisheries Code of 1998 (Republic Act 8550) as amended by RA 10654, the Local Government Code of 1991 (RA 7160), and the Agriculture and Fisheries Modernization Act of 1997 (RA 8435).

The Fisheries Code of 1998 sets out the general framework for managing the country’s fisheries sector with the BFAR as leading government agency responsible for conservation and management of fishery resources beyond municipal waters.

The Local Government Code of 1991 provides the local government units (municipal and city governments) the jurisdiction and responsibility to manage the fisheries within their jurisdiction (municipal waters – 15 km from the shoreline). It also grants preferential use of municipal waters to municipal or small-scale fisherfolks. Within the structure of RA 8550 and RA 7160, local fisheries ordinances for the management of municipal waters in accordance with the National Fisheries Policy mainly provides rules and regulations on licensing, issuance of permits and other fisheries related activities. These ordinances prohibit commercial and active fishing gears in their respective jurisdictional waters.

The Agriculture and Fisheries Modernization Act of 1997 sets out measures to modernize the fisheries sector particularly through credit and extension.

In addition, Executive Orders that provide rules for marine coastal environment protection include:

- E.O. 305 (2004) devolving the municipal and city governments the registration of fishing vessels 3 gross tons or below;
- E.O. 240 (1995) creating the Fisheries and Aquatic Resource Management Councils (FARMCs) in barangays (villages), cities and municipalities and their composition.

The Local Government Code of 1991 and as reiterated in the Fisheries Code of 1998, fisheries management and regulation of municipal waters are devolved to the Local Government Units (LGUs). The LGUs are the municipal/city governments which are under the Department of Interior and Local Government (DILG). The LGUs in consultation with the FARMC, enact ordinances in accordance with the national fisheries policy set out by the Fisheries Code. Such ordinances are reviewed by the Sanggunian Panlalawigan (Provincial level council) pursuant to Republic Act No. 7160. The LGUs also enforce all fishery laws, rules and regulations as well as valid fishery ordinances enacted by the municipality/city council.

The LGUs however, through its local chief executive and appropriate ordinance, may authorize or permit small and medium commercial fishing vessels to operate within the 10.1 to 15 kilometer area from the shoreline in municipal waters with certain conditions.

The Fisheries and Aquatic Resources Management Councils (FARMCs) are established at the national and local (municipalities/cities) levels. The organization and formulation of FARMCs undergo the process of consultation among LGUs, non-government organizations (NGOs), fisher folk, and other concerned People's Organizations. The National Fisheries and Aquatic Resources Management Council (NFARMC) comprising of representatives of stakeholders is the advisory/recommendatory body at the national level.

In contiguous fishing grounds and fishery resources such as bays and gulfs which straddle several municipalities, cities or provinces, the Integrated Fisheries and Aquatic Resources Management Councils (IFARMCs) are also created to recommend the enactment of integrated fishery ordinances and assist in the preparation of the Integrated Fishery Development Plan and enforcement of fishery laws, rules and regulation. The LGUs which share or border such resources may group themselves and coordinate with each other to achieve the objectives of integrated fishery resource management.

Besides BFAR, other government agencies that are mandated to implement relevant management or conservation of aquatic resources are the Department of Environment and Natural Resources (DENR) which has jurisdiction on habitats, protected areas, endangered species and biodiversity, the Department of Trade and Industry (DTI) that regulates fisheries business, and the Maritime Industry Authority (MARINA) on the regulation of fishing vessels.

3. OVERVIEW OF SAMAR SEA FISHERIES

Samar Sea is located in the province of Samar, Region 8 in Eastern Visayas Region. The province is divided into two (2) congressional districts that comprise of two (2) cities and twenty four (24) municipalities of which the majority are coastal cities/municipalities. Samar Sea has an estimated area of about 198 km². This fishing ground is muddy to sandy bottom and relatively shallow with prevailing depth of less than 50 meters. Deeper areas of less than 100 meters are located towards the northern portion.

a) *The trawl fleet*

Samar Sea is one of the most important fishing grounds for both municipal and commercial trawls. In 2007, baby trawl was the 3rd most dominant among municipal gear (23%) next to bottom set gillnet and shrimp gillnet. It was also the second in terms of catch rate after ring net. Other important municipal gears are the modified Danish seine and ring nets (Diocton, 2009).

According to the rapid survey conducted in selected Samar Sea areas as part of the activities under REBYC-II CTI in 2014, there are 73 small commercial trawlers, 66 large municipal and 266 baby trawlers.

b) *Stock assessment*

Studies in Samar Sea had been focused on assessment of demersal stocks. The otter trawler (Theodore N. Gill survey) averaged 42 kg/hr of marketable fish with the highest yield of 112 kg/hr at 20 fathom (37 m) contour. The resources consisted of cutlass fish, turbot, nemipterids, lizard fish, crevalles (jacks) and insignificant amount of shrimp (Warfel and Manacop, 1950). By 1979-80, the biomass from trawl surveys conducted by the University of the Philippines was

1.56-1.88 t/km² (Saeger, 1981; Armada et al., 1983) which was well below the accepted tolerable level of 3 t/km². Average daily catch also reduced from 30 kg/day in the 1960s to 8 kg/day in 1981, and to 3.5 kg/day in 1991 (Saeger, 1993).

The average municipal landing of shrimp trawls for the period 1992-1995 was about 812.25 tonnes/year (Mines, 1995). This implies that each shrimp trawl landed about 40 tonnes/year on the average or 0.33 tonnes/month (15.2 kg/day). During the survey, seven species of shrimps belonging to three genera, i.e., *Penaeus*, *Metapenaeus* and *Trachypenaeus sp.* were identified of high commercial value. *Penaeus merguensis* locally known as “puti” was the most abundant and dominant landing among the genus *Penaeus*. The catch per unit effort (CPUE) of 1.39 kg/haul for this species was already at a low level. Other penaeid shrimps identified were the *Penaeus semiculcatus* (bulik), *P. latisulcatus* (tigbason), *P. monodon* (lukon), *Metapenaeus ensis* (guludan), *Metapenaeus endeavouri* and *Trachypenaeus fulvus* (bangkigan).

The bycatch of demersal finfishes consisted of 7.35% of the total catch. These include common slipmouth (sap-sap), common whiting (aso-os), goat fish (ti-ao), sole fish (palad), threadfin bream (sagisi-on), eel (obod), cardinal fish (moong), goby (manloloho), lizard fish (alho), soldier fish (baga-baga), grouper (tingag), theraponids (bagaong), mojarras (baisa), flathead (sunog), black pomfret (sandatan), carangids and *Carangoides malabaricus*. The bycatch is usually used for food consumption by the fishers and operator. However, there is also a large portion of bycatch as small sizes of finfishes and fishers call them as “rejects” (also called trash fish, which are basically juvenile and immature finfishes) which comprised about 39% of the total catch. Though widely used among fishers, “rejects” is not officially used, thus is not reflected in national statistics for fisheries.

In general, the state of the demersal fish stocks in the Philippines including Samar Sea is generally considered overfished (Barut et al., 2004). Various trawl surveys indicated declining biomass primarily due to excessive fishing. Declining catch rates and major changes in species composition, particularly increase in squids, shrimps, anchovies and herrings and declines of large commercially valuable species like snappers, sea catfish and Spanish mackerels are also indicative of overfishing in major trawl fishing grounds like San Miguel Bay, Lingayen Gulf, Visayan Sea and Manila Bay (Barut et al. 2004; Armada et al. 2004; Green et al. 2004).

The more recent survey conducted by MV DA-BFAR using a high opening trawl in Samar Sea indicated a biomass of about 2.88 t/km² and the catch belonging to 107 genera. While the biomass of Samar Sea was observed to be somewhat higher than Visayan Sea (2.4 t/km²), it is however noticeable that the number of genera has declined in Samar Sea and diversity is comparatively inferior in contrast to the high diversity observed in Visayan Sea (DA-BFAR, 2013).

Most recently under the REBYC-II CTI Project, the estimated biomass based on the landing of shrimp trawl was about 2.1 t/km².

c) *Catch of juveniles and trashfish*

The pilot implementation of the Juvenile and Trashfish Excluder Device (JTED) in Calbayog City provided comprehensive information on the catch of trawlers operating in Samar Sea (Dickson et al. 2008). For the period September 2005 to December 2006, the local fleet of 18 trawlers based in the City landed a total catch of 1,289 tons of fish from 991 fishing trips. Moreover, the average catch per unit effort (CPUE) for shrimp trawl was just below 1 ton (0.94 tons) per 2 days (3 nights) fishing trip while CPUE for fish trawl was 2.4 tons per fishing trip in

the same period. For shrimp trawl, peak months were indicated in the month of October and lean in July-August. For fish trawl, lowest mean catch was observed in September and highest in June (Fig. 2).

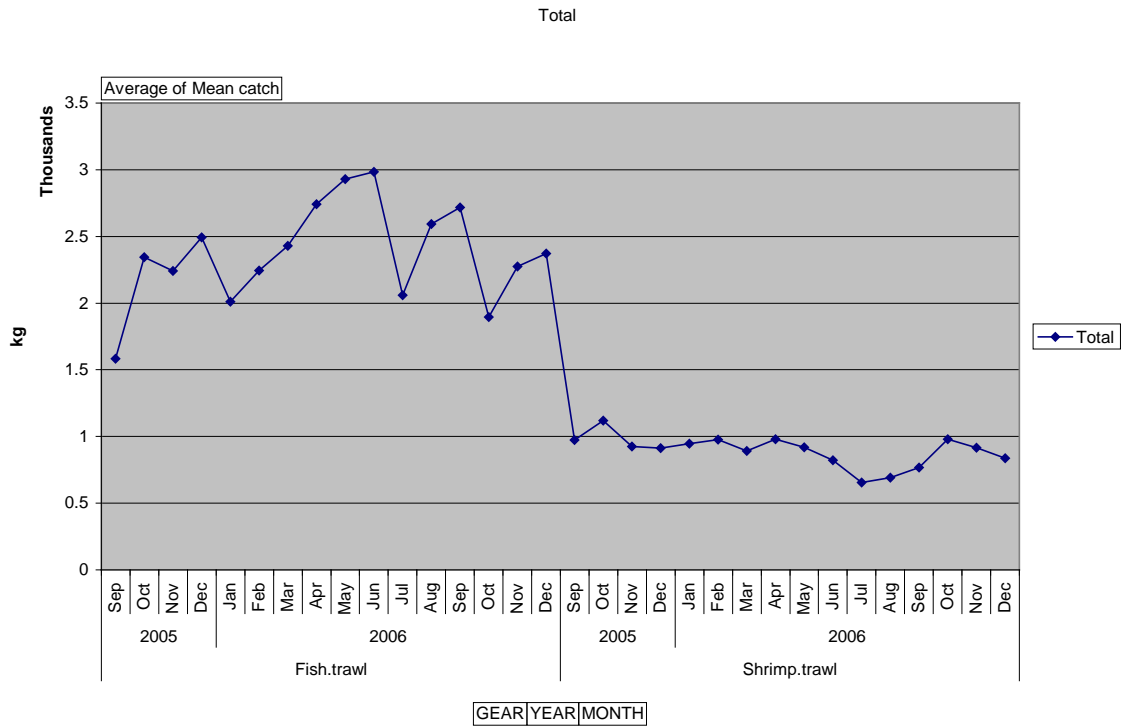


Figure 2. Catch-per-unit-effort (CPUE) for shrimp and fish trawl, Samar Sea, 2005-2006

d) **Spawning of commercial species**

The spawning months of major commercially important species was determined based on 5-point maturity scale and through determination of the species Gonado Somatic Index (GSI) (Dickson, et al., 2008) and ichthyoplankton survey (Diocton, 2014).

Meanwhile, the ichthyoplankton study provides reference to spawning months based on relative densities of fish eggs and larvae over the monthly period of the survey.

Based on the above methods, the spawning months of major commercially important species was indicated to mainly occur during the months of April, May, July and August.

Table 2. Spawning months of selected commercial species.

Species	J	F	M	A	M	J	J	A	S	O	N	D
Bisugo (<i>Nemipterus spp.</i>)								1,2				
Kalaso (<i>Saurida sp.</i>)												
Saramulyete (<i>Upeneus sp.</i>)							1,2			1		

Species	J	F	M	A	M	J	J	A	S	O	N	D
Tambong (<i>Leiognathus equulus</i>)							2					
Baga-baga (<i>Priacanthus spp.</i>)							2					
Lawayan (<i>Leiognathus spp.</i>)												2
Agumaa (<i>Rastrelliger faughni</i>)				1, 2	1							
Galunggong (<i>Decapterus spp.</i>)												1, 2
Hairtail (<i>Trichiurus spp.</i>)				2	2							
Hasa-hasa (<i>Rastrelliger brachysoma</i>)					2							
Alumahan, Burao (<i>Rastrelliger kanagurta</i>)				2	2	2						
Matambaka (<i>Selar crumenophthalmus</i>)							2					

Legend :

- 1** Results of study during REBYC 1, 2005-2006
- 2** Results of assessment conducted by SSU, 2013-2014

- Month of high proportion of matured (stage IV-V)
- Anticipated high occurrence of juvenile

E) *Coral reef status*

Survey of 19 sites with an estimated total area covered of 8,500 m² was conducted under the REBYC-II CTI Project. Overall estimated average coral cover was about 30% with estimated fish density of 0.43 fish/m². Based on local knowledge, destruction of corals can be attributed to human activities including various forms of destructive fishing.

Areas of relatively better coral cover were observed in Tagapul-an Tarangnan, Canhawan goti, (Catbalogan), Tigdaranaw Goti Is. (Tarangnan) and Cabilosan Is. (Almagro) (Table 3).

Table 3. Estimated coral cover and fish density in selected sites, 2013-2014.

Municipality	Site	Total Area (ha)	Transect Area (m ²)	Coral cover (%)	Est. fish density (fish/m ²)
Almagro	Poblacion	5	500	15.0	0.0
Almagro	BgyMalobago	6	500	25.0	1.0
Almagro	Cabilosan Is. (lighthouse)	40	500	35.0	0.7
Calbayog	Salhag Point		250	30.0	0.2
Calbayog	Punta Tinambacan	-	250	30.0	0.2
Calbayog	Tinambacan reef	-	250	25.0	0.1
Calbayog	Malajog point	-	250	15.0	0.2
Catbalogan	Lutao reef	10	500	25.0	0.3
Catbalogan	Sampotan Island	9	500	30.0	0.8
Catbalogan	Canhawan Goti Is	2	500	45.0	0.6
Tagapul-an	Bgy Lipot baybay	6	500	45.0	0.4
Tagapul-an	Bgy Labang baybay	6	500	35.0	0.3
Tagapul-an	Bgy Baquiw	4	500	40.0	0.4
Tagapul-an	Bgy Sugod	-	500	45.0	0.0
Sto Nino	Bgy Baras	4	500	25.0	0.9
Sto Nino	Ilijan Cove, BgyIlijan	10	500	20.0	0.6
Tarangnan	Libucan dacu	6	500	30.0	0.5
Tarangnan	SitioBaras, Bgy. Rama	2	500	15.0	0.2
Tarangnan	Tigdaranaw Goti Is.	18	500	40.0	1.1

Source : REBYC II-CTI Project Critical Habitat Survey, 2013-2014.

4. HISTORICAL ACCOUNT ON FISHING EFFORT

While the Local Government Units (LGUs) have variable accounts on the number of fisher folk and fishing boats as part of the Fisheries Profile, there is no record on the types of gear. Abdurahman (1988) observed that the dominant active fishing gear in Samar Sea was mini-otter

trawlers used in the municipal waters of Zumarraga, Catbalogan, Daram and Tarangnan and in some cases encroached into shallower waters of Maqueda Bay in the municipalities of San Sebastian, Jiabong, Calbiga, Pinabacdao and Villareal. They were operated year round to target highly priced penaeid shrimps/prawns, blue crabs, squids and octopus.

a) ***Fishing Fleet (Boats and Gears) Inventory***

Inventory on fishing boats and gears in Samar Sea as Pilot Project Site of REBYC-II CTI was developed in 2013 with the participation of the 11 LGUs.

The total number of fishing boats was 10,938 of which 59% were motorized and 31% non-motorized. The majority of the municipal fishing boats were from Daram, Tarangnan and Calbayog while commercial-sized fishing boats were observed only in Calbayog, Catbalogan, Daram, Zumarraga and Tagapul-an.

There were more than 24 types of municipal gears with a total of 13,875 units. The dominant gears were bottom set gillnet (*palubog*, 24.6%), simple handline (*kawil*, 10%), bottom set longline (*kitang*, 9%), crab pot (*panggal*, 9%), multiple handline (*undak*, 8%) and crab gillnet (*pang-alimasag*, 7.4%). Municipal fishing gears considered as active were baby trawl, ringnet, pushnet, bagnet and modified Danish seine; they were about 9% of the total.

There are 96 units composed of three (3) types of commercial fishing boats in Samar Sea. Trawl (*shrimp and fish*) was the most common comprising 42%, ringnet 40% and modified Danish Seine (*Pahulbot*) 19%.

In general, hook & line and trap/pot fishing operate on motorized or non-motorized bancas with about 0.2 GT and 0.7 GT, respectively. Common engines in motorized banca ranged 5-7 hp gasoline engines. Larger motorized bancas powered by 14-16 hp gasoline engines are used for gillnet fishing.

Commercial boats averaged 12 GT, powered by 150 hp Mitsubishi 6D15 automotive diesel engine.

Table 4. Inventory of fishing boats and gears by municipality, Samar Sea, 2013.

City/ Municipality	No. of boats (Motorized)	No. of boats (Non- Motorized)	Total Boats	Municipal																								Commercial																	
				Beach seine	Fish corral	Squid Pot (Pangasal pusit)	Crab Pot (Bintol, Panggal)	Fish pottraps	Bottom set gillnet (paunood, palubog)	Drift gillnet (Barangayan, Kuraniay)	Encircling Gillnet (warlog)	Crab Entangling Net	Shrimp Entangling net (pamasayan)	Trammel Net (Tribol)	Hook & Line (kawit)	Bottom Set Longline (Kiang)	Multiple Hook & line (Undak)	Troll Line (Subid, Tapsay, lambo, rambo, pahawin)	Spear fishing (Pamana)	Modified Danish Seine (hulbot)	Squid jig (Santik)	Lift net (paarak, Sarap- sarap)	Ringnet (Ligkop, tambogan, likos)	Bagnet (basnig)	Baby Trawl	Push net	Others	Total	Modified Danish Seine	Ringnet	Bottom Trawl	Total													
Almagro	684	131	815					0	37	2					248	424	49	32	123															915				0							
Calbayog	879	486	1365		51			348	425	131					408	271																			1942	10	7	17	34						
Catbalogan	663	336	999			15	1102	15	210			129	126		235	78																					2270	14	6	20					
Daram	1196	1256	2452				68	32	947		45	95	26	406	199	39	106																				2317	8	7	17	32				
Gandara	194	62	256		56			64	102																													270			0				
Pagsanghan	67	131	258		117		20	99	166						80	18																						500			0				
Sia Margarita	178	58	236				2	1	71	5		47	41			45																							317			0			
Sio Nino	366	82	448				3	8	115	6						38	235	50	10																					500			0		
Tagapul-an	300	471	771	2				0	68	16					153	82	404	285	91																					1101	4		4		
Tarangnan	1194	702	1896		5	42	3	79	763	103	557	43	32	328	225																										2532			0	
Zumaraga	703	739	1442	2				62	518					202		51																										1211	6		6
TOTAL	6424	4514	10938	4	229	57	1198	708	3422	160	154	1030	236	489	1403	1261	1169	384	368	241	272	22	152	2	753	142	19	13875	18	38	40	96													

b) *Major ports and landing sites*

Major fishing ports for commercial trawlers operating in Samar Sea are located in the cities of Calbayog and Catbalogan. Landing sites for municipal boats are in their respective villages and communities.

III. METHODOLOGY

1. Preparatory Activities

Socio-economic information of the fisheries in the pilot area is not readily accessible. To address this issue, a workshop on participatory approaches and socio-economic and gender mainstreaming was organized on 12-18 November 2014 at Catbalogan City, Western Samar. The workshop was one of the major national activities in preparation for the formulation of the Samar Sea Fisheries Management Plan (SSFMP). The workshop was aimed at providing the participants with understanding and appreciation of how socio-economic and gender information could be utilized in the management plan development process. City/Municipal Agriculturists/Planning Officers of the eleven (11) Local Government Units (LGUs) under the Alliance of Local Government Units bordering Samar Sea attended the activity.

Other participants came from the academe, Bureau of Fisheries and Aquatic Resources (BFAR) Regional Office 8, National Fisheries Research and Development Institute (NFRDI), the National Marine Fisheries Development Center (NMFDC), BFAR Central Office, the Provincial Government of Western Samar, the REBYC-II CTI Technical Working Group (TWG) and

representatives from the postharvest, fish traders, and the municipal and commercial fisheries sectors.

As an output of the Workshop, two sets of interview guides were prepared, namely: Trawl Fisheries Socio-economic Interview Guide and the Socio-economic Interview Guide for Other Fisheries (Annex 1 & 2). These were developed through working group sessions that were guided by the following questions: (1) What is the contribution of trawl fisheries to livelihoods? (2) What is the contribution of trawl fisheries to food security and nutrition? (3) What are the markets for the trawl fisheries products? and (4) What are the costs associated with trawl fishing and how does the cost structure compare with the returns?

The two guides were translated to the local “Waray” language by key stakeholders and the project TWG. After the formulation, role playing where two of the participants acted as the interviewer and the other the interviewee was conducted to obtain initial reaction with regards to the survey guide. Thereafter, these were field tested in Barangay Estaka, Catbalogan City, a fishing village where trawl operators and other fishing gear operators reside. Field testing was initiated to determine and improve the questions and address other difficulties in the interview guides. After the pre-test, the participants in the workshop analyzed and presented the information collected, and the guides were revised according to their comments and suggestions.

Prior to the actual survey, another workshop attended by key stakeholders and Project TWG was conducted to determine the target list and distribution of respondents for the socio-economic surveys in the 11 local governments units from the Alliance of LGUs in Samar Sea. It was agreed that at least 10% of operators of each fishing gear type are to be interviewed. With regards to the socio-economic part, the list and distribution of respondents was drawn randomly based on the inventory of fishing boats and gears conducted in 2013. There were no agreed certain number of crews and boat owners to be interviewed, rather it depended on who would be available during the survey.

The surveys for the socio-economics of trawl and other fishing gears were administered by the Municipal Agriculturists/Fishery Technicians and members of the TWG REBYC-II CTI Project in the 11 coastal municipalities who are members of the Alliance of LGUs bordering the pilot project area. The 11 municipalities were Calbayog, Catbalogan, Sta. Margarita, Tarangnan, Almagro, Pangsanghan, Daram, Zumarraga, Gandara, Sto. Nino, and Tagapul-an, all located in Western Samar. These municipalities border the Samar Sea pilot area with about 167 km² (Figure 4).



Figure 3. Map of Samar Sea and the 11 local government units (LGUs) covered by the survey.

2. The Survey Guide and Data Analysis

The survey guides were drafted and prepared by the Project Technical Working Group and key stakeholders with technical backstopping from FAO-Rome and REBYC-II RFU.

The survey guide, with translation to the local “Waray” language, contains four (4) major parts. The first part tackles the demographic profile such as personal information of respondents, educational attainment, household information, source of livelihood, membership to organization and availment/access to credits and extension services.

The guide also contains technical information such as the type of fishing gears used onboard, power and engine details, boat specifications, participation in fishing activities, catch and effort data, utilization of income generated from fishing, sharing system, fishing ground, etc.

Meanwhile, other data needed in cost and return analysis of trawl in Samar Sea was included while another part aimed to generate perception of respondents on the social and technical issues related to trawl fishery.

The trawl fisheries socio-economic survey was conducted from December 2014 - April 2015 while the survey on other fishing gears was held from May 2015 - June 2015.

Data analysis and a write-shop on the socio-economics of trawl and other fishing gears was conducted in Calbayog City, Samar from July 1-4, 2015 with technical backstopping from FAO Rome and the SEAFDEC, Training Department, Thailand. The write-shop aimed to share experiences and lessons learned during the data collection phase, consolidate and analyze results from the surveys, prepare an outline of the socio-economic and gender components, carry out analysis on the economic performance of trawls and other fishing gears, and prepare a draft of the socio-economic component of the SSFMP.

IV. RESULTS AND DISCUSSION

In the Trawl Fisheries Socio-economic survey, there were 517 respondents coming from the six (6) trawling municipalities of Calbayog, Catbalogan, Daram, Sta, Margarita, Tarangnan, and Zumarraga. The trawl fisheries target respondents were divided into municipal and commercial trawls, and respondents covered both crew and operators (Table 5).

Table 5. Distribution of respondents for trawls by municipality.

SURVEY AREA	COM TRAWL		COM TRAWL TOTAL	MUN TRAWL		MUN TRAWL TOTAL	Grand Total
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Calbayog City	28	23	51	9		9	60
Catbalogan City	27		27	60	2	62	89
Daram	1	1	2	112		112	114
Sta. Margarita	5	1	6	55		55	61
Tarangnan	15	4	19	115		115	134
Villareal	1		1				1
Zumarraga	14		14	44		44	58
GRAND TOTAL	91	29	120	395	2	397	517
PERCENTAGE	75.8	24.2	100	99.5	0.5	100	
OVERALL PERCENTAGE	17.6	5.6	23.2	76.4	0.4	76.8	100

Majority of the respondents came from municipal trawl i.e. 77% while commercial trawl respondents were 23%. Out of the 120 respondents from commercial trawls, 76% were fish trawlers while 24% were shrimp trawlers. Meanwhile, majority of the 397 respondents from municipal trawls were shrimp trawlers with 99.5% and only 0.5% were squid trawl respondents.

1. DEMOGRAPHIC PROFILE

There were two types of trawl namely: commercial (fish and shrimp) and municipal (shrimp and squid) categories. Table 6 shows that respondents were mainly male (99% in commercial fish trawls and 92.5% in commercial shrimp trawls). For municipal shrimp trawls, only 1% of the respondents were females while squid trawling was an exclusively male occupation.

Table 6. Socio-demographic characteristics of trawlers in Samar Sea, Philippines.

CATEGORY	COMMERCIAL TRAWL		COMMERCIAL TRAWL OVERALL (%) (n=120)	MUNICIPAL TRAWL		MUNICIPAL TRAWL OVERALL (%) (n=397)
	FISH (%) (n=93)	SHRIMP (%) (n=27)		SHRIMP (%) (n=395)	SQUID (%) (n=2)	
Sex of respondent						
Female	1.3	2.5		1.0	0	
Male	98.7	92.5		99.0	100	
Age Bracket						
15 to 24	19	18	18	5	0	5
25 to 34	29	33	30	19	50	19
35 to 44	27	20	24	36	0	36
45 to 54	19	20	19	23	0	23
55 to 64	5	5	5	14	50	14
65 and Over	1	0	1	3	0	3
No response	0	5	2	0	0	0
Average age	36	37	37	42	46	44
Civil Status						
Married	70.9	60.0	67.2	92.7	100.0	92.7
Single	25.3	35.0	28.6	5.6	0.0	5.5
Widow	0.0	0.0	0.00	0.5	0.0	0.5
Widower	3.8	0.0	2.5	0.5	0.0	0.5
No Response	0.0	5.0	1.7	0.8	0.0	0.8
Total %	100.0	100.0	100.0	100.0	100.0	100.0
Highest Education Attained						
Elementary Level ¹	29.11	25.00	27.73	39.14	50.00	39.20
Elementary Graduate	34.18	30.00	32.77	22.73	0.00	22.61
High School Level ²	13.92	20.00	15.97	17.42	50.00	17.59
High School Graduate	13.92	2.50	10.08	10.86	0.00	10.80
Unspecified	1.27	7.50	3.36	4.55	0.00	4.52
College Level ³	3.80	5.00	4.20	3.03	0.00	3.02
College Graduate	2.53	7.50	4.20	0.76	0.00	0.75
Vocational	0.00	2.50	0.84	0.76	0.00	0.75
Never Attended School	1.27	0.00	0.84	0.76	0.00	0.75
TOTAL%	100.00	100.00	100.00	100.00	100.00	100.00

- ¹ Have attended elementary but did not graduate
- ² Have attended High School studies but did not graduate
- ³ Have attended College studies but did not graduate

The relative age distribution of respondents from commercial and municipal trawlers are further shown in Table 6. Commercial trawlers have higher percentage of single respondents as they require heavier works aside from having to spend more fishing days onboard compared to municipal trawlers who are operating closer to the shore and on a daily basis. Likewise, these are apparent on their ages as older fishers are engaged in municipal trawls, with shrimp trawls are dominated by the age bracket 35 - 44 years. Half of squid trawl respondents were between 25 - 34 years, with the remaining 50% were found in the 55 - 64 years of age bracket.

A comparatively similar distribution was observed for commercial shrimp trawlers, with the highest proportion, (33%) of the fishers in the 25 – 34 years age bracket, 20% of the respondents were in the 35 - 44 years and 20% in the 45 - 54 years bracket. Relatively fewer fishers (17% of respondents) were engaged in shrimp trawling fishery at age 55 years or over. Respondents showed a higher average age in municipal trawl compared to commercial trawlers. This is expected as work onboard involves and requires heavier manual labor and longer fishing days.

Trawl fishers, similar to other types of fishers, were in general only educated to elementary level, (37%). Only 17% studied but dropped out of high school and only 11% graduated. This was more pronounced in the municipal sector where about 39% did not even finish elementary education. With this background, it is understandable that the fishers have limited options and find it difficult to compete in other sectors, except in fishing, which they have been exposed to and engaged in for most of their lives. With the program of the government providing free elementary and high school education in public schools, they still find it hard to afford paying additional expenditures like miscellaneous and other daily expenses which, according to them is also difficult to sustain. The need to assist their parents in providing income to the family runs as their foremost obligation and is apparently reflected in the low educational attainment of the respondents.

The closeness of family ties in the Filipino culture was evident from the survey as it has proven that extended families exist among the respondents. In all types of trawls both commercial and municipal, son, daughter and wife are the primary household members who stay with the respondents. Moreover, father, mother, grandfather, grandmother, nieces, nephews and other relatives were the other household members identified by the respondents.

When interviewed on livelihood sources of household members, fishing was the most dominant response with 51%, followed by housekeeping with 10% and non-fishing related with 7.9%. Farming, teaching, carpentry, former overseas Filipino worker, fish processing, aquaculture, livestock rearing, fish brokering and ancillary fishing occupations were likewise identified as sources of livelihood by the household members.

Table 7. Membership of respondents in organizations.

ORGANIZATION	COMMERCIAL (COM) TRAWL		COM TRAWL TOTAL	MUNICIPAL (MUN) TRAWL		MUN TRAWL TOTAL	GRAND TOTAL
	FISH	SHRIMP		SHRIMP	SQUID		
Homeowner's Association	0	0	0	0.505051	0	0.502513	0.386847

ORGANIZATION	COMMERCIAL (COM) TRAWL		COM TRAWL TOTAL	MUNICIPAL (MUN) TRAWL		MUN TRAWL TOTAL	GRAND TOTAL
	FISH	SHRIMP		SHRIMP	SQUID		
Religious Association	2.531646	2.5	2.521008	1.262626	0	1.256281	1.547389
Fisheries and Aquatic Resources Management Council (FARMC)	2.531646	0	1.680672	2.272727	0	2.261307	2.12766
Barangay Council	1.265823	2.5	1.680672	5.808081	0	5.778894	4.83559
Fisherfolk Association	8.860759	22.5	13.44538	6.565657	0	6.532663	8.123791
Not a member of any	12.65823	25	16.80672	44.69697	0	44.47236	38.10445
No Response	72.1519	47.5	63.86555	37.62626	100	37.9397	43.90716
Other Organization	0	0	0	1.262626	0	1.256281	0.967118
TOTAL %	100	100	100	100	100	100	100

It is noticeable that the most dominant response indicate that they are not members of any organization (Table 7). Moreover, a higher percentage of respondents with membership in an organization particularly from the municipal fisheries sector are members of fisher folk organizations. Less than 20 percent of all respondents are members of any association, of which less than 10 percent as members of a fisher folk association. It is worth noting that only a few of the respondents are members of the FARMC, who acts as the advisory body of BFAR on fishery management. Considering the voluntary nature of the survey and even with much encouragement from the enumerators for a response, the other respondents did not reply to the question on their membership.

Table 8. Access to credit facilities in Samar Sea, Philippines.

HAVE AVAILED OF CREDIT	COMMERCIAL TRAWL		COM TRAWL (%)	MUNICIPAL TRAWL		MUN TRAWL (%)	TOTAL (%)
	FISH (%)	SHRIMP (%)		SHRIMP (%)	SQUID (%)		
NO	62	78	67	51	0	50	54
YES	9	15	11	29	0	29	25
NO RESPONSE	29	8	22	20	100	21	21
TOTAL %	100	100	100	100	100	100	100

Table 9. Extension services provided to trawl fishers in Samar Sea, Philippines.

AVAILMENT OF EXTENSION SERVICES	COM TRAWL		COM TRAWL TOTAL	MUN TRAWL		MUN TRAWL TOTAL	GRAND TOTAL
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Yes	20	7	27	206	-	206	233
<i>BFAR</i>	3		3	2		2	5
<i>DOH</i>		1	1	10		10	11
<i>LGU</i>	-	1	1	84	-	84	85
<i>DSWD</i>	15	5	20	100		100	120
<i>OTHER AGENCIES</i>	2	-	2	10	-	10	12
No Response²	19	3	22	53		55	77
None³	40	30	70	137		137	207
GRAND TOTAL	79	40	119	396	-	398	517

² Respondent chose not to respond to the question

³ Respondents did not receive any extension service

Low access to formal credit for fishers is apparent with only 11% of the respondents from commercial, and 29% from the municipal trawlers able to access formal credit (Table 8). This is apparently due to low membership of most of the respondents in organizations where credit institutions prefer to provide credit to organizations/associations. No response was obtained of credit from informal lenders.

Commercial trawlers' exposure to extension services was rare, with more than 60% of respondents claiming to have not been reached by government agency extension services (Table 9). A higher percentage was observed on municipal trawl. The most common extension service accessed by trawl operators was the Department of Social Work and Development (DSWD). This is through the conditional cash transfer program otherwise known in the country as the 4Ps (Pangtawid Pamilyang Pilipino Program) that provides financial assistance to poorer families for education of their children. Though quite low, extension services from the Bureau of Fisheries and Aquatic Resources (BFAR) was observed to be the 4th highest government agency to have provided extension services in the survey area. Services rendered were typhoon assistance and basic training on fishery livelihoods.

2. ECONOMICS OF TRAWL AND OTHER FISHING GEARS

Trawlers in the Samar Sea are generally categorized as commercial fish trawls (*palupad*), commercial shrimp trawls (*pakayod*), and municipal trawls (*pakayod*). Other gears include fishing methods not classified as trawls, that are commonly used in Samar Sea.

The commercial fish trawl or locally known as *palupad* usually has an average overall length of 22 meters, powered by 120-280 horsepower (HP) diesel engines. The fishing gear used by commercial trawlers are relatively bigger consisting of 9 panels of polyamide (PA) and polyethylene (PE) nettings. The size of the net is proportionate to the size and horsepower of the fishing boat. This trawler type is capable of operating in areas from 10 to 50 meters deep. A

fishing trip consists of an average of two (2) days continuous fishing operation with 2 to 4 hours of dragging per setting. This type of trawl employs an average of 10 crew members. The commercial shrimp trawl has an average overall length of 12 meters and usually employs 4 crew, while the municipal trawl has an overall length of 9 m with 1 or 2 crew. A fishing trip for commercial shrimp trawls consists of an average of 1.6 days while the municipal trawlers consists of 1 day fishing operation.

Municipal trawlers had the highest average number of fishing trips per month (21.6 trips). The commercial shrimp trawlers had an average of 14.5 trips per month while the commercial fish trawlers had 10.6 trips per month. It is apparent that commercial trawlers spend more fishing days per trip compared to municipal as they have stronger engines, larger boats and larger fishholds. All types of trawls had a very similar annual fishing effort, ranging from 10 to 11.6 fishing months per year. The average catch per trip was relative to the type of engine used, with those boats powered by 160 hp averaging 690 kg/trip, 80 hp averaging 100 kg/trip and 10-16 hp averaging 12 kg/trip. Overall, the total average estimated catch 92,916 kg wherein the average catch per year for the 3 categories in Samar Sea is estimated as 73,140 kg, 16,800 kg and, 2,796 kg respectively (Table 10). With these estimates, trawling has an annual production of 92,736 kg.

Table 10. Average catch and fishing effort of trawl by engine horsepower category.

Engine horsepower	Number of respondents	Average fishing days per trip	Average fishing trips/month	Average fishing months/year	Average fishing trips/year	Average catch per trip (kg)	Estimated annual catch (kg)
160 hp (6D14) (commercial)	14	2.42	10.6	10	106	690	73140
80 hp (4DR5) (commercial)	5	1.6	14.5	11.6	168	100	16800
10-16 hp (single piston) (municipal)	123	1	21.6	10.8	233	12	2796

It was observed that an average of 3 kg of fish are being brought home by crew onboard commercial trawlers. Fish trawlers bring home an average of 2.6 kg while shrimp trawlers bring home an average of 4.5 kg. Meanwhile, municipal fishermen bring home an average of 1.6 kg of fish. Overall, trawl respondents bring home an average of 1.9 kg.

High value rejects are caught by commercial trawlers which are normally bought by traders for dishes/viands and also for further processing such as drying, fish paste/sauce and fish meal. Prices of rejects from commercial fishermen are significantly high as these quite often comprised of high-value fish species. In most cases, rejects, otherwise called trash fish in the Philippines, caught by municipal fishermen are sold as basis for fishmeal and at a comparatively low value.

Table 11. Average weight of fish per trip that boat captain and crew take for home consumption.

RESPONDENT TYPE	AVERAGE REJECT CATCH/TRIP (kg)	AVERAGE REJECT VALUE/KILOGRAM (PHP)	TOTAL REJECT VALUE/TRIP (PHP)
Commercial trawl	68.8	47.67	3, 279
Municipal trawl	2.0	18.45	36

Note: US\$ 1.0 is equivalent to Php46.98

Table 12. Annual economic performance analysis for 160 hp trawl

Type of Cost	Cash (PhP)	Non-Cash (PhP)	Total (PhP)
Fixed Cost			
Depreciation of fishing boat		69,601	69,601
Depreciation of fishing gear		28,750	28,750
Depreciation of equipment		8,706	8,706
Opportunity capital		11,268	11,268
		118,325	118,325
Operational cost			
Fuel/lubricant	2,769,379		2,769,379
Crew share	416,017		416,017
Labor wage	127,167		127,167
Maintenance cost	526,151		526,151
Ice	293,937		293,937
Transportation	83,930		83,930
Food provision	288,431		288,431
MARINA fee	5,579		5,579
BFAR fee	1,448		1,448
Other incidental expenses	784,800		784,800
	5,296,836		5,296,836
Total cost			5,415,161
Total revenue			7,339,770
Operating profit			2,042,934
Net profit			1,924,609

Note: US\$1.0 is equivalent to Php46.98

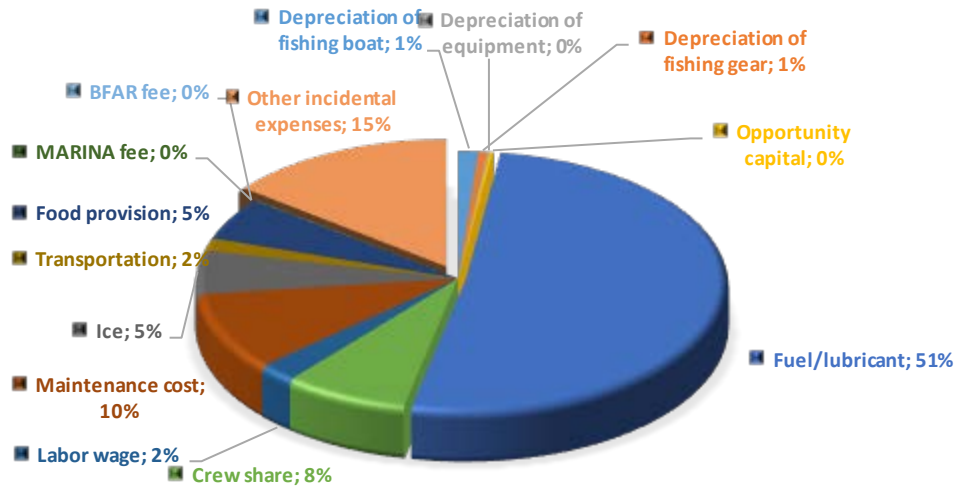


Figure 4. Distribution of cost of 160 hp commercial fish trawl (Source: Socio-economic survey 2015).

Table 12 indicates the economic performance analysis of a typical commercial trawler with a 160 hp engine. The total annual cost was P5 415 161. Out of this, P2 769 379 or (51%) was spent for the fuel and lubricant (Figure 5). Considerable amount was also spent for the other incidental expenses which was P784 800 or 15%. The maintenance cost contributed P526 151 (10%). Other significant expenses went to crew share P416 017 (8%), ice and food (5%).

The high cost of fuel and maintenance for 160 hp commercial trawl indicated that the fishing boats, particularly the engines used onboard, were fuel inefficient and old. Incidental costs are other expenses which are supposed to be low in nature. However, it was observed to be significantly high in their operations. When asked, the respondents chose not to reveal the breakdown of the cost for other incidental expenses due to confidentiality reasons.

The total annual revenue from 160 hp commercial trawling was calculated as P7 339 770 with a net profit of P1,924,609 or about 26% of the total annual revenue. Individual revenue was the product of the average catch per trip and the average catch value (P100/kg), while total revenue was the product of average individual revenue and the average number of trips per year.

Table 13. Annual economic performance analysis for commercial shrimp trawl with 80 hp (Socio-economic survey 2015).

Type of Cost	Cash (PhP)	Non-Cash (PhP)	Total (PhP)
Fixed Cost			
Depreciation of fishing boat		8,400	8,400
Depreciation of fishing gear		5,900	5,900
Depreciation of equipment		2,000	2,000
Opportunity capital		1,743	1,743
		18,043	18,043

Operational cost		
Fuel/lubricant	315,840	315,840
Crew share	36,960	36,960
Labor wage	50,400	50,400
Maintenance cost	840,000	840,000
Ice	41,664	41,664
Transportation	16,800	16,800
Food provision	56,000	56,000
MARINA fee	3,300	3,300
BFAR fee	533	533
Other incidental expenses	252,000	252,000
	1,613,497	1,613,497
Total cost		1,631,540
Total revenue		1,680,000
Operating profit		66,503
Net profit		48,461

Note: US\$1.0 is equivalent to Php46.98

Of the total annual cost of P1 631,540 for 80 hp commercial trawl, 52% was spent for maintenance which formed the highest expenditure for this category. The cost of fuel and lubricant contributed only 19% and for other incidental expenses was 16%. A small amount was spent for food, ice and labor which was 3% each. The high maintenance cost manifested the poor condition of the fishing boat. The absence of cost for Maritime Industry Authority (MARINA) and Bureau of Fisheries and Aquatic Resources (BFAR) indicated that the fishing activities were illegal. Since laborers' wage was missed in the survey guide, the information for the analysis of annual economic performance of commercial trawl using 80 hp category was based on the prevailing minimum daily wage in the area which is P300 (Table 13).

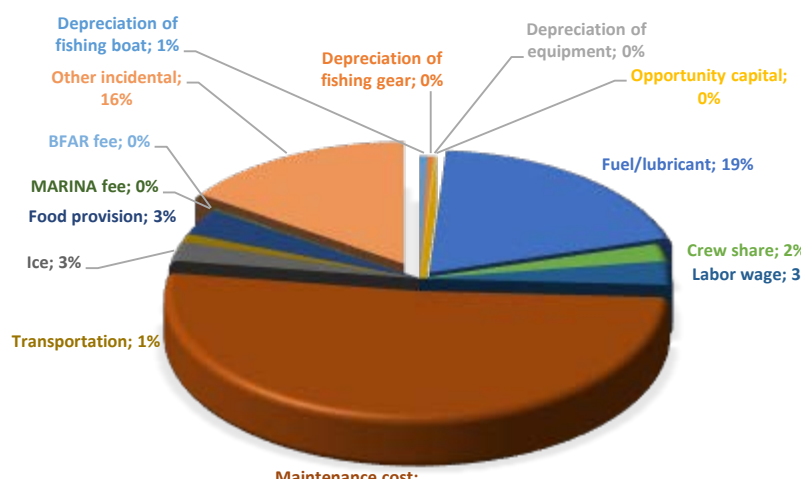


Figure 5. Distribution of cost of 80 hp commercial shrimp trawl
(Source : Socio-economic survey 2015).

For municipal trawls with 10-16 hp single piston engines, the total annual cost amounted to P185 869 (Table 14 and Figure 7). The bulk was spent for fuel and lubricant, crew share (30%), food (8%) maintenance cost and labor (6%). The opportunity cost was insignificant because there was no equipment used in the fishing operation aside from the fishing boats and engines onboard. It was evident that no MARINA and BFAR payments made for municipal trawl in the analysis of economic performance because only commercial fishing boats or fishing boats more than three gross tons are required to secure permit from the Maritime Industry Authority (MARINA) and Bureau of Fisheries and Aquatic Resources (BFAR). On the other hand, the registration of municipal fishing boats or fishing boats below three gross tons is under the mandate of the Local Government Units (LGUs) through enabling city or municipal ordinance. However, fishing licence is not given to trawl because it is classified as an active gear which is prohibited to fish within municipal waters.

Table 14. Annual Economic Performance Analysis of Municipal Trawl, 10-16hp. (Socio-economic survey 2015).

Type of Cost	Cash (PhP)	Non-Cash (PhP)	Total (PhP)
Fixed Cost			
Depreciation of fishing boat		3,544	3,544
Depreciation of fishing gear		2,136	2,136
Opportunity capital		436	436
		6,116	6,116
Operational cost			
Fuel/lubricant	74,746		74,746
Crew share	55,839		55,839
Labor wage	10,790		10,790
Maintenance cost	10,449		10,449
Ice	4,131		4,131
Transportation	8,775		8,775
Food provision	15,025		15,025
	179,753		179,753
Total cost			185,869
Total revenue			280,410
Operating profit			100,657
Net profit			94,540

Note: US\$1.0 is equivalent to Php46.98

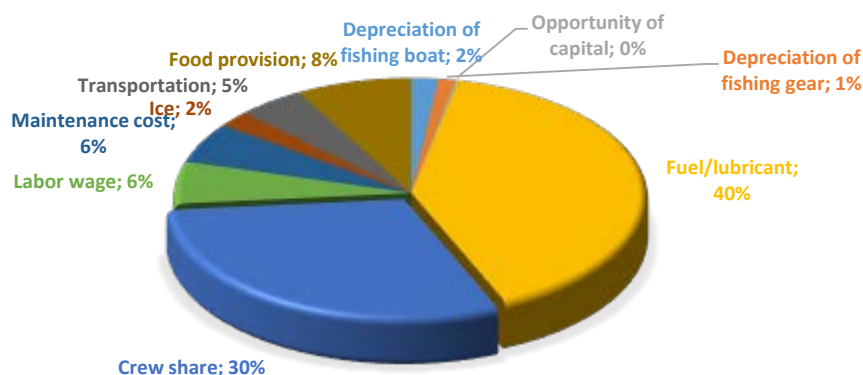


Figure 6. Distribution of cost of municipal trawl. (Socio-economic survey 2015).

Table 15. Annual economic performance (P_{HP}) of trawlers, according to type and engine horsepower (Socio-economic survey 2015).

Type of cost	Commercial fish trawl (160 HP)	Commercial shrimp trawl (80 HP)	Municipal trawl (10-16 HP)
Fixed cost	118,324.89	18,043	6,116.12
Operational cost	5,296,836.46	1,613,497	179,753.17
Total cost	5,415,161.35	1,631,540	185,869.29
Total revenue	7,339,770.40	1,680,000	280,409.77
Operating profit	2,042,933.94	66,503	100,656.60
Net profit	1,924,609.05	48,461	94,540.48

Note: US\$1.0 is equivalent to P_{HP}46.98

Table 16. Net profit and income for owners and crew (Socio-economic survey 2015).

Gear	Net profit (PhP)	Crew share based on survey response (PhP)	Crew share based on 50-50 sharing system (PhP)	Number of crew	Income of lowest rank crew (PhP)
Commercial trawl (160 hp)	1,924,609	416,016.67	462,304.50	8	160,384.08
Commercial trawl (80 hp)	135,820	-	67,910.00	5	18,520.91
Municipal trawl (10-16 hp)	94,540	55,838.52	47,270.00	2	31,513.33

Note: US\$1.0 is equivalent to PhP46.98

Table 17. Income and shares of trawl crew (Socio-economic survey 2015).

Gear	Net profit (PhP)	Crew share based on survey response (PhP)	Crew share based on 50-50 sharing system	Number of crew	Income of lowest rank crew
Commercial fish trawl (160 hp)	1,924,609	416,016.67	962,394.5	8	160,384.08
Commercial shrimp trawl (80 hp)	48,461	36,960	24,230.5	5	18,520.91
Municipal trawl (10-16 hp)	94,540	55,838.52	47,270.00	2	31,513.33

Note: US\$1.0 is equivalent to PhP46.98

In terms of production and economic performance, there is a clear disparity between the 3 main categories of trawlers. Obviously, the 160 hp trawler is the most profitable, having the highest economic return (Table 15), although it also requires the highest operational cost. The municipal trawler with a 10-16 hp engine seems to operate more profitably than the commercial shrimp trawler with a 80 hp engine, considering operational costs vs. net profit derived from their operations as well as the income for fishermen (Table 16, Table 17).

3. TRAWL CATCH AND BYCATCH LANDING SURVEY

During the REBYC I Project (executed in 2002-2008), regular monitoring of landed catch including onboard sampling were undertaken. Sampling was undertaken every other two (2) days which is adopted from the National Stock Assessment Program of the BFAR and NFRDI.

Based on the monitoring of landed and sampling of catch from boat landings under the REBYC I Project, more than one third (38%) of the catch of shrimp trawls were lizard fish (*Saurida* spp), followed by threadfin bream (*Nemipterus* spp., 10%). Shrimps which were considered as the target species were just about 1% of the total catch. The rejects which comprised of small-sized fish of low or no commercial value as well as the juveniles of commercially important species was 15% of the total landings (Figure 8).

The composition of rejects in shrimp trawl indicated high incidence of juveniles of commercially important species, among which were the lizard fish 8% (*Saurida* spp.), purple spotted bigeye 5% (Dilat, *Priacanthus tayenus*), cardinal fish 9% (Muong, Apogon sp.), hairtail 1% (espada, *Trichiurus* spp.) (Fig. 9).

For fish trawl, the catch was dominated by small pelagic species, e.g. roundscad 48% (Galunggong, *D. maruadsi*), sardines 11% (tamban, *Sardinella longiceps*) and mackerel 8% (agumaa, *R. faughni*). Demersal fish which are the dominant catch for fish trawl constitute a small portion of the catch like lizardfish (kalaso, *Saurida* spp.) 0.4% and threadfin bream 0.3%. The reject portion of the catch was also comparatively lower, with only 4 % of the total catch (Fig 10).

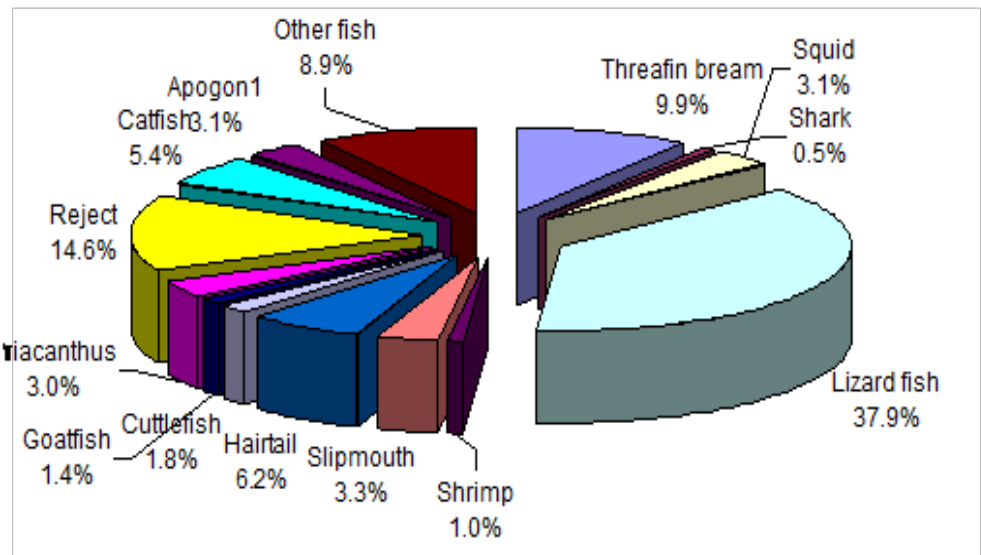


Figure 7. Catch composition of shrimp trawls, Samar Sea (Dickson et al. 2008)

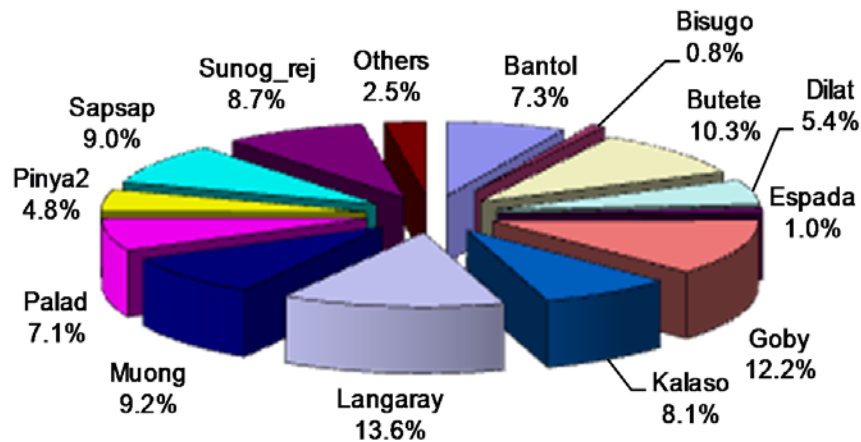


Figure 8. Composition of rejects (trash fish), shrimp trawl (Dickson et al 2008).

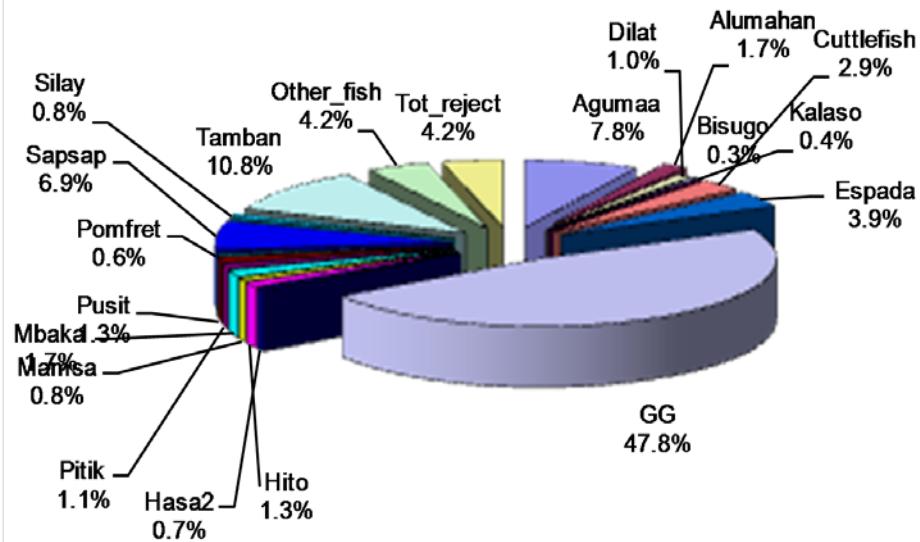


Figure 9. Catch composition of fish trawl, Samar Sea (Dickson et al. 2008).

The survey was conducted under the REBYC I Project. Of the total of 811.7 tonnes for six months (October 2013 to March 2014), commercial trawls in Calbayog City contributed 35% and municipal (4DR5¹) contributed 7% while the municipal 4DR5 in Catbalogan City contributed 44 % and for the municipal small gasoline trawl catch in Catbalogan and Brgy. Burabud, Sta. Margarita was 14%. For the whole Samar Sea the total count for commercial trawl was 40 and 753 medium and small trawl respectively operating in Samar Sea.

¹ For operational definition “4DR5” an automotive engine used by medium trawl with a gross tonnage ranging from 3 to 14 GT considered as commercial under R.A 8550 otherwise known as Fisheries Code of the Philippines of 1998. “Small municipal” refers to trawlers below 3 GT normally with outrigger powered by 16BHP gasoline or diesel engines.

Figure 11 shows the Good Catch and rejects in Samar Sea. Good catch refers to high quality and high value commercial species. These are also called commercial species in local language. Meanwhile, rejects also called trashfish by the locals, are small or juvenile species normally used as raw materials of local fish meal. A total of 135,052kg of bycatch was recorded from the sampling area. The bycatch in commercial trawl has 2 % with use of JTEDs in Calbayog City while the municipal 4DR5 got 62 % in Catbalogan City and the municipal small gasoline in Catbalogan City and Sta. Margarita was 16%. Catbalogan City medium trawler (4DR5) does not use JTEDs due to the revision of the local ordinance.

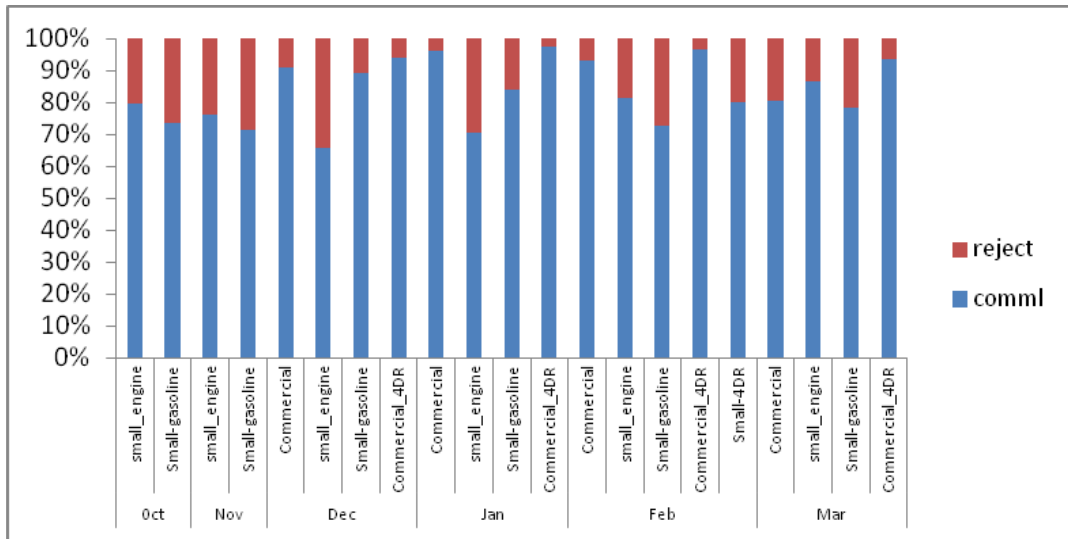


Figure 10. Good catch and rejects in commercial and municipal trawl, Samar Sea

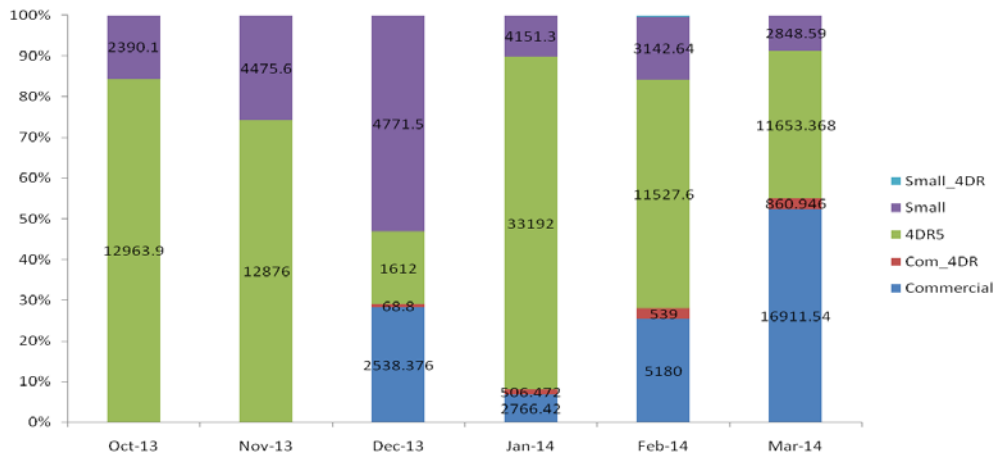


Figure 11. Bycatch in municipal and commercial trawls, Samar Sea.

A total of 676,654 kg of good catch was recorded for the last six months. Catbalogan City 4DR5 contributed about 44% of the catch landing followed by Calbayog Commercial contributing about 35% and next are the small engine and 4DR5 in Sta. Margarita which contributed 14% and the last was commercial 4DR5 which contributed about 7%.

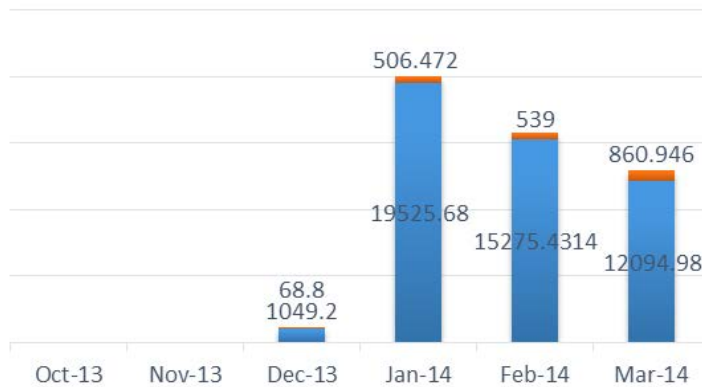


Figure 12. Good catch (kg) from commercial and municipal trawls, Samar Sea

For Calbayog City commercial trawl no operation of trawl due to fuel cost escalation of diesel from October to November 2013 while in December they only landed 11% due to super typhoon “Haiyan”. January 2014 landed 29% while February and March both got 30% as monthly catch (April, May, June, July close season) .

A total of 298,482 kg of demersal fish caught by trawl was recorded for the months of October 2013 to March 2014 for Catbalogan City medium trawl (4DR5). The bycatch ranged from 2 to 40%. During October and November 2013 the bycatch was 15% for both months while January 2014 got highest bycatch recorded, about 40%, and for the months of February and March was recorded 14% of bycatch consisting of juveniles of commercially important finfishes.

A total of 108,112 kg of demersal fish caught by trawl was recorded for the months of October 2013 to March 2014. On catch quality, October has 74% of good catch and 26% of bycatch, November has 72% of good catch and 28% of bycatch, December has 91 % of good catch and 9% of bycatch. In January, 84% was comprised of good catch and 16% of bycatch, February had 73% of good catch and 27% of bycatch while March had 78% of good catch and 22% of bycatch.

Table 18 elaborates the benefits from the 3 types of trawler based on net profitability. The response to the inquiry on *crew share* was weak. However from the data available, the 50-50 sharing system that splits net profit between the owner of the fishing boat/gear and crew, is common for 160 hp and 80 hp trawler operators. For 10-16 hp trawlers, a 60-40% sharing system is the usual practice. The share among the crew members themselves depends on the crew members position or responsibility, as indicated in Table 18, with the fishermen/deck hands receiving the lowest share.

Information from the Philippine Statistics Authority² shows that the food threshold (minimum income required to meet basic food needs and satisfy the nutritional requirements set by the Food and Nutrition Research Institute to ensure that one remains economically and social productive) and poverty threshold (similar concept, expanded to include basic non-food needs such as clothing, housing, transportation, health and education expenses) for 2015 are Php 6329 and Php 9064, respectively. Comparing these thresholds with the income received by a fisherman/

² Philippine Statistics Authority (<https://psa.gov.ph/poverty-press-release>)

deckhand, only those in the 160 hp trawler have incomes above the poverty threshold and those in the 80 hp and 16 hp are below the food threshold.

Table 18. Sharing system according to position.

POSITION	NO. OF SHARES	ESTIMATED INCOME (Php)
160 hp trawler		
1 Captain/Master fisherman	3 + 10% of the owners share	416,998.62
1 2 nd officer/MF	3	320,768.17
1 Engineman	2.75	294,037.49
1 hauler/storageman	2.5	267,306.81
1 Cook	2.25	240,576.13
3 fishermen/deckhand	1.5 each	160,384.08 (each)
80 hp trawler		
1 Captain/Master fisherman	3 + 10% of the owners share	43,832.82
1 Engineman	2.75	33,955.00
1 Cook	2.25	27,781.36
2 fishermen/deckhand	1.5 each	18,520.91 each
16hp trawler		
1 Master fisherman	2	63,026.67
1 fisherman/deckhand	1	31,513.33

Note: US\$1.0 is equivalent to Php46.98

4. OTHER MUNICIPAL FISHING GEARS

A number of other municipal fishing gears were also analysed. Hook and line, bottom set longline and bottom set gillnet were comparable in terms of production (Table 19) and net profit (Table 20).

Table 19. Estimated average annual catch and fishing effort of other common gears (Socio-economic survey 2015).

Common municipal gears	Number of samples	Average fishing trips per month	Average fishing months per year	Average fishing trips per year	Average catch per trip (kg)	Estimated annual production (kg)
Hook & line	77	21.68	10.83	234.01	6.32	1,479
Bottom set longline	50	20.76	10.38	213.50	7.82	1,670
Bottom set gillnet	49	22.36	10.59	236.49	7.30	1,726

Common municipal gears	Number of samples	Average fishing trips per month	Average fishing months per year	Average fishing trips per year	Average catch per trip (kg)	Estimated annual production (kg)
Crab pot	60	21.15	9.53	201.42	3.88	782

Table 20 summarizes the economic performance of the other commonly used municipal fishing gears showing that bottom set longlines have the highest net profit (PhP 99,245) and crab pot fishing, the least (PhP 16,780). In terms of production and income per fishermen, the range of income for the lowest ranked crew member was PhP 10,000-20,000 per year (Table 21). Bottom set longlines derived the highest individual income and crab pots, the least. The income derived from municipal trawling (16 hp) was comparatively higher than for the other municipal fishing gears.

Table 20. Summary of the economic performance of other common municipal fishing gears in Philippine pesos per year (Socio-economic survey 2015).

Type of cost	Hook & line (Peso)	Bottom set longline (PhP)	Bottom set gillnet (PhP)	Crab pot (PhP)
Fixed cost	2,775.44	4,365.19	7,626.52	4,332.41
Operational cost	57,948.74	63,346.19	90,889.90	57,104.01
Total cost	60,724.18	67,711.38	98,516.42	61,436.42
Total revenue	148,005.62	166,957.00	172,782.34	78,216.81
Operating profit	90,056.88	103,610.81	81,892.44	21,112.80
Net profit	87,281.44	99,245.62	74,265.92	16,780.39

Note: US\$1.0 is equivalent to PhP46.98

Table 21. Comparison according to share of fishermen/crew per year (Socio-economic survey 2015).

Gear	Net profit (PhP)	Crew share based on survey response (PhP)	Crew share based on 40-60 sharing system	Number of crew	Income of lowest rank crew
Hook & line	87,281	-	52,368	2	17,456
Bottom set longline	99,245	-	59,547	2	19,849
Bottom set gillnet	74,265	23,649.00	44,559	2	14,853
Crab pot	16,780	-	10,068	1	10,068

Note: US\$1.0 is equivalent to PhP46.98

The annual total costs for hook & line, bottom set longline, bottom set gillnet and crab pot amounted to PhP 60,724; PhP 67,711; PhP 98,516 and PhP 61,436, respectively, while the total revenue from each fishing gear was PhP 148,005; PhP 166,957; PhP 172,782 and PhP 78,216, respectively. Net profits were PhP 87,281.44, PhP 99,245.62, PhP 74,265.92 and PhP 16,780.30 (Tables 22-25).

Table 22. Annual Economic performance analysis for hook & line fishing (Undak/Kawil) based on socio-economic survey, 2015.

Type of Cost	Cash (Php)	Non-Cash (Php)	Total (Php)	%
Fixed Cost				
Depreciation of fishing boat		1,874.24	1,874.24	3.08
Depreciation of fishing gear		736.37	736.37	1.21
Depreciation of equipment			0.00	
Opportunity capital		164.83	164.83	.27
		2,775.44	2,775.44	4.56
Operational cost				
Fuel/lubricant	29,255.67		29,255.67	48.17
Crew share			0.00	
Opportunity cost of labour – can use the minimum wage for agricultural workers in the area (Non-cash cost)			0.00	
Maintenance cost	15,912.68		15,912.68	26.20
Ice	2,852.69		2,852.69	4.69
Food provision	9,927.70		9,927.70	16.34
Other incidental expenses			0.00	
	57,948.74		57,948.74	95.40
Total cost			60,724.18	
Total revenue			148,005.62	
Operating profit			90,056.88	
Net profit			87,281.44	

Note: US\$1.0 is equivalent to Php46.98

Table 23. Economic performance analysis for bottom set longline (kitang) fishing (Socio-economic survey 2015).

Type of Cost	Cash (Php)	Non-Cash (Php)	Total (Php)	%
Fixed Cost				
Depreciation of fishing boat		2,291.44	2,291.44	3.38
Depreciation of fishing gear		1,849.70	1,849.70	2.73
Depreciation of equipment			0.00	
Opportunity capital		224.05	224.05	.33
		4,365.19	4,365.19	6.44

Type of Cost	Cash (Php)	Non-Cash (Php)	Total (Php)	%
Operational cost				
Fuel/lubricant	28,822.50		28,822.50	42.56
Crew share			0.00	
Labor wage			0.00	
Maintenance cost	18,977.78		18,977.78	28.02
Ice	2,588.67		2,588.67	3.82
Transport			0.00	
Food provision	12,957.24		12,957.24	19.13
Other incidental expenses			0.00	
	63,346.19		63,346.19	93.53
Total cost			67,711.38	
Total revenue			166,957.00	
Operating profit			103,610.81	
Net profit			99,245.62	

Note: US\$1.0 is equivalent to Php46.98

Table 24. Economic performance analysis for bottom set gillnet (palubog) fishing (Socio-economic survey 2015).

Type of Cost	Cash (Php)	Non-Cash (Php)	Total (Php)	%
Fixed Cost				
Depreciation of fishing boat		3,270.21	3,270.21	3.31
Depreciation of fishing gear		3,960.88	3,960.88	4.02
Opportunity capital		395.43	395.43	.40
		7,626.52	7,626.52	7.73
Operational cost				
Fuel/lubricant	33,854.86		33,854.86	34.36
Crew share	23,649.00		23,649.00	24.00
Maintenance cost	14,606.74		14,606.74	14.82
Ice	4,702.51		4,702.51	4.77
Food provision	14,076.79		14,076.79	14.28
Other incidental expenses			0.00	
	90,889.90		90,889.90	92.23
Total cost			98,516.42	

Type of Cost	Cash (Php)	Non-Cash (Php)	Total (Php)	%
Total revenue			172,782.34	
Operating profit			81,892.44	
Net profit			74,265.92	

Note: US\$1.0 is equivalent to Php46.98

Table 25. Economic performance analysis for crab pot (panggal) fishing. (Socio-economic survey 2015).

Type of Cost	Cash (Php)	Non-Cash (Php)	Total (Php)	%
Fixed Cost				
Depreciation of Fishing boat		2,358.83	2,358.83	3.83
Depreciation of Fishing gear		1,757.08	1,757.08	2.85
Depreciation of equipment			0.00	
Opportunity capital		216.50	216.50	.35
		4,332.41	4,332.41	7.03
Operational cost				
Fuel/lubricant	30,466.21		30,466.21	49.58
Crew share			0.00	
Labor wage			0.00	
Maintenance cost	11,329.88		11,329.88	18.44
Ice	2,014.20		2,014.20	3.27
Transport			0.00	
Food provision	13,293.72		13,293.72	21.63
Other incidental expenses			0.00	
	57,104.01		57,104.01	92.92
Total cost			61,436.42	
Total revenue			78,216.81	
Operating profit			21,112.80	
Net profit			16,780.39	

Note: US\$1.0 is equivalent to Php46.98

5. CATCH UTILIZATION

Interviews corroborated the report of Dickson and Ramiscal (2010) showing that the distribution of the catch of trawlers follows various channels. The commercially important fish and shrimp catch is usually marketed through the channel of fish driers, retailers, middlemen or brokers. Direct selling in markets is also practiced particularly by female members of family of small trawlers (Figure 14).

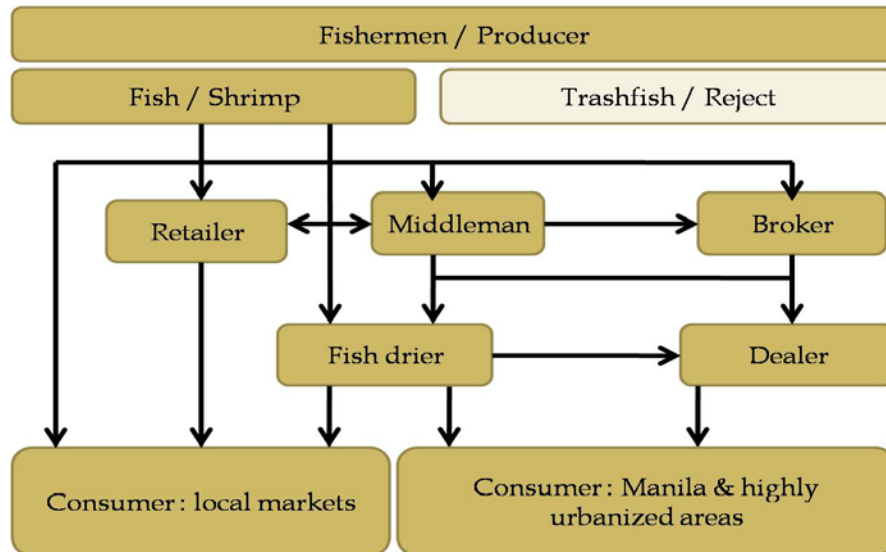


Figure 13. Market channel of fish and shrimp caught by trawl

In established fish ports and landing centers, a very common method of marketing is the *bulungan* or silent (whispered) auction.

The catch is sold in local markets although a significant portion of the catch - especially shrimps - are shipped to Manila or other urban centers. The bulk of the catch is consumed fresh. Fish drying is the most common form of processing particularly the smaller size commercial trawl caught species. Smoked and salted fish are also to a lesser extent prepared in various forms for selected species like anchovies (Ramiscal and Dickson, 2010).

6. BYCATCH UTILIZATION

The utilization of the bycatch could be summarized as for: (1) human consumption; (2) processing dried, salted, fish sauce; (3) direct feed for aquaculture; and (4) production of fishmeal. The proportion utilized in each segment is difficult to quantify considering the lack of information. Legaspi (1999) assessed that around 50-60% of bycatch and trash fish were for fresh utilization.

An important portion of the bycatch, particularly small-size juveniles of commercially important and low-value species are consumed fresh or dried. Relatively inexpensive fresh small-sized fish of commercially important species are widely acceptable and bought from wet markets especially by poor households. Dried fish is a traditional food consumed both by high and low income families, with prices depending on species and size. Fish drying is an important livelihood in many trawl landing centers.

“Rejects” from trawl, also called trashfish by the locals, is an important component in the culture of high value species like grouper, seabass and mud crab fattening. Bycatch are given fresh whole or in chopped form. Trash fish are also raw materials used in the preparation of local fish meal. Mixed species generated from demersal fisheries are commonly used by small-scale feed millers. Medium and large-scale feed producers utilize imported fishmeal.

The prevailing price of trashfish is in the range of P5-15 per kg, depending on the landed volume and available buyers. When trashfish is scarce, even small-size commercial fish are bought as feed for aquaculture, with prices reaching up to P60/kg.

The trade of trash fish caught by trawlers is carried out in various schemes: (1) directly sold to markets/consumers; (2) retailers; (3) fish driers; (4) dealers; and (5) fish/hog farmers (Fig. 15).

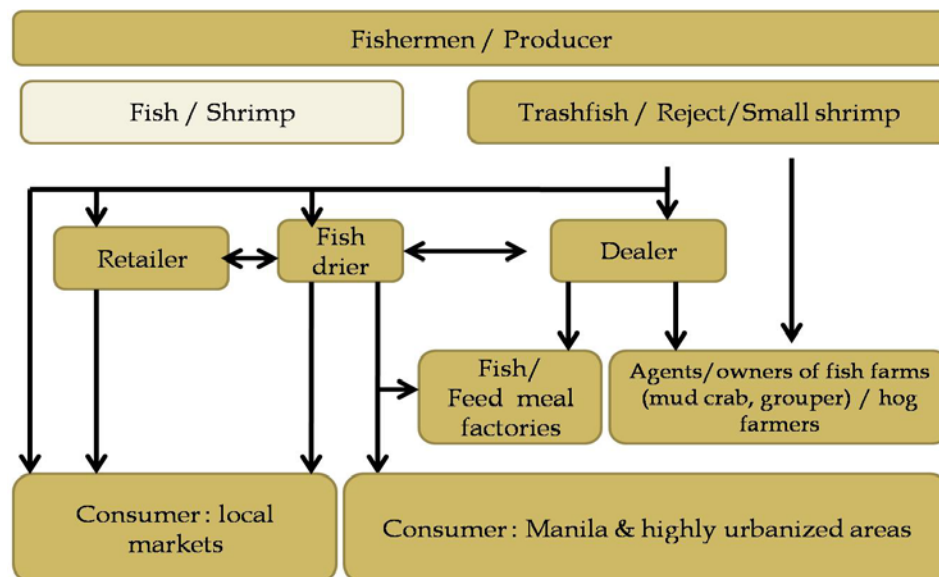


Figure 14. Bycatch utilization channel.

Trashfish is most of the time handled onboard without any preservation or icing. Those that are caught by boats on short trips (usually overnight) are often of better quality trashfish and are commonly used for human consumption (fresh or dried). Trashfish caught from longer fishing trips are normally sold fresh or dried and used as direct feeds for aquaculture, swine and fish/feed meal plants.

Fishermen land their catch mainly in fish ports and landing places. Good quality trashfish are sold directly in markets by family members or to retailers or driers. The portions of the trashfish that can be consumed as fresh are usually sold directly to fish markets or fish driers. Trashfish that are not intended or fit for human consumption are sold in fresh or dried forms to dealers/ wholesales or agents & owners of aquaculture or hog farmers. In some places buying stations are established by dealers of trashfish and consign to feed/fish meal/processing plants in volumes. In some areas, trashfish are bought at sea by agent-buyers on small boats and dispatch them to fish traders and fish farmers on commission basis.

Fresh small shrimps, particularly the brown rough shrimps, are usually sold directly to market or retailers (consumed fresh) or sold to driers/processors to produce *hibe*, a very popular dried small shrimps used as mixing ingredient in many local dishes.

7. PERCEPTION OF RESPONDENTS ON OTHER ISSUES

It should be noted that the Samar Sea has no available fishing ground for commercial fishermen. The emerging issue on the commercial sector was apparently shown by the respondents where operations of law enforcement was the factor affecting their fishing operations (Table 26). The Samar Sea Fisheries Management Plan tries to finally institutionalize this issue as it adopts the Ecosystem Approach to Fisheries Management (EAFM) concept, which is already stipulated under the RA 10654. Mechanical breakdown together with competition with other gears tied at 2nd rank. Other Filipino culture, the Fiesta syndrome is highlighted as the 3rd (4th) important factor affecting the fishing operations of commercial and municipal trawl fishermen. Health and safety issues, including operation conditions during Southwest monsoon, were also given importance by both sub-sectors of the trawl fisheries.

Table 26. Type of event/activities affecting fishing operations (Socio-economic survey 2015).

FACTORS AFFECTING FISHING OPERATION (COMMERCIAL)	COM TRAWL	FACTORS AFFECTING FISHING OPERATION (MUNICIPAL)	MUN TRAWL
Operations of Law Enforcement	1	Mechanical Breakdown	1
Mechanical Breakdown	2	Operations of Law Enforcement	2
Competition with other Fishing Gears	2	Fiestas and other Social Events	3
Fiestas and other Social Events	3	Health (Operator and Crew)	4
Health (Operator and Crew)	4	Southwest Monsoon	5
Red Tide Occurrence	5	Red Tide Occurrence	6
Southwest Monsoon	6	Fuel Price	7
Fuel Price	7	Local Market Price	8
Northeast Monsoon	8	Northeast Monsoon	9
Local Market Price	9	Competition with other Fishing Gears	10
Seasonality	10	Seasonality	11
Politics	11	Politics	12
Strict Compliance of JTEDS	12	Strict Compliance of JTEDS	13

With regards to municipal trawlers, mechanical breakdown was the most dominant event affecting their fishing operations. Same with the commercial trawlers, where low-cost engines (old second-hand engines) were being used to lower the investment costs. . Seasonality of fish species as well as politics were the two events with the least impact on trawl fishing operations in the area.

It is interesting to note that the least issue affecting their fishing operations was compliance of JTEDs. This can be attributed to the regular participation of both the commercial and municipal trawlers in all aspects of both the REBYC I and the REBYC II-CTI Projects in the country.

Moreover, it should be noted that these stakeholders have been involved in the planning, implementation and monitoring of the projects.

Table 27. Perception on the status/condition of resources and fishing grounds (Socio-economic survey 2015).

PERCEPTION OF RESPONDENTS	COM TRAWL		COM TRAWL TOTAL (n=114)	MUN TRAWL		MUN TRAWL TOTAL (n=403)	GRAND TOTAL (n=517)
	FISH TRAWL (n=76)	SHRIMP TRAWL (n=38)		SHRIMP TRAWL (n=401)	SQUID TRAWL (n=2)		
Declining	31.6	15.8	26.3	27.9	-	27.8	27.5
Depleted	10.5	-	7.0	28.9	-	28.8	24.0
Still Good	38.2	60.5	45.6	11.5	-	11.4	19.0
No Changes	6.6	2.6	5.3	0.2	-	0.2	1.4
No Comment	1.3	2.6	1.8	-	-	-	0.4
Seasonal	3.9	2.6	3.5	-	-	-	0.8
Others	-	-	-	3.5	-	3.5	2.7
No Response	7.9	15.8	10.5	27.9	100.0	28.3	24.4
TOTAL %	100	100	100	100	100	100	100

Varying perceptions were observed from commercial and municipal trawlers with respect to the condition of the resources and fishing grounds (Table 27). While 46% of the commercial trawlers perceived that the fishing grounds are still good, only 11% of the municipal trawlers sees it. These can be attributed to the fact that commercial trawlers have higher production as compared to the municipal trawlers. Aside from lower exposure to commercial trawling, this can also be the main reason why some of the respondents perceive that there had been no changes to the fishing ground.

Meanwhile, more than half of the municipal trawl respondents perceive that the fishing ground is already in bad condition as 29% and 28% stated that the fishing ground is depleted and resources declining, respectively.

Table 28. Top ten (10) specific fishery issues affecting fishing activities (Socio-economic survey 2015).

SPECIFIC FISHERY ISSUES	COM TRAWL RANKING	SPECIFIC FISHERY ISSUES	MUN TRAWL RANKING
Illegal Fishing Activities	1	No Legal Fishing Ground	1
Competition With Commercial Fishing Boats	2	Strict Law Enforcement	2
Boat And Gear Damage	3	Illegal Fishing Activities	3
Lax Enforcement	4	Declining Catch	4
No Legal Fishing Ground	5	Others	5
Declining Catch	6	Over Capacity	6
Allow Fishing Near Shore	7	Boat And Gear Damage	7
Apprehension	8	Closed Season	8
Fish Aggregating Device (FAD)	9	Competition With Commercial	9

SPECIFIC FISHERY ISSUES	COM TRAWL RANKING	SPECIFIC FISHERY ISSUES	MUN TRAWL RANKING
Support		Fishing Boats	
Others	10	Lax Enforcement	10
		OTHERS	11

Varying responses on specific fishery issues affecting the fishing activities of trawl respondents were recorded. The imposition of Fisheries Administrative Order (FAO) 201 banning the operation of active gears in municipal waters is primarily affecting the municipal trawlers as according to them, they have no legal fishing grounds (Table 28). Interestingly, this issue just ranked 5th for commercial fishermen which should be more affected by the aforesaid issue. Either this response was not elicited by the enumerators or were merely overlooked by the respondents.

Same observation was obtained with regards to competition with commercial fishing boats which was ranked 2nd by the commercial while 9th by the municipal. It was elicited that both respondent types refer to the intrusion of Danish Seine in their fishing grounds. However, with the banning of Danish Seine, this issue is expected soon to be resolved.

Table 29. Awareness of respondents on fishery rules/regulations (Socio-economic survey 2015).

LAWS/ REGULATIONS KNOWN BY RESPONDENTS	COM TRAWL		COM TRAWL TOTAL	MUN TRAWL		MUN TRAWL TOTAL	TOTAL %
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Mesh Size Regulation	39	50	43	39	100	39	40
Regulations on JTED	25	28	26	32	0	32	31
City Fishery Ordinances	24	8	18	12	0	12	14
Ban of Active Gear in Municipal Waters	0	0	0	2	0	2	1
Confused on Law	0	0	0	1	0	1	0
FAO 244	1	3	2	0	0	0	0
R.A. 8550	1	0	1	0	0	0	0
Others	3	13	6	0	0	0	2
No Idea	4	0	3	2	0	2	2
No Response	3	0	2	13	0	13	10
TOTAL %	100	100	100	100	100	100	100

Though this question was open-ended, only single responses have been attained. Based from the results, it was mesh size regulations that emerged as the regulation with the highest awareness among respondents (Table 29). Interestingly, the regulation requiring all commercial trawlers to install JTEDs in their operations emerged as the second.

Table 30. Use of income from trawl fishing (Socio-economic survey 2015).

USE OF INCOME	COM TRAWL		COM TRAWL TOTAL	MUN TRAWL		MUN TRAWL TOTAL	GRAND TOTAL
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Education	29	0	19	42	0	41	36

USE OF INCOME	COM TRAWL		COM TRAWL TOTAL	MUN TRAWL		MUN TRAWL TOTAL	GRAND TOTAL
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Basic Needs	33	28	31	28	0	27	28
Source of Funds for Fishing Operations	0	0	0	4	0	4	3
None	3	13	6	1	0	1	2
Financial	10	8	9	1	0	1	3
Appliances	3	5	3	0	0	0	1
House	4	3	3	0	0	0	1
Others	5	15	8	0	0	0	2
No Response	14	30	19	25	100	26	24
TOTAL %	100	100	100	100	100	100	100

Filipinos have a deep regard for education, which they view as a primary avenue for upward social and economic mobility and that individuals could get ahead through attainment of a good education. Middle and low income class parents make tremendous sacrifices in order to provide secondary and higher education for their children. This observation was corroborated by the data from the survey that the most dominant response on the use of income from fishing is on education of their children (Table 31). Moreover, it is also in fishing where they get their daily and basic needs. In most cases especially for the crew, daily or per trip income is mainly sufficient for daily needs and the possibility of savings from fishing is slim to none.

Table 31. Perception on income derived from fishing (Socio-economic survey 2015).

PERCEPTION OF INCOME	COM TRAWL (%)		COM TRAWL TOTAL (%) (n=119)	MUN TRAWL (%)		MUN TRAWL TOTAL (%) (n=398)	GRAND TOTAL (%) (n=517)
	FISH TRAWL (n=79)	SHRIMP TRAWL (n=40)		SHRIMP TRAWL (n=396)	SQUID TRAWL (n=2)		
Enough	26.6	60.0	37.8	48.7	0.0	48.5	46.0
Just Enough	41.8	5.0	29.4	12.9	0.0	12.8	16.6
Not Enough	16.5	10.0	14.3	7.6	0.0	7.5	9.1
Not Always	3.8	0.0	2.5	4.8	0.0	4.8	4.3
Not Sure	0.0	0.0	0.0	1.8	0.0	1.8	1.3
Sometimes Excessive	1.3	2.5	1.7	0.0	0.0	0.0	0.4
No Response	10.1	22.5	14.3	24.2	100.0	24.6	22.2
TOTAL %	100	100	100	100	100	100	100

In the interviews, respondents were asked about their perceptions on the sufficiency of their incomes to sustain their livelihood in which varying responses were recorded. Almost half of the respondents said that their income was 'enough' (46%) whilst 17% said it was 'Just Enough'. More Municipal Trawler respondents said that their income was Enough (48%) compared to Commercial Trawlers (38%). More shrimp trawler operators (60% - commercial & 49% -

municipal) perceived that their incomes were ‘Enough’ compared to fish trawlers (27%). No response was obtained from squid trawl operators.

Table 32. Willingness to shift from trawl to other fishing gears (Socio-economic survey 2015).

WILLINGNESS TO SHIFT GEARS	COM TRAWL (%)		COM TRAWL TOTAL (%)	MUN TRAWL (%)		MUN TRAWL TOTAL (%)	GRAND TOTAL (%)
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
No	38.0	55.0	43.7	22.7	0.0	22.6	27.5
Yes	29.1	20.0	26.0	44.9	0.0	44.7	40.4
No Response	30.4	25.0	28.6	30.1	100.0	30.4	29.9
Indecisive	1.3	0.0	0.8	2.3	0.0	2.3	1.9
No Comments	1.3	0.0	0.8	0.0	0.0	0.0	0.2
TOTAL %	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Overall, 40% of respondents expressed their willingness to shift to other fishing gears if required, while more than a quarter (27%) did not (Table 32). Data also showed that fewer commercial trawl operators were not interested in shifting to other gears (26%), as compared to Municipal Trawlers (44.7).

Incidentally, responses from the income derived from fishing can be the main reason why the most dominant response of the commercial trawlers was “prefer not to shift to other gears”. Similarly, among municipal, four out of 10 fishermen are willing to shift gears considering their perception of the fishing ground though their income is “enough” to sustain their daily needs.

Those who were willing to shift gears preferred encircling gillnet to be their alternative gear should they be required to do so (Table 33). Among the other preferred alternative gears were; bottom set gillnet, gillnet, bottom set longline and ringnet. For commercial trawlers, gillnets were the most dominant preferred gear (13%) followed by ring nets. Like trawls, ringnets are considered as an active gear and are also prohibited in municipal waters.

Table 33. Suggested alternative gears (Socio-economic survey 2015).

GEARS IDENTIFIED	COM TRAWL (%)		COM TRAWL TOTAL (%)	MUN TRAWL (%)	MUN TRAWL TOTAL (%)	GRAND TOTAL (%)
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL		
Encircling Gill Net	0.0	0.0	0.0	11.8	11.8	10.0
Bottom Set Longline	0.0	0.0	0.0	5.6	5.6	4.8
Ring Net	8.7	0.0	6.4	1.1	1.1	1.9
Gill Net	17.4	0.0	12.9	0.0	0.0	1.9
Drift Gill Net	0.0	0.0	0.0	1.7	1.7	1.4
Tuna Handline	8.7	0.0	6.4	0.0	0.0	0.9
Shrimp Gill Net	0.0	0.0	0.0	0.5	0.5	0.5
Bottom Set Gill Net	0.0	0.0	0.0	0.6	0.5	0.5

GEARS IDENTIFIED	COM TRAWL (%)		COM TRAWL TOTAL (%)	MUN TRAWL (%)		MUN TRAWL TOTAL (%)	GRAND TOTAL (%)
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Handline	0.0	12.5	3.2	0.0		0.0	0.5
Crab Gill Net	0.0	0.0	0.0	0.6		0.56%	0.5
No Particular Gear	47.8	75.0	54.8	69.1		69.1	67.0
Other Gears	17.4	12.5	16.1	9.0		9.0	10.0
TOTAL%	100.0	100.0	100.0	100.0		100.0	100.0

In most of the fishing operations onboard, the fishermen seem to mostly base their operations and navigation on experiences. When interviewed, navigational lights (29 %) are the most common equipment bought by the trawler operators for safety at sea, followed by ‘practicing carefulness’ (10%) (Table 34). Only 6 % had mobile phones and radio for weather updates, while only 6% listened to weather forecasts. 3% of respondents did not use or practice any of the above safety measures.

Table 34. Responses on safety of life at sea (Socio-economic survey 2015).

ROW LABELS	COM TRAWL (%)		COM TRAWL TOTAL (%)	MUN TRAWL (%)		MUN TRAWL TOTAL (%)	GRAND TOTAL (%)
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Navigational Lights	26.6	12.5	21.8	31.8	0	31.6	29.4
Carefulness	10.1	0	6.7	11.4	0	11.3	10.2
Weather Updates	7.6	2.5	5.9	6.3	0	6.3	6.2
Life Jacket	3.8	20	9.3	5	0	5	6
Listen To Weather Forecast	0	0	0	5	0	5	3.8
None	5	15	8.4	1.3	0	1.3	2.9
Safety First	7.6	2.5	5.9	0.5	0	0.5	1.8
Cell Phone For Communication	3.8	2.5	3.4	0.3	0	0.3	1
Ability To Swim	3.8	2.5	3.4	0	0	0	0.8
Compass	1.3	2.5	1.7	0	0	0	0.4
No Response	25.3	32.5	27.7	36.8	100	37.2	35
Others	5.1	7.5	5.8	1.5	0	1.4	2.6
TOTAL %	100	100	100	100	100	100	100

It has been observed that debris and other trash materials are hauled during trawl operations. For this reason, respondents were asked on their willingness to bring onshore any debris that were hauled. More than 3/4 (76%) expressed their willingness to bring such materials to the shore for proper disposal, while only a small portion (5%) were not willing to do so (Table 35). There are

also those who said sometimes (1.35%), or conditionally yes (0.39%). Willingness to land debris and trash did not appear to be linked to trawl type.

Table 35. Willingness to bring onshore debris/trash hauled by trawls (Socio-economic survey 2015).

RESPONSE	COM TRAWL (%)		COM TRAWL TOTAL (%)	MUN TRAWL (%)		MUN TRAWL TOTAL (%)	GRAND TOTAL (%)
	FISH TRAWL	SHRIMP TRAWL		SHRIMP TRAWL	SQUID TRAWL		
Yes	78.5	52.5	69.7	77.8	0.0	77.4	75.6
No Response	11.4	27.5	16.8	17.6	100.0	18.1	17.8
No	7.6	15.0	10.1	3.0	0.0	3.0	4.6
Sometimes	1.3	2.5	1.7%	1.2	0.0	1.3	1.3
Conditional Yes	1.3	2.5	1.7	0.0	0.0	0.0	0.4
Not Sure	0.0	0.0	0.0	0.3	0.0	0.3	0.2
TOTAL %	100.0	100.0	100.0	100.0	100.0%	100.0	100.0

V. SUMMARY/CONCLUSIONS

1. The survey covered both commercial (fish and shrimp trawls) and municipal trawls (shrimp and squid trawls). There were a total of 517 respondents where the majority were male. Most of the fishermen were between 25 to 44 years of age;
2. Older fishers were engaged in municipal trawls, especially in squid trawls. 50% of squid trawl respondents were 55-64 years. A higher percentage for 65 years and over was also observed in municipal sector with 3% of the total respondents;
3. Most trawl fishers were married, however a relatively higher percentage of married respondents were observed in municipal trawls (92%) compared to commercial trawls (67%). The average fishing experience was shorter in the commercial sector than for the municipal fishery;
4. There were 25 types/categories of household members with large and extended families that included not only the spouses and children but also nephews, nieces and in-laws.;
5. In general, fishers education was inadequate with many only able to reach elementary level education. Most were not members of any organization, but those that were, listed Fisherfolk Associations as the most common type;
6. There is low access to credit in both sectors, and extension services from government were inadequate and did often not reach the beneficiaries;

7. *Mechanical Breakdown* and *Law Enforcement Operations* were considered events that affected fishing operations the most. Fishers also regarded *Declining* and *Depleted Catches* and that *No Legal Fishing Grounds* as major issues;
8. Catch from trawling contributes to fish for home consumption. On average a crew member brings home the following per trip: 2.6 kg for fish trawlers; 4.5 kg for shrimp trawlers; and 1.6 kg for municipal trawlers.
9. Economic performance analysis showed that commercial fish trawlers, commercial shrimp trawlers, and municipal trawlers are all profitable, with commercial fish trawlers having the highest profit that is 40 times and 20 times that of municipal and commercial shrimp trawlers, respectively. The profit of municipal trawlers is twice that of commercial shrimp trawlers.
10. Using the concept of food threshold and poverty threshold, the economic performance analysis showed that the income of the lowest-ranked crew member (fisherman/deckhand) in the commercial shrimp and municipal trawlers are below the food threshold and only those in the commercial fish trawlers are above the poverty threshold.
11. Most respondents considered that their *income* from trawling was *enough* and that those 40% of the total respondents who are *willing to shift their fishing gears* prefer *gillnets* should they be required to do so.
12. Bottom set longlines have the highest net profit among commonly used fishing gears and the income derived from municipal trawling (16 hp) was comparatively higher than for the other municipal fishing gears.
13. Navigational Lights were the most common safety provision. Generally, safety at sea practices were not followed consistently; A majority of respondents expressed a willingness to bring debris/ trash collected in their trawls to shore, for proper waste disposal.
14. The municipal trawler with a 10-16 hp engine seems to be more profitable than the municipal trawler with a 80 hp engine considering operational costs vs. net profit derived from their operations as well as the income for fishermen.
15. April to June is observed to be the spawning months for commercially important fishes in Samar Sea.

VI. RECOMMENDATIONS

Based on the above information, the following recommendations, in line with the implementation of the Samar Sea Fisheries Management Plan (SSFMP) are proposed:

1. Capacity and awareness building activities to improve community organizations and promote alternative livelihoods;
2. Improvement of the delivery of extension services for fisheries related livelihoods through capacity improvement program, including strengthening the Fisheries Livelihood Development Technicians (FLDTs), that BFAR has recently deployed in all coastal LGUs nationwide.
3. An Integrated Fishery Law Enforcement Team with specific Manual of Operations should be formed to conduct regular monitoring of Samar Sea;
4. Regular fish landing, catch and fish maturity monitoring should be undertaken to support further adaption of the Fishery Management should it be necessary;
5. There is a need to form the fisherfolk into accredited organizations/ associations to bolster credit assistance and subsequent assistance for easier access to credit facilities;
6. Basic life-saving equipment onboard should be required by the relevant authorities coupled with training on basic SOLAS to improve safety at sea by the trawl fishermen;
7. Gillnets should be considered as the preferred alternative fishing gear, when providing assistance to trawl fishers affected by trawl fisheries management actions such as closed seasons;
8. Considering their willingness to bring onshore trashes and other debris for proper disposal, an incentive based scheme should be devised to foster clean-up of Samar Sea;
9. Fisherfolk children should be considered a priority in the provision of scholarship programs implemented by BFAR.
10. Closed season is recommended during the months of April to June each year to potentially replenish the commercially important stocks in Samar Sea; and
11. The data can be used for Fishery Management of Samar Sea using the EAFM Concept should Samar Sea be considered as one Fishery Management Unit.

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XI. ANNEX:



1. TRAWL FISHERIES SOCIO-ECONOMIC INTERVIEW GUIDE

(For Owners/Operators, Boat Captains, Master fishermen and Crew)

I. RESPONDENT'S PERSONAL INFORMATION:

Impormasyon han Tagabaton

Full Name: _____
Ngaran

Municipality/City: _____
Munisipyo/Syudad

Barangay/Sitio/Purok: _____
Barangay

Age: _____ **Sex:** _____ **Civil Status:** _____
Edad Kinatawo Estado

Religion: _____ **Dialect/s Spoken:** _____
Relihiyon Yakan

No. of Years Engaged in Trawl Fishing: _____
Pira na katuig nga nangisda han Trawl

II. EDUCATIONAL BACKGROUND:

Ang gin Adman

<input type="checkbox"/>	Never Attended School <i>Waray makaeskwela</i>	<input type="checkbox"/>	Vocational
<input type="checkbox"/>	Elementary Level	<input type="checkbox"/>	College Level
<input type="checkbox"/>	Elementary Graduate	<input type="checkbox"/>	College Graduate
<input type="checkbox"/>	High School Level	<input type="checkbox"/>	Post Graduate
<input type="checkbox"/>	High School Graduate		

III. HOUSEHOLD INFORMATION:

Impormasyon han Panimalay

No. of Household Members/Sources of Income: _____
Kadamu-on han naukoy ha Panimalay

Household Member <i>Myembro han</i>	Relation <i>Relasyon</i>	Gender <i>KInatawo</i>	Age <i>Edad</i>	Types Of Livelihoods <i>Klase Han</i>	Specify Months <i>Ano nga mga</i>	Ave. Monthly Income <i>Kita kada</i>
---	------------------------------------	----------------------------------	---------------------------	---	---	--

<i>Panimalay</i>				<i>Pangabuhian</i>	<i>Bulan</i>	<i>Bulan</i>

OTHER SOURCES OF MONTHLY INCOME INCLUDING REMITTANCES? HOW MUCH(Respondent)?

Iba nga surok han pangabuhian kaupod an nakakarawat tikang ha gawas? Pira man?

INCOME SOURCES	AMOUNT (P)

IV. ARE YOU A MEMBER OF ANY ORGANIZATION: Y N

Myembro kaba han bisan ano nga organisasyon:

Community/Religious Organization: _____

Organisasyon ha Comunidad/Relihiyon

Women Organization: _____

Organisasyon han Kababayenhan

Fisherfolk Association: _____

Organisasyon han mga Parapangisda

Fisherfolk Cooperative: _____

Cooperatibahan Parupangisda

Others: _____ *Lain pa*

HAVE YOU AVAILED OF ANY CREDIT FACILITY? YES NO

Nakatagamtam ka na ba han pautang?

If **NO**, Why None? _____

Kun waray, kay ano?

If **YES**, Please Specify _____

Kun mayda, ano ini?

V. HAVE YOU AVAILED OF ANY EXTENSION SERVICES FROM:

Nakatagamtam kana bahan mga bulig tikang:

A. **GOVERNMENT** **YES** **NO**

Gobyerno

If NO, Why None? _____
Kun waray, kay ano?

If YES, What Agency & Services? _____
Kun mayda, ano ini nga mga Ahensya ngan Serbisyo?

B. NON-GOVERNMENT ORG. YES NO

If NO, Why None? _____
Kun waray, kay ano?

If YES, What Agency & Services? _____
Kun mayda, ano ini nga mga Ahensya ngan Serbisyo?

VI. TYPES OF TRAWL GEAR/S USED?

Ano nga klase han pukot imo ginagamit?

Commercial Trawl	No. of Fishing Gears	Municipal (Baby) Trawl	No. of Fishing Gears
Squid Trawl (<i>pan noos</i>)		Pakayod	
Fish Trawl (<i>palupad</i>)(alho)		Padanas*	
Fish Trawl (galunggong/bolinao)		Galad-gad	
Others, Specify		Palupad	
		Others, Specify	

Note: * Padanas in Zumaragga is not considered as Trawl

No. of Fishermen (Officers and Crew) onboard?: _____
Kadamo-on han upod/sakay?

VII. ENGINE BRAND AND HORSE POWER:

Tatak han makina ngan kabalyos

Engine Brand: _____

Horse Power:

Tatak han makina

Kabalyos

VIII. NAME AND MEASUREMENT OF BOAT(TONNAGE MEASUREMENT in

meters). Pls. indicate unit of measure.

Sokol Han Sakayan/Baloto

NAME OF BOAT <i>Ngaran han Baloto</i>	LENGTH <i>Kahalaba</i>	BREADTH <i>Kahaluag</i>	DEPTH <i>Kataas</i>

IX. WHAT IS YOUR PARTICIPATION IN TRAWL FISHERIES?(one or more answers)

Ano an imo partisipasyon dida han trawl nga panagat?(usa o subra nga baton)

Owner
Tag-iya

Masterfisherman
Manulong/Maestro

Captain
Kapitan

Crew
Tripulante

Others, Specify _____
Iba pa, ano ini?

X. DISTRIBUTION OF AVE. MONTHLY HOUSEHOLD EXPENSES:

Pag bahin-bahin han gastos han panimalay:

EXPENSES	AMOUNT (P)
Food	
Health	
Education	
Shelter/Rental (repair, maintenance, renovation)	
Transportation	
Billings: Electricity Mobile Phone Load Water Cable	
Others	

XI. CATCH AND EFFORT DATA:

Lista han dakop kada panagat:

Ave. No. of Hauls/Day (24 hrs)	Ave. No. of Fishing Days per Trip	Ave. Catch per Trip (kg)	Ave. Fish Discard per Trip (kg)	Ave. Debris per Trip	No. of Average Trips per Month	No. of Fishing Months per Year
<i>Libada</i>	<i>Pira ka adlaw kada byahe</i>	<i>Pira ka kilo an dakop kada Byahe?</i>	<i>Pira ka kilo an gin hapil/labog ha dagat</i>	<i>Pira ka kilo an basura nga nakukuha kada byahe</i>	<i>Pira ka byahe kada bulan</i>	<i>Pira ka bulan han byahe ha usa ka tuig</i>

WHAT IS THE CATCH ARRANGEMENT/SHARING SYSTEM?

Nano an partida?

	Share from Net Income (%)	Catch Incentive (%)
Owner Tag-iya		
Crew Tripulante		

XII. HOW MUCH FISH DO YOU GET FOR HOME CONSUMPTION PER TRIP?

Ano ka damo han dakop han iyo gin gagamit para pagkaon ha balay? _____ kg.

XIII. WHERE IS YOUR USUAL FISHING GROUND?

Diin dapit han pirme mo ginapanagatan?

FISHING GROUNDS <i>Panagatan</i>	Bulan(Month)	DOMINANT FISH CAUGHT <i>Kasagaran nga isda nga nadadakop</i>
Libucan	October	Talad

XIV. BASED ON THE AVERAGE CATCH PER TRIP, PLS. INDICATE THE FOLLOWING:

Base han normal nga nadadakop nga isda kada byahe, alayon iglista an masunod:

Type	Species	Price Range	Total Weight (kg)
Fish Trawl			
Deklase			Prepare list of different types
Buyod			
Parotpot			
Jako			
Reject			
Shrimp Trawl			
Pasayan	Lukon		
	Bulik		
	Puti		
	Suahe		
	Tigbason		
	Guludan		
	Bangkigan		
Jako			

Reject			
Squid Trawl			
Deklase			
Buyod			
Parotpot			
Squid			
Jako			
Reject			

XV. COST AND RETURN ANALYSIS:

Bana-bana han benta ngan ganansiya:

a. Fixed Investment:

ASSETS <i>Propiyedad</i>	YEAR ACQUIRED/ YEAR BUILT <i>Kakano ginpalit o ginhatag/ginhimo</i>	PRICE (P) <i>Kantidad</i>	ECONOMIC LIFE (YEAR) HOW LONG CAN YOU USE YOUR ASSET? <i>Pira katuig magagamit han imo propiyedad?</i>
Boat <i>Sakayan</i>			
Gear <i>hulaw/higamit</i>			
Equipment <i>Ekepahis o garamiton</i> Fish box Fish tubs Styro foam Mobile phone GPS Compass Navigational Maps/Charts Handheld Radio Life Saving Devices Life Buoy			
TOTAL			

b. Operational and Marketing Costs per Trip:

ITEMS	PRICE (PESO) /TRIP OR OPERATION
Fuel & Lubricants <i>Krudo ngan asete</i>	
Crew Share <i>Sweldo han tawo</i>	
Laborers Wage (at port, market, etc.) <i>Suhol han mga trabahante</i>	
Maintenance Cost <i>Gastos han pagmentenar han sakayan</i>	
Ice Cost <i>Batonaw/yelo</i>	
Transportation Cost <i>Gastos ha pamasahe</i>	
Food Provision Cost <i>Gastos ha pagkaon</i>	
Cooking Paraphernalia <i>Gamit Panluto</i>	
TOTAL	

c. Other Expenses:*Iba pa nga Garastuhan*

ITEMS	AMOUNT
MARINA Registration Fees	
BFAR Commercial Fishing Vessel/Gear License	
Municipal Boat and Gear License	
Boat Maintenance Cost (yearly) <i>Gastos han pagmentenar han sakayan (tinuig)</i>	
Other Incidental Expenses <i>Iba pa nga garastuhan</i>	
TOTAL	

XVI. WHAT EVENT AND ACTIVITIES WOULD AFFECT YOUR TRAWL OPERATION? WHY?*Ano nga mga panhitabo /burohaton /higwaos nga makakaappekto han pagtrawl? Kay ano?*

Events/Activities	Explanation
Typhoon <i>Bagyo</i>	
Southwest Monsoon <i>Habagat</i>	
Northeast Monsoon <i>Amihan</i>	

Operations of Law Enforcement <i>Operasyon han mga Otoridad</i>	
Local Market Price <i>Presyo ha lokal nga Merkado</i>	
Fuel Price <i>Presyo han Gasoline</i>	
Competition with Other Fishing Gears <i>Kumpetensya han iba nga Panagat</i>	
Fiestas and Other Social Events <i>Patron, semana santa ngan kalagkalag</i>	
Seasonality <i>Kutsitsa</i>	
Red Tide Incidence <i>Insidente han Red Tide</i>	
Strict Compliance of JTEDs <i>Strikto han pagsunod han paggamit han JTEDs</i>	
Health (Operator & Crew) <i>Panlawas (Tag-iya ngan Tripulante)</i>	
Politics <i>Politika</i>	
Mechanical Breakdown <i>Na aberya</i>	
Others <i>Iba pa</i>	

XVII. OTHER IMPORTANT QUESTIONS RELATIVE TO FISHERIES ACTIVITIES OF THE RESPONDENTS.

1. **What is your perception on the status/condition of your fishing ground?**

Anu an imo pagkita han kamutangan han imo gin papangisdaan?

2. **What are the problems and recommendations relevant to fishing activities?**

Anu-ano an mga problema ngan mga rekomendasyon nga importante para ha pangisdaan?

PROBLEMS	RECOMMENDATIONS

3. What fishery law or regulation do you know that affects your fishing?

Ano nga mga balaod/regulasyon nga nakakaapekto han imo pangisda?

4. What are the benefits and other household amenities gained from your trawl fishing?

Ano nga mga benepisyo ngan iba pa nga nakukuha han imo pamilya tikang han imo panagat nga trawl?

5. Is your income from trawl fishing enough to sustain your daily family needs? Why?

An imo ba kita tikang han panagat nga trawl sadang para han kada-adlaw nga panginahanglanon han imo pamilya? Kay ano?

6. Would you like to shift or retain your fishing gear? If yes, what gear? If no, why not?

Kon tagan tyansa, maruruyag ka ba mag balyo ngadto han iba nga klase nga panagatan? Kon oo, ano? Kon diri, kay ano?

7. What measures do you practice and equipment you have to ensure your safety at sea?

Ano nga mga pitad nga imo ginbubuhat ngan ekepahis nga may da ka para malikyan ang disgrasya ha kadagatan?

8. Are you willing to take the debris/basura you collected into port for proper disposal?

Naruruyag kaba nga dad-on han mga basura nga nakukuha tikang han imo panagat ngadto sa ligid sa pantalan para ha tama nga bubutangan?

Name of Interviewer: _____

Date: _____



SOCIO-ECONOMIC INTERVIEW GUIDE FOR OTHER FISHERIES

(For Owners/Operators, Boat Captains, Masterfishermen and Crew)

XVIII. RESPONDENT'S PERSONAL INFORMATION:

Impormasyon han Tagabaton

Full Name: _____

Ngaran

Municipality/City: _____

Munisipyo/Syudad

Barangay/Sitio/Purok: _____

Barangay

Age: _____ **Sex:** _____ **Civil Status:** _____

Edad

Kinatawo

Estado

Religion: _____ **Dialect/s Spoken:** _____

Relihiyon

Yakan

No. of Years Engaged in Fishing: _____

Pira na katuig nga nangisda

FishR registered? _____ YES _____ NO

XIX. EDUCATIONAL BACKGROUND:

Ang gin Adman

Never Attended School

Waray makaeskwela

Vocational

Elementary Level

Illege Level

Elementary Graduate

College Graduate

High School Level

Post Graduate

High School Graduate

XX. HOUSEHOLD INFORMATION:

Impormasyon han Panimalay

No. of Household Members/Sources of Income: _____

Kadamu-on han naukoy ha Panimalay

Household Member <i>Myembro han Panimalay</i>	Relation <i>Relasyon</i>	Gender <i>KInatawo</i>	Age <i>Edad</i>	Types Of Livelihoods <i>Klase Han Pangabuhian</i>	Specify Months <i>Ano nga mga Bulan</i>	Ave. Monthly Income <i>Kita kada Bulan</i>

OTHER SOURCES OF MONTHLY INCOME INCLUDING REMITTANCES? HOW MUCH(Respondent)?

Iba nga surok han pangabuhian kaupod an nakakarawat tikang ha gawas? Pira man?

INCOME SOURCES	AMOUNT (P)

XXI. ARE YOU A MEMBER OF ANY ORGANIZATION: YES NO

Myembro kaba han bisan ano nga organisasyon:

Community/Religious Organization: _____

Organisasyon ha Comunidad/Relihiyon

Women Organization: _____

Organisasyon han Kababayenhan

Fisherfolk Association: _____

Organisasyon han mga Parapangisda

Fisherfolk Cooperative: _____

Cooperatibahan Parupangisda

Others: _____

Lain pa

HAVE YOU AVAILED OF ANYCREDIT FACILITY? YES NO

Nakatagamtam ka na ba han pautang?

If YES, Please Specify _____

Kun mayda, ano ini?

XXII. HAVE YOU AVAILED OF ANY EXTENSION SERVICES FROM:

Nakatagamtam kana bahan mga bulig tikang:

C. **GOVERNMENT** **YES** **NO**
Gobyerno

If NO, Why None? _____

If YES, What Agency & Services? _____
Kun mayda, ano ini nga mga Ahensya ngan Serbisyo?

D. **NON-GOVERNMENT ORG.** **YES** **NO**

If NO, Why None? _____
Kun waray, kay ano?

If YES, What Agency & Services? _____
Kun mayda, ano ini nga mga Ahensya ngan Serbisyo?

XXIII. TYPES OF GEAR/S USED?

Ano nga klase han pukot imo ginagamit?

Type of Gears	No. of Fishing Gears/units

No. of Fishermen (Officers and Crew) onboard?: _____
Kadamo-on han upod/sakay?

XXIV. ENGINE BRAND AND HORSE POWER:

Tatak han makina ngan kabalyos

Engine Brand: _____

Horse Power: _____

Tatak han makina

Kabalyos

XXV. NAME AND MEASUREMENT OF BOAT (TONNAGE MEASUREMENT in meters). Pls. indicate unit of measure.

Sokol Han Sakayan/Baloto

NAME OF BOAT <i>Ngaran han Baloto</i>	LENGTH <i>Kahalaba</i>	BREADTH <i>Kahaluag</i>	DEPTH <i>Kataas</i>

Is your boat registered? _____ **YES** _____ **NO**
Rehistrado ba an imo baluto?

If yes, ___ **LGU** ___ **MARINA** ___ **BFAR(BoatR)**

XXVI. WHAT IS YOUR PARTICIPATION IN YOUR FISHING OPERATION?(one or more answers)

Ano an imo partisipasyon dida han iyo panagat?(usa o subra nga baton)

<input type="checkbox"/> Owner <i>Tag-iya</i>	<input type="checkbox"/> Masterfisherman <i>Manulong/Maestro</i>	<input type="checkbox"/> Captain <i>Kapitan</i>
<input type="checkbox"/> Crew <i>Tripulante</i>	<input type="checkbox"/> Others, Specify _____ <i>Iba pa, ano ini?</i>	

XXVII. DISTRIBUTION OF AVE. MONTHLY HOUSEHOLD EXPENSES:

Pag bahin-bahin han gastos han panimalay:

EXPENSES	AMOUNT (P)
Food	
Health	
Education	
Shelter/Rental (repair, maintenance, renovation)	
Transportation	
Billings: Electricity Mobile Phone Load Water Cable	
Others	

XXVIII. CATCH AND EFFORT DATA:

Lista han dakop kada panagat:

Ave. No. of Hauls/Day (24 hrs)	Ave. No. of Fishing Days per Trip	Ave. Catch per Trip (kg)	Ave. Fish Discard per Trip (kg)	Ave. Debris per Trip	No. of Average Trips per Month	No. of Fishing Months per Year
<i>Libada</i>	<i>Pira ka adlaw kada byahe</i>	<i>Pira ka kilo an dakop kada Byahe?</i>	<i>Pira ka kilo an gin hapil/labog ha dagat</i>	<i>Pira ka kilo an basura nga nakukuha kada byahe</i>	<i>Pira ka byahe kada bulan</i>	<i>Pira ka bulan han byahe ha usa ka tuig</i>

WHAT IS THE CATCH ARRANGEMENT/SHARING SYSTEM?

Nano an partida?

	Share from Net Income (%)	Catch Incentive (%)
Owner <i>Tag-iya</i>		
Crew <i>Tripulante</i>		

XXIX. HOW MUCH FISH DO YOU GET FOR HOME CONSUMPTION PER TRIP?

Ano ka damo han dakop han iyo gin gagamit para pagkaon ha balay?

_____ kg.

XXX. WHERE IS YOUR USUAL FISHING GROUND?

Diin dapit han pirme mo ginapanagatan?

FISHING GROUNDS <i>Panagatan</i>	Bulan(Month)	DOMINANT FISH CAUGHT <i>Kasagaran nga isda nga nadadakop</i>

XXXI. BASED ON THE AVERAGE CATCH PER TRIP, PLS. INDICATE THE FOLLOWING:

Base han normal nga nadadakop nga isda kada byahe, alayon iglista an masunod:

Type	Species	Price Range	Total Weight (kg)
Deklase/Buyod			
Parotpot			
Jako/Reject			

XXXII. COST AND RETURN ANALYSIS:

Bana-bana han benta ngan ganansiya:

a. Fixed Investment:

ASSETS <i>Propiyedad</i>	YEAR ACQUIRED/ YEAR BUILT <i>Kakano ginpalit o ginhatag/ginhimo</i>	PRICE (P) <i>Kantidad</i>	ECONOMIC LIFE (YEAR) HOW LONG CAN YOU USE YOUR ASSET? <i>Pira katuig magagamit han imo propiyedad?</i>
Boat <i>Sakayan</i>			

Gear <i>hulaw/higamit</i>			
Equipment <i>Ekepahis o garamiton</i> Fish box Fish tubs Styro foam Mobile phone GPS Compass Navigational Maps/Charts Handheld Radio Life Saving Devices Life Buoy			
TOTAL			

b. Operational and Marketing Costs per Trip:

	PRICE (PESO) /TRIP OR OPERATION
Fuel & Lubricants <i>Krudo ngan asete</i>	
Crew Share <i>Sweldo han tawo</i>	
Laborers Wage (at port, market, etc.) <i>Suhol han mga trabahante</i>	
Maintenance Cost <i>Gastos han pagmentenar han sakayan</i>	
Ice Cost <i>Batonaw/yelo</i>	
Transportation Cost <i>Gastos ha pamasah</i>	
Food Provision Cost <i>Gastos ha pagkaon</i>	
Cooking Paraphernalia <i>Gamit Panluto</i>	
TOTAL	

c. Other Expenses:

Iba pa nga Garastuhan

ITEMS	AMOUNT
MARINA Registration Fees	
BFAR Commercial Fishing Vessel/Gear License	

Municipal Boat and Gear License	
Boat Maintenance Cost (yearly) <i>Gastos han pagmentenar han sakayan (tinuig)</i>	
Other Incidental Expenses <i>Iba pa nga garastuhan</i>	
TOTAL	

**XXXIII. WHAT EVENT AND ACTIVITIES WOULD AFFECT YOUR OPERATION?
WHY?**

Ano nga mga panhitabo /burohaton /higwaos nga makakaappekto han imo panagat?Kay ano?

Events/Activities	Explanation
Typhoon <i>Bagyo</i>	
Southwest Monsoon <i>Habagat</i>	
Northeast Monsoon <i>Amihan</i>	
Operations of Law Enforcement <i>Operasyon han mga Otoridad</i>	
Local Market Price <i>Presyo ha lokal nga Merkado</i>	
Fuel Price <i>Presyo han Gasoline</i>	
Competition with Other Fishing Gears <i>Kumpetensya han iba nga Panagat</i>	
Fiestas and Other Social Events <i>Patron, semana santa ngan kalagkalag</i>	
Seasonality <i>Kutsitsa</i>	
Red Tide Incidence <i>Insidente han Red Tide</i>	
Health (Operator & Crew) <i>Panlawas (Tag-iya ngan Tripulante)</i>	
Politics <i>Politika</i>	
Mechanical Breakdown <i>Na aberya</i>	
Others <i>Iba pa</i>	

XXXIV. OTHER IMPORTANT QUESTIONS RELATIVE TO FISHERIES ACTIVITIES OF THE RESPONDENTS.

9. What is your perception on the status/condition of your fishing ground?

Anu an imo pagkita han kamutangan han imo gin papangisdaan?

10. What are the problems and recommendations relevant to fishing activities?

Anu-ano an mga problema ngan mga rekomendasyon nga importante para ha pangisdaan?

PROBLEMS	RECOMMENDATIONS

11. What fishery law or regulation do you know that affects your fishing?

Ano nga mga balaod/regulasyon nga nakakaapekto han imo pangisda?

12. What are the benefits and other household amenities gained from your fishing?

Ano nga mga benepisyong ngan iba pa nga nakakuha han imo pamilya tikang han imo panagat?

13. Is your income from fishing enough to sustain your daily family needs? Why?

An imo ba kita tikang han panagat sadang para han kada-adlaw nga panginahanglanon han imo pamilya? Kay ano?

14. Would you like to shift or retain your fishing gear? If yes, what gear? If no, why not?

Kon tagan tyansa, maruruyag ka ba mag balyo ngadto han iba nga klase nga panagatan? Kon oo, ano? Kon diri, kay ano?

15. What measures do you practice and equipment you have to ensure your safety at sea?
Ano nga mga pitad nga imo ginbubuhay ngan ekepahis nga may da ka para malikyan ang disgrasya ha kadagatan?

16. Are you willing to take the debris/basura you collected into port for proper disposal?
Naruruyag kaba nga dad-on han mga basura nga nakukuha tikang han imo panagat ngadto sa ligid sa pantalan para ha tama nga bubutangan?

17. How much additional catch do you expect if law enforcement is effective?
Pira an imo dugang nga dakop kon epektibo nga gin imposar an balaud?

Name of Interviewer: _____ **Date:** _____