



The Samar Sea fisheries management plan

2016

Strategies for trawl fisheries bycatch management project



The Samar Sea fisheries management plan

REBYC II-CTI Project pilot site for Samar Sea

Prepared by the Technical Working Group (TWG)

**strategies for trawl fisheries bycatch management
(REBYC-II CTI; GCP/RAS/269/GFF)**

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1. Introduction

Samar Sea is situated between southern Luzon and eastern Visayas in the Philippines. It is bordered by the provinces of (Western) Samar to the east, Leyte to the south, Masbate to the west, and Northern Samar to the north. It is connected to the Philippine Sea to the north via San Bernardino Strait, Leyte Gulf to the south and east via San Juanico Strait, to the Visayan Sea to the southwest, and to the Sibuyan Sea to the northwest via Masbate Passage and Ticao Passage. Several bays and inlets are found in the fringes of Samar Sea including Maqueda Bay and Carigara Gulf (Fig. 1).

The entire Samar Sea has an estimated area of 198 km² or 150 nautical miles², it is bounded from Tinambacan Pt. (Calbayog) and Buad Island (Zumarraga), and the area has an average depth of 15 fathoms or 28 m (Samar Sea Profile).

The greater part of Samar Sea is within the waters of the province of Samar comprising of two (2) cities and nine (9) municipalities, namely Calbayog, Catbalogan, Tagapul-an, Sto Nino, Almagro, Sta. Margarita, Gandara, Pagsanghan, Tarangnan, Daram and Zumarraga. The number of registered fisherfolk in the province was 37,567 as of July 2, 2015 (BFAR FishR), which is about 5% of the population of the province (<http://samar.lgu-ph.com>).

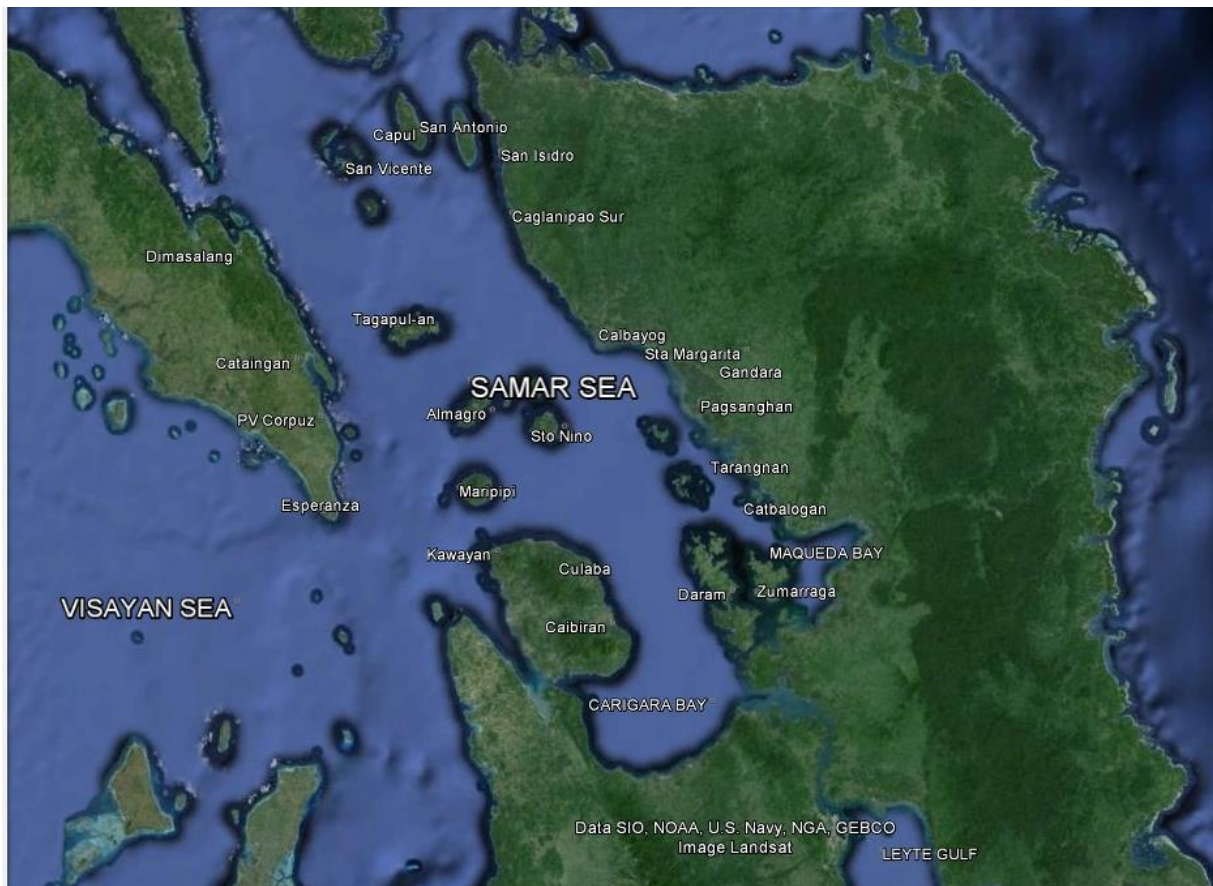


Figure 1: Map of Samar Sea.

Samar Sea is acknowledged to have experienced overfishing and significant degradation of marine resources. Before 1981, there were 50 commercial fish species, but within 10 years, it was reduced to only 10 due to overfishing and destructive fishing methods (like dynamite fishing), with average daily catch reduced from 30 kg/day in the 1960s, to 8 kg/day in 1981, to 3.5 kg/day in 1991 (ICLARM, 1993).

The first red tide in the Philippines occurred in the Samar Sea in 1983 (Hermes, 1983) and thereafter continued to occur at irregular intervals.

This Samar Sea Fisheries Management Plan will serve as a framework for managing the fisheries of the Province of Samar, particularly on the sector of marine capture fisheries.

1.1. Vision

The Samar Sea Fisheries Management Plan (SSFMP) envisions a Sustainable and Equitably-shared Samar Sea Fisheries through Dynamic Management by applying the principles of an Ecosystem Approach to Fisheries Management (EAFM) and other established principles in fisheries management. It will also be in line with the principles of the Philippine Fisheries Code of 1998 as **amended by R.A. 10654**.

1.2. Goals and objectives of the plan

Goal - Improve food security and reduce poverty of fishers through sustainable fishing industry development and management

Specific objectives

- Implement an EAFM-SSFMP to sustain the fisheries of Samar Sea
- Introduce fishing effort controls to improve fish biomass and maintain sustainable production of Samar Sea.
- Implement a rational monitoring, control and surveillance system (catch monitoring, regulatory/governance and fisheries law enforcement)
- Improve livelihood support/assistance to fisherfolk, and particularly to those that will be affected by the plan
- Reduce conflict among fishers/resource users
- Provide support to science as basis for the management of the fisheries of Samar Sea

1.3. Scope of the plan

This Plan shall cover all marine capture based fisheries in eleven (11) coastal municipalities and cities of the Province of Samar. The spatial scope is about 168.9 km², which is about 85.3% of the total area of Samar Sea (Fig. 2).

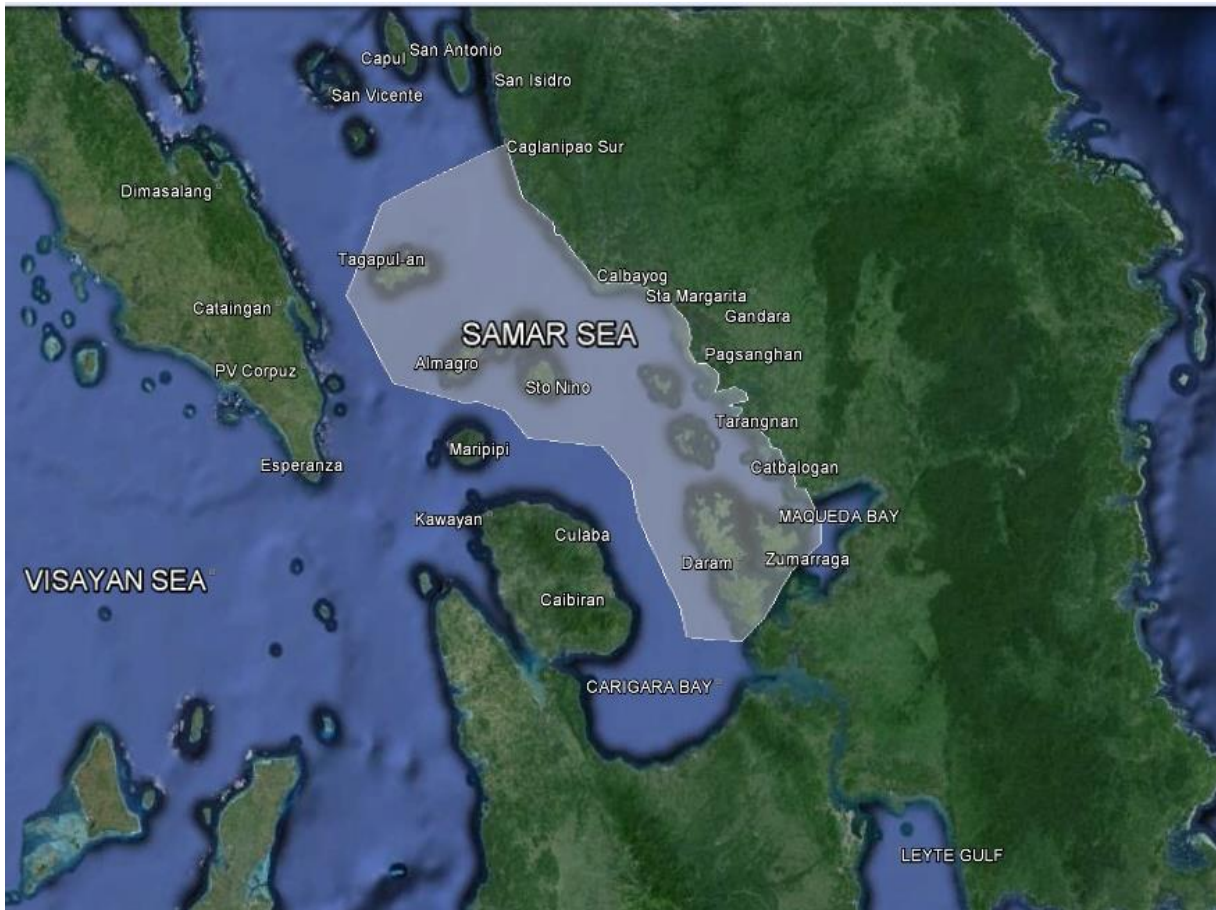


Figure 2: Map of Samar Sea and scope of the SSFMP.

2. Rationale for management

2.1. Historical account on status of fish stock/fisheries

2.1.1. Stock assessment

Studies in Samar Sea had been focused on assessment of demersal stocks. The otter trawler Theodore N. Gill survey averaged 92 lbs/hr of marketable fish with the highest yield of 248 lbs/hr at 20 fathom contour. The resources consisted of cutlass fish, turbot, nemipterids, lizard fish, crevalles and insignificant amount 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 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 (Armada, 2004).

The average municipal landing of shrimp trawls for the period 1992-1995 was about 812 tons/year (Mines, 1995). This implies that each shrimp trawl landed about 40.0 tons/year on the average or 0.333 tons/month or 15.16 kg/day. During the survey, seven species of shrimps, belonging to three genera, i.e., *Penaeus*, *Metapenaeus* and *Trachypenaeus*, were identified of high commercial value. *Penaeus merguensis* locally known as "puti" was the most abundant and dominated landing among the genus *Penaeus*. The catch per unit effort (CPUE) of 1.39 kg/haul for this species was already at low level. Other penaeid shrimps identified were the *Penaeus semisulcatus* (bulik), *P. latisulcatus* (tigbason) *P. monodon* (lukon), *Metapenaeus ensis* (guludan) *Metapenaeus endeavouri* and *Trachypenaeus fulvus* (bangkigan).

The bycatch of demersal finfishes consisted 7.35% of the total catch. These include common slipmouth (sap-sap), common whiting (aso-os), goat fish (ti-ao), sole fish (palad), threadfin breems (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 Malabar cavalla. The bycatch is usually used for food consumption by the fishers and operator. However, there is also a large portion of bycatch of small sized fin fishes and fishers call them as “rejects” (trash fish, which is basically juvenile and immature fin-fishes) which comprised about 39% of the total catch.

In general the state of the demersal fish stocks in the Philippines including Samar Sea is generally considered overfished fisheries (Barut et al., 2004; Armada & Campos 2004; Stobutzki et al. 2006). Various trawl surveys indicated declining biomass primarily due to excessive fishing (Table 2). 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). Viloso and Hermosa (1980) have identified a total of 226 species, belonging to 132 genera and 82 families from the same demersal (trawl) survey.

The more recent survey conducted by MV DA-BFAR using a high opening trawl in Samar Sea indicated a biomass of about 2.88t/km² - the catch belonged to 107 genera. While the biomass of Samar Sea was observed to be somewhat higher than that of 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 current REBYC II-CTI Project, the estimated biomass based on the landings of shrimp trawl was about 2.1 t/km² (SSU, 2014).

2.1.2. 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.

The average catch per-unit effort (CPUE) for shrimp trawl (panghipon) was just below 1 ton (0.94 tons) per 2 days/3 nights fishing trip while the CPUE for fish trawl (palupad) was 2.4 tons per 2 days/3 nights fishing trip. For shrimp trawl, peak months were indicated in the months of October while lean months (months of poor fishery) were observed in July-August. For fish trawl, lowest mean catch was observed in September and highest in June (Fig. 3).

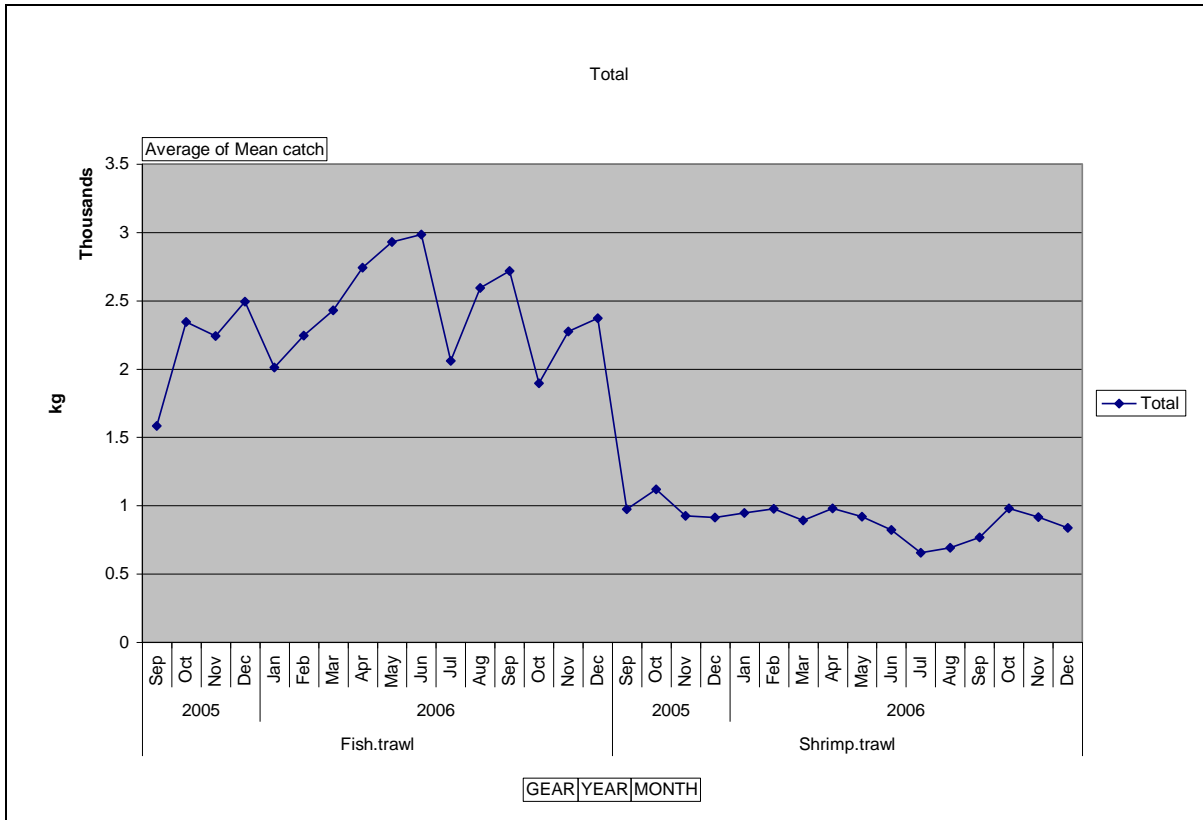


Figure 3: Catch-per-unit-effort (CPUE) for shrimp and fish trawl, Samar Sea, 2005-2006

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 (Fig. 4).

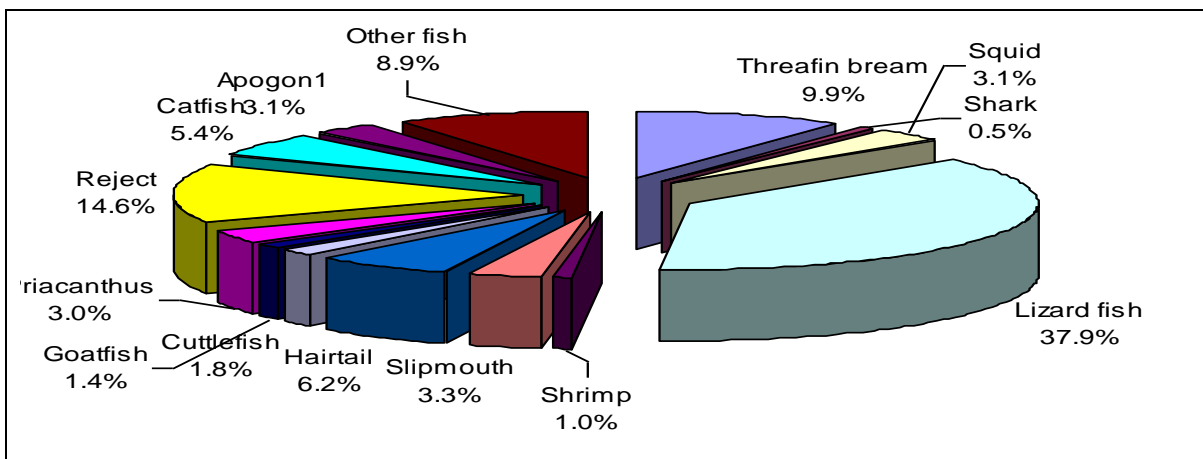


Figure 4: Catch composition of shrimp trawl, Samar Sea, 2005-2006.

The composition of rejects in shrimp trawl indicated high incidence of juveniles of commercially important species, among which were the lizard fish 8.1% (*Saurida spp.*), purple spotted bigeye 5.4%

(Dilat, *Priacanthus tayenus*), cardinalfish 9.2% (Muong, *Apogon sp.*), and hairtail 1% (Espada, *Trichiurus sp.*).

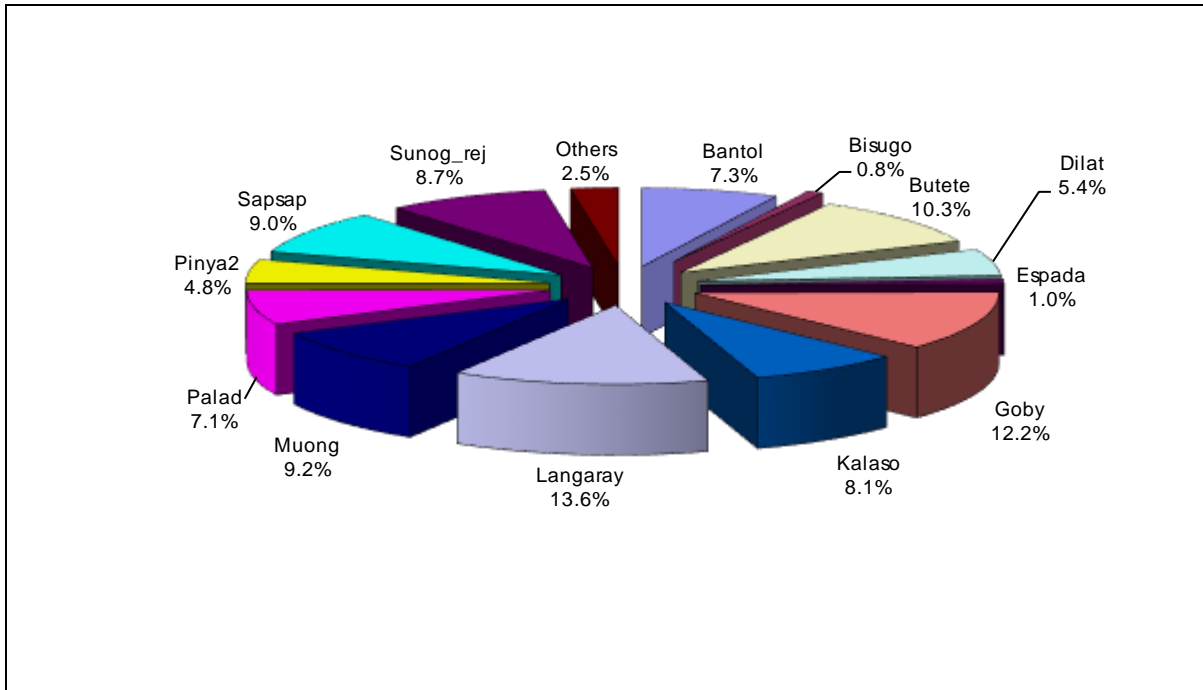


Figure 5: Catch composition of rejects, 2005-2006.

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 7.8% (*agumaa, R. faughni*). Demersal fish which are the dominant catch for fish trawl constitute a small portion of the catch like lizardfish (kalaso) 0.4% and threadfin bream 0.3%. The reject portion of the catch was also comparatively lower, with only 4% of the total catch.

2.1.3. Trawl catch and bycatch landing survey

The survey was conducted by the Samar State University (SSU) under the REBYC II-CTI Project. For the six months sampling period (October 2013 to March 2014), 812 tons of fish were observed, of which 35% were landed by commercial trawls and 7% by municipal (4DR5) from Calbayog City, while 44% was contributed by municipal 4DR5 from Catbalogan City and 14% by municipal small gasoline trawls from both Catbalogan City and Sta. Margarita.

For operational definition, “4DR5” is 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. “Reject” refers to bycatch. “Small municipal” were trawl with outrigger powered by 16HP gasoline or diesel engines.

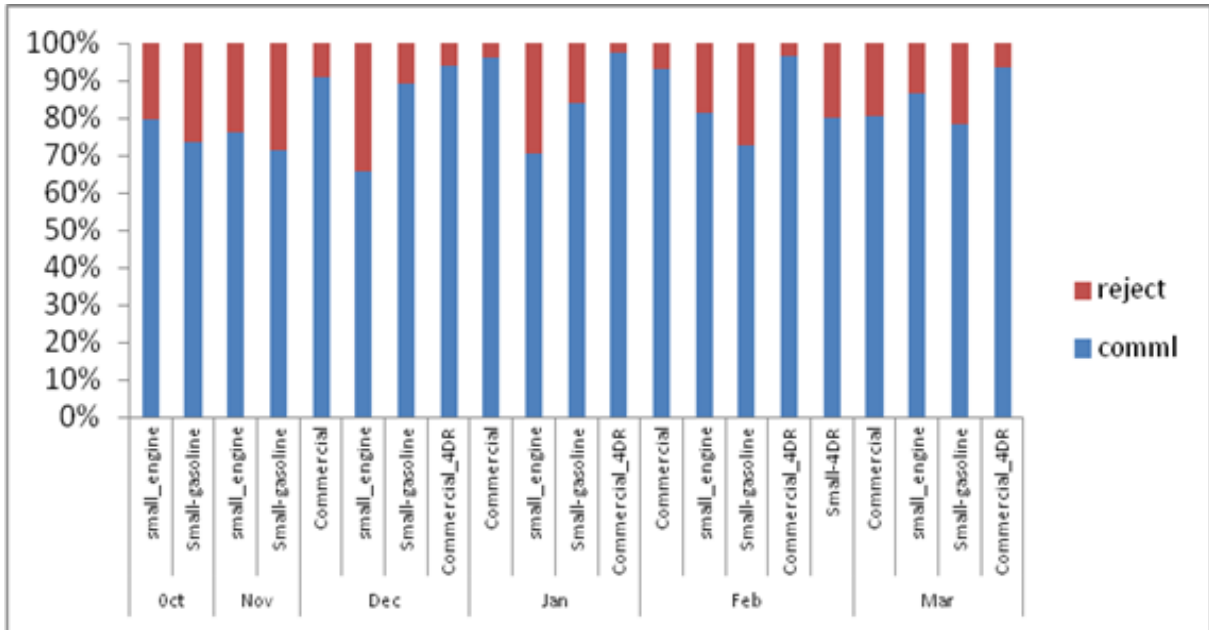


Figure 6: Good catch and bycatch (reject) in commercial and municipal trawl, Samar Sea

Total bycatch from all sampling areas was 135,052 kg. Bycatch was 2% of the total catch for commercial trawls using JTEDs in Calbayog City while bycatch was 62% for municipal medium 4DR5 in Catbalogan City. At least 16% of the total catches from municipal small gasoline vessels in Catbalogan City and Sta Margarita were bycatch. It should be noted that medium trawlers (4DR5) from Catbalogan City were not using JTEDs due to the revision of the local ordinance.

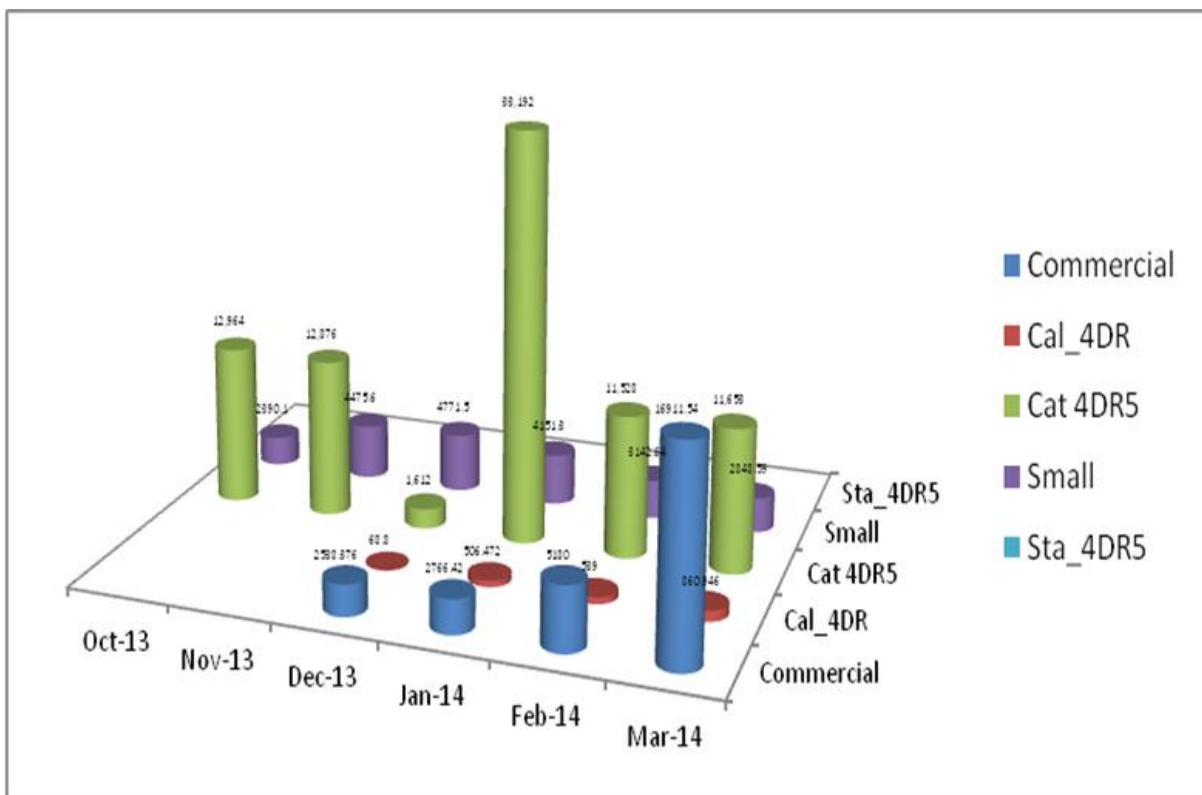


Figure 7: Bycatch in municipal and commercial trawls, Samar Sea.

A total of 676,653 kg of good catch was landed in 3 landing sites for six months (Oct 2013 to March 2014). In Catbalogan City, the commercial 4DR5 contributed about 44% of the catch landing followed

by commercial type in Calbayog City which contributed about 35%. Next are the small engine and 4DR5 in Sta. Margarita which has contributed 14%, and commercial 4DR5 contributed about 7%.

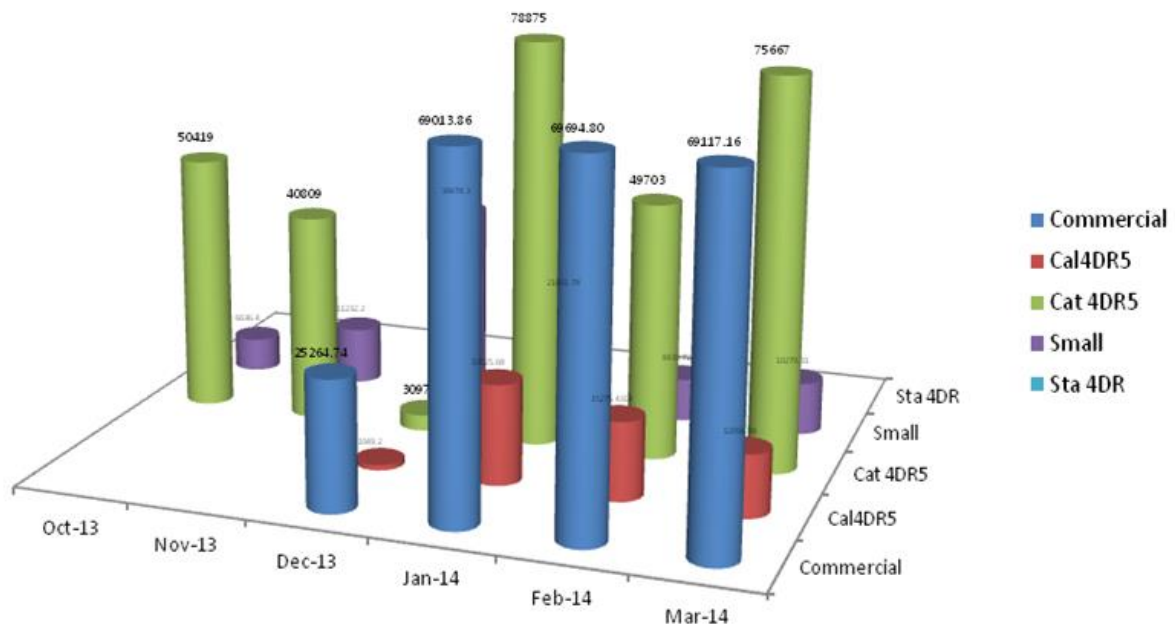


Figure 8: Good catch of commercial and municipal trawls, Samar Sea.

For Calbayog City commercial trawl there was no operation of trawls due to price escalation of diesel fuel from October to November 2013. In December it only landed 11% due to super typhoon “Haiyan”. January 2014 landed 29% while February and March both got 30% monthly catch landed (April, May, June, July is closed season).

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

A total of 108,112 kg of demersal fish caught by trawlers in Catbalogan and Sta. Margarita was recorded from October 2013 to March 2014.

Based from the monthly records, it was observed that during October, 74% was comprised of good catch while 26% were bycatch.

Meanwhile, November has 72% of good catch and 28% of bycatch while December has 91 % of good catch and 9% of bycatch. Moreover, January has 84% of good catch and 16% of bycatch while February recorded 73% of good catch and 27% of bycatch. Lastly, March has 78% of good catch and 22% of bycatch.

2.1.4. Spawning of commercial species

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

The 5-point maturity scale classifies stages 4 and 5 as fully matured while stages 1, 2 and 3 were as immature or maturing. GSIs were classified according to gonad weight where stages 4 and 5 were classified as fully matured while stages 1, 2 and 3 were as it is.

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

Based on the above, the spawning months of major commercially important species was indicated to mainly occur during the months of April, May, July and August. Thus the most plausible closed season should coincide with these months, the period of which should be agreed upon during the consultation process.

Table 1: 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 spp.</i>)												
Saramulyete (<i>Upeneus sp.</i>)							1,2			1		
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				2	2							
Hasa-hasa (<i>Rastrelliger brachysoma</i>)					2							
Alumahan, Burao (<i>Rastrelliger kanagurta</i>)				2	2	2						
Matambaka (<i>Selar crumenophthalmus</i>)							2					

Source:

- 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

2.1.5. Coral reef status

Survey of 19 sites with an estimated total area cover of 8,500 m² was conducted under the current REBYC II-CTI Project. Overall estimated average coral cover was about 30% and fish density of 0.43 fish/m². Destruction of corals can be attributed to human activities including various forms of 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 2).

Table 2: Estimated coral cover and fish density in selected sites, 2013-2014.

Municipality	Site	Total Area (has)	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	CanhawanGoti Is	2	500	45.0	0.6
Tagapul-an	BgyLipotbaybay	6	500	45.0	0.4
Tagapul-an	BgyLabangbaybay	6	500	35.0	0.3
Tagapul-an	BgyBaquiw	4	500	40.0	0.4
Tagapul-an	BgySugod	-	500	45.0	0.0
Sto Nino	BgyBaras	4	500	25.0	0.9
Sto Nino	Ilijan Cove, BgyIlijan	10	500	20.0	0.6
Tarangnan	Libucandacu	6	500	30.0	0.5
Tarangnan	SitioBaras, Bgy. Rama	2	500	15.0	0.2
Tarangnan	TigdaranawGoti Is.	18	500	40.0	1.1

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

2.2. Historical account on fishing effort

While the local government units (LGUs) have variable accounts on the number of fisherfolk and fishing boats as part of the Fisheries Profile, there is no record according to 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.

2.2.1. Fishing fleet (Boats and gears) Inventory

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

It is recognized that the socio-economic aspects of fisheries are important components in the formulation of the SSFMP to show the human well being part of the Ecosystem Approach to Fisheries Management as it impacted on the fisheries of Samar Sea. More details are provided under 3.1.2.

2.3.1. Survey coverage and method

Given that socio-economic information of the fisheries in the pilot area are not readily accessible, 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 important national activities in preparation for the formulation of the Plan. The workshop was aimed at providing the participants an understanding and appreciation of how socio-economic and gender information are utilized in the management plan. It was attended by the City/Municipal Agriculturists/Planning Officers of the eleven (11) municipalities under the Alliance of Local Government Units bordering Samar Sea. Other participants came from the Academe, BFAR Regional Office 8, National Fisheries Research and Development Institute, the National Marine Fisheries Development Center, BFAR Central Office, the Provincial Government of Western Samar, the REBYC-II CTI TWG and representatives from the Municipal and Commercial Fisheries Sectors.

As an output of the Workshop, two (2) interview guides were prepared, namely; Trawl Fisheries Socio-economic Interview Guide and the Socio-economic Interview Guide for Other Fisheries (see Appendix 1 and 2). These two guides were tested in a fishing village, Barangay Estaka, Catbalogan City, where trawl operators and other fishing gears operators were interviewed. The participants in the Workshop analysed and presented the data information collected, and the guides were revised according to the comments and suggestions.

A workshop was conducted to determine the list and distribution of respondents for the socio-economic surveys in the 11 local governments units composing the Alliance of LGUs in Samar Sea. For the socio-economic survey, the list and distribution of respondent-samples were drawn randomly based on the inventory of fishing boats and gears of 2013.

The socio-economic surveys for 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 composing the Alliance of LGUs bordering the pilot area of the project. The 11 municipalities were Calbayog, Catbalogan, Sta. Margarita, Tarangnan, Almagro, Pangsanghan, Daram, Zumarraga, Gandara, Sto. Nino, and Tagapul-an, all located in Western Samar.

2.3.2. Socio-economic demographic profile

There were two types trawl for both commercial (fish and shrimp) and municipal (shrimp and squid). Those that were directly engaged in the fishery were mainly males, with 99% in commercial fish trawls and 92.5% in commercial shrimp trawls. For municipal shrimp trawls, only 1% were females while all male respondents were covered for municipal squid trawl. The majority were aged between 25 and 34 (29%), and 35 to 44 with (27%). Older fishers are engaged in municipal trawls, with shrimp trawls dominated by an older age bracket 35 to 44 years. A higher percentage for 65 years and over was also observed in the municipal fisheries sector.

Trawl fishers were mostly married, however relatively higher percentage of married respondents were observed in municipal trawls (92%) compared to commercial trawls (67.2%). The average experience or years of fishing for fishers is also shorter in the commercial sector than in the municipal.

There were 25 types/categories of household members with a typical large and extended family that includes not only the spouse and children but also nephews, nieces and all sorts of in-laws. In general fishers' education was inadequate with many only able to reach elementary level education. The mainstream was not also members of any organization, with Fisherfolk Association as the common organization joined by the respondents.

There is low access to credit in both sectors and that extension services from government were inadequate or not availed of.

2.3.3. Cost and return analysis by type of gear

There is a clear disparity on production and economic performance among the 3 main categories of trawl; with the 160 hp obviously the most productive and with highest economic return, although it also requires high operational cost. The municipal trawl with 10-16 hp engine seem also to be in better operation than 80 hp engine, considering the operational cost required vs. net profit derived from their operations as well as the income for fishermen.

Among the other commonly used municipal fishing gears (hook and line, bottom set longline, bottom set gillnet and crab pot), bottom set longline was indicated to have the highest net profit of P99,245 and the crab pot as the least with P16,780. Bottom set longline also provided the highest derived income and crab pots as the least. The income derived from municipal trawl (16hp) is also comparatively higher than that of the other municipal fishing gears.

2.3.4. Role of women in the fishing industry

Since fishing is viewed as masculine livelihood, women in Samar Sea are mainly engaged in fish trading, processing, net mending and gleaning. There are also some who go out fishing with their husbands. The results of the study on Social Consequences of Fish Sanctuaries and Marine Protected Areas in Samar Sea show that here were housewives who had participated in the implementation and management of Fish Sanctuaries and Marine Protected Areas.

2.3.5. Perception of fishermen on the status of the fishing ground

“Mechanical Breakdown” and “Law Enforcement Operations” were considered as the events that mainly affected their fishing operations. Fishers also regarded “Declining and Depleted Catch” and that “No Legal Fishing Ground” emerged as main issues that confronted the respondents.

They also considered that their “Income from trawl fishing is enough” and that majority of the respondents are willing to shift to Gill Net Fishing should they be required to do so.

Navigational Lights was the most common safety paraphernalia/equipment. Safety at sea provisions and practice is not consistently followed; most of them expressed willingness to bring onshore debris or trash that their fishing gears haul for proper waste disposal.

2.3.6. Other Socio-economic information

- Samar population = 733,377 as of 2010 (Source: <http://www.samar.lgu-ph.com/>)
- Registered fishers = 23,293 as of 2015 (Source: BFAR FishR) = 3.3% of Samar population
- 35,141 direct employment (Source: REBYC II-CTI Socio-econ estimate) = 4.8% of Samar population
- 175,705 direct dependents (Source: REBYC II-CTI Socio-econ estimate) = 24% of Samar population

Table 4: Estimated production by gear type

REBYC II-CTI Project Socio-economic survey, 2015								
	Ave catch/ trip	Ave days / trip	Ave trip/ month	Ave moth / yr	No. of units (Inventory 2013-14)	Est. annual catch(t)	% by sector	% Total
TOTAL (Samar Sea)						39,400		100.00
COMMERCIAL								
L	765.55				101	7,541	19.14	19.14
Modified Danish Seine	800.00	5.00	10.00	10.00	18	1,440	19.10	3.65
Paarak	475.56	1.00	13.89	6.67	5	220	2.92	0.56
Pakayod	800.00	2.30	10.22	8.80	30	2,159	28.63	5.48
Palupad	2,000.00	3.18	7.71	9.35	10	1,442	19.12	3.66
Ringnet	300.00	1.00	20.00	10.00	38	2,280	30.24	5.79
MUNICIPAL	18.97				13,294	31,859	80.86	80.86
Beach Seine	100.00	1.00	7.00	3.00	4	8	0.03	0.02
Bottom Set Gill Net	16.89	1.00	21.18	9.19	3422	11,249	35.31	28.55
Bottom Set Longline	5.63	1.00	25.00	9.23	1261	1,639	5.14	4.16
Bottom Trawl	20.27	1.00	19.78	14.40	753	4,348	13.65	11.04
Crab Gillnet	3.06	1.00	26.26	11.22	1030	928	2.91	2.36
Crab Pot	3.99	1.00	21.90	18.34	1198	1,918	6.02	4.87
Drift Gillnet	35.43	1.00	19.45	8.36	160	921	2.89	2.34
Fish Corral	17.86	1.00	23.01	7.16	229	674	2.11	1.71
Fish pot	3.00	1.00		6.00	708	-	-	-
Handline	8.42	1.00	23.70	10.88	1403	3,047	9.56	7.73
Modified Danish Seine		1.00	20.00		241	-	-	-
Multiple Handline	3.40	1.00	19.80	10.00	1169	787	2.47	2.00

Push Net	6.70	1.00	15.50	10.00	142	147	0.46	0.37
Ringnet	152.00	1.00	17.50	8.65	152	3,497	10.98	8.88
Shrimp Gill Net	2.00	1.00	19.60	5.30	236	49	0.15	0.12
Spear Gun	3.48	1.00	18.95	9.22	368	224	0.70	0.57
Squid Jig	3.35	1.00	20.33	9.67	272	179	0.56	0.46
Squid Pot	12.75	1.00	14.83	12.00	57	129	0.41	0.33
Trammel Net	12.36	1.00	29.14	12.00	489	2,113	6.63	5.36

Source: REBYC II-CTI Project Socio-economic survey, 2015 (preliminary)

Table 5: Comparison of production estimates for Samar Sea.

	REBYC II-CTI Socio-econ survey Est annual catch(t)	NSA/BAS Figure (Ave 2011-2013)	(CERD, 2002)			
			1983	1994	2002	Ave
TOTAL (Samar Sea)	39,400	35,285	36,876	29,884	47,880	38,213
COMMERCIAL	7,541	5,996				
MUNCIPAL	31,859	29,288				

Table 6: Estimated production by gear classification

Gear classification	Est production (t)	%
Passive/municipal gear	23,857	60.55
Active gears	15,542	39.45
Total	39,400	100

Source: REBYC II-CTI Project Socio-econ survey, 2015 (preliminary)

Table 7: Estimated dependents by gear type.

	No. of Fishing Gears/ Units (Inventory 2013-14)	Observed Dependent Crew Owner (per boat)	Est Total Dependents Crew Owner (Raised)	Est Household Dependents Crew Owner (Raised)
TOTAL (Samar Sea)			35,141	175,705
COMMERCIAL			1,571	7,855
Modified Danish Seine	18	26	468	2340
PAARAK (Scope/Haul Seine net)	5	11	55	275
PAKAYOD (Bottom Trawl)	30	9	270	1350
PALUPAD (Norwegian Trawl)	10	17	170	850
RINGNET	38	16	608	3040
MUNCIPAL	13,294	54	33,570	167,850
BEACH SEINE	4	11	44	220
BOTTOM SET GNET	3422	3	10266	51330
BOTTOM SET LONGLINE	1261	3	3783	18915
BOTTOM TRAWL	753	3	2259	11295
CRAB GILLNET	1030	3	3090	15450
CRAB POT	1198	4	4792	23960
DRIFT GILLNET	160	4	640	3200
FISH CORRAL	229	2	458	2290
FISH POT	708	2	1416	7080
HANDLINE	1403	1	1403	7015
MODIFIED DANISH SEINE	241	3	723	3615
MULTIPLE HANDLINE LINE	1169	1	1169	5845
PUSH NET	142	1	142	710
RING NET	152	3	456	2280
SHRIMP GILLNET	236	3	708	3540
SPEAR	368	1	368	1840
SQUID JIG	272	1	272	1360
SQUID POT	57	2	114	570
TRAMMEL NET	489	3	1467	7335

Source: REBYC II-CTI Project Socio-economic survey, 2015 (preliminary)

2.4. Historical account on the management of Samar Sea

Several efforts have been attempted to manage the fisheries of Samar Sea but were not sustained. The first formally organized fishery council was the Western Samar Agricultural Resources Development Programme or WESAMAR, a six year programme (1991-1997) organized by a non-government organization (NGO) funded by the European Union (EU). The project was implemented under the Department of Agriculture, with the Asian Women Cooperative Development Forum (AWCF) providing a Gender Consultant. The consultancy services included a series of meetings with the management team and key implementers, designing and facilitating workshops to generate ideas and develop mechanisms on gender integration. A series of gender-related training to WESAMAR management was conducted. The development of a Gender Integration Plan and System (GIPS) for the project in the areas of community organisation, project appraisal, and monitoring and evaluation was another feature.

In 2000-2003, the Maqueda Bay Management Council (MBMC) was organized by the NGO Centre for Empowerment and Resources Development Inc. (CERD) and several local NGOs and LGUs under the leadership of Hon. Melcher Navarro, the then President of the League of Municipalities of Samar. The MBMC sought to provide direction to the management of Maqueda Bay (a marginal bay of Samar Sea) by integration and cooperation among the LGUs. In 2004, The MBMC was expanded to Samar Sea and Maqueda Bay Management Council (SSMBMC) with the leadership of Hon. Mel Senen Sarmiento, then the Mayor of Calbayog City. The SSMBMC was focused on integrated coastal management by unifying municipal policies and legislation as mandated by the 1998 Philippine Fisheries Code.

In 2004, the South Maqueda Bay Fish Network (SMB FishNet) was established through BFAR Regional Field Office 8 as an inter-local fisheries management institution composed of five (5) LGUs. The objective is strengthening collaboration among the LGU members, national government agencies/institutions, NGOs, and Peoples' organizations (POs). Specifically, the SMB Fish Net initiatives were geared towards rehabilitation and protection of marine habitats within the South Maqueda Bay area under the principles of integrated coastal (resources) management.

Likewise in 2002, with the continued conflict between municipal fishers and the unregulated fishing activities despite the legal prohibition of commercial fishing under Section 16 and 90 of RA 8550, the local government of Calbayog City introduced the Coastal Zoning Project which attempted to institute innovative measures through a process of consultation and finding win-win solutions to address the welfare and concerns of local fishers and residents. The process resulted in designating a "fishing highway" for small commercial fishing boats while not quite fully adhering to the existing national government regulations. The project won several national exemplary awards in local governance including the "Galing Pook Award" in 2004.

In June 2005, the FAO/GEF REBYC I Project experimented on bycatch reduction and introduced the application of the Juvenile and Trashfish Excluder Device (JTED) as a technical intervention in the on-going Coastal Zoning Project of Calbayog City. The Local Chief Executive of Calbayog and other local groups readily supported the implementation of a pilot project in which the use of the JTED became a condition for all commercial trawlers operating under the Coastal Zoning Project. The project was initially aimed at fine-tuning the selection of JTED designs and assessing the effect of the devices as they were put into practice in fishing operations. In addition, effort control on commercial fishing boats were introduced including limitation on the number of fishing days per trip and fishing trips per month. A working group was organized composed of representatives of various sectors/stakeholders that prepared the implementation plan and monitored and reviewed the project execution.

The early success of the Coastal Zoning Project was, however, not sustained owing to legal limitations and resistance of some sectors.

Eventually, Fisheries Administrative Order 237 (2010) provided the Regulation Requiring the Instalment of Juvenile and Trashfish Excluder Device (JTED) in Trawls in Philippine Waters.

Recently the Samar Sea Alliance of LGUs for Fisheries Management and Development (SSAFMD-Alliance) was organized with the intention to institutionalize a Council to address matters pertaining to development, conservation, management and utilization of fisheries and aquatic resources of Samar Sea. Currently, 2 cities and 9 municipalities are official members of the Alliance.

2.5. Fishing ground mapping

With the purpose of evaluating the provision of designated fishing zones by the various fisheries in Samar Sea, a survey was conducted under the REBYC II-CTI Project. Actual inspections of the operations of the various fishing gears as well as several consultations with selected stakeholders were conducted to determine fishing ground distribution by gear type which further demonstrated characteristics of tropical fisheries where multispecies fish are caught with a variety of fishing gears causing conflicts in the use of the same/shared fishing grounds.

Bottom set gillnet which is the most common fishing gear and is operated at depths ranging 10-18 m when targeting Indian mackerel (*alumahan*) and at 18-50 m for short bodied mackerel (*hasa-hasa*). Fishing season is during the period from October to March.

Table 8: General distribution of fishing ground by gear type, distance from shore, depth and fishing season.

Type	Gear	Bottom type	Distance from shore (km)	Depth (m)	Fishing months
Municipal	Bottom-set gillnet	Sandy, muddy	3-5	10-50	Oct-Mar
Municipal	Hook & line	Sandy, rocky	5	15-30	Year round
Municipal	Bottom-set longline	Sandy, Muddy	5-8	Shallow 80-100	Oct-mar Apr-June
Municipal	Crab pot/trap	Sandy, muddy	2-8	5-40	Jan-June
Municipal	Drift gillnet	-	1-2	30-100	Oct-May
Municipal	Trawl	Sandy, Muddy	4-7	7-15	Year round
Municipal	Ringnet	-	4-7	15-20	Mar-June
Commercial	Trawl	Sandy, Muddy	8-15	10-50	Year round
Commercial	Ringnet	-	8-20	20-60	Oct-May

Another important fisheries in the area is the simple hook and line which is the second most common gear. Fishing is carried out along the coast, commonly within 5 kilometers from the shorelines of Calbayog down to Catbalogan and around small islands near Libucan and Canahauan Islands. The multiple hook and line is usually carried out in deeper areas at an average depth of 50 meters during the end of northeast (NE) monsoon until the start of southwest (SW) monsoon. The major fishing areas include Sto. Nino, Camandag Is., Libucan Is., Tarangnan and Catbalogan.

Another variation of hook and line is the bottom set longline which is operated during the period from October to March when NE monsoon prevails. It is carried out about 3 kilometres off Sta. Margarita waters and in deeper areas during the period from April-June at depth ranges 80-100 meters in Sto. Nino area.

Fish aggregating devices (FADs) are deployed all over Samar Sea particularly off Daram, Catbalogan, Tarangnan, Sto Nino, Tagapul-an and Calbayog City. FADs are used in conjunction with hook & line and ringnet fishing.

Municipal trawl fishing is usually done at night in Zumarraga channel and Daram channel and in shallow coastal areas of Sta. Margarita, Calbayog, Pagsanghan, and Catbalogan. The fishing operation is year round with a peak season from December to January except during typhoons. On the other hand, the usual fishing operations for commercial types of trawlers are carried out farther at about 7 kilometres from the shorelines of Calbayog City to Catbalogan City, and some are carried out west of Sto. Niño at a depth of more than 30 meters. Commercial trawling is done either at night time or day time throughout the year except typhoons.

Modified Danish seine (*pahulbot*) is one of the most efficient fishing gears in Samar Sea. It operates during daytime throughout the year in deeper waters east of Sto. Nino, west of Calbayog City, and northwest of Daram. Fishing activities were also observed in the islands of Libucan and Canauan, and Maqueda Bay competing with gill netting, bottom set longline and handline operations.

Another efficient fishing gear is the commercial ring net that operates during daytime with the aid of Fish Aggregating Devices (FADs) and in night time by the aid of light. Fishing is usually carried out close to Tarangnan, Catbalogan City and Zumarraga channel where many municipal fishing gears also operate. Other important fisheries like crab pot (*panggal pang-alimasag*) and crab gill net are operated nearshore at depth ranges from 4 to 18 meters. These crab fishing gears can operate at either day time or night time in fishing grounds adjacent to Calbayog City, Pagsanghan, Tarangnan, Catbalogan City, Sto. Nino. However, day time operation is being practiced by fishermen as a measure to avoid conflict, particularly with trawling which causes damage or loss to these gears when their marker buoys are not recognized during night time operations. Crab gillnet (*pang-alimasag*) fishing was observed to be relatively prevalent in Catbalogan City with less significant operations observed in Calbayog City, Tarangnan and Sto. Nino.

Fish corrals are located in the shallow areas of Calbayog City, Sta. Margarita, Catbalogan City and Maqueda Bay. Commercial encircling gill nets or locally known as *Bulitsihan* were also observed in waters off Calbayog City.

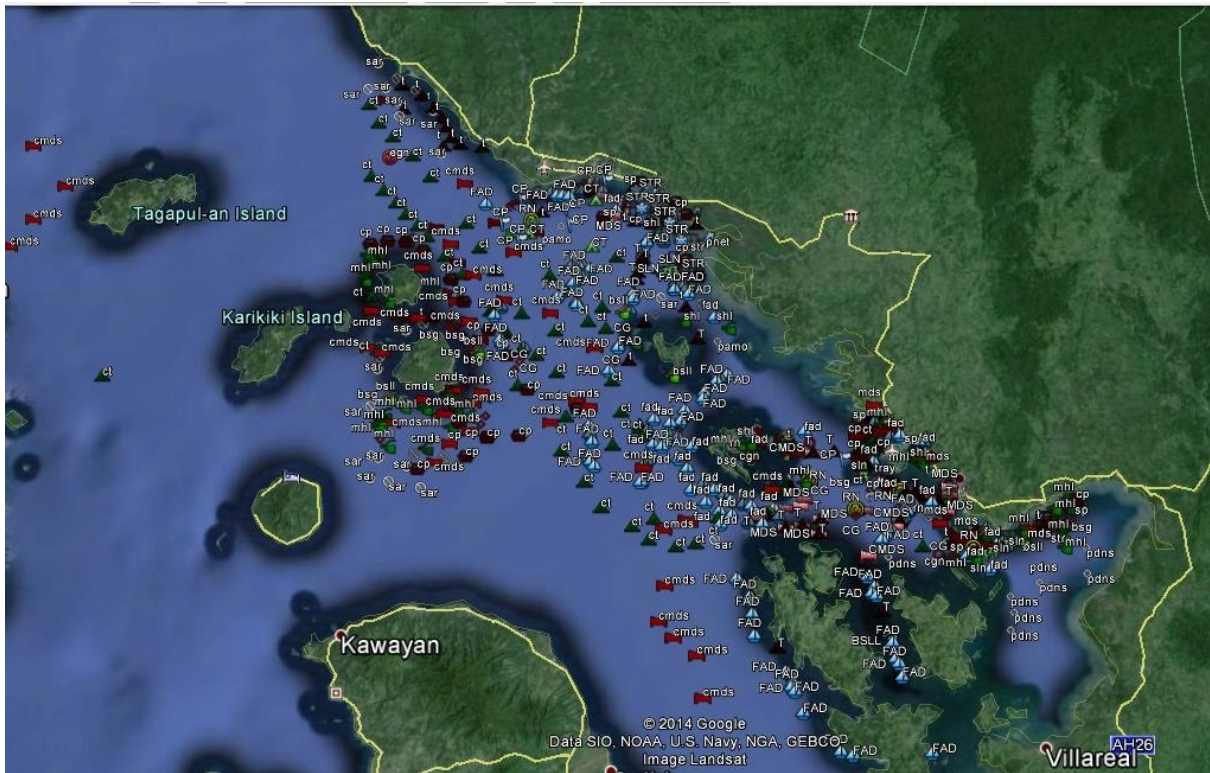


Figure 9: Distribution of fishing gears based on surveys and stakeholders consultation (Source: REBYC II-CTI Project fishing ground survey and consultations).

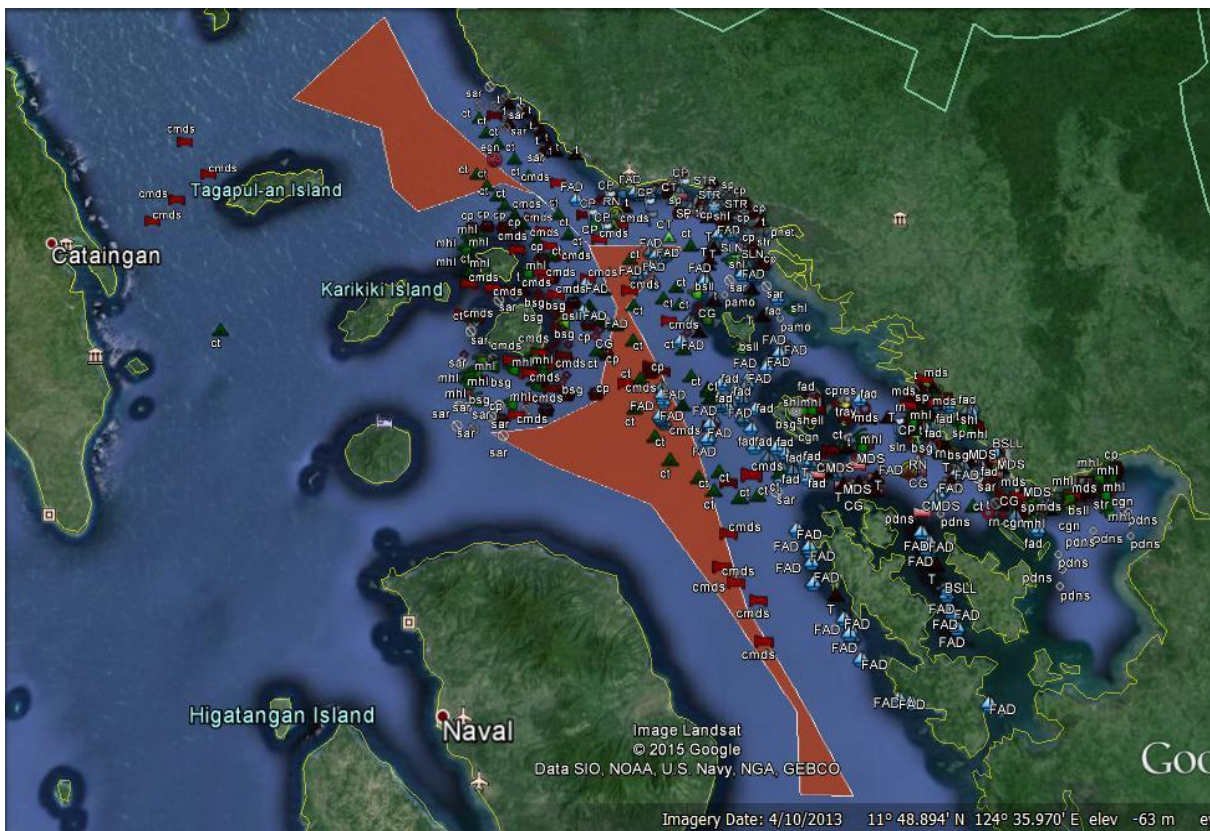


Figure 10: Map of proposed fishing highway

3. Management framework

3.1. Emerging international management concepts and principles

3.1.1. Code of Conduct for Responsible Fisheries (CCRF)

Adopted by the Food and Agriculture Organization of the United Nations (UN-FAO), the Code of Conduct for Responsible Fisheries (CCRF) provides the framework for international efforts to ensure sustainable exploitation of aquatic living resources in harmony with environment. It recognizes the importance of fisheries in terms of nutritional, economic, social, environmental and cultural perspectives. It emphasizes that management should take into account the biological characteristics of the resources and environment as well as the interest of users and consumers.

3.1.2. Ecosystem Approach to Fisheries Management (EAFM)

The EAFM is “An approach to fisheries management and development that strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic, and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.” It addresses balancing human and ecological well-being through good governance. Its two main paradigms are: protecting and conserving ecosystem structure and functioning, and providing food, income and livelihood. It promotes participation and finding innovative and win-win solutions in attaining the goals of the management.

EAFM offers the most practical and effective way to manage complex fisheries and a globally endorsed paradigm as decision-making process in fisheries management. This approach represents a move away from the conventional fisheries management systems that focus only on the sustainable harvest of target species, towards systems and decision-making processes that balance environmental well-being with human and social well-being, within improved governance frameworks.

3.1.3. E-EAFM Training/workshop for stakeholders of Samar Sea

The Essential Ecosystem Approach to Fisheries Management (E-EAFM) course (Staples et al., 2014) was conducted as a national activity of the REBYC II-CTI Project Pilot Site in Samar Sea on July 14-19, 2014 at Catbalogan, Samar.

Local fisheries managers, planners and local government development officers, law enforcement officers and fisherfolk from municipal and commercial sector, particularly trawlers, participated. It provided the knowledge on the process of EAFM and how this can assist in decision-making for responsible and sustainable capture fisheries including trawl fisheries in Samar Sea.

Workshops focused on identifying issues and management actions that can be used as basis for the formulation of the Samar Sea Fisheries Management Plan (SSFMP) which encompasses the entire fishery of Samar Province but with focus on trawl and commercial fishing. The issues and recommendations are shown in Appendix 1.

3.1.4. The REBYC II-CTI Project Technical Working Group (TWG)

With representation from the various stakeholders of Samar as the pilot site of the REBYC II-CTI Project, the main task of the TWG is to prepare, participate in, coordinate and monitor plans/activities of the project. Following the EAFM training/workshop, the TWG further discussed and deliberated on the issues, recommended management actions and formulated the draft SSFMP.

3.1.5. The SSFMP for REBYC II-CTI Formulation Process

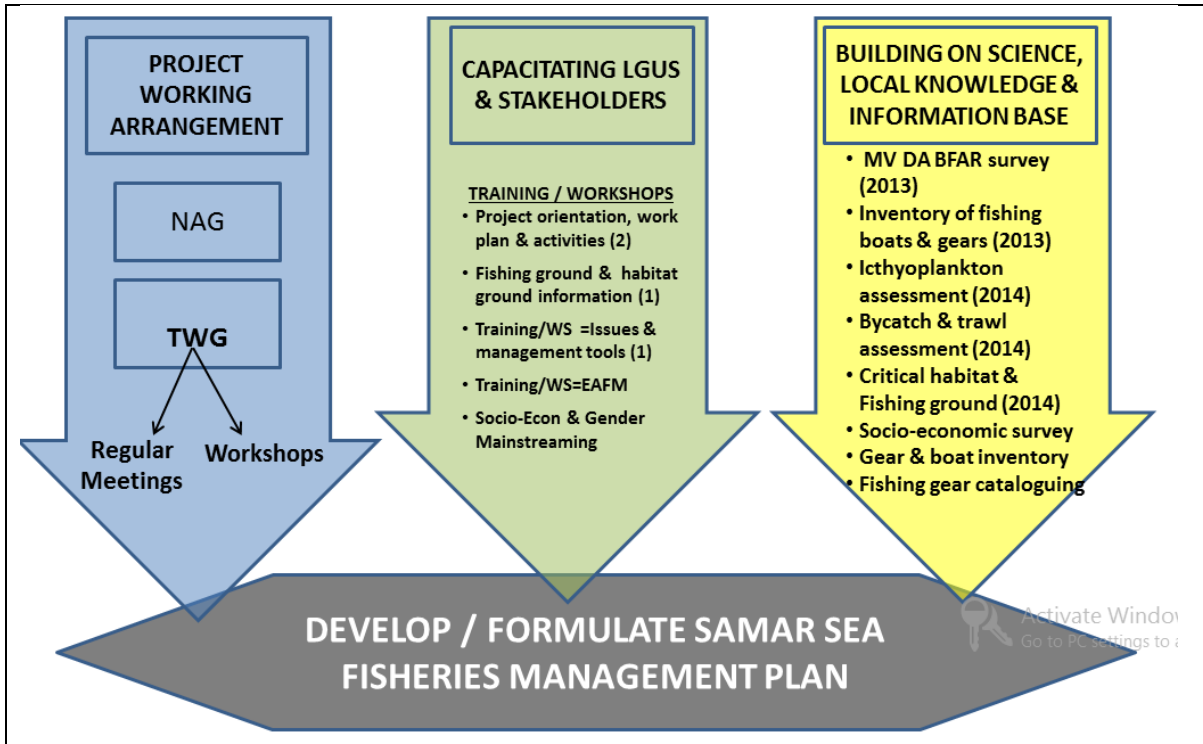


Figure 11: The SSFMP for REBYC II-CTI Formulation Process

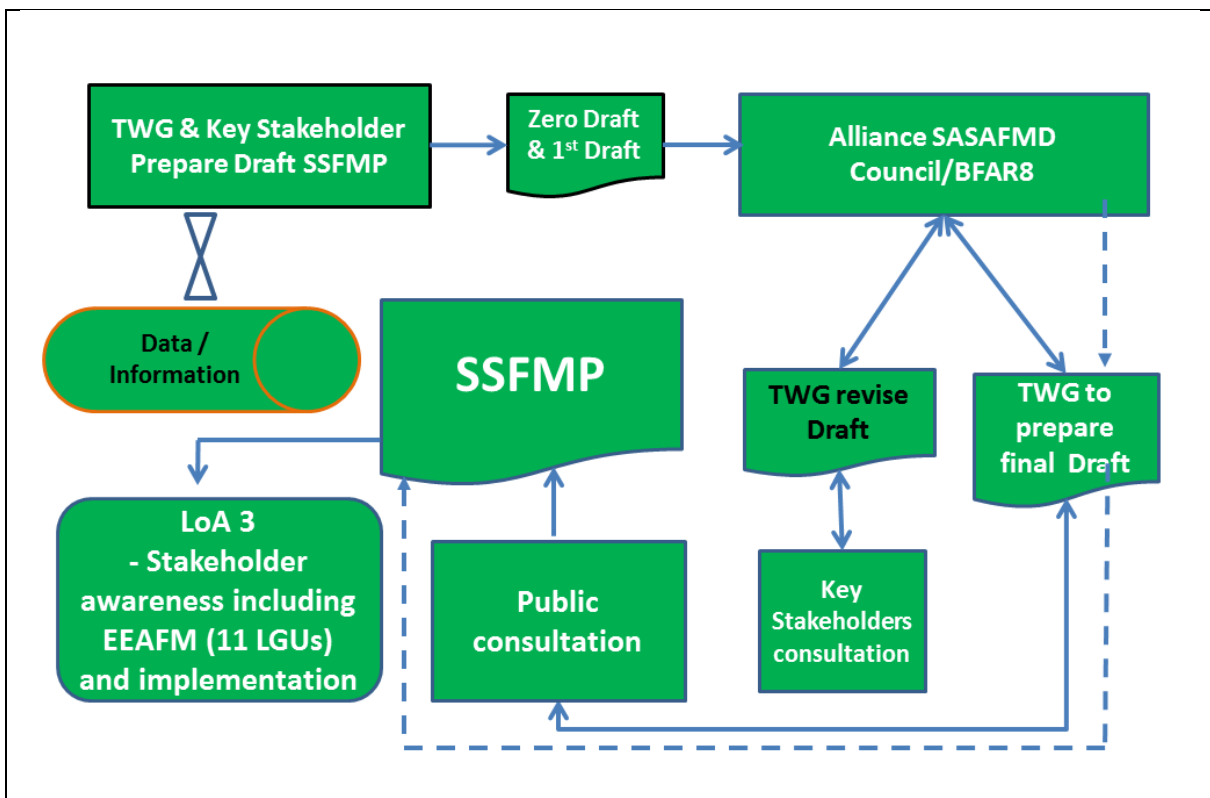


Figure 12: The SSFMP for REBYC II-CTI formulation process

3.2. 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 – up to 15 km from the shoreline). It also grants preferential use of municipal waters to municipal or small-scale fisherfolk. Within the structure of RA 8550 and RA 7160, local fisheries ordinances for the management of municipal water in accordance with the National Fisheries Policy mainly provide rules and regulations on licensing, issuance of permits and other fisheries related activities. Common among these ordinances is the prohibition of 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 on credits and extension.

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

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

The Local Government Code of 1991, and as reiterated in the Fisheries Code of 1998, devolves fisheries management and regulation of municipal waters 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) 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 LGU, however, through its local chief executive and appropriate ordinance, may authorize or permit small and medium commercial fishing vessels to operate within the ten point one (10.1) to fifteen (15) kilometre 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, NGOs, fisherfolk, and other concerned POs. The National Fisheries and Aquatic Resources Management Council (NFARMC), comprising of representatives of stakeholders, is the advisory and recommendatory body at the national level.

In contiguous fishery resources and fishing grounds 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 and other government agencies that are mandated to implement relevant management/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 that regulates fisheries business and the Maritime Industry Authority (MARINA) on the regulation of fishing vessels.

3.3. Organization / Institutional framework

The SSFMP will be implemented through the cooperative endeavour of various institutions with mandates that encompass the activities prescribed in the management plan. Table 4 summarizes the various institutions and their respective mandates who will be involved in implementing this plan.

Agency / Arrangement	Mandates
SSAFMD	<p>Formulate fisheries management framework for Samar Sea which will serve as guide for the implementation of the policies approved programs and projects.</p> <p>Coordinate with concerned agencies on matters related to Samar Sea fisheries management, development, utilization of fisheries and marine resources.</p> <p>Established linkages or network with regional, national and international agencies providing technical and financial assistance to the development of Samar Sea.</p> <p>Responsible in the implementation of Samar Sea Fisheries Management Plan (SSFMP).</p>
11 Local Government Units of Samar	Formulate ordinances and enforce fishery laws using the SSFMP as framework
Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA-BFAR-8)	<p>Provide technical support LGUs and Alliance; provide livelihood assistance / support</p> <p>Responsible for the development, improvement, management, and conservation of the country's fishery and aquatic resources.</p>
Department of Interior and Local Government (DILG)	Promote peace and order, ensure public safety, and further strengthen local government capability aimed towards the effective delivery of basic services to the citizenry.
SUCs/Academe/NFRDI	Conduct Research & Development, technical assistance and provide scientific data for fisheries management and livelihood program in the context of conservation measures
Maritime Industry Authority (MARINA)	Has jurisdiction over the registration of commercial fishing, passenger, and cargo vessels, as well as businesses involved in vessel construction and repair, and cargo shipping or forwarding
Department of Environment and Natural Resources (DENR)	<p>Responsible for the conservation, management, development and proper use of the country's environment and natural resources.</p> <p>PCRA assistance</p>
Philippine National Police – Maritime Group (PNP-MG)	Vested with the authority to perform all police functions over Philippine territorial waters and rivers and coastal areas
Department of Transportation and Communication (DOTC)	The primary policy, planning, programming, coordinating, implementing and administrative entity of the executive branch of the government on the promotion, development and regulation of a dependable and coordinated network of transportation and communications systems as well as in the fast, safe, efficient and reliable transportation and communication services.

Philippine Coast Guard (PCG)	Assigned to enforce fisheries law. It also is responsible for Inspecting vessels for compliance with safety, licensing, and manning requirements.
Department of Trade and Industry (DTI)	The primary policy, planning, programming, coordinating, implementing and administrative entity of the executive branch of the government on the promotion, development and regulation of a dependable and coordinated network of transportation and communications systems as well as in the fast, safe, efficient and reliable transportation and communication services.
NAMRIA (National Mapping and Resource Information Authority)	The central mapping agency, depository, and distribution facility for natural resources data in the form of maps, charts, texts, and statistics.

4. Issues and management options

The range of management options to address the issues, objectives and management options and Implementing Strategy/Guideline are outlined as follows:

Issue/s	Objective/s	Management option/s	Implementing strategy/ guideline
Ineffective fisheries management	Implement a Samar Sea-wide EAFM based-SSFMP to sustain the fisheries.	<ol style="list-style-type: none"> 1) Formulate & adopt the Samar Sea Fisheries Management Plan through EAFM process 2) Seek out external support on the implementation of SSFMP and EAFM Process 	<ul style="list-style-type: none"> ➤ Operationalize the Samar Sea Alliance of Local Government Units for Fisheries Management and Development (SSAFMD-Alliance) <p>TWG to endorse SSFMP to the Alliance Alliance to prepare a Resolution adopting the Management Plan</p> <p>Rules and Regulations for specific management options identified in the SSFMP and implemented through Alliance Resolutions/Unified Ordinance including but not limited to the following:</p> <ul style="list-style-type: none"> ○ Memorandum of Agreement (MOA) between Alliance and BFAR ○ Closed Season ○ Establishment of Alliance Fishery Law Enforcement Team (AFLET) <p>Establishment of fishing zone and rules and regulations for the operations of active fishing gears (including catch/vessel documentation/monitoring,</p> <p>Alliance to harmonize local fishery ordinances of LGUs (2 Cities and 9 Municipalities)</p> <p>Awareness of the implementation of SSFMP to local communities</p>

Issue/s	Objective/s	Management option/s	Implementing strategy/ guideline
			<ul style="list-style-type: none"> ➤ Alliance to prepare a Resolution pursuing external assistance and cooperation (technical & financial) in the implementation of SSFMP ☑ Outsource relevant national and international organizations to support the sustainable implementation of the SSFMP
Illegal fishing	Implement a rational monitoring, control and surveillance system (catch monitoring, regulatory/governance and fisheries law enforcement) <ul style="list-style-type: none"> • Reduce incidence of dynamite and cyanide • Reduce incidence of IUU commercial fishing boats • Maintain a regular patrol/ law enforcement activities 	<ol style="list-style-type: none"> 1) Establishment of Alliance Fisheries Law Enforcement Team (ANFLET) 2) Provision of patrol boats & sustained logistics 3) Institutionalize incentives & protection to fishery law enforcers 4) Regular dialogue/awareness building between fisherfolks, law enforcers & LGUs 5) Establish cyanide detection laboratory in Samar 	<ul style="list-style-type: none"> ➤ Adopt a Joint Resolution for the Establishment of the Alliance Fishery Law Enforcement Team (AFLET) <ul style="list-style-type: none"> ○ Arrangements among law enforcement agencies / groups ○ Composition ○ Capacity building ○ Operations protocol ○ Others ➤ Support from BFAR and International/National organization ➤ Logistics support to be provided by the Alliance ➤ Request LGUs to standardize and sustain incentives and protection to support the fishery law enforcers ➤ Request Alliance to provide legal support to law enforcement teams on the filing of cases, attending court hearings, preparation of evidences and affidavits ➤ Request Alliance and BFAR to conduct regular dialogue/awareness building between fisherfolks, law enforcers & LGUs ➤ Request BFAR to provide facility for the establishment of cyanide detection laboratory in the Cities of Catbalogan and Calbayog
Overfishing / Overcapacity	Introduce fishing effort controls to improve fish biomass / or maintain sustainable production of Samar Sea	<ol style="list-style-type: none"> 1) Establish seasonal closure during spawning months 2) Moratorium on number of boats 3) Establish control/inspection mechanism at LGU 	<ul style="list-style-type: none"> ➤ <u>Adopt Joint Resolution for the Declaration of a Closed Season for the Conservation and Management of Demersal and Pelagic Fishes in Samar Sea</u> ➤ Adopt Alliance Resolution on the designation of fishing zone and rules

Issue/s	Objective/s	Management option/s	Implementing strategy/ guideline
	<ul style="list-style-type: none"> • Increase biomass (production or t/km²) • Improve catch rate • Improve coral cover • Improve fish density • Maintain/reduce commercial fishing boats 	<p>level for active gears (limit fishing days & trips)</p> <p>4) Establish fishing colour coding scheme</p> <p>5) Exclusive fishing rights for Samar based fishing boats</p> <p>6) Strict compliance to fishery laws and regulations and other technical measures</p>	<p>and regulation for active fishing gears to include the following</p> <ul style="list-style-type: none"> ○ control/inspection mechanism (log-in, log-out) ○ catch documentation/ monitoring ○ vessel monitoring measure/s <ul style="list-style-type: none"> - colour coding - tracking?? ○ Moratorium ○ Exclusive fishing rights for Samar based fishing boats ○ IEC
Conflict among resource users	Reduce resources users conflict	<p>1) Designate fishing zone where for non-passive gears</p> <p>2) Establish a Forum under the Samar Sea Alliance to foster collaboration among fisherfolks finding win-win solution</p>	<p>➤ Alliance to adopt a resolution/ordinance designating fishing zones and defining rules and regulations for the operations of active fishing gears.</p>
Science/ knowledge gap and monitoring need / (Information gaps)	<p>Provide sustainable science base for fisheries management</p> <p>Increase awareness of stakeholders on the importance of EAFM</p>	<p>1) Immediate coverage of NSAP in Samar Sea</p> <p>2) FishR / BoatR</p> <p>3) Conduct stakeholder orientation on EAFM specially to LCEs</p> <p>4) Conduct seminars and workshops to 2 Cities and 9 Municipalities</p>	<p>➤ BFAR to assign additional NSAP enumerators for deployment in Tarangnan, Sta. Margarita and Pagsanghan.</p> <p>➤ BFAR reports NSAP results Alliance for planning and management purposes</p> <p>➤ BFAR and LGUs to continue FishR and BoatR implementation</p> <p>➤ REBYC-II CTI Project will conduct orientation with the LCEs on EAFM</p> <p>➤ Dissemination of the EAFM process/ approach to local communities in the 2 Cities and 9 Municipalities under the Alliance</p>
Inadequate (alternative) livelihood program	Improve livelihood support/assistance to fisherfolks, particularly those that will be affected by the plan	<p>Promote / provide alternative livelihood</p> <ul style="list-style-type: none"> - from active to passive gear - from capture to aquaculture 	<p>➤ Provision of alternative livelihood component of the management plan and mechanism (including financing) for its implementation</p> <p style="color: red;">Under the Alliance – BFAR MOA</p> <p>➤ BFAR and academe to promote and provide assistance on active fishing gear conversion to passive fishing</p>

Issue/s	Objective/s	Management option/s	Implementing strategy/ guideline
			gear, and from capture activities to aquaculture. ➤ Introduce and demonstrate sustainable fishing methods with the small fishermen

5. Implementation scheme / arrangement

5.1. Role of the Samar Sea Alliance for Fisheries Management and Development (SSAFMD)

The Samar Sea Alliance for Fisheries Management and Development (SSAFMD) which has governing and policy-making bodies shall:

- a. Review and endorse SSFMP for adoption of every member LGU;
- b. Formulate unified policies using the SSFMP framework which shall serve as guide for the participating LGUs in managing of fisheries activities and all other related activities;
- c. Supervise the implementation of the policies, approved programs and projects;
- d. Coordinate with concerned agencies including BFAR all plans, measures and development activities relative to SSFMP and all matters related to conservation and utilization of fisheries and marine resources in the area;
- e. Enter into contract, memoranda of agreement and any similar transaction that shall facilitate the implementation of the SSFMP Plan;
- f. Collect and/or receive and disburse funds intended for the operation of the Alliance and its program/projects/activities;
- g. Establish linkages or networks with local, national, regional and international agencies to avail of financial, material or technical assistance and
- h. Serve as advisory body to the LCE and SBs on the matters related to coastal fisheries and aquatic resources management.
- i. Conduct annual review of the SSFMP and institute adoptive measures as maybe necessary

Under SSAFMD are the following Committees

- Committee on Ways and Means will be headed by one of the Board of Directors, the committee will be in-charge of all matters directly and principally relating to the fiscal, monetary and financial affairs of the Alliance including solicitation, borrowing, credit and bonded indebtedness.
- Committee on Training and Education will be headed by one of the Board of Directors, the committee will oversee the educational needs of the members, creating educational programs to the constituents, professional development (fishery related and business) and teaching, and training and operational support on fishery law enforcement to the volunteer fishery law enforcers.
- Committee on Coastal Fisheries Resource Management and implementation of the Samar Sea Fisheries Management Plan will be headed by one of the Board of Directors, the committee will determine and take actions on all fishery development and utilization of coastal marine fishery resources, address pollution, and stock assessment.

- Committee on Fishery Law Enforcement will be headed by one of the Board of Directors. The committee will be in-charge of the coastal and marine resource protection against illegal use of fishery resources within Samar Sea.
- Alliance Fishery Law Enforcement Team (AFLET) – The AFLET will be mainly responsible for law enforcement operations and protection of fishery resources in Samar Sea. For the purpose, a fishery law enforcement operations manual may be prepared for Samar Sea.

5.2. Role of the TWG

In performing its responsibilities, the Alliance has created the Technical Working Group (Alliance-TWG) as its subsidiary body. The TWG which comprises representatives from member-LGUs, fisheries related NGOs, academe, BFAR, law enforcers and fisherfolk representatives are mainly responsible for the provision of scientific and technical inputs as well as the advisory and consultative body to the Alliance.

5.3. Role of BFAR

- Training and Technical support
- Provision of alternative livelihood

6. Financial consideration

6.1. Common Trust Fund of the Alliance

The LGU members shall establish a common trust fund, which shall include their contributions, those from BFAR and other National/Provincial Government Offices, concerned government agencies/institutions and other sources (NGO, PO, donations from International Organizations, grants from development partners, etc.). The mechanisms of depositing and disbursing the fund shall be determined during the meeting of the board. The preferred mechanism shall be the most expeditious and least complicated way of disbursement.

The Common Trust Fund shall be managed and disbursed by the assigned Board of Director on Committee on Appropriation based on the approved Work and Financial and authorized by the Board.

6.2. Contributions of Alliance Members

The LGU Member shall allot appropriate amount of money from their respective development plans according to as what was agreed upon to the Alliance as their contribution. The LGUs shall pay their respective base contributions on a quarterly basis. Any changes of the contributions shall be decided by the Board.

6.3. Contribution of BFAR

- Current BFAR programs, projects and activities in Samar Sea shall be aligned according to the SSFMP. The focus will be on
 - Training and Technical assistance
 - Livelihoods
 - Law enforcement

7. Roles and responsibilities of institutional partners

7.1. The Local Government Units (LGUs)

The LGUs, refers to the Local Chief Executive with the assistance of their respective Municipal Agricultural Officers, Fishery Technicians and focal point persons, shall continue to undertake their

responsibilities with respect to the protection and rehabilitation of coastal resources and ecosystems, delivery of fisheries extension services in their respective territorial jurisdictions, provide manpower especially during meetings conducted by the Alliance, and support in the implementation of the Samar Sea Fisheries Management Plan.

7.2. The Bureau of Fisheries and Aquatic Resources (BFAR)

The Bureau, refers to the BFAR-Regional Field Office VIII which shall coordinate with the Alliance in the implementation of its fisheries program, projects and activities for the Samar Sea. It will extend technical services in support to fisheries livelihood programs/projects, and provide support in implementation of SSFMP.

7.3. Department of Interior and Local Government (DILG)

Responsible for promoting peace and order, ensuring public safety and strengthening local government capability in the delivery of basic services.

7.4. Department of Transportation & Communication (DOTC) / Philippine Coast Guard (PCG)

The PCG is mandated to promote safety of life and property at sea, safeguard the marine environment and resources, enforce all applicable laws within the Philippine Waters and conduct maritime security operations and other activities in support of national development. The PCG is the lead agency to enforce the fishery law enforcement in the protection of fishery resources in Samar Sea.

7.5. Maritime Industry Authority (MARINA)

Responsible for the registration of commercial fishing vessels, the issuance of licenses, the addressing of safety concerns pertaining to vessel construction, and the enforcement of maritime law.

7.6. CSO, NGOs and POs

Advocacy on resource conservation and management of fisheries and aquatic resources, community organizing, capacity building for fisherfolk, linking and networking among partner agencies.

Provide livelihood programs.

7.7. Fisherfolk and boat operators

Co-managers as represented in the Fisheries and Aquatic Resources Management Councils; participate in the implementation of management activities including coastal watch (Bantay Dagat) as may be authorized by responsible agencies; participate in public consultation and awareness building activities.

8. Monitoring and REVIEW process

This plan is subject to annual review by the Alliance with the assistance of BFAR, and, if necessary, apply adaptive management and control measures that are primarily based on Reference Points (and/or indicators), best available scientific evidence and other aspects that the Alliance may want to consider.

For this purpose, the Alliance-TWG shall formulate/define the procedure of review and institution of adaptive measures, in accordance to the EAFM process.

9. Timetable

ACTIVITIES	2015		2016				2017				Responsibility		
	N	D	J	F	M	Q3	Q4	Q 1	Q 2	Q 3		Q 4	
Finalize SSFMP; endorsement of SSFMP to the LGUs through the Alliance													REBYC II CTI Project
Adopt the SSFMP through a Resolution (Res #1)													Alliance
Adopt /Revise the Memorandum of Agreement between the Alliance and BFAR. (Res #2)													Alliance and BFAR8
Conduct IEC/Awareness building on EAFM and SSFMP to local communities													REBYC II CTI Project
Adopt Joint Resolution for the Declaration of a Closed Season for the Conservation and Management of Demersal and Pelagic Fishes in Samar Sea (Res #3)													Alliance, 11 LGUs
Adopt a Joint Resolution for the Establishment of the Alliance Fishery Law Enforcement Team (AFLET) (Res #4)													Alliance, BFAR, PNP, PCG
Designate fishing zones and implementing rules and regulations for active fishing gears (Res #5).													
Coordinate with relevant national and international organizations to support the sustainable implementation of the SSFMP													Alliance, REBYC II CTI Project
Capacity building for AFLET													Alliance, BFAR, PNP, PCG
Request BFAR to provide facility for the establishment of cyanide detection laboratory in the Cities of Catbalogan and Calbayog													Alliance
Implement the close season													Alliance, BFAR, FB operators
BFAR to assign patrol boats for visibility during the close season period													BFAR, Alliance
Formulate moratorium on the number of municipal active fishing boat operations in Samar Sea													Alliance
Establish catch documentation, log-in and log-out system and for active fishing gear users													Alliance-TWG
LGU to establish color coding fishing scheme													Alliance
Alliance to promulgate exclusive fishing rights in Samar Sea and adjacent waters													Alliance
Deployment of NSAP enumerators													BFAR8
Implementation of FishR and BoatR													BFAR, alliance
Provision of alternative fishing gear / livelihood													BFAR8, Alliance-LGUs
Introduce and demonstrate sustainable fishing methods with the small fishermen													REBYC II-CTI Project
SSFMP Review and action planning													Alliance, BFAR, Stakeholders

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Appendix I Issues and recommendations during the E-EAFM Training/workshop for stakeholders of Samar Sea

Issues	Objective/s	Indicator	Benchmark	Management actions
1) Illegal fishing				
Poor law enforcement	<ul style="list-style-type: none"> Strengthen law enforcement 	<ul style="list-style-type: none"> No FLET conducted No MCS plan Incentive scheme adopted No. Cyanide lab established 	<ul style="list-style-type: none"> Base: poor Target : Improved law enforcement 	<ul style="list-style-type: none"> Provision of patrol boats & sustained logistics Strengthen community / barangay law enforcement (including awareness building; Conduct regular awareness building fora between fisherfolks& law enforcers);
Lack of cooperation among people themselves regarding enforcement of fishery laws	<ul style="list-style-type: none"> Improve cooperation among stakeholders on enforcement of fishery laws 	<ul style="list-style-type: none"> # IEC for a conducted 	<ul style="list-style-type: none"> Base: Low interest Target :Increased interest / cooperation 	<ul style="list-style-type: none"> Institutionalize incentives & protection to fishery law enforcers Provide alternative livelihood Establish cyanide laboratory in Samar Enforcement @Alliance level(unified enforcement)
Dynamite / cyanide fishing/DSeine	<ul style="list-style-type: none"> Eliminate dynamite fishing 	<ul style="list-style-type: none"> % of dynamite & cyanide fishing 	<ul style="list-style-type: none"> Baseline : rampant Target = 20% annual reduction 	
low prosecution of fishery law violators	<ul style="list-style-type: none"> Expedite prosecution 	<ul style="list-style-type: none"> % of cases resolved annually % of case pursued 	<ul style="list-style-type: none"> Base : Slow Target : Speed up resolution of cases 	<ul style="list-style-type: none"> Improve post-apprehension proceedings by designating special (green) courts

2) Ineffective fisheries management				
Inappropriate fisheries management plans	<ul style="list-style-type: none"> Implement a doable mgt. plan 	<ul style="list-style-type: none"> Acceptable & implementable policy/mgt measures 	Base : Some regulations are not followed Target : Adopt the plan in 2015	<ul style="list-style-type: none"> Formulate & adopt an Samar Fisheries Management Plan through EAFM process, that includes livelihood, sources funds, responsibilities of different govt agencies & fisher groups, etc.
Lack of alternative livelihood	<ul style="list-style-type: none"> Identify & suitable alternative livelihood 	No of fisherfolk provided with suitable alternative livelihood	Base : Target: Suitable alternative livelihood are available upon implementation of the plan	<ul style="list-style-type: none"> Provision of alternative livelihood component of the mgt plan and mechanism (including financing) for its implementation
Lack of funds / Financial access difficulties	<ul style="list-style-type: none"> To provide financing & facilitate access 	No of fisherfolks provided financial assistance	Base : Very difficult to avail/access fisheries credit/financing Target:	

3) Overcapacity / overfishing / bycatch				
Overfishing	<ul style="list-style-type: none"> To reduce fishing capacity 	<ul style="list-style-type: none"> biomass stock to indicator Number of boats CPUE Species composition 	<p>Base; biomass stock 2.88 t/km2</p> <p>Species co. (Rene)</p> <p>No. of commercial/municipal (Nap)</p>	<ul style="list-style-type: none"> Close season (cite science basis) <ul style="list-style-type: none"> Ringnet = Mar-May Trawl (pakayod) –Sep-Dec Trawl (norway) = Mar-May Fishing ground zones (cite result of fishing ground mapping) <ul style="list-style-type: none"> Fishing highway Exclusive fishing rights for Samareños only Moratorium on the number of boats (replacement allowed without scale up) Strengthen management of existing MPAs (see attached list by municipalities) Establish control/inspection mechanism at LGU level for active gears (enhanced effort control) Establish fishing colour coding scheme Strict compliance to technical measures Promotion / provision of alternative livelihoods <ul style="list-style-type: none"> From active to passive gear From capture to aquaculture
4) Conflict among fishing sector				
Conflict of fishermen	<ul style="list-style-type: none"> Reduce resources users conflict 	<ul style="list-style-type: none"> No. of conflicts incidence 	<p>Base: Frequent</p> <p>Target: reduce</p>	<ul style="list-style-type: none"> Establishment of fishing zones Establish a Forum under the Samar Sea Alliance to foster collaboration among fisherfolk finding win-win solution

				<ul style="list-style-type: none"> • LGU requirement to establish and register fisherfolk/associations; strengthen existing association (FishR / BoatR)
5) Science and monitoring need / (Information gaps)				
Knowledge gap Poor agriculture-fishery data	To provide sustainable science based for fisheries management	No. of fish stock assessment conducted	Base : no updated assessment conducted Target: continuous data collection and assessment	Immediate implementation BFAR NSAP in Samar Sea FishR&BoatR implementation
Low EAFM awareness	To increase awareness of stakeholders on the importance of EAFM	No. of EAFM-based plan adopted	Base: no EAFM-based plan Target: EAFM-based plan is adopted asap	Conduct stakeholder orientation on EAFM specially LCEs Formulate the SSFMP in the context of EAFM

