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Preliminary assessment of the handline (banca) fisheries in the Philippines

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The contribution of knowledge by the fishing industry, including fish production and processing companies, individual fisherfolks, vessel owners, operators and middlemen, is recognised and highly valued in this Project. Their participation in the stakeholder workshops also provided significant input to the Project reports. They have highlighted important research and training needs and opportunities that may serve as basis for future collaboration between the Philippine Government and the fishing industry.

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2 Executive summary

The Philippines, with an Exclusive Economic Zone (EEZ) of 2.2 million sq. km, including over 7,000 islands, relies on fisheries as one of its major industries, sources of employment and in promoting food security. The handline fishery using bancas (or pump boats), catching commercially viable species such as tuna, is a major component of both municipal and commercial fisheries in the Philippines. Handline fishing is considered one of the most sustainable forms of fishing in the country. However, the economic significance of the handline fishery is increasingly threatened by a number of factors, including poor information on the fishery and inadequate management and regulatory systems, which impact negatively on the economic development of the handline sector. An assessment of the current state of the handline fishery and the identification of opportunities to help improve its management regime were raised as research priorities by the Philippines Bureau of Fisheries and Aquatic Resources (BFAR).

This Project provided a description of the nature of the handline fishery in three regions within the Philippines, namely Region V (Bicol), Region VIII (Eastern Samar) and Region XII (General Santos). New information was gathered through the collection of catch data from market sampling by enumerators and through interviews held with fisherfolks, fish processors, fishing companies, and local government councils. Regional workshops were also conducted to provide a venue for the discussion of problems and opportunities for improved management of the handline fishery.

The three regions have different handline fishery characteristics, fishing grounds, fishing operations, catch composition, size and length of catch, and socio-economic characteristics. The handline fishery in General Santos has the most advanced commercial operations mainly targeting yellowfin tuna, with most tuna products bound for international market. Region VIII Eastern Samar has a small number of commercial handline vessels and a significant number of municipal vessels (<3GT), targeting mainly skipjack and yellowfin tuna using hook and line and troll lines. Region V Bicol comprises small municipal vessels using simple handline, jiggers, multiple hook and line, and troll lines. The catch for each gear varies, and is composed not only of yellowfin, albacore, and skipjack tunas, but also other species such as squid, bigeye scad and dolphinfish. All the fishing operations in these areas rely heavily on the use of *payaos* or fish aggregating devices (FADs). Amongst the three regions, length frequency of tuna is higher and catch per unit effort (CPUE) is larger, for the handline fisheries landing at General Santos.

A number of concerns have been raised by stakeholders in the three regions, such as: competition with other gear users; illegal fishing; lack of effective law enforcement; absence of search and rescue programs; inadequate sources of capital; lack of cooperation amongst fisherfolk; and, the need for alternative livelihoods. Despite the numerous challenges, opportunities were identified for the future development of the handline fishing sector, including: additional investment, particularly for establishing icing and post-harvest facilities; certification of the handline fishery as a sustainable fishery; exploring alternative livelihoods; strengthening community-based enforcement; and, the advancement of the principle of ‘co-operativism’ among fisherfolks.

Lastly, research and training needs for future collaboration and action by the Philippine Government and the fishing industry were identified at stakeholder workshops. The most commonly raised of these were: an investigation of the carrying capacity of fishing areas, including spawning grounds and season, stock assessment, habitat use, and use of FADs; study of the suitability and efficiency of alternative chilling systems for handline fishing vessels; tuna marketing systems or value chain study; training on best practice handling of tuna on board vessels; tuna quality classification, traceability of fish and food safety; potential impact of climate change on fisheries; training to promote safety of life at sea, including GPS and compass reading; and, provision of alternative livelihoods for the families of fisherfolk.

3 Background

The Philippines has an Exclusive Economic Zone (EEZ) of 2.2 million sq. km, including over 7,000 islands, and produces about 3.93 million metric tons of fish, crustaceans, molluscs and aquatic plants (BFAR, 2006). This places the country in the top ten fish producing nations of the world. Total employment in the fishing industry is over 1.6 million and fishing products which constitute about 12 per cent of the average diet of Filipino nationals. As an export industry, capture fisheries generates billions of dollars.

Handline fishing is a traditional method of fishing using different types of hook and line and bancas more commonly known as pump boats in the Philippines. Similar handline fishing methods have been practiced for about a thousand years in the Philippines and the Pacific, and are the most common type of fishing in both municipal and commercial fishing sectors in the country. It has been estimated that there are ~9.45 million sets of handline gear in municipal waters (within 15 km from the coast), which is more than double the total number of other gears in municipal waters. Hook and line is also the most common fishing gear used amongst commercial fishers, totalling 54,000 sets deployed in Philippine waters (National Statistics Office, 2005).

Handline fisheries, which generally target commercially viable species such as tuna, are considered among the most sustainable forms of fishing in the country. However, the economic significance of the handline fishery is increasingly threatened by a number of factors, including declining fish stocks, illegal fishing, competition with other fishing gears, environmental factors such as climate change, poor information on the fishery, and inadequate management and regulatory systems.

For a number of years, handline fishing vessels could neither be classified as municipal nor commercial fishing vessels because of the nature of their operations, creating a gap in the regulatory framework to manage such fisheries. The enactment of Republic Act 9379, the Handline Fishing Law, in 2007 allowed for the regulation of handline fishing vessels and takes into account their unique characteristics. However, implementing rules and regulations on the registration and licensing of handline fishing vessels have yet to be agreed on and the sector has remained unable to benefit from applying regulations that would promote its development and competitiveness, as well as ensure the safety and seaworthiness of the fishing vessels. Similarly, some of the commercial handline fishing operations targeting tuna stocks have difficulties complying with the strict regulations of regional fisheries management organisations of which the Philippines is a member, such as the Western and Central Pacific Fisheries Commission (WCPFC). New regulations on Illegal, Unreported and Unregulated (IUU) fishing have also been adopted by the Philippines' trading partners, such as the European Union and the United States, which would need to be implemented by the handline fishery sector in order to continue trading in these markets.

The numerous challenges confronting the handline fishery prompted the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong and the Philippine Bureau of Fisheries and Aquatic Resources (BFAR) to explore potential areas of collaboration and to highlight issues that might be addressed in collaborative research projects. The current research project also arose from the recommendations of previous Australian Centre for International Agricultural Research (ACIAR) projects in the Philippines. The legal and policy framework for the management of Philippine (and Indonesian) fisheries, focusing on IUU fishing was first investigated by the University of Wollongong from 2000-2006 with funding assistance from ACIAR. In those projects, the Philippine handline fishery was identified as a specific area of concern in relation to fisheries assessment, management and compliance, particularly with respect to the lack of sufficient information on the sector and the inadequacy of existing regulations to address the handline fishing vessels and operations.

Upon consultations with the BFAR, particularly the National Fisheries Research Development Institute (NFRDI) in 2008, and with the support of members of handline fishing industry organisations, the current project was proposed to ACIAR. It aimed at directly monitoring catch composition of the handline vessels, examining some of the socio-economic aspects of the sector, and identifying major issues and constraints in effectively managing the fishery. This small research project was developed to provide new information about the Philippine handline fishery, in order to assist in applying long-term improvements in the policy and management frameworks and in promoting the sustainability of the fishery. It also aimed to fill some of the gaps in data collection to support the BFAR National Stock Assessment Program. Finally, research opportunities, development challenges, training needs and opportunities for future collaboration and action by the Philippine Government and the fishing industry were investigated. This project is only considered a preliminary assessment of the fishery because of the limited scope of work feasible within the duration of a small research and development project.

4 Objectives

The primary aim of this project was to provide new information concerning the Philippine handline fishery, which would assist in applying long-term improvements in the policy and management frameworks, and so reduce the IUU fishing components and promote the sustainability of the fishery.

Three specific objectives were developed for this project:

- The first objective was a preliminary investigation of the nature of the handline fishery in the Philippines, including the challenges confronting the fishery.
- The second objective was to benchmark the legal framework for the handline fisheries against national and international obligations and best practice.
- The third objective was to investigate the opportunities, challenges and information gaps in developing a management framework for this fishery.

5 Methodology

In order to achieve the above objectives, collection of fisheries data was conducted from market sampling by enumerators and through interviews and consultations with members of the fishing industry. Assessment of the legal framework was also undertaken by collecting national and local legislation and analysing them against relevant international and regional fisheries management measures. Finally, regional workshops were conducted to provide feedback to the industry on the outcome of data collection, discuss challenges confronted by the handline sector, and identify research and training needs and opportunities to improve the management of the fishery.

The methodology undertaken to achieve the specific objectives of the project are described as follows:

5.1 Nature of the Philippine handline fisheries

The assessment of the Philippine handline fisheries commenced with the selection of the project sites. Three provincial regions, as determined by the Bureau of Fisheries and Aquatic Resources, were selected for this study, namely Region V (Bicol), Region VIII (Samar) and Region XII (General Santos). The regions were selected on the basis of their importance as centres for handline fishing operations and also, for Regions V and VIII, prior to the study, very little data or useful information was available on the nature and catches of these municipal fisheries.

This component of the study involved two main activities: the collection of fisheries catch data using market enumerators and the collection of socio-economic information through interviews with fisherfolks, fish processors and other fishing companies.

At each location, two enumerators were appointed for a period of 12 months. Daily landings data (including species, size composition, fishing methods, and estimated effort) covering several landing sites within each region have been collected for approximately 12 months during 2009-2010. These data have been entered into databases and used as the basis for regional reports prepared to describe the handline fisheries in each region. The project enumerators were trained by project members from BFAR-NFRDI on species identification and classification, as well as other requirements for data collection.

In addition, field studies were carried out to obtain existing documentation from the three regions, to interview fishers and fishing companies, and to make on-board and market observations of the handline fishing operations, including records of illegal and unreported fishing activities. Post-harvest activities in the sector were also observed and discussed with fisheries representatives. Interviews with local fisheries and port officials, as well as local councils were conducted to obtain management perspectives. These interviews were led by project members from the University of Wollongong.

5.2 Benchmark the legal framework for the handline fisheries against national and international obligations and best practice.

For each of the selected regions above, a desktop study of the municipal, provincial, national, international and regional laws, regulations, and measures that were relevant to the handline fishery have been reviewed. This represents the first compilation and analysis of relevant local legislation and measures that could form the basis for a sound management framework for this fishery. This component of the project was undertaken by the project members from the University of Wollongong.

5.3 Investigate the opportunities, challenges and information gaps in developing a management plan for these fisheries.

The final component of the research involved holding regional Workshops in each of the three regions, inviting industry and government officials from key fishing ports and local areas. The regional Workshops presented preliminary findings on the biological, socio-economic, and legal aspects of the fishery. These workshops were also venues for the discussion of management opportunities, challenges and information gaps, as well as proposals for developing mechanisms and pathways for the adoption of improved management and policy options for the handline fishery.

In the workshops, participants were asked to consider the information that have been presented as a result of the market sampling and initial consultations with the industry, and to provide some feedback on important elements for the future of the handline fisheries. Members of the handline fishing sector were asked to lead the discussions and identify some priorities for future work, particularly with respect to research, training or workshops and meetings.

6 Achievements

The project team was able to meet all the milestones set for the project and conduct all planned activities. The results of these milestones are incorporated in the reports written for the three regions (See Appendices 1-3).

The following tables summarise the achievements against the activities and milestones set for the project in the proposal.

6.1 Nature of the Philippine handline fisheries

No	Activity	Output/Milestone	Date Accomplished	Achievement
1.1	Carry out site visits to Regions where handline fishery operates	Selection of study locations	July-August 2009	Site visits were carried out by BFAR-NFRDI staff to identify the regional project sites. Regions V (Bicol), VIII (Eastern Samar), and XII (General Santos) were selected and specific local project sites and port areas were determined.
1.2	Appoint enumerators in suitable locations	Appointment of regional staff	August-September 2009	Two enumerators were hired for each Region to collect port sampling data.
1.3	Collect field data on handline fisheries	Data collected on fishery for one year	For Region XII, August 2009-July 2010 (port sampling); Nov 2009 (interviews and socio-economic data gathering) For Regions V and VIII, Sept 2009-Aug 2010 (port sampling; March 2010 (interviews and socio-economic data gathering)	Port sampling was conducted during the said period. Data on catch composition, size composition, fishing gears, and catch and effort were collected. Field visits and interview with government officials and members of the fishing industry were conducted to collect socio-economic data on handline fishery.
1.4	Prepare report on the nature of handline fisheries	Survey results compiled and analysed. Report prepared.	Dec 2010; May 2011	Draft reports on port sampling data were completed and revised to incorporate results of socio-economic data gathering. See Appendices 1-3.

6.2 Benchmark the legal framework for the handline fisheries against national and international obligations and best practice.

No	Activity	Output/Milestone	Date Accomplished	Achievement
2.1	Carry out site visits to provinces to document existing legal framework	Field visits completed	For Region XII, Nov 2009 For Regions V and VIII, March 2011	Site visits were carried out by ANCORS UOW and BFAR-NFRDI staff in regional ports and fish landing sites to collect copies of local legislation and policies, as well as interview government officials and members of the industry on the

				efficacy of the existing legal framework on handline fishery.
2.2	Review national and inter-national legal obligations and best practice	Review completed	January 2011	National and local legislation on fisheries were analysed and gaps in the legal framework for handline fishery were identified.
2.3	Prepare report on legal framework	Report prepared	May 2011	The analysis on the legal framework was integrated in the regional reports. See Appendices 1-3.

6.3 Investigate the opportunities, challenges and information gaps in developing a management plan for these fisheries.

No	Activity	Output/Milestone	Date Accomplished	Achievement
3.1	Hold provincial workshops	Workshops and industry consultations held in each province.	For Region XII, 24 May 2011 (General Santos City) For Region VIII, 27 May 2011 (Tacloban City, Eastern Samar) For Region V, 30 May 2011 (Tabaco City, Bicol)	A provincial stakeholder workshop was held in each region. The workshops discussed the results of the port sampling and industry consultations. It further discussed the challenges confronting the handline fishery, as well as potential research and training needs of the industry. Participants to the workshop included government officials and members of the industry.
3.2	Prepare workshop reports.	Workshop reports finalised.	July 2011	The results of the workshop are summarised and integrated into the regional project reports. See Section 7 (below) and Appendices 1-3.
3.3	Prepare project final report	Final report prepared.	July 2011	The final report was prepared providing the achievements of the project and key results and recommendations.

7 Key Results and Discussion

The key results of the project are summarised in this section of the report. The first three parts of this section provides the results of the port sampling, study on the socio-economic aspect of the fishery, and analysis of the legal and policy framework for each of the region. The fourth part synthesises the results of the assessment of the handline fisheries in the three regions to ascertain common features, issues, constraints, and opportunities.

7.1 Preliminary Assessment of Handline Fishery in Region XII General Santos City

The handline fishery in General Santos City is one of the most important commercial tuna fisheries in the Philippines, both in terms of its contribution to the economy of the southern Philippines and the benefits derived by thousands of people depending on tuna fisheries. A commercial handline tuna vessel can be as large as 30m in length with gross tonnage close to 50GT, and can stay at sea from 22 to 30 days. It is composed of a series of small pump boats and accommodates 15 to 30 fishermen. The main handline gear in the area is hook and line made of nylon, with either J-type or circle type hooks designed to target large tuna.

The main target species of the handline fishery in General Santos is yellowfin tuna (*Thunnus albacares*) which is mostly destined for international trade. The size of tuna ranges from 51cm to 200cm. The total effort in the fishery is generally in the range of 4,600 to 7,100 boat days per month, with the highest effort in the current study observed in March 2010. The catch per unit effort for tuna in General Santos ranges from 35 kilograms (kgs) to 115 kgs/trip-day.

Handline fisheries in General Santos City has been increasingly threatened by competition from other tuna fisheries, declining stocks, lack of appropriate management arrangements, lack of timely and accurate data, and environmental degradation. The decline in tuna stocks have translated into fishermen catching smaller fish and conducting longer fishing trips, resulting in lower profits for the fishing industry. The lack of a sound management regime for the tuna handline fishery is a result of the absence of implementing rules and regulations for the Handline Fishing Law enacted in 2007.

In this research project, port sampling and consultations with members of the fishing industry have identified key challenges confronting the handline fishing sector in General Santos. These challenges include: decreasing catch by handline vessels affecting the supply of fish to tuna canneries; ineffective fish handling techniques onboard vessels resulting in poor product quality; difficulty in competing in the international market of tuna; lack of an effective registration and licensing system; and the lack of access to fishing grounds outside Philippine national waters. There is also a surmounting pressure to comply with stricter regulations governing commercial tuna fisheries in the western and central Pacific region, which are perceived by the industry to be burdensome.

A number of priority research and training needs have been identified by the handline fishing industry as crucial for the development of the sector and represent potential projects where further collaboration and assistance may be needed. These research and training needs include: a study on the efficiency of chilling systems for handline fishing vessels; an investigation of the carrying capacity of Saranggani Bay, including its spawning grounds and season, stock assessment, habitat use, and use of fish aggregating devices (FADs); policy implications of FAD use in Saranggani Bay; tuna marketing system or value chain study; workshop on best fishing practices and development of manuals in local dialects; and training on handling of tuna on board vessels, tuna quality classification, traceability of fish and food safety.

7.2 Preliminary Assessment of Handline Fishery in Region V Bicol Region

Unlike in General Santos, the handline fishery in the Bicol region is mostly municipal in character. Four types of handlines are observed in the region: simple handline, jigger, multiple handlines or multiple hook and lines, and troll lines. The most common of these handlines are the simple handline or drop line, comprising 82% of the total number of handlines sampled from September 2009 to August 2010. For simple handline, yellowfin tuna (*Thunnus albacares*) is the major species caught, and comprised 48% of the total catch. Jiggers target squids and octopus. Multiple hook and line fisherfolk mostly catch tuna, particularly yellowfin tuna. For troll line fisheries, skipjack tuna (*Katsuwonus pelamis*) is the major species caught and comprised 87% of the total catch for the observed year. Handline fishermen in the Bicol Region catch yellowfin tuna ranging from 38cm to 170cm, while the size of albacore tuna (*Thunnus alalunga*) catch ranges from 80cm to 120cm. The range of lengths of yellowfin tuna caught by handline fishermen were from 125cm to 140cm and for albacore tuna, from 89cm to 98cm. These dominant length sizes are generally bigger than the length sizes of yellowfin tuna unloaded in General Santos City. The average CPUE for a subset of these tuna catches ranged from 0.5 kg to 6.5 kgs/trip-hour.

The management of municipal handline fishery is embodied mostly in local fisheries ordinances which adhere to the Philippine Fisheries Code. Although these ordinances are not specific to handline fishing, some of the measures adopted in these ordinances are relevant to the sector, such as the registration of fisherfolks, licensing of vessels and gears, and various measures such as closed seasons and areas, marine protected areas, fish length and size regulations, and mesh size requirements.

In discussions during this project, a number of concerns were raised by municipal handline fisheries stakeholders in the Bicol region. These issues mainly focus on competition with other gear users, lack of effective law enforcement, absence of search and rescue programs, inadequate sources of capital, lack of cooperation amongst fishermen, and the need for alternative livelihoods. The most common concern amongst handline fishermen in the region is the decline in catch production caused by overfishing attributed to vessels using other gears such as bagnets and ringnets. Medium to large scale commercial vessels have been reported to either fish illegally in municipal waters, or just outside the 15-km limit, catching tuna which is supposed to be caught by handline vessels.

A number of priority research and training needs for future collaboration were also identified to assist in the development of the handline sector. These research and training needs are: study on the seasonality of tuna and tuna like species, their habitat and biological characteristics; research on FADs, their impact on tuna fishing, and better design of FADs to improve tuna catch; effects of different handline hooks on species caught in various water depth; study on modern technology to improve fishing operations; impact of climate change on fisheries in the Bicol region; training to promote safety of life at sea, including GPS and compass reading; proper catching, killing and bleeding of tuna and tuna like species, and other commercial species; preservation of the quality of fish, proper handling and storage of fish (e.g. desired freezing temperature); and proper sizing and grading of tuna.

7.3 Preliminary Assessment of Handline Fishery in Region VIII Eastern Samar

The handline fishery in the Eastern Samar region is mostly municipal in character, and consists only of a handful of commercial vessels. The fishery comprises about 75% of overall fisheries in the province in terms of the number of vessels and gears, and consisting only of a handful of commercial vessels. Two types of handlines are observed

in the region, a simple handline or hook and line, and troll lines. Skipjack tuna is the major species caught by simple handline and troll lines, comprising 49% and 42% of the catch, respectively. The size of tuna caught ranges from 15cm to 120cm, with the most dominant lengths between 25cm to 45cm.

The management of municipal handline fishery is embodied mostly in local fisheries ordinances which adhere to the Philippine Fisheries Code. Similar to the local laws in Bicol Region, the local ordinances in Eastern Samar are not specific to handline fishing, although some of the general measures adopted in these ordinances are relevant for the sector such as the registration of fisherfolks, fishing vessels and gears, licensing of vessels and gears, and various measures such as closed seasons and areas, marine protected areas, fish length and size regulations, and mesh size requirements. The municipal fishery ordinance of Guiuan also has additional policies and objectives which are not commonly found in other local ordinances and comply with international standards. One of these policies is the precautionary principle, as well as the promotion of responsibility and accountability in the use of coastal and aquatic resources. Both policies recognize stewardship in the management of coastal and aquatic resources, the adoption of which demonstrates a commendable effort on the part of the municipality to contribute to the sustainability of its fisheries resources.

A number of concerns have been raised by municipal handline fisheries stakeholders in Eastern Samar. These issues mainly focus on competition with other gear users, lack of self-managed fish aggregating devices, lack of effective law enforcement, absence of search and rescue programs, non-compliance by some larger handline tuna vessels with the Handline Fishing Law, inadequate post harvest facilities and techniques, inadequate sources of capital, lack of cooperation amongst fishermen, need for alternative livelihoods, and environmental factors such as climate change. Similar to Region V, the most common concern amongst handline fishermen in this region is competition from vessels using active gears such as ringnets, which is believed to pose a major threat to the sustainability of fisheries resources.

In the Stakeholder Workshop held in Eastern Samar, a list of priority research and training needs were identified by the fishing industry. These research and training areas are believed to be most beneficial for the development of the handline sector and include: research on spawning season and migration patterns of tuna species in Eastern Samar waters; study on the effect of climate change on tuna handline fishing; improvement on the design of FADs; training on efficient post harvest techniques and technology; tuna classification and sashimi grade; safety of fisherfolks on the high seas (e.g. compass reading, use of GPS, typhoon path reading); and alternative livelihood for the family of fishermen.

7.4 Comparison of Handline Fishery Characteristics, Issues, and Opportunities

In summary, the major characteristics, problems, and opportunities for the handline fishery sectors in Regions XII, V, and VIII port landing sites are provided below.

	Region XII	Region V	Region VIII
Type of Handline Fishery	Commercial	Municipal or small-scale	Largely municipal, with a few commercial vessels
Number of vessels	1,000-1,2000 vessels	1,069 vessels	207 vessels
Length of fishing at sea	22-30 days	One to a few days	One to a few days

Handline gear types	Hook and line (e.g. J type and circle type hooks)	Simple handline, pole and lines, multiple handline, troll line, jiggers	Simple handline, troll line
Size composition	Ranging from 51cm-200cm, with 91-120cm as the dominant length size	For yellowfin tuna, size ranges from 38cm-170cm, and 80-120cm for albacore tuna. The dominant length of yellowfin tuna is 125cm-140cm and 89cm-98cm for albacore tuna. Skipjack tuna caught by multiple handline gears range from 13cm-50cm, with dominant length size at 15cm-20cm Skipjack tuna caught by troll line, ranges from 20cm-70cm with 40cm-45cm as dominant length size	For yellowfin tuna, 15cm- 120 cm; skipjack tuna from 15cm-65cm, with the dominant length of tuna caught by hook and line for both species to be between 25cm-45cm
Effort days	4,600 to 7,100 boat days per month	4,000 to 12,000 boat hours per month	4,500 to 13,500 boat hours per month
Cath per unit effort	35 kgs/trip-day to 115 kgs/trip-day	0.5kg-6.5 kgs/trip-hour	Yellowfin tuna, 0.5kg-2.5kgs/trip-hour; skipjack tuna, 0.3kg-3.9 kgs/trip-hour
Catch composition	Yellowfin tuna (*Thunnus albacares*) 72-92%; bigeye (*Thunnus obesus*), 1-9%; albacore (*Thunnus alalunga*), 0-8%; marlins (*Makaira mazara* and *Makaira indica*), 5-26% and other species, 0-1%.	Simple handline, yellowfin (*Thunnus albacares*) 48%; albacore (*Thunnus alalunga*), 35%; skipjack (*Katsuwonus pelamis*), 5%; dolphinfish (*Corypheana hippurus*), 4%, sailfishes (*Istiophorus platypterus*), 2% and other species, 6%. For multiple hook and line, yellowfin (*Thunnus albacares*), 34%; bigeye scad (*Selar crumenopthalmus*), 26%; skipjack tuna (*Katsuwonus pelamis*), 19%; frigate tuna (*Auxis thazard*), 7%; longtail tuna (*Thunnus tonggol*), 3% and other species, 11%. For troll line, skipjack (*Katsuwonus pelamis*), 87%; dolphinfish (*Corypheana hippurus*), 10%; yellowfin tuna (*Thunnus albacares*), 2%; and marlin (*Makaira mazara*), 1%.	For hook and line, skipjack (*Katsuwonus pelamis*), 49%; yellowfin tuna (*Thunnus albacares*), 27%; dolphinfish (*Corypheana hippurus*), 7%; marlin (*Makaira mazara*) 5%; and other species, 9%. For troll line, skipjack tuna (*Katsuwonus pelamis*), 42%; yellowfin tuna (*Thunnus albacares*), 39%; eastern little tuna (*Euthynnus affinis*), 7%; mackerel scad (*Decapterus macarellus*), 5%; dolphinfish (*Coryphaena hippurus*), 2%; and other species, 5%.
Issues	Decreasing catch by handline vessels affecting the supply of fish to tuna canneries. Ineffective fish handling techniques onboard vessels resulting in poor product quality. Difficulty in competing in the international market of tuna. Lack of an effective registration and licensing system. Lack of access to fishing grounds outside Philippine national waters.	Competition with other gear users. Lack of effective law enforcement. Absence of search and rescue programs. Inadequate sources of capital. Lack of cooperation amongst fishermen. Need for alternative livelihoods.	Competition with other gear users, particularly with ring-nets. Lack of self-managed fish aggregating devices. Lack of effective law enforcement. Absence of search and rescue programs. Non-compliance by some larger handline tuna vessels with the Handline Fishing Law. Inadequate post harvest facilities and techniques. Inadequate sources of capital. Lack of cooperation amongst

			fishermen. Need for alternative livelihoods. Environmental factors such as climate change.
Research Needs	A study on the efficiency of chilling systems for handline fishing vessels. An investigation of carrying capacity of Saranggani Bay, including spawning grounds and season, stock assessment, habitat use, and, use of FADs. Policy implications of FAD use in Saranggani Bay. Tuna marketing system or value chain study.	Study on the seasonality of tuna and tuna like species, their habitat and biological characteristics. Research on FADs, their impact on tuna fishing, and better design of FADs to improve tuna catch. Effects of different handline hooks on species caught in various water depth. Study on modern technology to improve fishing operations. Impact of climate change on fisheries in the Bicol region.	Spawning season and migration patterns of tuna species in Eastern Samar waters. Effect of climate change on tuna handline fishing. Improvement on FAD designs. Efficient post harvest techniques and technology.
Training Needs	Workshop on best fishing practices. Fisheries manuals in local dialects. Training on handling of tuna on board vessels, tuna quality classification, traceability of fish, and food safety.	Training to promote safety of life at sea, including GPS and compass reading. Proper catching, killing and bleeding of tuna and tuna like species, and other commercial species. Preservation of the quality of fish, proper handling and storage of fish (e.g. desired freezing temperature). Proper sizing and grading of tuna.	Tuna classification and sashimi grade. Safety of fisherfolks on the high seas (e.g. compass reading, use of GPS, typhoon path reading).

8 Impacts

This small research and development project has already made significant management, scientific, capacity, and community impacts and is expected to have a number of other beneficial impacts (e.g. environmental, social, and economic) in the medium to the long term. The benefits derived from the project will be ensured through the dissemination of its results and outputs.

8.1 Management, Scientific, Capacity and Social Impacts

One of the main impacts of this project is its contribution to the fisheries data collection and management in the Philippines. The new information generated from this project has contributed to the strengthening of data collection efforts in the Philippines. As highlighted earlier in this report, there is no dedicated regional enumeration for the handline fishery, and for Regions V and VIII, data gathering and analysis specific to the fishery was previously non-existent. The new data on handline fishery obtained from this small project now forms part of the national database on fisheries, particularly within the National Stock Assessment Program (NSAP), which assists the country in achieving a more accurate picture of the Philippine fisheries and in developing management measures. The NSAP data on tuna handline is also submitted to the Western and Central Pacific Fisheries Commission in which the Philippines is a member. This project has therefore assisted the Philippines in implementing its scientific and management obligations under the regional fisheries management organisation, which will strengthen the country's position in international and regional negotiations.

This project is another step towards promoting the sustainability of tuna handline fishery for the purpose of increased international trade. There is currently a pilot project between an international non-governmental organisation and the government to obtain eco-labelling certification for the handline fishery in other regions in the Philippines. This small project has increased the potential for the eco-labelling process to be duplicated in other handline fishery in the Philippines, such as in the ACIAR project sites. Such initiatives will increase the marketability of tuna derived from handline fishing gears.

The project has also assisted the Philippine government, particularly the provincial and local offices of the Bureau of Fisheries and Aquatic Resources in their data collection functions. By hiring new enumerators for the duration of the project, BFAR increased the capacity of local fisheries offices to collect, compile, and analyse much needed data for the management of local fisheries.

The results of the port sampling, particularly in terms of size composition (i.e. smaller fish caught), catch per unit effort (i.e. low CPUE), and seasonality of catch encouraged reflection and recognition from the industry to better manage tuna handline fisheries in the Philippines. Based on the industry consultations (see Section 7 of this Report), the handline sector in the three regions raised the need to conduct additional research on the biology and habitat of tuna, as well as more effective handline fishing methods and technology, in the hope to increase their understanding of the fishery. The regional consultations and workshops also provided a forum for relevant stakeholders to have open discussions on handline practices and management perspectives, issues confronting the sector, and research and training requirements and opportunities. These workshops have increased the knowledge of relevant stakeholders on the state of their fishery. Furthermore, by discussing various constraints in the handline fishery and their recommendations to improve the management of the sector, the fishermen at the regional and local levels are empowered. The project also assisted in the communication between

the government and the private industry on the best practices to manage handline fishery and in resolving fisheries conflicts.

It is expected that if the research and training needs of the handline sector are addressed and prioritised, there will be beneficial long-term impacts on the sustainability of the handline fishery. By obtaining accurate data, improving the technology in the fishery, proper management of fishing gears and FADs, and fostering cooperation amongst handline fisherfolks, the management of handline fisheries in the Philippines will be improved significantly. Sound management of the handline fishery will also have a positive effect on the health of the stocks, fish habitat and the marine environment. This will further lead to increased profitability in the industry, relieving the economic pressure currently faced by the handline sector. Laws, policies, and management measures promoting improved technology and the sustainability of the Philippine handline fisheries may attract higher prices of tuna from different regions, open up new markets, and make this sector more competitive in international trade compared to other types of tuna fishery in the world. Consequently, enhanced economic status of the sector will uplift the social well-being of handline fisherfolks.

8.2 Communication and Dissemination Activities

The initial results of the project have been disseminated to the three regions, particularly to the members of the handline fishing industry through the stakeholder workshops held in May 2011. Copies of the draft reports containing the results of port sampling, research on the socio-economic aspects of the fishery, and legal analysis were made available to the participants during the workshops. The final reports containing the agreed outcome of the workshops will also be made available to all relevant stakeholders in the government and the industry upon completion, through the Bureau of Fisheries and Aquatic Resources. As highlighted above, the stakeholder workshops facilitated the uptake of new information on handline fishery in Regions XII, V, and VIII. Providing the stakeholders with the final output of this small project will provide some guidance for the Philippine Government, local fisheries agencies, and the industry to conduct additional research and training, as well as seek further collaboration and projects to improve the management of handline fishery.

9 Conclusions and recommendations

This section contains the key conclusions and recommendations arising out of the project.

9.1 Conclusions

Various types of handline fishing have been practiced in the Philippines for over a thousand years and is still the most common fishing method in both municipal and commercial fishing sectors in the country. The three regions investigated in this project represent some of the most significant centres of tuna handline fishing in the country, responsible for fish products that reach both domestic and international markets. Although considered one of the most sustainable forms of fishing, the handline fishing sector is facing a number of challenges that impact negatively on the competitiveness and profitability of the industry, and more importantly on the livelihood of handline fishermen. Some of the threats to the handline fishery include illegal fishing, declining fish stocks, competition with other users, environmental factors (such as climate change), poor fisheries information, inadequate management regime, and lack of effective fisheries enforcement. Increasing regulatory measures adopted at the international and regional levels are also of concern for the handline sector, as such measures are perceived as burdensome and too restrictive for the traditional methods employed by handline fishers. These are some of the challenges confronting the handline fishing industry that require improved management and enforcement, effective data collection, and further research.

Despite numerous challenges, there are also opportunities for both commercial and municipal handline fishing sectors in the three regions, which may be explored. These opportunities include additional and strategic investment, particularly in establishing icing and post-harvest facilities, certification of the handline fishery as a sustainable fishery, establishment of exploring alternative livelihoods, strengthening community-based enforcement, and increasing cooperation amongst fisherfolks.

9.2 Recommendations

In addition to the various opportunities highlighted in the project, and after the preliminary assessment of the biological and socio-economic nature of the handline fishery, a number of priority research and training needs have been identified by the handline fishing sector to develop and improve the management of the industry. The research and training priorities common to Regions XII, V, and VIII in the Philippines that were raised in stakeholder workshops include:

- An investigation of carrying capacity of fishing areas, including spawning grounds and season, stock assessment, habitat use, and use of FADs;
- A study on the efficiency of chilling systems for handline fishing vessels;
- Improved tuna marketing system or a value chain study;
- Training in: handling of tuna on board vessels; tuna quality classification; traceability of fish; and, food safety;
- A study on the potential impact of climate change on the handline fisheries;
- Training to promote safety of life at sea, including GPS and compass reading; and
- Provision of alternative livelihoods for the families of fishermen.

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11 Appendixes

The following reports are appended to the Final Report.

11.1 Appendix 1: Report for Region XII

Preliminary Assessment of the Handline Fishery in General Santos City, Philippines

11.2 Appendix 2: Report for Region V

Preliminary Assessment of the Handline Fishery in Bicol Region, Philippines

11.3 Appendix 3: Report for Region VIII

Preliminary Assessment of the Handline Fishery in Eastern Samar, Philippines

PRELIMINARY ASSESSMENT OF THE HANDLINE FISHERY IN GENERAL SANTOS CITY, PHILIPPINES

Report Prepared for the "Preliminary Assessment of the Handline (Banca) Fisheries in the Philippines" (FIS/2009/033), Project funded by the Australian Centre for International Agricultural Research (ACIAR)

Prepared by the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Bureau of Fisheries and Aquatic Resources (BFAR) National Fisheries Resources and Development Institute, and BFAR Region XII

July 2011

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Executive Summary

The handline fishery in General Santos City is one of the most important commercial tuna fisheries in the Philippines, both in terms of its contribution to the economy of the southern Philippines and the benefits derived by thousands of people depending on tuna fisheries. Handline fishing is considered more sustainable than other fishing methods as it targets mature fish, primarily yellowfin tuna. However, the economic importance of handline fisheries in General Santos City has been increasingly threatened by competition from other fisheries, declining stocks, ineffective management arrangements, lack of accurate data, and environmental degradation. The declining tuna stocks mean that fishermen catch smaller fish and conduct longer fishing trips, resulting in lower profits for the fishing industry.

In this research project, port sampling and consultations with members of the fishing industry have identified key challenges confronting the handline fishing sector in General Santos. These challenges include: decreasing catch by handline vessels affecting the supply of fish to tuna canneries; ineffective fish handling techniques onboard vessels resulting in poor quality product; difficulty in competing in the international market of tuna; lack of an effective registration and licensing system; and the lack of access to fishing grounds outside Philippine national waters. The ability of handline vessels to access international fishing grounds is hampered by the longstanding problem of the lack of a suitable management and regulatory framework, and the need to ensure the safety and seaworthiness of vessels used in the fishery. There is also a surmounting pressure to comply with stricter regulations governing commercial tuna fisheries in the western and central Pacific region, which are perceived to be burdensome for the handline sector.

Therefore there is an urgent need to improve the management regime for the handline fishery in General Santos City to prevent further negative economic and social impacts. This may be achieved through consultations between government agencies, the handline sector, and other members of the fishing industry. While these issues are being addressed, a number of opportunities may assist in reviving the economic contribution of the handline sector in General Santos City and shape its role in fisheries policy development. These opportunities include increasing the capacity within tuna cooperatives in the handling of fish onboard vessels; exploring options to promote certification and labelling of tuna products for international trade; and more active participation of the industry in domestic policy discussions, as well as in bilateral and regional fishing access negotiations. Promotion of industry consultation by government may also increase discussion and lead to a better understanding of issues within the handline sector in General Santos City.

A number of priority research and training needs have been identified by the handline fishing industry as crucial for the development of the sector and represent potential projects where the Philippines may require external assistance. These research and training needs include:

- A study on the efficiency of chilling systems for handline fishing vessels;
- An investigation of carrying capacity of Sarangani Bay, including spawning grounds and season, stock assessment, habitat use, and, use of fish aggregating devices (FADs);
- Policy implications of FADs in Sarangani Bay;
- Tuna marketing system or value chain study;
- Workshop on best fishing practices and development of manuals in local dialects; and
- Training on handling of tuna on board vessels, tuna quality classification, traceability of fish, and food safety.

Acknowledgment

This Project Members would like to acknowledge the helpful assistance BFAR Region XII, the regional Philippine Fisheries Development Authority, and members of the tuna fishing industry from the SOCSKSARGEN Federation of Fishing and Allied Industries, Inc (SFFAII), Citra Mina Seafood Corporation, Pescador Sea Trading, and DFC Tuna Venture Corporation, Handline Tuna Cooperative, Umbrella Fishing Alliance, and various handline associations, companies, businesses, operators, traders and fishers.

Special credit is given to Engr Miguel Lamberte Jr, Port Manager of PFDA; Mr Ambutong Pautong, BFAR Region XII, Ms Meriam Buguis Amerkhan, Senior Manager, Corporate Affairs Management Division, Citra Mina Group of Companies; Mr Jerry C Demalerio, Vice President of Operations, DFC Tuna Venture Corporation; Mr Bayani Fredeluces, then Executive Director of SFFAII; Mr Raul Gonzalez, Owner and Operator of handline vessels; Mr Jerry Jasmine, Pescador Trading; Mr Dario Lauron, President of tuna handline cooperative, Mr Boy Asetre, Citra Mina Production Manager; Ms Janet Templonuevo and Ma Zillah Bacongco, Project Enumerators; Mr Glennville Castrence of BFAR Region XII; and Mr DM Estramadura, Project Research Assistant, for their time and contribution to the project. We would also like to express our gratitude to Atty Malcolm Sarmiento, Director of BFAR, Atty Benjamin Tabios Jr, Assistant Director of BFAR, and Mr Sani Macabalang, Director of BFAR Region XII for their support to the Project.

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The wisdom and generous contribution of knowledge by the fishing industry is recognised and highly valued in this Project. Most of the socio-economic data included in this report were provided by the members of the tuna fishing industry, particularly the SFFAII. This Project would not have been a success without their strong support and cooperation.

The generous funding of the Australian Centre for International Agricultural Research (ACIAR) for this Project, and its continuous financial support to Philippine-related projects, is highly appreciated.

PRELIMINARY ASSESSMENT OF THE HANDLINE FISHERY IN GENERAL SANTOS CITY, PHILIPPINES

Report Prepared for ACIAR-funded Project entitled "Preliminary Assessment of the Handline (Banca) Fisheries in the Philippines" (FIS/2009/033)

1. Introduction

Handline fishing is a traditional method of fishing using different types of hook and line and bancas, the latter more commonly known as pump boats in the Philippines. Similar handline fishing methods have been practiced for thousands of years in the Philippines and the Pacific, and remain the most common type of fishing in both municipal and commercial fishing sectors in the country. A national census on fisheries conducted in 2003 indicates that there are about 9.45 million sets of handline gears in municipal waters (within 15 km from the coast), which is more than double the total number of other gears set in these waters. This number represents a 300% increase from 1980. Hook and line is also the most common fishing gear used amongst commercial fishers, totalling 54,000 sets deployed in 2003. Similar to municipal hook and line, this number has increased significantly, from 2,655 commercial handline gears in 1980 (National Statistics Office, 2005).

Hook and line fishing exists in all fishing grounds in the Philippines, within the archipelagic waters, territorial sea, and the exclusive economic zone (EEZ). Handline fisheries target a number of species, including commercially significant species such as tuna. It is estimated that there are more than 3,000 Philippine handline vessels or pump boats fishing for tuna alone. This number of vessels equates to tens of thousands of fishers directly involved in the fishing activity, and to millions of people who depend on the handline fisheries for both subsistence and in the downstream fishing economy.

The economic importance of the handline fishery in the Philippines is increasingly threatened by declining fish stocks, illegal fishing, competition with other gear users, environmental factors (such as climate change), and increasing regulatory measures. Declining fish stocks are leading to problems in the handline fisheries, such as smaller-sized fish and longer fishing trip lengths. Unfortunately, information about the handline fisheries of the Philippines is poor and there are inadequate management arrangements in place. For a number of years, handline fishing vessels could neither be classified as municipal or commercial fishing vessels, because of the nature of their operations. This created a gap in the regulatory framework to manage such fisheries. The enactment of Republic Act 9379, or the Handline Fishing Law, in 2007 allowed for regulations for handline fishing vessels that took into account their unique characteristics. However, implementing rules and regulations on the registration and licensing of handline fishing vessels have yet to be agreed upon and the sector has remained unable to enjoy the benefits of these regulations that would assist in development and competitiveness of handline fishing, as well as ensure the safety and seaworthiness of the fishing vessels. There is therefore an urgent need to improve the management regime for the handline fishery to prevent further negative economic and social impacts.

This Report provides a preliminary assessment of tuna handline fishing in General Santos City. It examines the nature of tuna handline fisheries in the area, the socio-economic aspect of handline fishing sector, and the legal and policy framework to manage handline fishing in the region. It presents a synthesis of the various studies: the outcome of sampling landings of the handline fisheries, conducted from August 2009 to July 2010; the interviews with relevant stakeholders conducted in November 2009; the legal and policy study on the fishery; and, the outcome of the stakeholder workshop conducted in May 2011. This Report further summarises issues for the tuna handline fishing industry and highlights prospects for the development and effective management of

the handline sector. It also provides the context upon which the project on the preliminary assessment on handline fisheries in the Philippines was developed with the assistance of the Australian Government.

2. The ACIAR Project on Handline Fishing: Background, Aims and Methodology

The legal and policy framework for the management of Philippine (and Indonesian) fisheries, focusing on illegal, unreported and unregulated (IUU) fishing was first investigated by the University of Wollongong from 2000-2006 with funding assistance from the Australian Centre for International Agricultural Research (ACIAR). During the project, the handline fishery was identified as a specific area of concern in relation to fisheries assessment, management and compliance, particularly with respect to the lack of adequate information on the sector and the inadequacy of existing regulations to address the unique characteristics of handline fishing vessels.

Upon consultations with the Bureau of Fisheries and Aquatic Resources (BFAR) in 2008, the current project was proposed to ACIAR which aims directly monitor catch composition of the handline vessels, examine some of the socio-economic aspects of the sector, and identify major issues and constraints in effectively managing the fishery. This Project was then developed to provide new information concerning the Philippine handline fishery which will assist in applying long-term improvements in its policy and management frameworks. It also aims to fill some of the gaps in data collection to support the BFAR National Stock Assessment Program.

There are three specific objectives of the ACIAR Project on Handline Fishing. The first objective is to investigate the nature of handline fishery in select regions in the Philippines using existing data and port sampling. The second objective is to benchmark the legal framework for the hand-line fisheries against national and international obligations and best practice. The third objective is to identify opportunities, challenges and information gaps in developing a management plan for this fishery.

To achieve the aims of this research project, field studies have been conducted in three regions: Region V, VIII, and XII. Specific sites in these regions have been selected on the basis that they either do not have, or have significant data gaps on handline fishery. Two new enumerators have been appointed in each region for a period of 12 months to collect catch and other fisheries data. The Project Team, comprising staff from the UOW Australian National Centre for Ocean Resources and Security (ANCORS) and the National Fisheries Research Development Institute (NFRDI), and Regional Offices of BFAR also consulted with and interviewed members of the fishing industry, including handline fishers, vessel owners and operators, company owners, fish distributors, and port and fisheries officials to ascertain the legal and economic challenges confronting the handline fishery. Post harvest activities of the handline sector were also observed during field visits. The field research is supplemented by an examination of the provincial and national laws and regulations, as well as regional and international instruments governing handline fishery in the Philippines. Workshops involving the industry and government officials in key fishing ports were also held to present preliminary findings and investigate management opportunities and challenges, as well as develop mechanisms and pathways for the adoption of an effective management regime for the handline fishery in the Philippines.

Amongst the selected project sites is General Santos City in Region XII. Although NSAP activities exist in the port of General Santos City, there is no enumeration conducted exclusively for handline fisheries. Additional enumeration was deemed necessary in order to increase the frequency of port sampling in the area and thus obtain more accurate data. As further elaborated in the succeeding sections of the Report, the focus on the handline fishery in General Santos merits a closer examination because of the commercial nature of the activities in the area, the significant

contribution of tuna resources to the income of the city and the region, and the growing threats to the viability of the handline fishing sector and their implications to the peace and stability of greater Mindanao.

3. Socio-economic Aspect of the General Santos City Tuna Handline Fishing

General Santos City lies at the head of Sarangani Bay, dubbed as the 'Boom Town City of the South' and considered as one of the fastest-growing cities in the Philippines. It is one of the key economic areas of the South Cotabato, Cotabato City, Sultan Kudarat, Sarangani and General Santos City (SOCCSKSARGEN) growth region. General Santos is also known as the 'Tuna Capital of the Philippines' due to the high volume of tuna unloaded everyday, which can surpass that of any other fish port or even the entire unloading of all other fish ports in the country combined (Aprieto, 1995). It is the largest producer of sashimi-grade tuna in the Philippines.

Handline fishing targeting tuna started in 1969, along the coastal and marine areas of Sarangani Province and General Santos City. Handline fishing uses the traditional hook and line method and is considered by the fishermen of General Santos to be one of the best means of catching large tuna and marlin. The method is also considered selective and eco-friendly in that the gear only catches mature fish, particularly yellowfin tuna. Handline fishing does not target juvenile tuna, unlike purse seine and longline fishing which are known to catch at least 70% of the spawning population.

3.1 Handline Vessels

Twenty years ago, the average size of handline vessels was less than 40 feet in length. Today, most pump boats are close to 80 feet in length with gross tonnage close to 50GT. A typical modern handline boat is composed of a series of a small pump boats *(pakura)* which are used in catching tuna (Photo 1). The number of small boats and fishermen in every fishing vessel depends on the capacity of the mother vessel. For example, a mother boat that measures 17.76 meters (m) in length and 3.78m breadth at depth of 1.62m, has a capacity of 27.96 gross tons (GT) with a 16.97 net GT.

Photo 1: Modern handline vessel (top) with small pump boats (bottom) in General Santos Harbour.

Pump boats are fitted with surplus truck diesel engines which are converted for marine use. The hull of a pump boat is usually made of wood or fiberglass, composed of one deck, one mast and outriggers. The boat has a narrow central hull, about 10 to 12 feet wide and does not allow for large fish holds, modern equipment, or cabin and crew quarters. It has a transom type of stern and rake type of stem with an engine horse power (hp) of 170 (127kw).

This type of boat can accommodate 26 fishermen. The small pump boat or *pakura* usually has 16hp engine. The cost of construction for each *pakura* is around PhP 40,000 (or about $1,000). On the other hand, a 25 gross tons (GT) "mother" boat costs about PhP 1.2 million (about $30,000), including the construction of small pump boats.

From 1969 to 1980s, there were only around 500 handline boats operating in General Santos City. The number of handline boats continued to increase until it reached its peak in the mid 1990s with around 2,500 vessels. However, the number of handline vessels decreased quickly in the late 1990s due to a number of factors. These factors include the closure of Indonesian waters to foreign access, arrest and detention of handline vessels by Indonesian authorities, de-listing and scrapping of vessels, stricter domestic regulations, declining tuna catches, increasing operational cost, and other economic challenges. In 2011, it was estimated that there are only about 1,000 to 1,200 handline vessels left operating from General Santos City, and this number continues to decrease.

3.2 Handline Gears

The main handline gears in General Santos City are hooks and lines made of nylon, measuring 1.5 to 3.0 millimeters (mm) in diameter and about 200 to 300 meters long, which allows fish to move and swim after capture. Handline fishermen use "J-type" and circle-type hooks, the sizes of which range from 5 to 8, which are designed to target large tunas. Some vessels also use small hook sizes, ranging from 13 to 18, in order to target small pelagic fish for their food during the fishing trip.

The bait used is usually fish flesh. When fish bait is not available, fishermen use crystal silt, buttons, and cellophane which they squirt with some squid ink to attract target species. When a fish bites the bait, the fish is allowed to move on the nylon line. The fishermen will wait for the fish to become weak before they will slowly pull the nylon up and put the fish into a box full of ice.

Fishing for tuna by handline vessels is usually aided by the use of Fish Aggregating Devices (FADS), locally called as *payaos*. FADs are used not only by handline vessels, but are often shared by fishing vessels using other gears, such as purse seine and ring nets. The tuna handline "mother" boats are usually tied to the *payao* for protection from strong waves and currents, and fishing is undertaken from the smaller fishing vessels (see photo above), usually within a distance of 200 meters from a *payao.*

3.3 Handline Fishing Operations

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

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

Handline fishermen schedule their fishing expeditions across the year. A good fishing operation during peak seasons can take three to ten days; however, some trips are longer and can take up to a few weeks. Handline vessels conduct seven to eight fishing trips a year. The search for better fishing grounds often affects the period of fishing operations. The declining catch in the Philippine EEZ has forced handline fishing vessels to fish farther away and for longer periods, which result in the

deterioration of fish catch quality. Fish obtained from fishing trips greater than two weeks is generally not suitable for export quality.

About five years ago, there were bigger handline vessels with the capacity of more than 500 blocks of ice. Economic pressures have contributed to the downsizing of handline fishing operations and vessels. The current capacity and manning requirements of individual handline vessels vary greatly. A vessel carrying 30 to 59 blocks of ice involve 12 or 13 fishermen. A vessel carrying 35 blocks of ice fishing in Sulu fishing grounds would currently need PhP90,000 (~$Aus2,500) to operate and would need to catch 1,500 kilos of tuna to break even. A handline vessel which can carry 120 blocks of ice can cost Php250,000 (~AUD6,250) to PhP280,000 (~AUD7,000) to operate. On the other hand, a vessel carrying 190 blocks of ice going to furthest point in southeast Mindanao waters require about PhP380,000 in operating cost, and would need to earn at least PhP800,000 (~AUD20,000) to pay for the cost of fishing. For bigger operations, a handline operator would need to obtain PhP1 million (~$Aus25,000) in gross sales in order to be profitable.

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

3.4 Handline Fishermen and Cooperatives

Fishermen depend on the size of their catch to increase their share in the profit from a fishing operation. Boat captains normally get 25% of the gross profit, while 20% goes to the crew. In general, the income of handline fishermen ranges from PhP5,000 to PhP10,000 per fishing trip.

Cooperatives play a significant role in tuna handline fishing in General Santos City. The major cooperative consists of 19 members with 23 stall owners in the fish port. There are about five cooperatives in the area, with almost the same size of membership of about ten vessels each. These cooperatives are also members of the SSFFAII. The main role of the handline cooperatives is to facilitate discussions with the government and other fishing sectors, such discussions related to the enactment and implementation of the Handline Fishing Law 2007; potential access in foreign waters; and, development of the handline fishing sector.

Photo 2: Yellowfin tuna unloaded by Handline Vessels and NSAP sampling in GSCFPC, Market 1

3.5 Fishing Ground

The usual fishing grounds for General Santos fishermen include: the Moro Gulf, which is often called as 'Centro' by fishermen; the Philippine-Indonesia border in Irian Jaya; Mati, which is part of Davao del Sur; and Maitum and Kiamba, within the jurisdiction of Sarangani Province. Most of the landed catch in General Santos City Fishport Complex (GSFPC) comes from the waters of Moro Gulf and Philippine-Indonesia border. The above locations are considered to have an abundance of tuna and tuna-like species, primarily yellowfin tuna. Some handline vessels are also known to have ventured into neighbouring and international waters. However, stricter fishing regulations and regionalization of access to tuna resources have deterred handline vessel fishermen from further expeditions outside the Philippine EEZ.

The distance of the fishing ground and the abundance of stocks also dictate the quality of the tuna. For example about 50 to 70% of the tuna caught in the Sulu Sea is export grade quality. In southeast Mindanao, only about 30% of the catch may be exported while the remaining fish is consumed locally.

3.6 Fish Port Facilities for Handline Vessels

Most handline fishermen unload their catch in Market 1 of General Santos City Fishport Complex. It is located at Barangay Tambler, General Santos City in a 32-hectare lot owned by the Philippine Government and under the administration of the Philippine Fisheries Development Authority (PFDA). The construction of the GSCFPC was funded by Overseas Economic Cooperation Fund (OECF) of Japan. GSCFPC is the nation's second largest fish port after Navotas, and considered to have facilities that meet international standards. Handline vessels pay 10 cents per kilo of tuna unloaded in this port.

Photo 3: General Santos City Fishport Complex (GSCFPC)

The GSCFPC has six -35°C cold storage freezers, each with a 300 MT capacity; a 4 MT/day brine freezer; a 60 MT/DAY ice plant; and 758 meters of landing or preparation area. It includes four market halls, fish container storage yard and maintenance shop, among others. The operation of GSCFPC paved the way for larger and higher quality fisheries production, serving the needs of both large and small fish producers and processors. The port also has six canneries nearby which can process about 250 to 300 MT/day, as well as additional 400 MT of cold storage. The GSCFPC has mercury testing facilities which are utilized specifically for tuna bound for international trade.

There has been a noticeable decline in the number of port calls of handline vessels at GSCFPC. It is estimated that there are no more than 50 handline vessels calling into port and unloading about 10 MT of tuna a day. This is a significant (~60%) reduction in landings at this port over the last few years. The continuous decline in the number of port calls by handline vessels is an indication of the

economic difficulties faced by the sector. Such decreases in fishing vessels making port landings also impact on the supply of raw materials for processing plants. Some of the processing plants within General Santos City are currently under-utilized because of the lack of adequate tuna raw materials. Bigger tuna companies have also invested in mariculture facilities to supplement capture fisheries.

The Philippine Fisheries Development Authority (PFDA) recognizes the need to improve the facilities in GSCFPC in order to maintain the international market of tuna. One of the steps undertaken to achieve this objective is the expansion of the port by opening Market 4, where a certification system for fisheries export will be established. The PFDA has also been engaging in discussions with potential funding agencies and financiers to help improve port facilities. The authority recognizes that increasing competition from countries such as Thailand would need to be addressed through the development of a more efficient port landing and fish certification system that meets international standards.

3.7 Marketing and Trade of Tuna

There are four destinations of tuna caught by handline vessels. Sashimi grade tuna is exported, normally to the USA and Japan; ~20-25% of tuna is sent to processors and exporters as tuna loins; value adding for other tuna products is conducted by processing plants and canneries; and, lastly, some catches are sold directly in the local market. Market price for tuna sold by handline fishers depend on the grade classification of unloaded fish. Prices of fish for local market range from Php 90 (~AUD2.25) to PhP 120 (~AUD3) per kilo and those destined for export may be sold from Php 130 to PhP 250 (~AUD7) per kilogram.

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

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

One of the biggest challenges identified by handline fishers in the marketing and trading of tuna is the lack of competitive prices. They attribute this problem to the limited number of exporters that prevent a free hand on the market and prices of tuna. There are currently eight international exporters for tuna that are deemed by some members of the handline industry to have a large influence over the selling price of the fish in the international market.

4. Results of Port Sampling in General Santos City Fish Port

Port sampling was conducted in the General Santos Fishport Complex between August 2009 to July 2010, with the assistance of two enumerators. This activity was implemented not only for the purposes of the Project, but also to supplement data collection under the National Stock Assessment Program (NSAP) of BFAR. The data collected under NSAP are used to compare and clarify fisheries data collected in national statistics and for fisheries management. The data collected under this Project are also integrated into the catch report submitted to the Western and Central Pacific

Fisheries Commission (WCPFC) as part of the obligations of the Philippines as a Member of the Commission.

The coverage of the port sampling conducted in General Santos City is presented in **Table 1**. The table shows number of days sampled each month, total number of vessel trips by handline vessels recorded on these days (and estimated landings in metric tonnes, MT), number of trips sampled and number of fish measured.

Table 1. Details of Port Sampling in General Santos City Fish Port Complex, Aug 2009-July 2010

		Total Landings		Total Sampled		
Month/Year	Nos. Days Sampled	Trips	MT	Trips	MT	Length Frequency Measurements
Aug-09	11	73	140	30	78	0
Sep-09	10	64	115	51	96	2225
Oct-09	11	89	120	72	106	3239
Nov-09	10	74	134	66	118	3930
Dec-09	11	77	105	63	86	3146
Jan-10	10	74	123	62	105	3129
Feb-10	10	63	170	46	125	4629
Mar-10	11	84	143	72	119	5229
Apr-10	10	63	169	49	126	3787
May-10	11	84	279	65	214	7145
Jun-10	10	103	329	77	267	7537
Jul-10	11	118	258	93	220	5710

The following sections summarise the results of the port sampling in terms of catch composition, size composition, and catch and effort data.

4.1 Catch Composition

For the handline fishery, yellowfin tuna (*Thunnus albacares*) is the major species caught, comprising 72 to 92% of the total tuna catch. The rest of the catch is composed of bigeye (*Thunnus obesus*), 1-9%; albacore (*Thunnus alalunga*), 0-8%; marlins (*Makaira mazara* and *Makaira indica*), 5-26% and other species, 0-1%. The other species includes swordfishes (*Xiphias gladius*), opah (*Lampris guttatus*) and sailfishes (*Istiophorus platypterus*).

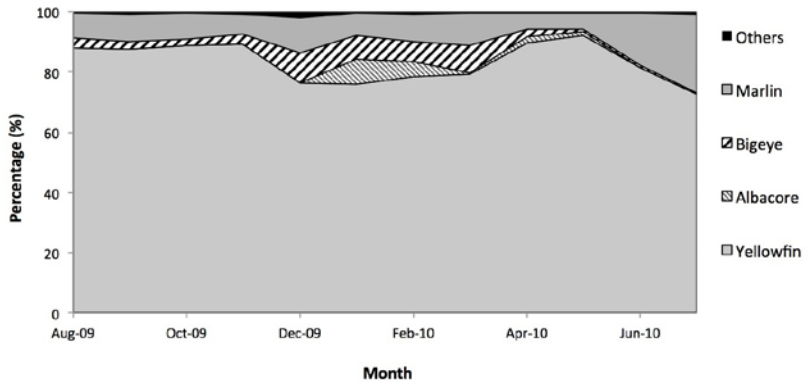

Figure 1. Catch Composition of Handline Vessels Unloading in General Santos

4.2 Size Composition

Length frequency data for handline fishery in General Santos was collected from September 2009 to July 2010 and has been binned into 5-cm (51-55 cm to 196-200 cm) and 10-cm size classes (51-60 cm to 191-200 cm). The length frequency distribution information presented (Figure 2) consists of the actual number of yellowfin tuna and bigeye tuna measured in each size class. The data were produced from the NSAP Database System (Version 5.1) after data entry and report generation.

Based on these data and observations on the size composition, it is concluded that handliners based in General Santos City catch yellowfin and bigeye tunas ranging from 51-200 cm. For yellowfin tuna, the dominant length caught by handliners ranges from 91-100 cm and 111-120 cm, and 71-80 cm for bigeye tuna (Figure 2).

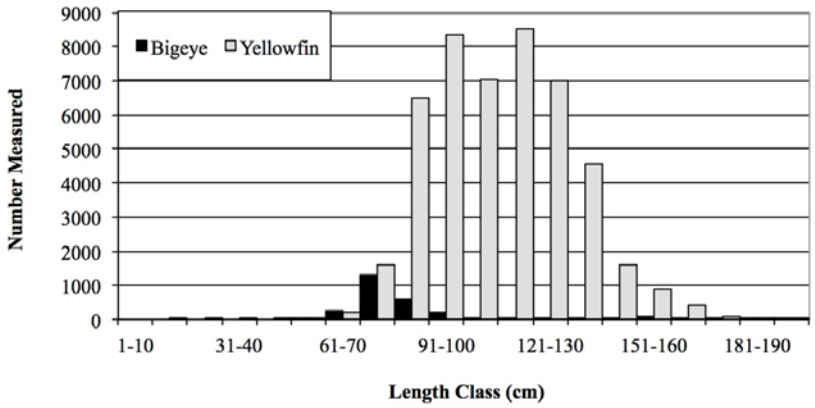

Figure 2. Size Composition of Yellowfin and Bigeye Tuna Caught by Handline Vessels

4.3 Catch and effort data

Catch and effort data were also collected during port sampling (Figure 3), and trends in catch per unit effort (CPUE) calculated for the General Santos handline fishery from August 2009 to July 2010 (Figure 4).

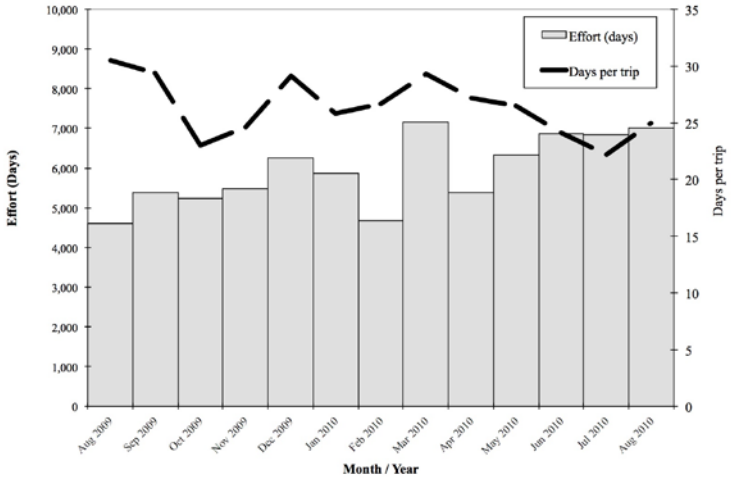

Figure 3. Monthly Effort (Days) and Days/trip for the Handline Fleet, Aug 2009-July 2010

The total effort in the fishery is generally in the range of 4,600 to 7,100 boat days per month, with the highest effort observed in March 2010 at around 7,150 boat days (Figure 3). This peak in total effort coincided with low CPUE catch for yellowfin tuna (Fugure 4). The number of days per fishing

trip by handline vessels ranged from 22 to 30 days (August 2009 – July 2010). When compared to existing and historical data (NSAP data, 1997 – present), the number of days per fishing trip has increased gradually over time. This data is consistent with accounts given by handline fishing vessel operators that they have to fish in more distant waters, in the hope of obtaining better catches.

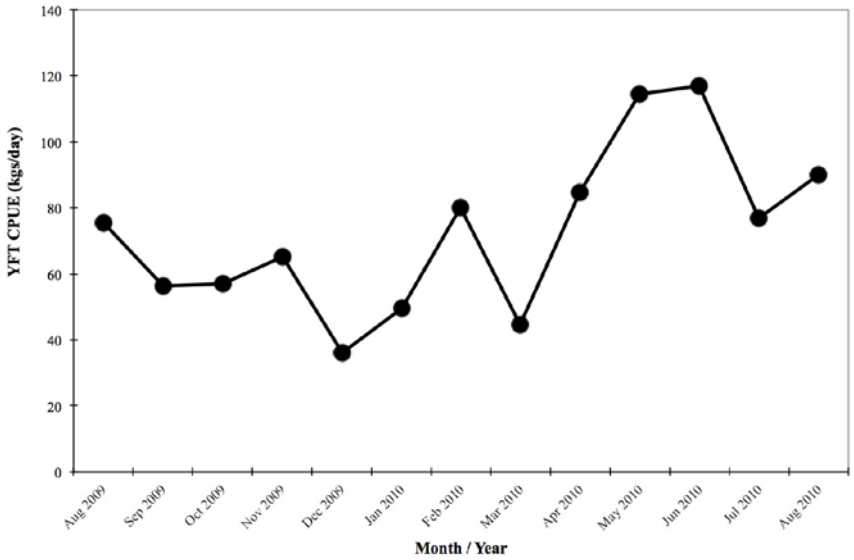

Figure 4. Monthly Yellowfin CPUE for the General Santos City Handline Fleet, Aug 2009-July 2010

Figure 4 also shows how the yellowfin CPUE for the General Santos City handline fleet has fluctuated during 2009-10, ranging from 35 up to 115 kg/trip-day. Sharp drops in the CPUE during the months of December 2009 and March 2010 were observed, but the fishery experienced an increase in yellowfin CPUE in the second quarter of 2010. In the months of December 2009 and March 2010, there was an increase in the number of days per trip or months with the highest effort days. These months coincided with lowest yellowfin CPUE, suggesting that while vessels travelled beyond their usual fishing grounds, catch per day did not change. In contrast, catch rate in February and April 2010 coincided with lower effort (days), suggesting that a component of the fleet travelled into more distant waters, with corresponding improvement in catch rates.

5. Legal and Policy Framework for the Management of Handline Fishery in General Santos City

The legal and policy framework for the management of handline fishery in General Santos City comprises (1) the overall legal framework that applies to all types of fisheries in the Philippines: 2) framework specifically applicable to the handline fishery; (3) regional and international framework directly impacting on the handline fishery in the Southern Philippines.

5.1 General Framework for the Management of Fisheries in the Philippines

The utilisation, conservation, and management of fisheries resources in the Philippines is primarily governed by three laws namely, the Philippine Fisheries Code 1998, the Agriculture and Fisheries Modernisation Act 1997, and the Local Government Code 1991. The Philippine Fisheries Code 1998 provides the basic fisheries management framework; the Agriculture and Fisheries Modernisation Act 1997 addresses fisheries development as a component of the agricultural sector; and the Local Government Code 1991 provides guidelines for local autonomy and decentralisation which includes fishery functions. There are also regulations implementing the Philippine Fisheries Code in the form of Implementing Rules and Regulations and Fisheries Administrative Orders issued by the Department of Agriculture. Aside from these basic fisheries-related laws, national policies are also

part of the general framework for sustainable fisheries management. These national policies include the Draft Philippine National Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing (NPOA-IUU), Philippine Tuna Management Plan, National Marine Policy, Philippine Agenda 21, and the Medium-Term Philippine Development Plan (MTPDP). Although not discussed in this Report, there are also other laws and policies relating to the environment, trade, and safety of fishing vessels which form part of the general framework for the effective management of fisheries and control of fishing activities in the Philippines. These laws, policies, and regulations provide the basis for the specific framework applicable for the management of handline fishery discussed in the succeeding section.

5.2 Framework for the Management of Handline Fishery

The handline fishery, and the larger fishing community of General Santos city, has been the principal driver in the development of a specific framework that takes into account the unique nature of commercial handline fisheries. For more than a decade, the handline fishing sector has advocated for the adoption of a registration and licensing scheme particular to the handline fishing vessels in General Santos City. An adequate system for registering and licensing handline vessels is deemed critical for their fishing operations, especially those that extend to the waters of neighbouring States and in areas managed by regional organisations.

5.2.1 The Handline Fishing Law

It was in 2007 when Republic Act No 9379, or the Handline Fishing Law, was enacted in the hope of resolving some of the legal issues in registering and licensing handline fishing boats. The law aims to strengthen the rules and regulations governing handline fishing and ensure the safety and seaworthiness of handline fishing vessels. In this legislation, handline fishing is defined as a "traditional fishing method that use the hook and line, a passive fishing gear with a single vertical line carrying one hook and used by simply dropping the line into the water and waiting for the fish to bite. A handline fishing boat is "a fishing boat with or without outrigger and with or without auxiliary small boats on board that exclusively utilizes the handline fishing method". In this definition of the handline fishing boat, there is no specification as to the gross tonnage of the vessel, the number of small auxiliary boats, or the extent of their fishing areas.

Section 4 of the Handline Fishing Law provides that the registration, inspection, manning and other documentation of handline fishing boats are the responsibilities of the Maritime Industry Authority (MARINA), while the licensing and related documentation are the functions of BFAR.

Section 5 provides that Philippine registered handline fishing boats may operate in international waters or waters of other countries that allow such operations, provided that they comply with appropriate and applicable safety, manning, radio communications and other standards and requirements geared at promoting seaworthiness. Such vessels are also required to secure an appropriate international fishing permit and certificate of clearance from BFAR. Similar with other types of vessels, fish caught by handline fishing boats shall be considered as caught in Philippine waters and therefore not subject to import duties and taxes when the same is landed in designated fish landings and fish ports in the Philippines. Lastly, Section 5 of the Handline Fishing Law provides that fishermen on board Philippine registered handline fishing boats conducting fishing activities beyond the Philippine EEZ are not considered as overseas Filipino workers.

The Handline Fishing Law provides for the manning requirements of handline fishing vessels. It requires all persons holding the position of Boat Master to be issued a Boat Captain licence after submitting a Certificate of Engagement from the present boat owner whom he works with, affidavit

of boat owner taking the risk and responsibility for engaging the Boat Master, and a Certificate of Completion for theoretical and practical training for all applicants to the position. Similarly, the Boat Engineer of a handline boat would need to be issued a Boat Engine Officer Licence after submitting a Certificate of Engagement from the boat owner and after obtaining completing theoretical and practical training. Such training needs to be complied with within one year. For handline boats fishing outside the Philippine EEZ, the boat master, engineer and other personnel shall submit relevant manning documents, as well as the Seaman's Identification and Record Book (SIRB). The Identification Cards of the Boat Master and Boat Engine Officer bear the words "Only for Handline Fishing Boat".

The Handline Fishing Law also contains provisions on the construction of vessels. Section 7 provides that existing and newly constructed handline fishing boats shall be admeasured or re-admeasured and shall follow prepared boat plans. For boats of five gross tons and below including auxiliary boats, the requirement is a picture and actual dimensions of the boat submitted by the owner or boat builder. For boats above five gross tons, the boat plan should be signed and sealed by a naval architect.

Lastly, the Handline Fishing Law provides that 90 days from the approval of the Act, rules and regulations will be promulgated by the Secretary of the Department of Agriculture, through a technical working committee composed of the BFAR, the MARINA, the Philippine Coast Guard, the National Telecommunications Commission and other concerned government agencies, in consultation with fisherfolk and handline fishing industry organisations and other stakeholders. The rules and regulations will consist of provisions on the establishment of a one-stop shop for the industry; first aid, life saving and firefighting devices; operation of radio communication facilities; reportorial requirements, and other standards that promote seaworthiness.

While there may have been success in adopting a legislation specific to handline fishing, some issues relating to their registration and licensing persist. Four years have passed since the enactment of RA 9379 and the law is yet to be fully implemented. This is primarily due to the lack of agreement between concerned agencies and the handline fishing industry on the regulations that would govern the registration and licensing of fishing vessels. The requirement to obtain relevant certificates of training equivalent to commercial vessels proves to be problematic for handline boat owners and masters. Handline boat owners, especially those who own only one or a few boats, maintain that obtaining the equivalent certificates of training is cumbersome. There is a general perception that such training is expensive and should be shouldered by the government imposing the new requirements. To facilitate fishing operations in waters of neighbouring States, some fishing companies pay for the training of handline fishermen to obtain certificates of competency. However, such practice is not common amongst individual vessel owners. These circumstances place the handline sector in almost the same position as it were before—where vessels can obtain fishing licences without having the appropriate registration papers and manning certificates. The lack of an effective registration and licensing system also accounts for the inaccurate record of the number of handline vessels operating from General Santos City.

Consultations between different government agencies and the industry have resumed towards the establishment of procedures for the implementation of RA 9379. There have been positive indications from the handline fishing industry in General Santos City that the development of rules and regulations on handline fishing are now being prioritised by the government and that such regulations will be adopted at the soonest possible time.

5.2.2 Other Applicable Regulations

A number of regulations may be identified as relevant for the fishing operations of the handline sector. One of these regulations is Fisheries Administrative Order No 233 (2010) on the conservation of aquatic wildlife. This fisheries administrative order provides for the requirement to obtain prior permits for the local transport, as well as the exportation and importation of a number of fish species, including yellowfin, skipjack, bullet, and frigate tunas. This regulation implies that any local movement or international trade of these tuna species without proper certification may be punishable by law. Any trade of tuna products are also subject to food handling and safety requirements, such as the Hazard Analysis Critical Control Point, and other trade-related regulations such as rules of origin, catch certification, and import and export control.

The Philippines is also in the process of finalising a FAD Management Policy which will be adopted as a Fisheries Administrative Order to reduce fishing mortality of juvenile yellowfin and bigeye tuna arising from fishing activities using *payaos*. This Fisheries Administrative Order will provide regulations on the design and operation of FADs used by purse seine, ring net, and handline vessels in the Philippine EEZ. Similar management schemes for fishing using FADs in archipelagic waters will be developed. It would therefore be necessary for the handline sector to participate actively in the discussions to develop such fisheries administrative order, to ensure that its interests in fishing using *payaos* are taken into account. Other regulations such as FAD area and time closures applied within Philippine waters would also need to be complied with by handline vessels.

Some of the fisheries regulations, such as reporting of data or maintenance of fishing logbooks are considered as administrative burden on the part of the handline vessel master and crew. While handline vessels may welcome fisheries enumerators and port officials to inspect and measure their catch, they do not necessarily accede to the recording of their catch at sea, because such activities are believed to interfere with their operations.

5.2 Legal Framework for Fishing Beyond the Philippine EEZ

Even though handline fishing vessels are currently restricted from accessing fisheries resources beyond the Philippine EEZ, it is important to describe the legal regime that applies to the operation of handline fishing in areas outside Philippine jurisdiction. An elucidation of the applicable domestic and regional measures in this regard would inform the handline sector on their rights and obligations to fish in international waters, and would assist in preventing illegal fishing activities.

As provided in Section 5 of the Handline Fishing Law, handline fishing vessels may conduct fishing operations outside the Philippine EEZ subject to compliance with a number of requirements, including registration, safety, manning, and licensing of vessels. Similar to the requirements for commercial fishing vessels, international fishing permits are required before any handline fishing operation can occur within the waters of other States or on the high seas. Hence, before any handline fishing activity may be allowed in areas outside the Philippine EEZ, these basic domestic legal requirements should be met and associated documentation would need to be obtained. Additional regulations and measures may also apply, such as those highlighted below.

5.2.1 Access to Other Coastal State Waters

Handline vessels provided access to the waters of other coastal States are required under Article 62(4) of the United Nations Convention on the Law of the Sea to abide by any regulations that may be imposed by that coastal State. These regulations may include catch limits, capacity limits, reporting requirements, vessel monitoring system, and other restrictions. Such conditions may be included in a bilateral agreement between the Philippines and the coastal State, contract between

the handline vessel and the foreign government or private industry (in cases of joint ventures), or included within the terms and conditions of the awarded foreign licence.

There are currently no bilateral arrangements with other States providing for access to resources of handline vessels; hence, any handline fishing activity conducted in other countries' jurisdiction may be considered illegal. Access into neighbouring coastal State waters without permission by that State not only has legal ramifications, but also political consequences in the diplomatic relations between the Philippines and its neighbouring States. This may further result into a suspension and termination of, or withdrawal from bilateral fishing access negotiations and agreements.

5.2.2 Access to WCPFC Management Area

The applicable framework for the access of handline vessels to tuna fisheries on the high seas and other areas in the Western and Central Pacific is the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention), as well as the conservation and management measures and resolutions adopted by the Western and Central Pacific Fisheries Commission (WCPFC). The main objective of the WCPF Convention is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific ocean. The WCPF Convention applies to all stocks of highly migratory fish within the Convention Area (as defined in Article 3 of the Convention), except sauries. The Convention also applies a number of international fisheries management principles such as ecosystem approach to fisheries, precautionary approach to fisheries, compatibility of measures between the EEZ and high seas, and cooperation between members, non-members, and interested parties.

One of the basic requirements for fishing on the high seas within the Convention Area is the inclusion of the vessel on the WCPFC Record of Fishing Vessels (Art 24, WCPF Convention; CMM 2009-01). This means that a handline vessel would need to be included in the WCPFC Record of Fishing Vessel before it can fish on the high seas of the western and central Pacific ocean. Inclusion in the WCPFC Record of Fishing Vessels requires the acquisition of an international fishing permit from BFAR and compliance with vessel registration and safety requirements imposed by MARINA as highlighted above.

In addition to being on the WCPFC Record of Fishing Vessels, the WCPF Convention and adopted conservation and management measures also provide for other requirements on vessels fishing on the high seas such as compliance with VMS and observer program requirements (CMM 2007-01, CMM 2007-02). Handline fishing vessels would need to comply with these requirements before they can conduct fishing on the high seas areas of the western and central Pacific ocean. Any handline vessel that would be found in breach of these conservation and management measures may be considered as an illegal, unreported and unregulated (IUU) vessel (CMM 2010-06) with certain legal and economic repercussions.

A number of conservation and management measures relevant to handline fishing have been adopted under the Convention: some of them are stock-specific; other measures ensure effective control over fishing vessels; and a number of regulations relate to monitoring, control and surveillance. One important measure pertains to the conservation and management of yellowfin and bigeye tuna (CMM 2008-01 which is under review). Most of the measures adopted in CMM 2008-01 apply to purse seine and longline fisheries; however, it also provides for fishing effort restrictions for other commercial tuna fishing, such as the General Santos City handline fishing. Paragraph 39 of CMM 2008-01 provides that members and cooperating non-members of the WCPFC would need to take necessary measures to ensure that the total capacity of their respective other commercial tuna

fisheries for bigeye and yellowfin tuna, do not exceed the average level for the period 2001-2004 or 2004. The exception is when the fishery is taking less than 2,000 tons of such tuna species. Hence, the handline fishing sector would need to comply with any domestic measures that would be imposed on its commercial tuna fishery as part of the Philippine compliance with its obligations under the WCPF Convention.

CMM 2008-01 also provides for the closure of the high seas pocket bordering Indonesia and Papua New Guinea, an area which is most accessible to the Philippine tuna fleet. While CMM 2008-01 provides for the closure of the high seas to purse seine fishery (para 22), there are legal interpretations that the high seas is closed to all types of fisheries.

Other relevant WCPFC conservation and management measures include mitigating impacts of tuna fishing on non-target species and prohibition of fishing in data bouys. Any domestic regulation adopted to give effect to these regional measures would need to be complied with by the handline fishing sector. Lastly, a critical component of the Philippine obligation to the WCPFC is the submission of timely and accurate data on its tuna fisheries. Hence, any reportorial requirements imposed by the Philippines on its fishing vessels would need to be adhered to. The submission of fisheries data will not only contribute to an effective management of tuna fisheries in the western and central Pacific, but will also assist the country in developing measures to conserve and manage its domestic tuna fisheries.

6. Summary of Issues in the Management of Handline Fishery in General Santos City

From this preliminary assessment, a number of factors clearly affect the development of the handline fishing sector in General Santos City, such as dwindling catch, unprofitability of fishing operations, and decreasing market. There also appears to be significant differences between the perceptions of the handline fishing industry as to how the sector needs to be managed and the legal regime that the Philippine Government would like to apply to handline vessels. These differences in perspectives have certainly contributed to the challenges currently faced by the handline fishing sector.

Based on the preceding discussions, which took into account the perspectives of the handline fishing industry of General Santos City, the issues confronting the sector may be summarised as follows:

- Decreasing catch by handline vessels affecting the supply of tuna fresh and frozen processors;
- Problem in the handling and refrigeration of fish on handline vessels, especially during long fishing trips;
- Difficulty to compete effectively in the international trade and market of tuna products with increasing operational cost;
- Lack of an effective and simplified registration and licensing system; and
- Lack of access to fishing grounds outside the Philippine EEZ.

It was emphasised by some of the members of the handline industry in General Santos City that in addition to the depletion of tuna resources in the EEZ, there is a surmounting pressure to comply with stricter regulations governing commercial tuna fisheries which prove to be burdensome to the sector. These economic and legal pressures have aggravated the already declining condition of the

sector and losses incurred by vessel owners, forcing them to go out of business or take undesirable risks of fishing in neighbouring waters.

7. Opportunities for the Handline Fishery in General Santos City

While these issues remain unaddressed, a number of opportunities may be identified for General Santos City to help them revive the economic contribution of the handline sector and shape its role in fisheries policy development. The feasibility of these opportunities has not been assessed in this project; however, they may provide some constructive options for the development of the handline fishing sector.

One of the opportunities for the handline fishing sector is to increase the capacity among the tuna cooperatives with respect to the **handling of tuna onboard vessels**. While some members of the sector, particularly those with the support of established fishing companies, may have the knowledge and training on post-harvest techniques, smaller handline operators may not possess the same; hence the need to build on this capacity. In 2008, the Southeast Asian Fisheries Development Center (SEAFDEC) conducted an on-site training for the handling of tuna catch onboard handline bancas in General Santos City. This training may be used as a springboard to develop similar or better training between handline fishermen organised collectively by cooperatives.

The second opportunity for the handline industry is to work with the Government towards **meeting sustainability criteria** for the management of tuna fisheries, which will allow tuna products from handline vessels to be certified for international trade and obtain a label indicating sustainability. A number of smaller fisheries in the world, such as pole and line fishery in the Maldives, have been part of eco-labelling programs, such as that developed by the Marine Stewardship Council (MSC). The World Wildlife Fund for Nature (WWF) is currently undertaking pilot projects for tuna handline fisheries in various parts of the Philippines to be part of the MSC program. The Food and Agriculture Organization has also developed guidelines for the establishment of such programs that would not necessarily require costly processes involved in third-party labelling schemes. The development of an eco-labelling system would require at the very least, a tuna management plan, and subsequently a handline fishery management program.

The third opportunity for the handline fishing sector is with respect to its **participation in policy discussions**, both domestically and in the western and central Pacific region. As an example, the handline sector in General Santos City may be more actively involved in the development of relevant policies and plans, such as the revision of the Philippine National Tuna Management Plan. The Philippine National Tuna Management Plan is currently being updated to address issues confronting the tuna industry. It would be critical for the handline operators and fishermen to identify issues and policies that would be most beneficial for the sector. A relevant opportunity in this respect is providing input into **bilateral and regional fisheries negotiations**. Larger fishing companies promoting other types of fishery such as purse seining are often involved in bilateral access negotiations. There is a prospect for the handline sector to leverage on discussions initiated by purse seine companies as they may not necessarily compete with the same access arrangements. Similarly, while it may seem that the regional conservation and management measures in the western and central Pacific provide legal obligations that impede on, more than encourage, the participation of handline fishing vessels in regional tuna fishery, the WCPF Convention has not excluded this sector in the access to tuna resources. The handline fishing sector may be able to revisit some of the rights accorded to it under the WCPF Convention that promote its participation in regional tuna fisheries.

8. Future Research and Training Opportunities

The Project Workshop held in May 2011, which gathered government officials and members of the handline and larger fishing industry in General Santos, identified a list of research priorities and training needs which are believed to be most beneficial for the development of the handline fishing sector. The following research and training areas were identified:

- Pilot study on the efficiency of the SEAFDEC chilling system for handline fishing vessels (i.e. within a 25-day cycle).

- A study on the carrying capacity of Sarangani Bay, with respect to spawning grounds or season, tuna stock assessment, habitat (e.g. coral transplantation or artificial reef), and use and impact of FADs;

- Policy implications of FADs in Sarangani Bay;

- Tuna marketing system or value chain study;

- Workshop on good handline fishing practices; and

- Training on handling of tuna on board vessels and tuna quality classification, such as tuna decomposition and sensory, HACCP, SSOP and GHP training, and traceability of fish.

The General Santos fishing industry also identified other needs such as a regular tuna buyer-fishermen dialogue, information and exchange materials on tuna fisheries, and relevant manuals in local dialects.

The research, training, and other needs highlighted above will not only help develop the handline fishing industry in General Santos City, but are also potential project themes that will further enhance collaboration between the government and the fishing industry, as well as areas where the Philippines may require additional assistance from overseas funding agencies such as ACIAR.

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Annex A

FIGURE 1.

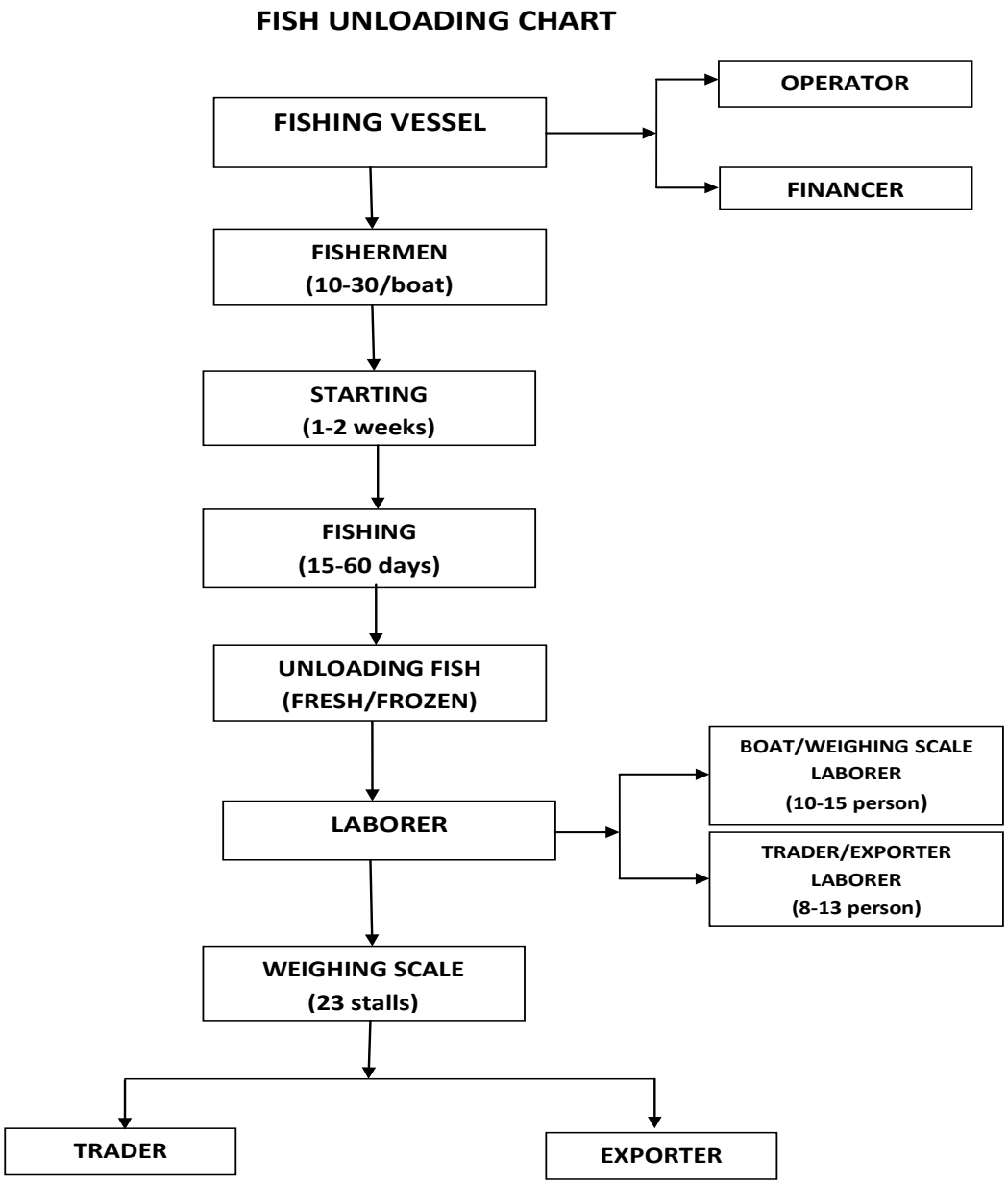


Figure 2.

FLOW DIAGRAM
MARKET OPERATIONS

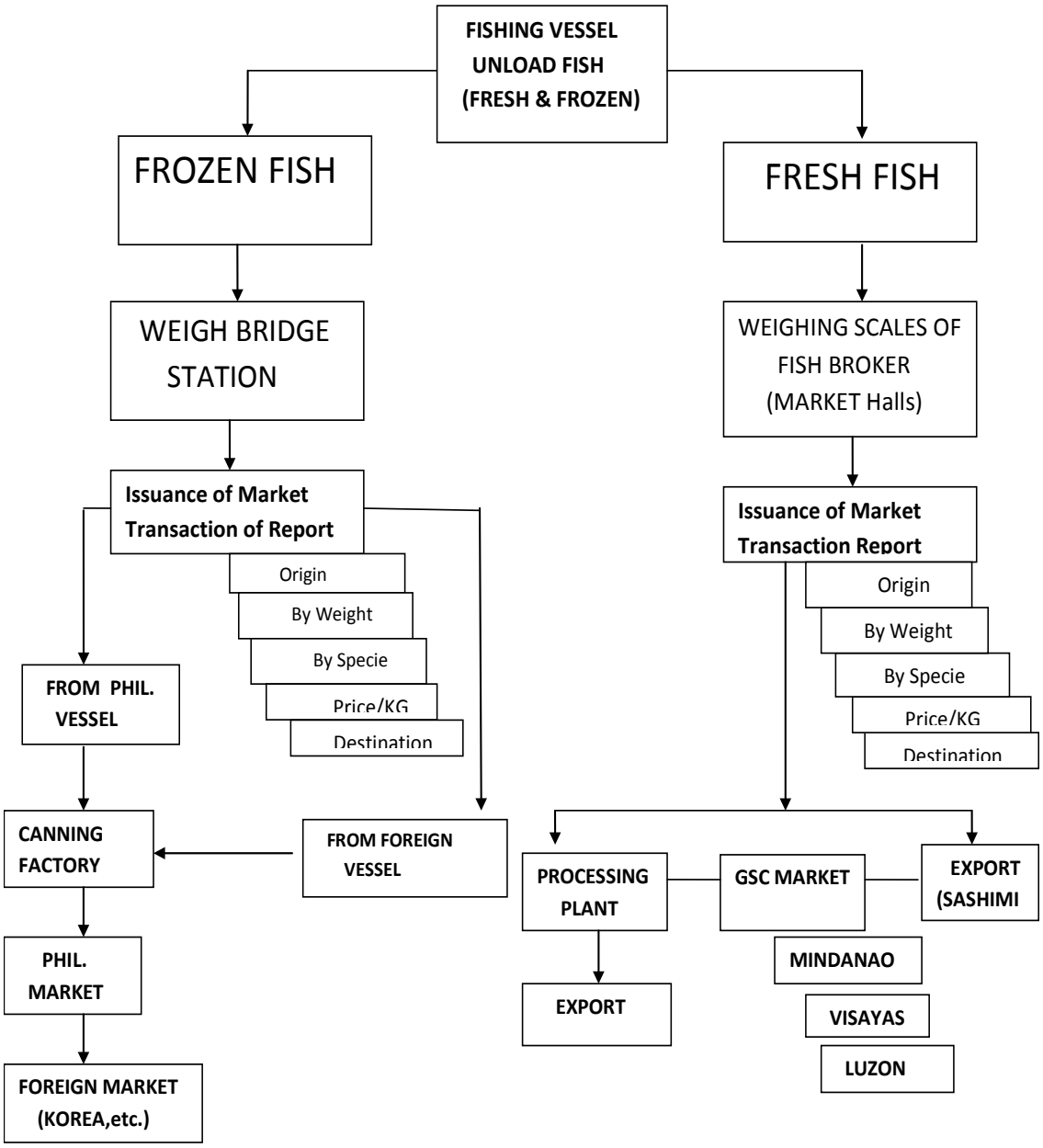
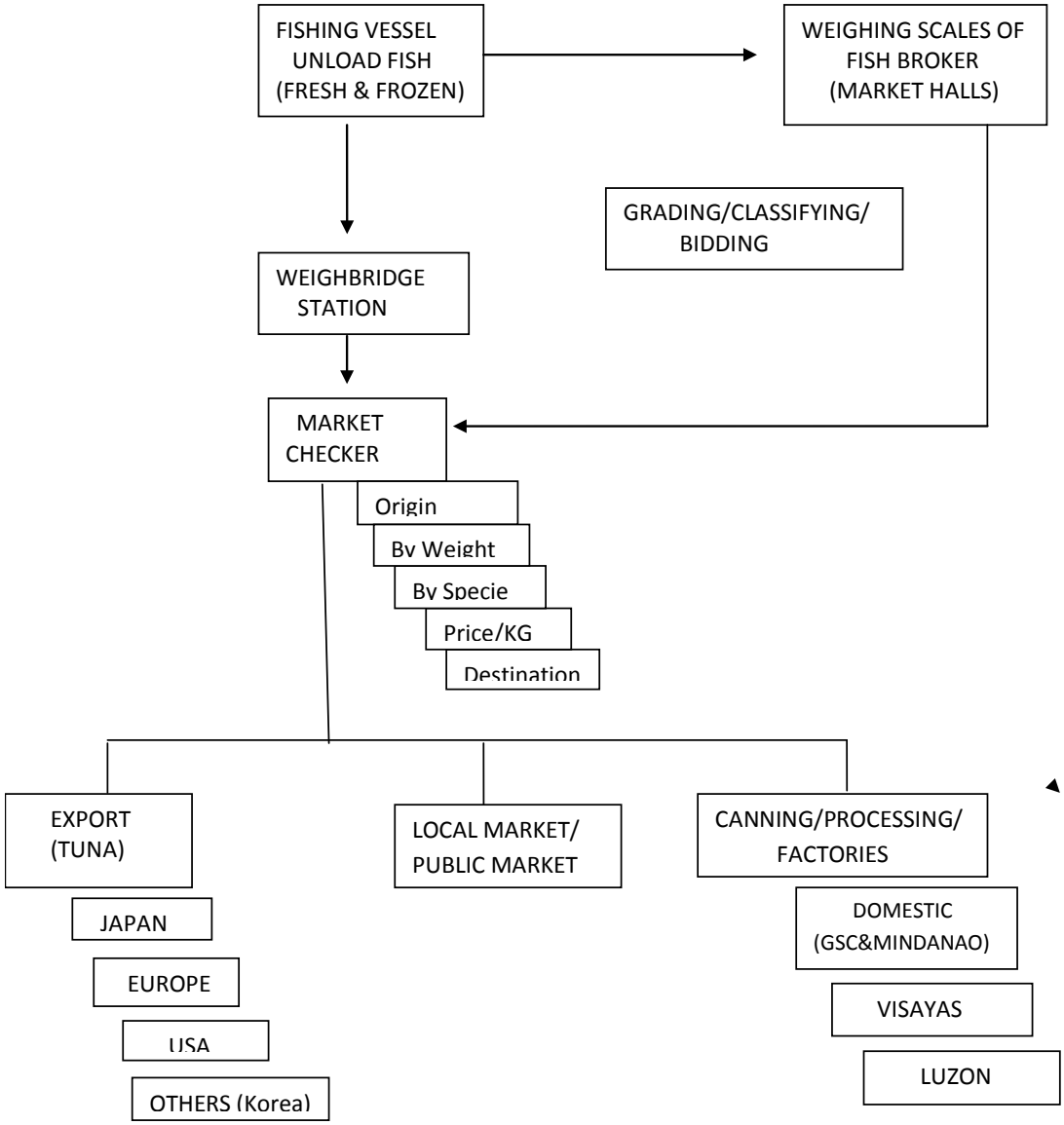


FIGURE 3.

FISH UNLOADING
FLOW CHART



Annex B


General Santos tuna catch
General Santos port activities
Port visit and consultation with the fishing industry
WELCOME
Project Leaders
Regional Workshop

PRELIMINARY ASSESSMENT OF THE HANDLINE FISHERY IN BICOL REGION, PHILIPPINES

Report Prepared for the "Preliminary Assessment of the Handline (Banca) Fisheries in the Philippines" (FIS/2009/033), Project funded by the Australian Centre for International Agricultural Research (ACIAR)

Prepared by the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Bureau of Fisheries and Aquatic Resources (BFAR) National Fisheries Resources and Development Institute, and BFAR Region V

July 2011

Australian Government
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Prepared for the Australian Centre for International Agricultural Research
July 2011

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Executive Summary

This Report provides a preliminary assessment of the handline fishery in the Bicol Region, particularly in Barangay Sabang, San Jose, Camarines Sur; Barangay Nato, Sagñay, Camarines Sur; Sugod, Tiwi, Albay; and Tabaco City, Albay. The handline fishery in the region is mostly municipal in character. Four types of handlines are observed in the region: simple handline, jigger, multiple handlines or multiple hook and lines, and troll lines. The most common of these handlines are the simple handline or drop line, comprising 82% of the total number of handlines sampled from September 2009 to August 2010. For simple handline, yellowfin (*Thunnus albacares*) is the major species caught which comprises 48% of the total catch. Jiggers target squids and octopus. Multiple hook and line mostly catch tuna, particularly yellowfin tuna. For troll line, skipjack (*Katsuwonus pelamis*) is the major species caught which comprises 87% of the total catch for the observed year.

The management of municipal handline fishery is embodied mostly in local fisheries ordinances which adhere to the Philippine Fisheries Code. Although these ordinances are not specific to handline fishing, some of the measures adopted in these ordinances are relevant for the sector, such as the registration of fisherfolks, licensing of vessels and gears, and various measures such as closed seasons and areas, marine protected areas, fish length and size regulations, and mesh size requirements.

A number of concerns have been raised by municipal handline fisheries stakeholders in the Bicol region. These issues mainly focus on competition with other gear users, lack of effective law enforcement, absence of search and rescue programs, inadequate sources of capital, lack of cooperation amongst fishermen, and the need for alternative livelihoods. The most common concern amongst handline fishermen in the region is the decline in catch production caused by overfishing attributed to vessels using other gears such as bagnets and ringnets. Medium to large scale commercial vessels have been reported to either fish illegally in municipal waters, or just outside the 15-km limit, catching tuna which is supposed to be caught by handline vessels.

Despite numerous challenges, there are a number of opportunities for the municipal handline fishing sector. These opportunities include additional investment, particularly in establishing icing and post-harvest facilities, certification of the handline fishery as a sustainable fishery, exploring alternative livelihoods, promoting a regional focus on fish trade, strengthening community-based enforcement, provision of stricter fisheries penalties, and the advancement of the principle of 'cooperativism'. A number of priority research and training needs for future collaboration were also identified to assist in the development of the handline sector. These research and training needs are:

- Study on the seasonality of tuna and tuna like species, their habitat and biological characteristics;
- Research on FADs, their impact on tuna fishing, and better design of FADs to improve tuna catch;
- Effects of different handline hooks on species caught in various water depth;
- Study on modern technology to improve fishing operations;
- Impact of climate change on fisheries in the Bicol region;
- Training to promote safety of life at sea, including GPS and compass reading;
- Proper catching, killing and bleeding of tuna and tuna like species, and other commercial species;
- Preservation of the quality of fish, proper handling and storage of fish (e.g. desired freezing temperature); and
- Proper sizing and grading of tuna.

Acknowledgments

The Project Members would like to acknowledge the helpful assistance of the Bureau of Fisheries and Aquatic Resources (BFAR) Region V, the local governments of Barangay Sabang, San Jose, Camarines Sur; Barangay Nato, Sagñay, Camarines Sur; Sugod, Tiwi, Albay; and Tabaco City, Albay; and the handline fishing industry of the Bicol Region. In particular, we would like to thank Regional Director Dennis V del Socorro and Assistant Regional Director Marjurie Grutas of BFAR Region V, as well as Atty Malcolm Sarmiento, Director of BFAR, and Atty Benjamin Tabios Jr, Assistant Director of BFAR, for their support to the project. Special credit is given to Ms Virginia Olano, Project Leader of National Stock Assessment Program (NSAP) Region V for her outstanding organisation and facilitation of the industry consultations and stakeholder workshop. The hard work of the ACIAR Project and NSAP Region V Enumerators, Ms Consorcia Leonidas, Ms Dahlia Bolor, Mr Orsui Bello, and Ms Rosemarie Bubuli, are also acknowledged, as well as the assistance of Mr DM Estramadura and Dr Lowell Bautista in the collection of field data.

We would like express our gratitude to the members of the handline fishing industry who have participated and provided substantial input into our consultations in March 2010. *From Brgy Sabang*, San Jose, Camarines Sur: Messrs. Tiboy Parola; Venencio Bermas; Oscar Barbado; Joseph Delfino; Marcelo Pano; Sebastian Capaso; Salvador Pano, Jr; Eddie Dadis; Andres Pano; Manuel Pano; Rolando Buenaflor; Josie Beringuela; Rudy Caceres; Eduardo Delfin; Romeo Paga; Jaime Pagal, Jr.; and Erwin Alde. From *Brgy Nato*, Sagñay: Messrs. Eddie Cope; Pascua Aquino; Erick Miranda; Agustin Clarina; Rodel Clarina; Rudy Coralde; Manuel Sical; Maximeno Aquino; Efren Paga; and Jovi Cayao. From Brgy Bolangon: Mr Marlon Noga; Mr Rolly Noga; and Ms Rosalinda Bogate. From *Brgy Atulayan*, Messrs Sixto Esminda; Helario Buenavente; Emilio Buenavente, Jr.; Rodolfo Perico; Fabiana Pollo; Juan Pacay; and Sonny Sadsad; Sophronio (Bong) Briguera; Paulino Camatoy Jr; Jaime Coralde; Herman Cano; Andres Olaño Jr; and Arceli Coral. From *Sugod, Tiwi, Albay*: Messrs Antonio Cericos; Eduardo Bragais; Ulyses Clutario; Jaime Madrelijos; Ronel Cuate; Noli Imperial; Nenita Clet; Marcelino Coprada; Sofronio Kallos Jr; Paulo Dacuya; Mario Clerigo; Carlo Cericos; Nimrob Bobis; Joey Clerigo; Elmer Clutario; Jose Oraa; Herson Bragais; and Nenette Clapis. From *Tabaco City, Albay*: Arnulfo Chavenia; Vicente Bornilla; Rudy Burus; Virgilio Berlon; Joey Piol; Christopher Bron; Martin Balaguer; Orlando Bañadero; Edwin Bora; Ramon Brutas; Mario Banadera; Carmelita Britanico; Nino Bonaobra; Ruben Botaloa; Edwin Bien; Ronald Villania; and Domingo Banzagales.

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PRELIMINARY ASSESSMENT OF THE HANDLINE FISHERY IN BICOL REGION, PHILIPPINES

Report Prepared for ACIAR-funded Project entitled "Preliminary Assessment of the Handline (Banca) Fisheries in the Philippines" (FIS/2009/033)

1. Introduction

Handline fishing is a traditional method of fishing using different types of hook and line and bancas, the latter more commonly known as pump boats in the Philippines. Similar handline fishing methods have been practiced for thousands of years in the Philippines and the Pacific, and remain the most common type of fishing in both municipal and commercial fishing sectors in the country. A national census on fisheries conducted in 2003 indicates that there are about 9.45 million sets of handline gears in municipal waters (within 15 km from the coast), which is more than double the total number of other gears set in these waters. This number represents a 300% increase from 1980. Hook and line is also the most common fishing gear used amongst commercial fishers, totalling 54,000 sets deployed in 2003. Similar to municipal hook and line, this number has increased significantly, from 2,655 commercial handline gears in 1980 (National Statistics Office, 2005).

Hook and line fishing exists in all fishing grounds in the Philippines, within the archipelagic waters, territorial sea, and the exclusive economic zone (EEZ). Handline fisheries target a number of species, including commercially significant species such as tuna. It is estimated that there are more than 3,000 Philippine handline vessels or pump boats fishing for tuna alone. This number of vessels equates to tens of thousands of fishers directly involved in the fishing activity, and to millions of people who depend on the handline fisheries for both subsistence and in the downstream fishing economy.

The economic importance of the handline fishery in the Philippines is increasingly threatened by declining fish stocks, illegal fishing, competition with other gear users, environmental factors (such as climate change), and increasing regulatory measures. Declining fish stocks are leading to problems in the handline fisheries, such as smaller-sized fish and longer fishing trip lengths. Unfortunately, information about the handline fisheries of the Philippines is poor and there are inadequate management arrangements in place. For a number of years, handline fishing vessels could neither be classified as municipal or commercial fishing vessels, because of the nature of their operations. This created a gap in the regulatory framework to manage such fisheries. The enactment of Republic Act 9379, or the Handline Fishing Law, in 2007 allowed for regulations for handline fishing vessels that took into account their unique characteristics. However, implementing rules and regulations on the registration and licensing of handline fishing vessels have yet to be agreed upon and the sector has remained unable to enjoy the benefits of these regulations that would assist in development and competitiveness of handline fishing, as well as ensure the safety and seaworthiness of the fishing vessels. There is therefore an urgent need to improve the management regime for the handline fishery to prevent further negative economic and social impacts.

This Report provides a preliminary assessment of tuna handline fishing in Bicol Region, specifically in four areas: (1) Tabaco City, Albay; (2) Sugod, Tiwi, Albay; (3) Nato, Sagñay, Camarines Sur, and (4) Sabang, San Jose, Camarines Sur. It examines the nature of tuna handline fisheries in the area, the socio-economic aspect of handline fishing sector, and the legal and policy framework to manage handline fishing in the region. It presents a synthesis of the various studies: the outcome of sampling landings of the handline fisheries, conducted from September 2009 to August 2010; the interviews with relevant stakeholders conducted in March 2010; the legal and policy study on the fishery; and, the outcome of the stakeholder workshop conducted in May 2011. This Report further summarizes

issues for the tuna handline fishing industry and highlights prospects for the development and effective management of the handline sector. It also provides the context upon which the project on the preliminary assessment on handline fisheries in the Philippines was developed with the assistance of the Australian Government.

2. The ACIAR Project on Handline Fishing: Background, Aims and Methodology

The legal and policy framework for the management of Philippine (and Indonesian) fisheries, focusing on illegal, unreported and unregulated (IUU) fishing was first investigated by the University of Wollongong from 2000-2006 with funding assistance from the Australian Centre for International Agricultural Research (ACIAR). During the project, the handline fishery was identified as a specific area of concern in relation to fisheries assessment, management and compliance, particularly with respect to the lack of adequate information on the sector and the inadequacy of existing regulations to address the unique characteristics of handline fishing vessels.

Upon consultations with the Bureau of Fisheries and Aquatic Resources (BFAR) in 2008, the current project was proposed to ACIAR which aims directly monitor catch composition of the handline vessels, examine some of the socio-economic aspects of the sector, and identify major issues and constraints in effectively managing the fishery. This Project was then developed to provide new information concerning the Philippine handline fishery which will assist in applying long-term improvements in its policy and management frameworks. It also aims to fill some of the gaps in data collection to support the BFAR National Stock Assessment Program.

There are three specific objectives of the ACIAR Project on Handline Fishing. The first objective is to investigate the nature of handline fishery in select regions in the Philippines using existing data and port sampling. The second objective is to benchmark the legal framework for the hand-line fisheries against national and international obligations and best practice. The third objective is to identify opportunities, challenges and information gaps in developing a management plan for this fishery.

To achieve the aims of this research project, field studies have been conducted in three regions: Region V, VIII, and XII. Specific sites in these regions have been selected on the basis that they either do not have, or have significant data gaps on handline fishery. Two new enumerators have been appointed in each region for a period of 12 months to collect catch and other fisheries data. The Project Team, comprising staff from the UOW Australian National Centre for Ocean Resources and Security (ANCORS) and the National Fisheries Research Development Institute (NFRDI), and Regional Offices of BFAR also consulted with and interviewed members of the fishing industry, including handline fishers, vessel owners and operators, company owners, fish distributors, and port and fisheries officials to ascertain the legal and economic challenges confronting the handline fishery. Post harvest activities of the handline sector were also observed during field visits. The field research is supplemented by an examination of the provincial and national laws and regulations, as well as regional and international instruments governing handline fishery in the Philippines. Workshops involving the industry and government officials in key fishing ports were also held to present preliminary findings and investigate management opportunities and challenges, as well as develop mechanisms and pathways for the adoption of an effective management regime for the handline fishery in the Philippines.

Among the selected project sites is the Bicol Region, focusing on four areas: (1) Tabaco City, Albay; (2) Sugod, Tiwi, Albay; (3) Nato, Sagñay, Camarines Sur, and (4) Sabang, San Jose, Camarines Sur. These areas are known to have considerable municipal tuna handline fishing operations in the entire region, but with sparse data record. Enumeration was therefore necessary to collect additional

information on the fishery and support the activities of the National Stock Assessment program in Region V.

3. The Bicol Region

The Bicol Region, or Region V in the administrative regions of the Philippines, is located at the southernmost tip of Luzon. The area is bounded on the north by Lamon Bay, Pacific Ocean on the east, the Sibuyan Sea and Ragay Gulf on the west. It is also connected by land to Luzon through the Quezon province. Not only does the region have a significant land area (about 17,632 square kilometers), it also has a long coastline. The Bicol Region stretches towards the Pacific Ocean for more than 160 miles.

The region is composed of four provinces: Albay, Camarines Sur, Camarines Norte, and Sorsogon, including two island provinces of Catanduanes and Masbate. It has seven cities, namely, Legazpi, Naga, Iriga, Tabaco, Ligao, Sorsogon, and Masbate. In addition, the region is politically subdivided into 107 municipalities, and more than 3,000 barangays, many of which are in coastal areas. The total population of the Bicol region is estimated at five million people as at 2007.

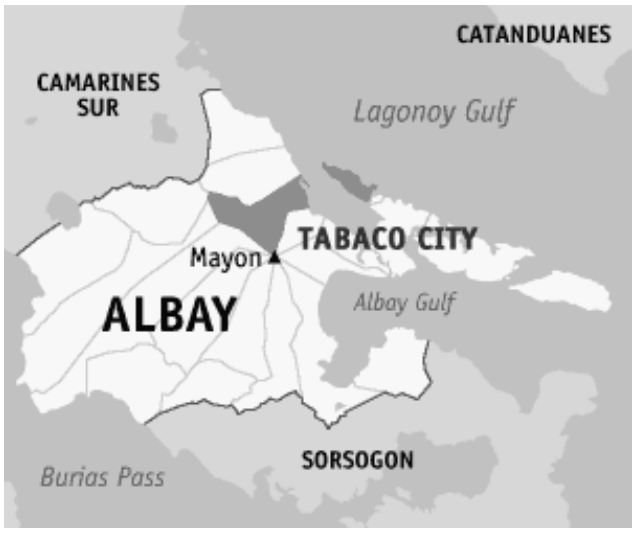

Figure 1. Map of the Bicol Region

The following section describes the municipal jurisdiction of the four project sites.

The City of Tabaco is located on the eastern coast of the province of Albay and includes San Miguel island, an island located at the western end of a strip of islands in the Lagonoy Gulf. There are 47 barangays comprising the city, and five barangays are located on the island. Tiwi, Albay is one of the more progressive municipalities of the region and Sugod is one of its 25 barangays. Similarly, Sagñay is one of the municipalities of Camarines Sur, with Nato as one of its 19 barangays. San Jose is another municipality in Camarines Sur, with Sabang as one of the 29 barangays included in its jurisdiction. Most of the municipal waters of these project sites, with a breadth of 15 kilometres from the coast, are further classified into zones. Municipal waters are classified as: Zone 1, Fishing Zone; Zone II, Ecotourism Zone; Zone III, Fishery Management Zone; and Zone IV, Trade and Navigational Zones. For purposes of coastal zone management, the municipal waters is classified into three coastal zones: Zone I, Aquaculture and Mariticulture Zone; Zone II, Industrial Zone; and Zone III, Marine Sanctuary/Research and Experimental Zone.

The metes and bounds of municipal waters are clearly provided in local fishery ordinances. For example, the municipal waters of Tabaco City comprises the Tabaco Bay and Lagonoy Gulf; San Miguel Island; Natunawan Peninsula; tidal waters, including marshes and swamps, as well as rivers within the city. In the case of Tiwi, the municipal waters covers 24,000 hectares including a portion of the Lagonoy Gulf, rivers, tidal waters, streams and creeks, from Barangay Baybay to Mayong, Albay.

In general, municipal waters is reserved for the preferential use of municipal fisherfolks and their organisations. However, small and medium scale commercial fishing vessels may be allowed to operate within the 10.1 to 15 kilometers (km) limit of the municipal water, subject to permission by the local government. No commercial fishing is allowed within municipal waters with depth of less than seven fathoms.

4. Fisheries in the Bicol Region

The surrounding waters of the Bicol Region, particularly the Lagonoy Gulf, are one of the major fishing grounds in the Philippines. Not only is the area known for its fisheries resources, it is also known as a habitat of ecologically important marine resources such as marine mammals.

Fishing activities in the Bicol region mainly comprise municipal fishing, including fishing for sustenance and fishing in shallow areas. However, small to medium scale commercial fishing are also conducted in coastal waters. Municipal fishing in Bicol accounts for 137,168 metric tonnes (MT); while commercial fishing only produced 58,882 MT and aquaculture, 67,049 MT in 2008. Together, fisheries production in the region comprises five per cent of the total fisheries production in the Philippines. This production is translated to PhP7.2 billion in terms of value for municipal fisheries and PhP2.4 billion for commercial fisheries. These values show the significance of municipal fishing in the region, compared to other regions in the Philippines.

In order to determine the extent of the handline fishery in the Bicol Region, two project enumerators were hired to gather data from September 2009 until August 2010 in the four project sites. Each of the enumerators was tasked to conduct port sampling in two project sites. Table 1 summarises the data collected in the four project sites in the Bicol region.

Table 1. Summary of Port Sampling Data Collected in Region 5, Sept 2009-Aug 2010

Note that 0MT includes any weight <1MT.

					TOTAL UNLOADINGS		TOTAL SAMPLED				
Landing Center	Month/ Year	Gear	Days Sampled	%	Trips	MT	Trips	%	MT	%	LFRQ
Brgy. Sabang, San Jose, Camarines Sur	Sep-09	Handline	20	67	246	11	142	58	11	100	599
	Oct-09		20	65	296	6	234	79	6	100	613
	Nov-09		20	67	212	2	157	74	2	100	183
	Dec-09		21	68	169	1	125	74	1	100	144
	Jan-10		21	68	151	2	92	61	2	98	58
	Feb-10		19	68	233	3	149	64	3	100	49
	Mar-10		21	68	296	2	161	54	2	99	63
	Apr-10		20	67	491	8	328	67	8	100	246
	May-10		21	68	213	4	161	76	3	81	131
	Jun-10		20	67	175	4	145	83	4	98	132
	Jul-10		20	65	156	3	153	98	3	100	152
	Aug-10		20	65	106	2	106	100	2	100	50
Brgy. Sabang, San	Nov-09	Jigger	11	3	1	0	1	100	0	0	0
	Jan-10		2	6	2	0	2	100	0	0	0

Jose, Camarines Sur	May-10		1	3	1	0	1	100	0	0	0
	Jun-10		6	20	28	0	7	25	0	0	0
	Jul-10		13	42	69	1	69	100	1	100	0
	Aug-10		10	32	53	0	53	100	0	0	0
Brgy. Sabang, San Jose, Camarines Sur	Sep-09	Multiple Hook & Line	8	27	15	0	15	100	0	0	0
	Oct-09		5	16	10	0	10	100	0	0	0
	Dec-09		1	3	1	0	1	100	0	0	0
	Jan-10		8	26	39	0	29	74	0	0	28
	Mar-10		3	10	5	0	5	100	0	0	0
	Apr-10		1	3	2	0	2	100	0	0	0
	May-10		8	26	18	0	17	94	0	0	43
	Jun-10		10	33	53	0	52	98	0	0	6
	Jul-10		11	35	63	0	63	100	0	0	45
	Aug-10		19	61	114	0	109	96	0	0	113
Nato, Sagñay, Camarines Sur	Sep-09	Handline	16	53	215	10	211	98	10	100	255
	Oct-09		21	68	236	5	235	99	5	100	445
	Nov-09		20	67	160	2	157	98	2	100	191
	Dec-09		16	52	38	0	37	97	0	0	30
	Jan-10		17	55	87	2	82	94	2	100	89
	Feb-10		18	64	93	2	92	99	2	98	69
	Mar-10		16	52	79	0	75	95	0	97	78
	Apr-10		13	43	35	0	34	97	0	0	6
	May-10		15	48	27	0	27	100	0	0	16
	Jun-10		15	50	30	0	30	100	0	0	17
	Jul-10		10	32	22	0	21	95	0	99	5
	Aug-10		16	52	35	0	34	97	0	99	7
Nato, Sagñay, Camarines Sur	Dec-10	Jigger	4	13	7	0	7	100	0	0	0
	Jan-10		2	6	3	0	3	100	0	0	0
	Feb-10		3	11	6	0	6	100	0	0	0
	Apr-10		1	3	1	0	1	100	0	0	0
	May-10		6	19	10	0	10	100	0	0	0
	Jun-10		3	10	5	0	5	100	0	0	0
	Jul-10		6	19	8	0	8	100	0	0	0
	Aug-10		5	16	5	0	5	100	0	0	0
Nato, Sagñay, Camarines Sur	Sep-09	Multiple Hook & Line	5	17	8	0	8	100	0	100	24
	Oct-09		1	3	1	0	1	100	0	100	40
	Nov-09		1	3	1	0	1	100	0	0	0
	Dec-09		5	16	8	0	6	75	0	82	100
	Mar-10		1	3	1	0	1	100	0	100	6
	Apr-10		3	10	5	0	4	80	0	100	13
	May-10		2	6	3	0	3	100	0	93	23
	Jun-10		4	13	6	0	6	100	0	100	18
	Jul-10		12	39	21	0	21	100	0	100	25
	Aug-10		10	32	27	0	27	100	0	100	16
Sugod, Tiwi, Albay	Sep-09	Handline	20	67	478	24	462	97	23	96	791
	Oct-09		14	45	195	7	195	100	7	98	528
	Nov-09		17	57	380	11	380	100	11	100	549
	Dec-09		10	32	119	3	113	95	3	98	133
	Jan-10		20	65	266	5	187	70	5	100	365
	Feb-10		19	68	328	9	231	70	9	98	321
	Mar-10		21	68	153	2	138	90	2	100	398
	Apr-10		19	63	236	10	205	87	10	97	413
	May-10		21	68	235	4	183	78	4	100	239
	Jun-10		19	63	278	5	194	70	5	99	224
	Jul-10		20	65	241	4	233	97	4	100	230
	Aug-10		20	65	202	4	197	98	4	100	178
Sugod, Tiwi, Albay	Sep-09	Multiple Hook & Line	16	53	113	1	111	98	1	60	825
	May-10		4	13	15	0	8	53	0	100	18
	Jun-10		12	40	53	0	31	58	0	100	13
	Jul-10		1	3	9	0	9	100	0	100	17
	Aug-10		13	42	86	0	86	100	0	100	432
Sugod, Tiwi, Albay	Sep-09	Troll line	1	3	11	0	11	100	0	100	35
	Oct-09		11	35	99	1	96	97	1	97	357

	Nov-09		12	40	94	2	93	99	2	99	385
	Dec-09		18	58	209	2	195	93	2	100	497
	Jan-10		4	13	9	0	6	67	0	100	16
	Apr-10		2	7	34	0	33	97	0	100	147
Tabaco City, Albay	Sep-09	Handline	20	67	253	33	105	42	33	100	830
	Oct-09		21	68	213	12	84	39	12	99	454
	Nov-09		14	47	113	7	66	58	7	100	186
	Dec-09		20	65	115	4	55	48	4	99	108
	Jan-10		17	55	79	3	43	54	3	100	66
	Feb-10		19	68	120	9	84	70	9	100	87
	Mar-10		20	65	87	7	58	67	7	95	104
	Apr-10		20	67	125	10	81	65	10	99	176
	May-10		20	65	109	7	66	61	7	99	141
	Jun-10		20	67	180	12	78	43	12	99	121
	Jul-10		21	68	127	7	51	40	8	100	98
	Aug-10		21	68	95	5	61	64	5	100	59

The port sampling activities not only provided significant data for the ACIAR Project but also contributed to the National Stock Assessment Program (NSAP) of BFAR. The main objective of NSAP is to strengthen the data collection and verification system in the country in order to obtain a better assessment of fish stocks in the country which will lead to a more effective fisheries management.

4.1. Overview of Handline Gears

Handline gear is one of two types of line gears. It is defined as long simple lines with a small series of baited hooks requiring constant attention. There are different types of handlines, namely: a) simple handlines or drop lines (Hl); b) multiple handlines (MHL); c) jiggers; d) pole and lines (PL); and e) troll lines (TL).

A simple handline or drop line is defined as a single vertical line carrying one of two barbed hooks and works by simply dropping it into the water and waiting for fish to bite. A multiple handline or multiple hook and line is a handline gear with a single vertical line and a small series of barbed hooks attached by spreaders at regular intervals. Jiggers are lines, each bearing a multiple hook device, which works by jerking it up and down under a bright light, making the hook lures attractive primarily to squids. Pole and lines are handlines attached to a pole or poles used with baits of all kinds. Lastly, troll lines are long handlines, fixed horizontally with a hook or hooks at the free end, baited either with a natural bait or an artificial lure, and the whole arrangement drawn or towed behind a boat underway.

Based on the data gathered in the project sites of Region V, four types of handlines were observed. These are the simple handline, jigger, multiple handlines or multiple hook and lines, and troll lines. The graph below shows the percentage catch contribution using different types of handlines in Region V. The type of handline that has produced most catch is simple handline or drop line (82%), followed by jigger (9%), multiple hook & line (5%), and troll line (4%).

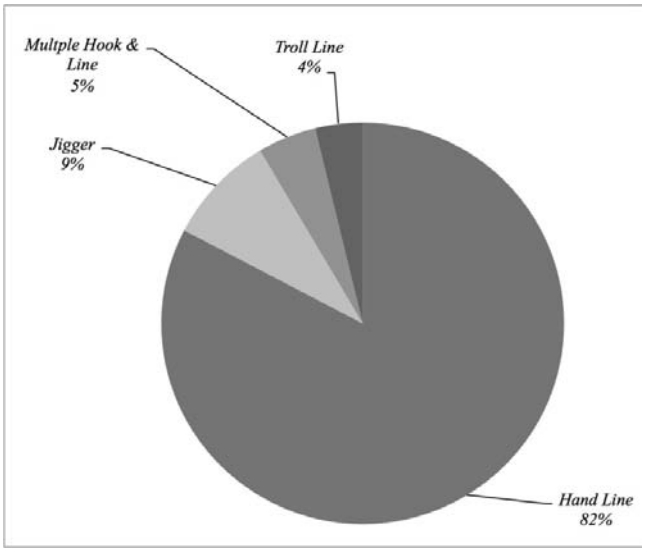

Figure 2. Catch Percentage by Handline Gears, Sept 2009-Aug 2010

The succeeding section further examines the catch composition, size composition, and catch and effort data for the handline fishery in the Bicol Region. The data collected were encoded and integrated into the NSAP Database system version 5.1, from which reports of processed data were generated. Biological and socio-economic data specific to handline fishery in the four project sites are very limited prior to the port sampling conducted in this Project.

4.2 Catch Composition

Handlines or Drop Lines

For simple handline, yellowfin (*Thunnus albacares*) is the major species caught which comprises 48% of the total catch as observed for one year. The rest of the catch is composed of albacore (*Thunnus alalunga*), 35%; skipjack (*Katsuwonus pelamis*), 5%; dolphinfish (*Corypheana hippurus*), 4%, sailfishes (*Istiophorus platypterus*), 2% and other species, 6%.

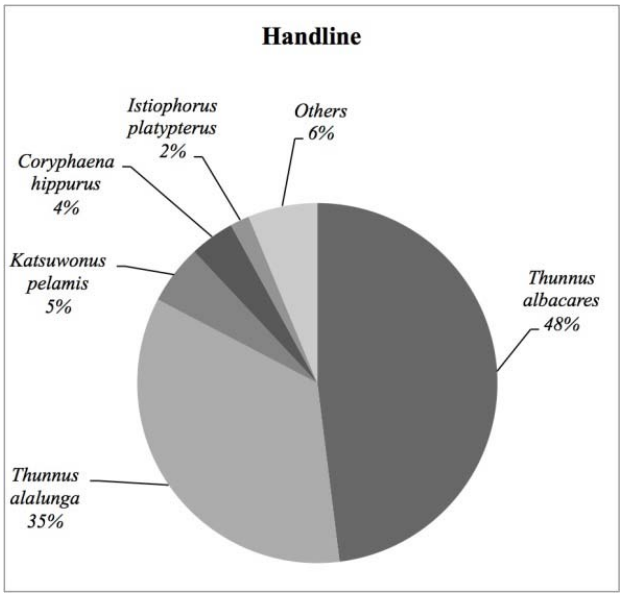

Figure 3. Catch Composition for Handline Fishing Gear, Region V, Sept 2009-Aug 2010

Jigger

For jiggers, which targets squids and octopus, the major species of squid caught are Loligo species, 37%; Sepia species, 27%; and Sepioteuthis species, 2%. The rest of the catch comprises octopus species (34%).

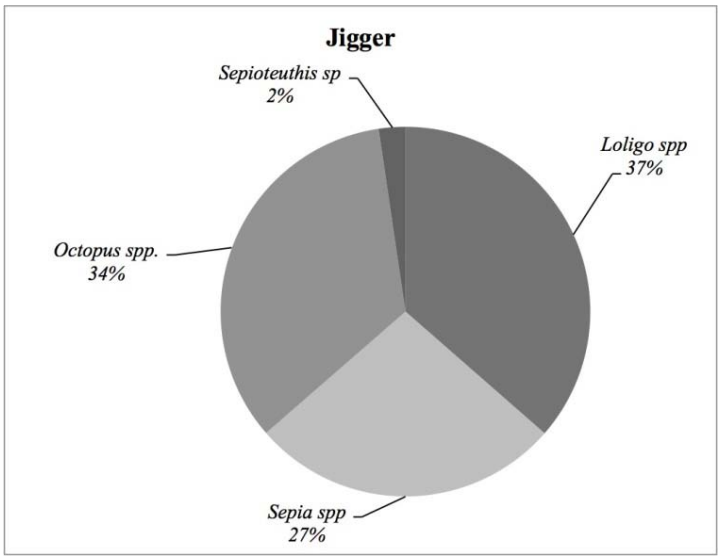

Figure 4. Catch Composition for Jiggers, Region V, Sept 2009-Aug 2010

Multiple Hook and Line

For multiple hook and line, yellowfin (*Thunnus albacares*) is the major species caught which comprises 34% of the total catch as observed for one year. The rest of the catch comprises bigeye scad (*Selar crumenopthalmus*), 26%; skipjack tuna (*Katsuwonus pelamis*), 19%; frigate tuna (*Auxis thazard*), 7%; longtail tuna (*Thunnus tonggol*), 3% and other species, 11%. The other species would include neritic tunas and other small pelagic fishes.

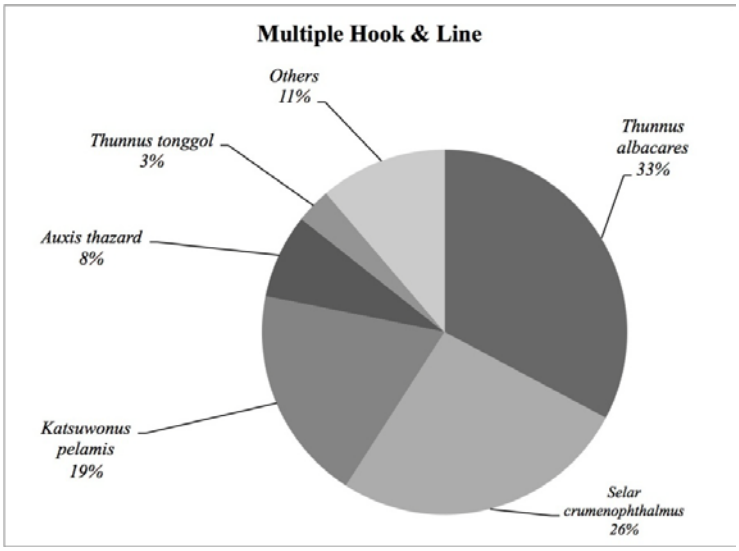

Figure 5. Catch Composition for Multiple Hook and Line, Region V, Sept 2009-Aug 2010

Troll line

For troll line, skipjack (*Katsuwonus pelamis*) is the major species caught which comprises 87% of the total catch as observed for one year. Other catch includes dolphinfish (*Corypheana hippurus*), 10%; yellowfin tuna (*Thunnus albacares*), 2%; and marlin (*Makaira mazara*), 1%.

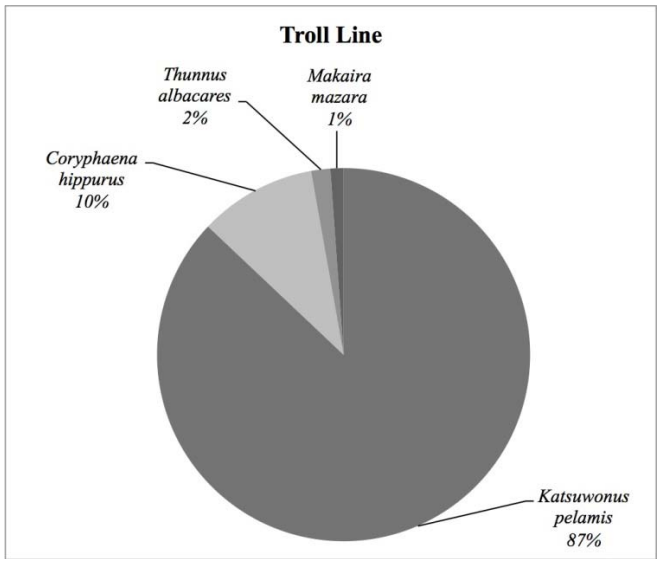

Figure 6. Catch Composition for Troll Lines, Region V, Sept 2009-Aug 2010

4.3 Size Composition

This section presents the size composition of fish caught using different handline gears in the Bicol Region.

Handline(HL)

Available length frequency data for the handline fishery were compiled for the Bicol Region from September 2009 to August 2010. Length frequency distribution consists of the actual number of yellowfin and albacore tuna measured. Based on the data, handline fishermen in the Bicol Region catch yellowfin tuna ranging from 38-170 cm, while the size of albacore tuna caught ranges from 80cm to 120 cm. The dominant length of yellowfin tuna caught by handline fishermen are 125cm to 140cm and 89cm to 98cm for albacore tuna. These dominant length sizes are generally bigger than the length sizes of yellowfin tuna unloaded in General Santos City.

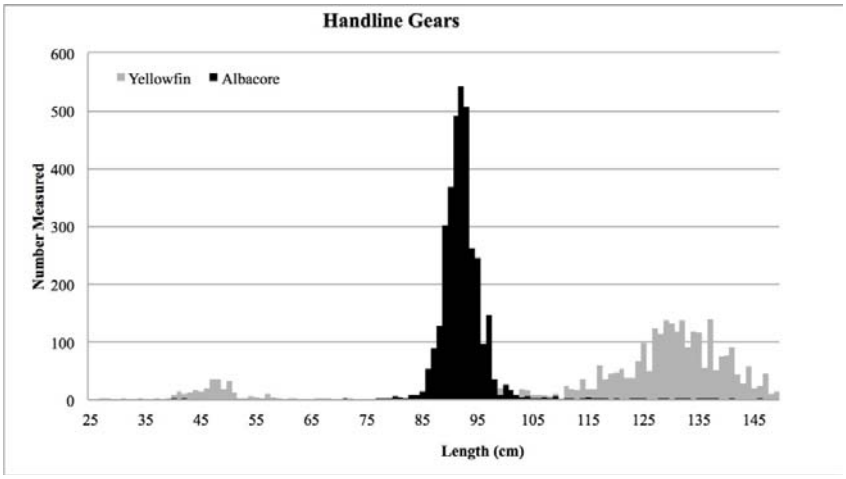

Figure 7. Length Sizes of Yellowfin and Albacore Tuna Caught, Region V, Sept 2009-Aug 2010

Multiple Hook and Line (MHL)

The available length frequency data for multiple hook and line from September 2009 to August 2010 were also compiled. Length frequency distribution consisted of the actual number of skipjack tuna measured. Based on the data collected, multiple hook and line gears in the Bicol region catch skipjack tunas ranging from 13cm to 50cm. The dominant length sizes of skipjack tuna caught by MHL ranges from 15cm to 20cm. The dominant length of skipjack tuna unloaded by multiple hook and line was observed to be smaller than the dominant length sizes of skipjack tuna caught by troll line gear.

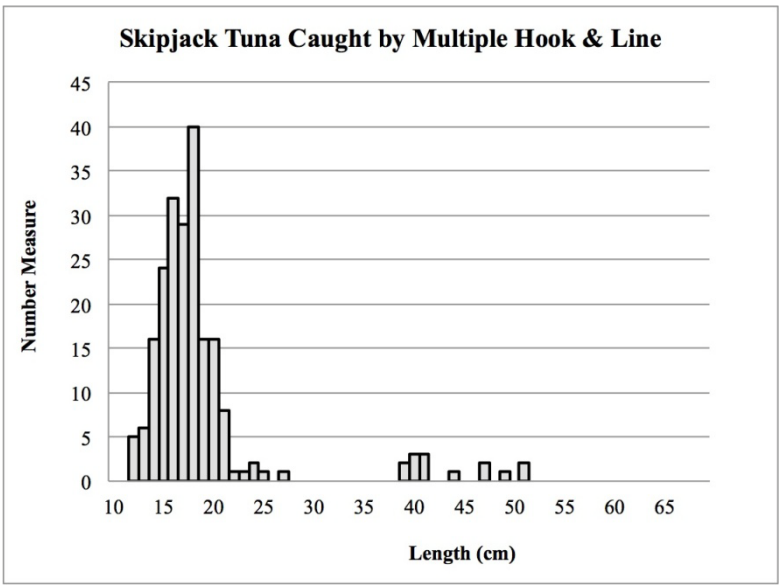

Figure 8. Length Sizes of Skipjack Tuna Caught in Multiple Hook and Line Gears, Region V, Sept 2009-Aug 2010

Troll Line (TL)

The length frequency of species caught by troll lines in the Bicol region from September 2009 to August 2010 was also compiled. As indicated earlier, the main species caught through this method are skipjack tuna. The data shows that troll lines in the project sites catch skipjack tunas ranging from 20cm to 70cm. The dominant length of skipjack tuna caught by troll line in this region ranges from 40cm to 45cm.

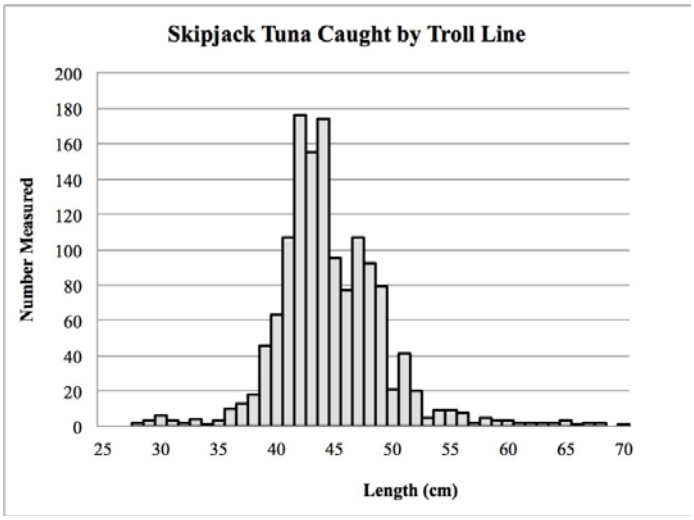

Figure 9. Length Sizes of Skipjack Tuna Caught in Troll Lines, Region V, Sept 2009-Aug 2010

4.4 Catch and Effort Data

This section summarises the catch and effort data for handline fisheries in the Bicol Region from September 2009 to August 2010.

Simple Handline

The handline gear in Bicol is one of the major fishing gears in the Philippines, targeting tunas and other pelagic fishes. The graph below shows the trends in catch per unit effort for simple handline or dropline in all four project sites in the Bicol region.

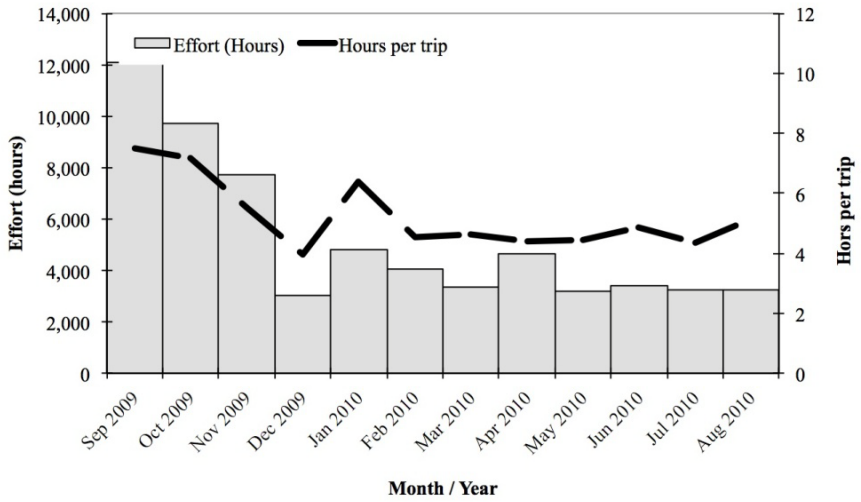

Figure 10. Monthly Effort (Hours) and Hours/Trip Using Simple Handline Gears, Region V, Sept 2009-Aug 2010

The total effort is recorded at 4,000 to 12,000 boat hours per month with the highest effort observed in September 2009 at the maximum 12,000 boat hours. This data corresponds to the highest CPUE catch for albacore tuna during that period. In general, the average effort is around 3,000 boat hours per month. The hours per trip ranges from five to seven hours, with the general average of five hours per trip recorded throughout the sampling period.

The next two graphs present the monthly CPUE for yellowfin and albacore tuna, the main species caught by simple handline gears.

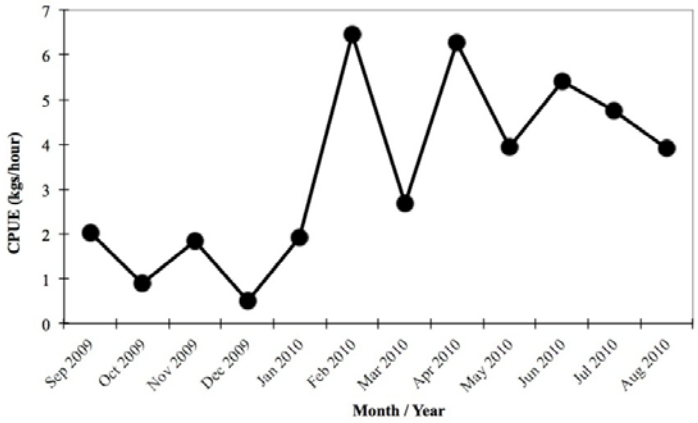

Figure 11. Monthly Yellowfin Tuna CPUE for Simple Handline Fishing Gears, Region V, Sept 2009-Aug 2010

It is observed from the above data that the CPUE for yellowfin tuna has fluctuated over the duration of the port sampling. The CPUE ranged from 0.5kg to 6.5kgs/trip-hour. There was a noticeable increase in the CPUE during the months of February and April 2010, while low catch rates have been experienced from September to November 2010, with the exception of albacore catch.

Figure 12 present the CPUE for albacore tuna from September 2009 to August 2010.

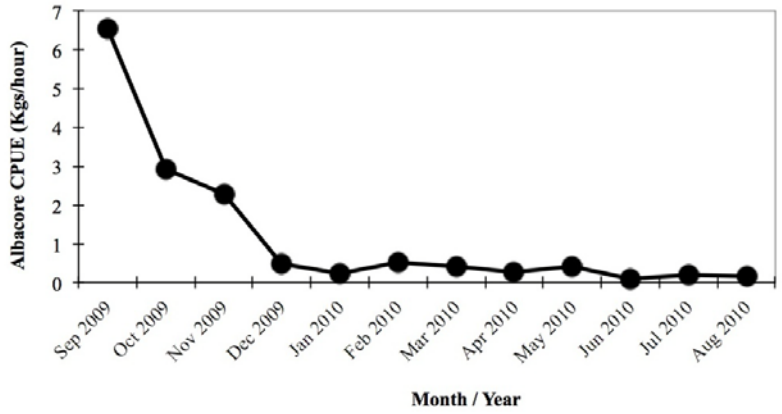

Figure 12. Monthly Albacore Tuna CPUE for Simple Handline Fishing, Region V, Sept 2009-Aug 2010

The CPUE for albacore tuna for the Bicol handline fleet ranges from zero to 6.5 kgs/trip-hour. It was observed that September 2009 had a very high CPUE for albacore tuna. After this period, the albacore CPUE began to drop to a period where it was very low, ranging from 0.2kg to 0.5kg/trip-hour. It was also observed that in the period when albacore tuna catch was high, the catch of yellowfin tuna was low. Based on field interviews, some fishers attributed the good catches of albacore to the volcanic activity of Mount Mayon. The said volcano erupted in December 2009 and good catches of albacore was experienced few months before the said eruption. Such abundance in the catch of albacore was not observed in previous years.

Jigger

Jigger in Bicol region is one of the major fishing gears in the Philippines, targeting squids and octopus. The following describes the available effort data and examines CPUE trends from September 2009 to August 2010.

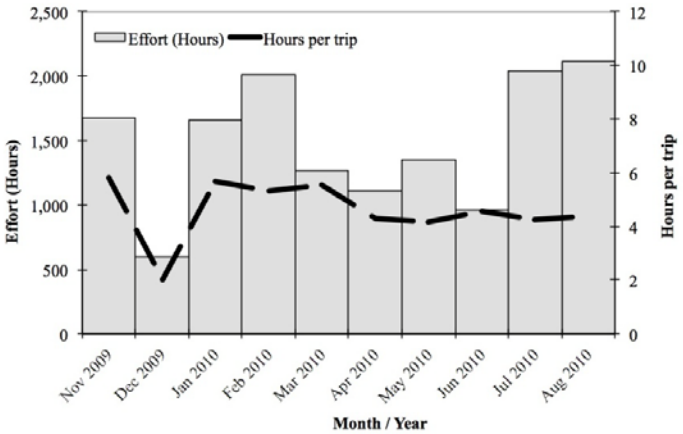

Figure 13. Monthly Effort (Days) and Days/Trip for Jiggers, Region V, Sept 2009-Aug 2010

The effort is observed at 600 to 2,000 boat-hours per month with the highest effort observed in February, July and August 2010 at around 2,000 boat hours. The average hours per trip of boats using this gear would be around four to five hours.

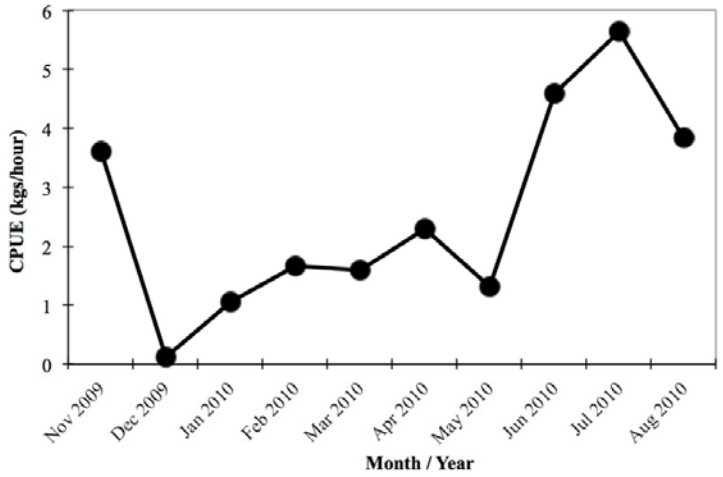

Figure 14. Monthly CPUE for Jigger Fishing, Region V, Sept 2009-Aug 2010

Based on collected data summarized in Figure 14, the highest CPUE was observed on July 2010 with 5.5kgs/trip-hour. The lowest CPUE was observed last December 2009 with almost zero catch. Good catch for jiggers was observed from June to August 2010, as shown by increasing CPUE trend.

Multiple Hook and Line

Multiple hook and line is another type of handline gear in the Bicol region which targets tunas and other pelagic fishes. Figure 15 presents the available effort data and trends in CPUE for MHL based in Bicol from September 2009 to August 2010.

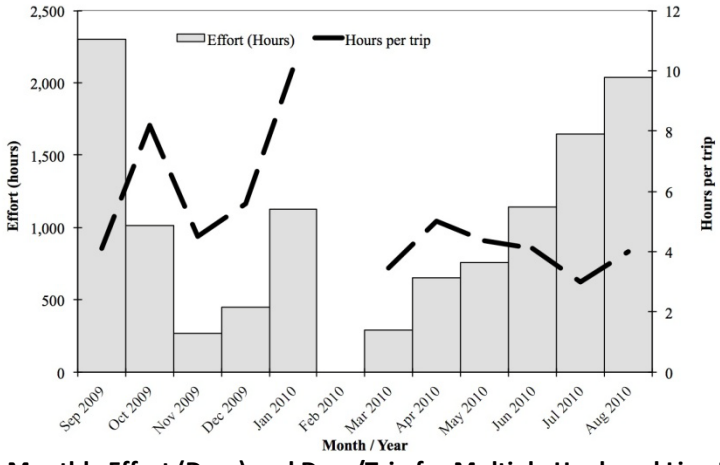

Figure 15. Monthly Effort (Days) and Days/Trip for Multiple Hook and Line Fishing, Region V, Sept 2009-Aug 2010

In multiple hook and line, the total effort ranges from 300 to 2,300 boat hours per month with the highest effort observed in September 2009 at the maximum 2,300 boat hours. Generally, there was a decreasing trend in effort (hours) from September to December 2009. However, an increasing trend in effort was observed from March to August 2010. Hours per trip ranges from three to eight hours with the sampling period. There was no recorded data for this gear for February 2010.

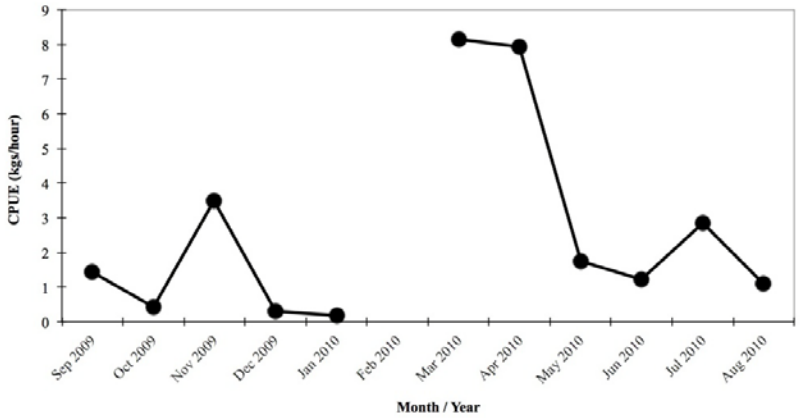

Figure 16. Monthly CPUE for Multiple Hook and Line Fishing, Region V, Sept 2009-Aug 2010

The highest CPUE for multiple hook and line fishing was observed on March 2010 at 8kgs/trip-hour, while the lowest CPUE was observed last January 2010 with almost zero catch. Good catches for multiple hook and line as shown with high CPUE index was observed during the months of March and April 2010.

Troll Line

The troll line gear is another type of handline gear observed in the Bicol region which targets tunas and other pelagic fishes. The following sections provide a description of the available effort data and looks at trends in CPUE for Bicol region troll line fishers from September 2009 to August 2010.

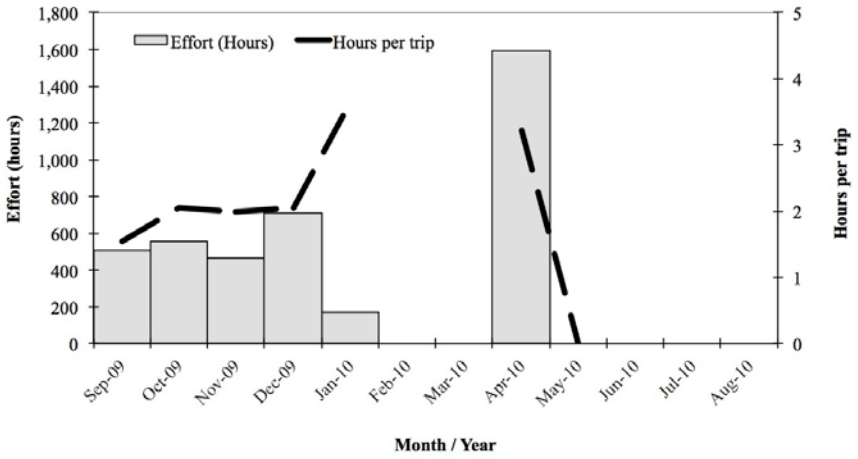

Figure 17. Monthly Effort (Days) and Days/Trip for Troll Line Fishing, Region V, Sept 2009-Aug 2010

It may be noted that there are only a few months when catch for troll line gears were recorded. This may be due to the seasonality of the fishing operations using this gear. Based on the port sampling conducted, the total effort generally ranges from 170 to 1,500 boat hours per month with the highest effort observed in April 2010 at around 1,590 boat hours. The days per trip record ranges from two to three hours.

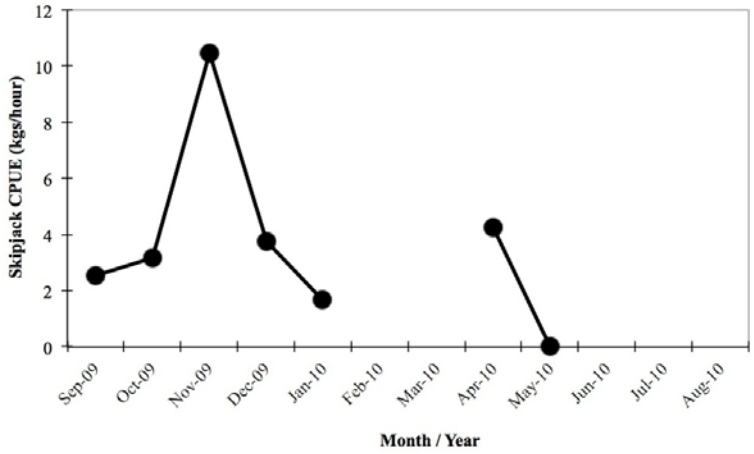

Figure 18. Monthly CPUE for Troll Line Fishing, Region V, Sept 2009-Aug 2010

This figure shows that the skipjack CPUE for the Bicol troll line fleet has fluctuated over the sampling period, and that the CPUE was observed to range from 2.5kgs to 10kgs/trip-hour, with an average of 4kgs/trip-hour. The highest skipjack CPUE was observed last November 2010 with 10kgs/trip-hour.

5. Socio-economic Aspects of Handline Fishing in the Bicol Region

In the Philippines, about 40% of the population lives in coastal areas, and about eight to ten million of them are directly relying on fisheries for subsistence. Almost 80% of these communities are characterized as having extreme poverty, lack of alternative livelihood, and inadequate basic service delivery. Recognizing that the municipal fishing sector is one of the marginalized sectors of the society, Philippine legislation expressly provides for the preferential access of municipal fishers in municipal waters.

Photo: Handline fishing vessels unloading in Bicol areas

Handline fishing operations in the Bicol Region are conducted in the municipal waters of the Lagonoy Gulf. In some cases, however, operations are conducted in the deeper waters of the Pacific Ocean. Most of the activities are rather small in scale and heavily relied upon by coastal communities for their livelihood. In terms of demographic profile, most small-scale fishermen come from similar socio-economic and educational backgrounds. In the municipalities, most fishermen know each other, may share friendly or even kinship or familial ties with other fishermen, and broadly identify with other fishermen in the same area (as opposed for instance, with fishermen from a neighbouring town or village). In most instances, they have common fishing practices, use the same types of gears, share the same fishing ground, have similar market, and confront similar challenges. The handline fishermen also most often have their own boats.

Fishing is an economic activity requiring either significant or steady capital, which is a factor of production most small-scale fishermen find hard to raise given their often dire socio-economic situations. In many municipalities, there is a local businessman who provides the capital for

operational expenses, (i.e., cash) in exchange for fish, a guaranteed share in fish catch, profit from the sale of fish, or an agreed amount of money. In some cases, these entrepreneurial businessmen operate a store where fishermen and their families could buy on credit basic necessities such as rice and canned goods. These stores also sell items used by fishermen in their fishing activities such as gasoline (petrol), ice, nets, hooks, and baits. Since handline fishing is a seasonal activity, most fishermen and their families rely on financiers to tide them over until the next fishing season. However, the relationship between financiers and fisherfolks are often seen as mutually beneficial. *Payao* owners also require handline vessels to pay for fishing around their FADs. The sharing agreement is usually two parts to the *payao* owner and one part to the handline vessel owner.

The market for tuna caught by handline vessels are generally for the local or nearby markets, although a very small portion of the catch may be transported to Manila by consignment. Tuna sold and transported to Manila are bound for overseas market. The lack of international market for tuna by Bicol handline vessels is primarily due to the distance of the ports to major hubs for international fish trade, transport barriers, and lack of access to good post-harvest facilities.

Photos. Measuring length size of yellowfin tuna (bound for Manila) and albacore tuna (sold at the local market) in Bicol

5.1 Fishing Operations in Tabaco City, Albay

Fishing operations in Tabaco City are conducted around San Miguel Island, Catanduanes and Rapu-Rapu Islands and waters off Camarines Sur. There are 312 boats with 10 to 16 hp engine using hook and line in Tabaco City. The number of accounted hook and lines is 1,387. There are 333 registered fisherfolks.

Fishing lasts for about three to 10 hours depending on the proximity of the fishing ground. Fishermen use about three to five kilograms of round scads as baits. Some of the handline fishermen rely on fish brokers for their capital.

Landing of catch occurs between 0630 to 1130 and 1400 to 1600. About 50% of the fish is Grade A tuna attracting inter-city and overseas market. Tuna sold in local markets cost about PhP110 PhP120 (~AUD4) per kilo while tuna for export has a minimum price of PhP130 (~AUD5) per kilo. Catches are transported to the mainland to be sold in the local markets or transported to Manila.

5.2 Fishing Operations in Sugod, Tiwi, Albay

In the case of Sugod, Tiwi, there are 466 handline vessels using hook and line that land their catch in local ports. The number of handline vessels generally decline in December, when most of the fishermen shift to troll line fishing. Motorized bancas with 10hp to 16hp engines are used but non-

motorized bancas are also deployed, especially by bottom set long line and multiple hook and line. Landings occur for the whole day from 0400 to 1800hr with its peaks in early mornings and late afternoons. There are 3,825 registered handline gears and 988 registered fisherfolks in Tiwi.

Fishing operations by local residents are not only limited to the municipal waters of Tiwi, but extend towards the waters off Tabaco City and to the provincial waters of Camarines Sur and Catanduanes. Fishing activities range from three to five hours employing *Sardinella* as the major bait and in some cases *Decapterus* and *Selar*, depending on availability. Catches are sold locally in the town market and nearby municipalities through fish buyers. Some of the fish go to Legaspi, Tabaco, and Manila. Tuna is sold at PhP 80 to PhP90 (~AUD23) a kilo at the highest, and PhP30 to PhP35 (<AUD1) a kilo, at the lowest.

5.3 Fishing Operations in Sabang, San Jose, Camarines Sur

Most handline fishermen in Sabang use motorized bancas with 5hp engines. There are 201 registered fisherfolks and 205 muncipal handline vessels landing their catch in the fish port per month. Of these vessels, about 50 bancas operate multiple hook and line and an occasional 10 vessels operate with bottom set long lines and jiggers. There are about 50 payaos used by more than 100 handliners in Sabang waters. There are 667 accounted handline gears in the area. The cost of one handline vessel is about PhP4,000 (~AUD100) for a non-motorised banca and about PhP 25,000 to PhP30,000 (~AUD900) for a motorized one.

Fishing operations, ranging from eight to 12 hours, are conducted in the municipal waters of Sabang and in the adjacent municipalities of Presentacion and Cabotohan. Different types of small pelagic fishes, e.g., *Rastrelliger*, *Sardinella*, mackerel and scads, are used as baits for the operation of hook and line. Some operators also use squids and synthetic crystalets as baits, the latter primarily used in multiple hook and line fishing. The catch is about 20 kilos per trip, with the biggest catch in history of 86 kilos. Tuna can sell up to PhP180 (~AUD5) per kilo.

Landing of fish in the local fishing port and market occurs in the morning between 0600 to 1200, and catches are sold directly to local buyers. Tuna is normally sold for PhP80 (~AUD2) per kilo. Some catches, however, are sold in nearby municipalities.

5.3 Fishing Operations in Nato, Sagñay, Camarines Sur

Vessels used by handline fishermen in Nato are mostly motorised bancas with 5hp to 10hp engines. Generally, they use hook and line as the major fishing gear, but around December most fishermen shift to using bottom set long line. In some instances, jiggers and multiple hook and lines are employed as fishing gears. There are 87 registered fishermen, 87 handline gears, and 86 handline fishing vessels in Nato.

The municipal waters of Patitinan and Boñgalon, Sagñay are the major fishing grounds for Nato fishermen and their operations normally last between six to 12 hours. Within this timeframe, about two to three kilograms of small pelagic fishes (e.g., round scads, mackerels, sardines and anchovies) are used as bait. Crystalets are also sometimes used as artificial baits. The time of fish landing is between 0600 to 0900 and 1500 to 1900. Catches are sold directly to local buyers, who in turn sell the fish in local markets or to nearby municipalities. Tuna is sold at the highest for PhP80 to PhP100 per kilo (~AUD3) and at the lowest for PhP40 to PhP50 (~AUD1).

Although handline fishing is a key fishery in the area, the local market and population depends significantly on ringnet catch. About 70% to 80% of the population relies on the catch by ringnet

vessels for their livelihood. About 40% of the total catch of tuna in the area comes from ringnet vessels.

6. Legal and Policy Framework for the Management of Handline Fishery in the Bicol Region

The legal and policy framework for the management of handline fishery in the Bicol Region comprises (1) the overall legal framework that applies to all types of fisheries in the Philippines; and (2) the framework specifically applicable to the handline fishery. Since the handline fishery in the Bicol Region is mostly municipal in scope, a discussion of the access to waters beyond the Philippine EEZ is excluded for the purpose of these discussions.

6.1 General Framework for the Management of Fisheries in the Philippines

The utilization, conservation, and management of fisheries resources in the Philippines is primarily governed by three laws namely, the Philippine Fisheries Code 1998, the Agriculture and Fisheries Modernisation Act 1997, and the Local Government Code 1991. The Philippine Fisheries Code 1998 provides the basic fisheries management framework; the Agriculture and Fisheries Modernisation Act 1997 addresses fisheries development as a component of the agricultural sector; and the Local Government Code 1991 provides guidelines for local autonomy and decentralisation which includes fishery functions. There are also regulations implementing the Philippine Fisheries Code in the form of Implementing Rules and Regulations and Fisheries Administrative Orders issued by the Department of Agriculture.

Under the Local Government Code 1991, local government ordinances provide regulations on fisheries matters at the local level. There are four classifications of local ordinances. A 'municipal fishing ordinance' may be formulated to provide the scope of jurisdiction of local governments as well as regulations on licensing and delineation of municipal boundaries. A 'special fisheries ordinance' may be issued on special demarcated fisheries areas, closed season and environmentally critical areas and sanctuaries. A 'unified fisheries ordinance' is formulated by local government units which border bays, lakes and gulfs for the purposes of integrated resource management. The Philippine Fisheries Code, the Local Government Code, including fisheries administrative orders, provide the basis for the adoption of local fisheries ordinances. Local government councils adopting fisheries ordinances have the obligation to ensure that such ordinances, whether municipal, city or provincial, are consistent with the provisions of the Philippine Fisheries Code.

Aside from these basic fisheries-related laws, national policies are also part of the general framework for sustainable fisheries management. These national policies include the Philippine Tuna Management Plan, National Marine Policy, Philippine Agenda 21, and the Medium-Term Philippine Development Plan (MTPDP). Although not discussed in this Report, there are also other laws and policies relating to the environment, trade, labour, and safety of fishing vessels which form part of the general framework for the effective management of fisheries and control of fishing activities in the Philippines. These laws, policies, and regulations provide the basis for the specific framework applicable for the management of handline fishery discussed in the succeeding section.

6.2 Framework for the Management of Municipal Handline Fishery in the Bicol Region

The framework for the management of the municipal handline fishery for the Bicol Region may be divided into national legislation specifically addressing handline fishing, and municipal fisheries ordinances adopted by local governments. This framework also includes the local institutional framework necessary for the effective management of handline fishery in the Philippines.

6.2.1 The Handline Fishing Law

As highlighted in Section 6.1 of this Report, the general framework on fisheries conservation and management applies to all types of fisheries, including handline fishing. To resolve issues relating to the registration and licensing of commercial handline vessels, Republic Act No 9379 or the Handline Fishing Law was enacted in 2007. This law aims to strengthen the rules and regulations governing handline fishing and ensure the safety and seaworthiness of handline fishing vessels. In this legislation, handline fishing is defined as a "traditional fishing method that use the hook and line, a passive fishing gear with a single vertical line carrying one hook and used by simply dropping the line into the water and waiting for the fish to bite. A handline fishing boat is "a fishing boat with or without outrigger and with or without auxiliary small boats on board that exclusively utilizes the handline fishing method". In this definition of the handline fishing boat, there is no specification as to the gross tonnage of the vessel, the number of small auxiliary boats, or the extent of their fishing areas.

Section 4 of the Handline Fishing Law provides that the registration, inspection, manning and other documentation of handline fishing boats are the responsibilities of the Maritime Industry Authority (MARINA), while the licensing and related documentation are the functions of BFAR.

Section 5 provides that Philippine registered handline fishing boats may operate in international waters or waters of other countries that allow such operations, provided that they comply with appropriate and applicable safety, manning, radio communications and other standards and requirements geared at promoting seaworthiness. Such vessels are also required to secure an appropriate international fishing permit and certificate of clearance from BFAR. Similar with other types of vessels, fish caught by handline fishing boats shall be considered as caught in Philippine waters and therefore not subject to import duties and taxes when the same is landed in designated fish landings and fish ports in the Philippines. Lastly, Section 5 of the Handline Fishing Law provides that fishermen on board Philippine registered handline fishing boats conducting fishing activities beyond the Philippine EEZ are not considered as overseas Filipino workers.

The Handline Fishing Law provides for the manning requirements of handline fishing vessels. It requires all persons holding the position of Boat Master to be issued a Boat Captain licence after submitting a Certificate of Engagement from the present boat owner whom he works with, affidavit of boat owner taking the risk and responsibility for engaging the Boat Master, and a Certificate of Completion for theoretical and practical training for all applicants to the position. Similarly, the Boat Engineer of a handline boat would need to be issued a Boat Engine Officer Licence after submitting a Certificate of Engagement from the boat owner and after obtaining completing theoretical and practical training. Such training needs to be complied with within one year. For handline boats fishing outside the Philippine EEZ, the boat master, engineer and other personnel shall submit relevant manning documents, as well as the Seaman's Identification and Record Book (SIRB). The Identification Cards of the Boat Master and Boat Engine Officer bear the words "Only for Handline Fishing Boat".

The Handline Fishing Law also contains provisions on the construction of vessels. Section 7 provides that existing and newly constructed handline fishing boats shall be admeasured or re-admeasured and shall follow prepared boat plans. For boats of five gross tons and below including auxiliary boats, the requirement is a picture and actual dimensions of the boat submitted by the owner or boat builder. For boats above five gross tons, the boat plan should be signed and sealed by a naval architect.

Lastly, the Handline Fishing Law provides that 90 days from the approval of the Act, rules and regulations will be promulgated by the Secretary of the Department of Agriculture, through a technical working committee composed of the BFAR, the MARINA, the Philippine Coast Guard, the National Telecommunications Commission and other concerned government agencies, in consultation with fisherfolk and handline fishing industry organisations and other stakeholders. The rules and regulations will consist of provisions on the establishment of a one-stop shop for the industry; first aid, life saving and firefighting devices; operation of radio communication facilities; reportorial requirements, and other standards that promote seaworthiness.

Because of the vague definition of handline vessels under the Handline Fishing Law and the absence of implementing rules and regulations, the scope of application of the registration, manning, and licensing requirements under the legislation is difficult to ascertain. Current interpretation of the Handline Fishing Law suggests that the municipal handline vessels are not within the scope of application of the law, and hence will not be affected by any change resulting from the adoption of new regulations. However it would still be necessary for the handline industry to be actively involved in future consultations towards a development of an administrative order implementing the Handline Fishing Law to ensure that the interests of the region's handline operators and fishermen are protected.

6.2.2 Other Applicable Regulations

A number of regulations may be identified as relevant for the fishing operations of the handline sector. One of these regulations is Fisheries Administrative Order No 233 (2010) on the conservation of aquatic wildlife. This fisheries administrative order provides for the requirement to obtain prior permits for the local transport, as well as the exportation and importation of a number of fish species, including yellowfin, skipjack, bullet, and frigate tunas. This regulation implies that any local movement or international trade of these tuna species without proper certification may be punishable by law. Any trade of tuna products are also subject to food handling and safety requirements, such as the Hazard Analysis Critical Control Point, and other trade-related regulations such as rules of origin, catch certification, and import and export control.

The Philippines is also in the process of finalising a FAD Management Policy which will be adopted as a Fisheries Administrative Order to reduce fishing mortality of juvenile yellowfin and bigeye tuna arising from fishing activities using *payaos*. This Fisheries Administrative Order will provide regulations on the design and operation of FADs used by purse seine, ring net, and handline vessels in the Philippine EEZ. Similar management schemes for fishing using FADs in archipelagic waters will be developed. It would therefore be necessary for the handline sector to participate actively in the discussions to develop such fisheries administrative order, to ensure that its interests in fishing using *payaos* are taken into account. Other regulations such as FAD area and time closures applied within Philippine waters would also need to be complied with by handline vessels.

6.3 Local Framework for Managing Handline Fisheries

The framework for the management of handline fisheries in the Bicol Region comprises local fisheries ordinances which are adopted consistent with national laws, policies, and programs, such as the Philippine Fisheries Code and its implementing regulations, the Local Government Code, and other domestic policies and laws on coastal resource management and environmental protection.

The applicable local ordinances governing fisheries in the Bicol Region are as follows: 1) Office of the Sangguniang Panlungsod (City Council), Ordinance No. 05-2009, An Ordinance Enacting the Basic Fishery Ordinance providing for the Management, Conservation, Development, Promotion, Protection, Utilization and Disposition of All Fish and Fishery Aquatic Resources within the Municipal

Waters of Tabaco City and for Other Related Purpose in Conjunction with All National Laws, Orders, Regulations and Decree; 2) Province of Camarines Sur, Municipality of San Jose, Ordinance No 05-011, An Ordinance providing for the Development, Conservation, and Management of the Fisheries and Aquatic Resources in the Municipality of San Jose, Province of Camarines Sur; 3) Province of Albay, Municipality of Tiwi, Municipal ordinance No 2008-01, An Ordinance Providing for Sustainable Development and Management of Tiwi Municipal Waters and its Coastal and Fishery Resources, Harmonizing and Integrating All Ordinances Pertinent Thereto for All Other Purposes.

These local ordinances are adopted for the management, conservation, and development of fisheries in municipal waters. The objectives of local these fishery ordinances include the following:

- Conservation, protection and sustained management of the municipal waters and coastal areas;
- Prevention of poverty and the provision of supplementary livelihood among city fisherfolks;
- Improvement of productivity of aquaculture within ecological limits;
- Support for city fisherfolks through appropriate technology, post-harvest technology and research, credit, marketing assistance and other necessary services;
- Participation of people's organizations in the conservation and management of coastal fisheries; and
- Promotion of awareness of sustainable fisheries through appropriate training, information and education.

These objectives may be clearly summarized into two: the *first* being the conservation and proper management of fisheries resources for the benefit of local fisherfolks; and *second* is to increase the capacity of these fisherfolks on fisheries for their economic development. Such objectives promote the rights and privileges of local fisherfolks in municipal waters as espoused in the Philippine Constitution.

Local fisheries ordinances provide for the preferential right of city fisherfolks, cooperatives and organisations listed in the city fisherfolk registry to conduct fishery-related activities in municipal waters. In certain circumstances, the City government may also conduct public bidding to determine the participation of fisherfolks to exercise such right. The general order of preference in awarding fishing rights start from local municipal or city residents, transient fishermen from neighbouring towns and provinces, local cooperatives, and those who have acquired permits from the local government.

The rights of fisherfolks in municipal waters are not only supported by a number of regulations promoting the preferential rights of fisherfolks but also the protection from competition with commercial vessels. The local ordinance also provides for accreditation of fisherfolks and their associations, as well as support to registered fisherfolk organisations and cooperatives in terms of fisheries research, marketing, training, and supplemental livelihood.

The following section summarizes the legal and policy measures for the management of handline fisheries in the Bicol Region. These measures include the registration of fisherfolks, fishing vessels and gears, licensing of vessels and gears, and various measures such as closed seasons and areas, marine protected areas, fish length and size regulations, and mesh size requirements. It should be noted that the local fishery ordinances apply to all types of fishing, including handline fishing.

6.3.1 Local Fisheries Management Measures in Tabaco City, Albay

The key measures under the local fishery ordinance applicable for the management of handline fishery in Tabaco City Albay are discussed below.

Registry of Fisherfolks

The city of Tabaco provides for the Registry of City Fisherfolks who are fishing or who would like to fish in municipal waters. Such registry is used to determine priorities for awarding fishing licences, limiting entry into municipal waters, and monitoring fishing activities.

Registry of Fishing Vessels and Gears

Vessels of three gross tons and less operating in municipal waters are required to be registered. Included in the registry are details of the fishing vessel (i.e. name of vessel, registry number and admeasurement, engine brand and horsepower, and vessel identifying marks), the name and address of owner, and the gears used. Fishing gears are also required to be registered under the City government.

Fishing Vessel and Gear Licensing

Fishing licences are issued to registered fisherfolks upon completion of requirements and payment for boat and fishing gear registration. Only fishing in municipal waters for daily food subsistence is allowed to be conducted without a licence. A small amount of fee is paid to conduct fishing activities or exercise fishing privileges.

Terms and Conditions of a Licence

The local ordinance on fisheries provides that a person holding a licence assumes the responsibility for the operations of its fishing vessels, including the actions of its fish workers, employees, and agents. The terms and conditions of a licence further includes installation of warning or beacon lights and some requirements for the construction of fish pens and cages. The licence also provides a number of prohibitions, including fishing with the use of traps, nets and gears within 20 meters of any fish corral or mussel farm, as well as construction outside designated zones which will obstruct free navigation. An important licence condition most relevant to handline fishing is the limitation of fish aggregating devices to five units for each fisherfork. The FADs are to be constructed at least 100 meters apart and only in designated areas.

Other Fisheries Management Measures

Tabaco City implements a number of other measures to manage fisheries in municipal waters. These measures include closed season for catching of *siganid* from February to May; prohibition of the gathering of *siganid* fry in April; declaration of Sagurong marine fishery reserve, and the protection of mangroves. The fishery ordinance also generally prohibits the use of mesh nets less than 3cm when stretched to protect small fish. The use of explosives, noxious substances, and electricity in fishing are also prohibited.

The local ordinance provides for regulating the harvest level in Tabaco municipal waters based on best scientific information. It states that such scientific information should cover estimates of fishing effort corresponding to the maximum sustainable yield which will provide the maximum limit reference point for the municipal capture fishery. However, the MSY for Tabaco municipal waters is yet to be determined.

Other Regulatory Measures

All commercial fishing operations are prohibited in the municipal waters of Tabaco City. The local ordinance of Tabaco City also apply a number of regulatory measures such as obtaining invoices for the transport of fish and fishery products from the point of origin to the destination, as well as limitations on the use of air compressors.

Administrative Sanctions

Except for subsistence fishing, it is considered unlawful for any person to conduct a fishing activity without a licence or with unregistered vessels or gears. This illegal activity is subject to administrative penalties. The ordinance also provides for the apprehension or impounding of fishing vessels including its equipment and paraphernalia. Breach of the terms and conditions of the fishing licence are also subject to punishment, although such penalties for specific violations are not clearly specified in the local ordinance. In general, violation of the fishery ordinance shall be fined with a minimum of PhP2,500 (~AUD65) to PhP5,000 (~AUD120) or imprisonment of six months to two years, or both.

Collected fines from illegal fishing activities are distributed as follows: 40% to the City; 50% to the apprehending team; and 10% to the barangay where the violation is committed.

Public Awareness

The local government, through the City Council supports information education campaigns and activities promoting coastal resource and fisheries management in Tabaco City.

6.3.2 Local Fisheries Management Measures in Tiwi, Albay

Registry of Municipal Fisherfolks

The municipality of Tiwi provides for the registry of coastal and fishery resource users for the purpose of determining priorities among them, regulating and limiting entry into municipal waters, and monitoring fishing activities. Such registry includes information on the names of fishers, municipal fishing gears, and other information. The registry is updated annually.

Fishing Vessel Licencing

Fishing licences are issued to registered fisherfolks upon completion of requirements and payment for boat and fishing gear registration. Documentary requirements for obtaining a fishing vessel licence include a certificate of registration, an affidavit of ownership, a barangay clearance, inspection report of compliance with vessel colour coding, and a clearance certificate from the Philippine Coast Guard for motorized bancas of less than 3 GT. A vessel licence is valid for one year.

Fisheries Management Measures

The local fishery ordinance of Tiwi provides for the power of the Municipal Council to adopt measures to manage fisheries resources. These measures may include a ban on taking any species, protection of rare, threatened and endangered species, ban of certain gears and methods, limitation of fishing in or total closure of overfished areas, regulation on the construction of artificial reefs and FADs, and creation of replenishment zones such as fish sanctuaries, mangrove areas and nurseries. Other measures include the protection of spawners and breeders, and management of mangroves and seagrasses.

Community Based Coastal Resource Management

The importance of community based coastal resource management is emphasized in the Tiwi local legislation on fisheries. Coastal management plans are considered integral to the development plan of the municipality. Within this context, the ordinance also provides for a community-based mangrove reforestation. Barangay Baybay, for example, is declared as an eco-tourism area for development.

Environmental Impact Assessment

The ordinance requires the preparation of a detailed Environmental Impact Assessment prior to undertaking any projects which have a significant impact on the quality of the environment.

Regulations on the Trade of Fishery Products

Certain restrictions apply on the importation and exportation of certain fish, particularly with respect to their size, in order to protect local biodiversity. All fishery products bound for trade also need to be accompanied by appropriate certificates.

Fisheries Violations and Penalties

The fishery ordinance prohibits the conduct of a number of activities, including the use of compressor, the illegal use of superlights, taking of rare, threatened or endangered species, coral exploitation, use of *muro-ami* or destructive gears, use of explosives and noxious substances, and use of fine mesh nets. These violations are subject to the payment of fines or imprisonment, the proceeds from which are divided between the barangay involved (20%), municipality (50%), and the apprehending people (30%). Confiscated fish catch is either sold through public auction or distributed to public institutions, such as jails and hospitals.

6.3.2 Local Fisheries Management Measures in San Jose, Camarines Sur

Registry of Municipal Fisherfolks

The municipality of San Jose provides for the registry of municipal fisherfolks who are required to renew their registration bi-annually.

Registry of Fishing Vessels

All municipal fishing vessels operating in municipal waters are required to be registered. Before any registration can take place, the municipal government requires the submission of all information, including the ownership of the fishing vessel; a statement that the vessel is not subject to any pending case of fisheries violation at the time of registration; and inspection report stating that the vessel complies with colour coding and identification requirements. The fishing vessel is required, under the terms of the licence to be registered at all times, and to fish only in zones specified in the licence.

Fisheries Management Measures

The municipal fishery ordinance of San Jose provides for the adoption of a number of measures to better manage municipal fisheries. These measures include a ban on taking of certain species, closed seasons, demarcation and marking of fishing areas within municipal waters, limitation of fishing in or total closure of overfished areas, and ban of certain gears and methods. The ordinance also provides for fishery refuges or sanctuaries to comprise at least 15% of the municipal waters, for the purpose of protecting habitat and spawning grounds of fish. It may also be limited for special use, or for educational, research or special management purposes.

Fisheries Development Planning

The local ordinance requires the development of a Municipal Fishery and Coastal Resource Development Plan which shall be the basis for the long term development and management of fisheries resources in the municipality. This Plan is developed by the Municipal FARMC and is integrated with the local development plan of the municipality.

Fishing Violations and Penalties

A number of specific prohibitions have been provided in the local legislation, such as fishing without a licence, fishing by a person not registered within the municipality, failure to carry a licence, commercial fishing in municipal waters, use of active gear, and use of fine mesh nets and other prohibited gears. Prohibited activities include the unlawful sale of illegally caught fish, non-compliance with colour coding requirements, failure to keep logbooks and catch reports, the illegal use of superlights, clearing of mangroves, and obstruction of enforcement officers.

The Municipal government decides the amount of fine to be imposed on fishing violations. The legislation provides a process of assessment in the determination of fines and sanctions to be applied against illegal activities. It recognizes the value of the resource to the municipality, hence emphasizing the need not only for compensation in case of damage to the resource, but also the costs of rehabilitation of the habitat and the resource. As an example, the ordinance provides that any person conducting activities without a licence shall be required to pay 200% of the total licence fee plus a surcharge of 75% for every month beyond the deadline for the filing of the licence application. It also provides for the impounding of fishing vessels and gears and revocation of the licence.

6.4 Institutional Framework for Managing Handline Fisheries

Local fishery ordinances provide institutional mechanisms which could facilitate the development of policies and regulations on municipal fisheries, as well as their implementation. Every municipality and city has a different structure on how to govern fisheries resources.

One aspect of the institutional framework is the establishment of a fisheries management office within the local government, particularly within the office of the Municipal Mayor. As an example, in the San Jose fishery ordinance, a Fishery Management Office was established under the office of the Municipal Mayor. This office is responsible for the maintenance of the Registry of Municipal Fisherfolks and Fishing Vessels, issuance of fishing licences, division of municipal waters into zones, and coordination with Fisheries and Aquatic Resource Management Councils (FARMCs) in the implementation of fisheries development plan. There are also municipalities or cities where a fishery officer may belong to the desk of the City Agriculturist. Some municipalities with strong interests in fisheries also have an elected position for a Councilor for Fisheries.

In addition to an office responsible for fisheries management, an appointed fisheries officer and elected local council officer, local ordinances also provide for the establishment of a Municipal Fisheries and Aquatic Resource Management Councils. The municipal FARMCs have a critical role in preparing fisheries development plans, recommending the enactment of fishery ordinances, and providing advice to the Council on fisheries matters. A municipal FARMC also serves as a conduit for discussions between city, provincial and national FARMCs, and the national government. Every municipality in the ACIAR project sites has established a FARMC.

Another important component of an effective institutional framework for the management of municipal fisheries is law enforcement. In Tabaco City, the fishery ordinance establishes a Fishery Law Enforcement Team, comprising the Philippine National Police, the Philippine Navy, the Philippine Coastguard, the PNP Maritime Command, fishery law enforcement agents, officers and members of FARMCs, and deputized fish wardens. Members of city fisherfolk organisations and cooperatives, as well as barangay officials may also be trained on fishery law enforcement. In this team, the City Agriculturist, together with the leader of the law enforcement team, is given the task to prepare enforcement reports. In San Jose, these fisheries law enforcement teams are called *Bantay Dagat* (Guardian of the Seas), a community-based enforcement system, which supports traditional fisheries enforcement.

Municipal Fisherfolk Cooperatives and Associations

The last component of the institutional framework for municipal fisheries is fisherfolk organizations, particularly through cooperatives. In order to promote the development of municipal fisherfolks, the San Jose fishery ordinance supports the creation of associations and cooperatives. Upon accreditation, such association may be granted preferential right to fishing, including exclusive

use of defined areas in municipal waters. They may also allow fishing by commercial vessels owned by the association. Other rights include access to credit facilities by the government, operation of post harvest facilities, and representation in municipal FARMCs. Municipal fisherfolk cooperatives also facilitate public awareness to protect coastal fishery resources, as well as enhance participation of fishermen in policy and decision-making.

7. Summary of Issues on the Management of Handline Fishery in the Bicol Region

A number of concerns have been raised by municipal handline fisheries stakeholders in the ACIAR Project sites. These issues mainly focus on competition with other gear users, lack of effective law enforcement, absence of search and rescue programs, inadequate sources of capital, lack of cooperation amongst fishermen, and need for alternative livelihoods. The most common concern amongst handline fishermen in the four project sites is the decline in catch production caused by overfishing attributed to vessels using other gears such as bagnets and ringnets. Medium to large scale commercial vessels have been reported to either fish illegally in municipal waters, or just outside the 15-km limit, catching tuna which is supposed to be caught by handline vessels.


Photos. Medium scale ringnet vessels of the Bicol region unloading their catch in local ports.

The following section highlights the key issues identified by the stakeholders of the municipal handline sector in the Bicol Region. These issues have been agreed collectively as the most pressing concerns for the ACIAR project sites.

Tabaco City, Albay

- Use of bagnets (*taksay*), which are not only used by other local fishing vessels, but also by foreign vessels;
- Use of destructive fishing methods, such as compressors and dynamites;
- Fishing by larger vessels in the periphery of municipal waters in the Pacific Ocean, preventing fish from reaching coastal waters;
- Oversupply of fish in the local market and lack of adequate post-harvest facilities;
- Seasonality of fisheries and the associated lack of alternative livelihood during off season in fishing;
- Lack of search and rescue operations to ensure the safety of fishing vessels;
- Lack of continuity of local fisheries programs;
- Distrust on the part of fisherfolks on the way the government manages the fishery;
- Lack of sustainable funds for community-based enforcement (i.e. *Bantay Dagat*);
- Lack of political will to resolve fisheries issues despite regular FARMC meetings; and
- Ineffective organisation of FARMCs.

Sugod, Tiwi, Albay

- Lack of effective control on the fishing activities of *taksay* (baby purse seine) users;

- Seasonality of tuna fisheries;
- Lack of adequate postharvest facilities;
- Lack of FADs owned or managed by local handline fishers;
- Need for alternative sources of livelihood;
- Impact of other activities on fisheries, such as quarrying and illegal logging;
- Lack of cooperation and effective organization for local handline fishers;
- Lack of measures to promote the safety of fishing vessels; and
- Inadequate training on fisheries prosecution and handling of evidence.

Sabang, San Jose, Camarines Sur

- Decline in catch production, possibly as a result of overfishing;
- Conflict between ringnet vessels and handline vessels in terms of catch and areas of fishing;
- Presence of ringnet operators from neighbouring municipalities;
- Lack of political will to address conflict between fishers;
- Lack of alternative livelihoods;
- Lack of adequate post harvest facilities affecting the quality of fish, especially blue marlin which is a high value product; and
- Lack of organized fishermen's association.

Nato, Sagñay, Camarines Sur

- Overfishing;
- Licensing of ring net vessels which compete with handline vessels for catch;
- Use of illegal fishing methods such as dynamites;
- Ineffective fisheries law enforcement; and
- Lack of alternative livelihood, including in aquaculture.

7. Opportunities for the Handline Fishery in the Bicol Region

Despite numerous challenges, there are opportunities for the municipal handline fishing sector of Bicol which may be further examined. One of these opportunities relates to development of the industry through **additional investment**. In the field visits conducted by the ACIAR project team to General Santos City, there were indications that some of the fish processing companies may be interested in expanding their business in other regions, either by getting their fish supply or establishing canneries. This opportunity may open up potential business arrangements with the fishing industry in the Bicol Region. The fishing industry of Region V may also want to promote **certification of the handline fishery** as a sustainable fishery by working with the government and non-governmental organisations such as the World Wildlife Fund for Nature (WWF). The WWF is currently undertaking pilot projects for tuna handline fisheries to meet the sustainability criteria of the developed by the Marine Stewardship Council (MSC). Other opportunities may be explored for the growth of the handline fishing industry, such as the **establishment of icing and post-harvest facilities**. As in the practices of other countries and other regions of the Philippines, the development of post-harvest facilities may be initiated and funded by the government, and leased and operated partly or wholly by the industry. The local governments may also investigate on other non-fisheries activities which the fishing industry may consider as part of their **alternative livelihood** or source of income during off-seasons in fishing. The Bicol region may also examine the possibility of having a **regional focus on fish trade**, where the local governments can explore various markets for tuna caught by handline vessels and establish a consortium of tuna supply from the various ports of the region. This may assist in strengthening the position of Region V in national and international fish trade and encourage handline fishermen to get involved in external trade.

In terms of enforcement of fisheries law, two areas where local governments of the Bicol region may improve on are in terms of strengthening community-based enforcement and the provision of stricter fisheries penalties. **Better organisation of *Bantay Dagat*** as a community based enforcement system will lead to improved implementation of law, especially with respect to illegal fishing in coastal waters. A more effective enforcement regime will help gain the confidence of handline fishermen in fisheries management, which may eventually lead to self-compliance, one of the factors contributing to a strong institutional framework in municipal fisheries. Part of a reliable enforcement regime is a **robust penalty system**. The other areas of the Bicol region may take lead from the local fishery ordinance in San Jose which contains useful provisions on imposing penalties of sufficient severity, in order to deter illegal fishing.

The last aspect of development that each of the local regions has the greatest opportunity to consider is the advancement of the **principle of 'cooperativism'**. One of the key aspects to municipal fisheries is enhancing cooperation through the establishment of cooperatives. Philippine municipal law supports the organization of fisherfolks to promote economic activities and services, and facilitate mutual help and cooperation. The collective voice of cooperatives is important in developing fisheries policies, putting forward economic interests, and in finding solutions to common problems.

8. Further Research and Training Needs and Opportunities

The stakeholder Workshop held in May 2011, which gathered government officials and members of the handline fishing sector of the Bicol Region identified a list of research priorities and training needs which are believed to be most beneficial for the development of the handline sector. The following research topics were identified during the Workshop:

- Seasonality of tuna and tuna like species, their habitat and biological characteristics;
- Research on FADs, their impact on tuna fishing, and better design of FADs to improve tuna catch;
- Effects of different handline hooks on species caught in various water depth;
- Study on modern technology to improve fishing operations; and
- Impact of climate change on fisheries in the Bicol region;

In terms of training, the following areas where identified as crucial for the improvement of the handline fishing industry:

- Safety of life at sea, including GPS and compass reading;
- Proper catching, killing and bleeding of tuna and tuna like species, and other commercial species;
- Preservation of the quality of fish, proper handling and storage of fish (e.g. desired freezing temperature);
- Proper sizing and grading of tuna;

The fishing industry also provided a number of recommendations to help uplift the status of the handline fishing sector. These recommendations include: increased involvement of fishermen in future research on fisheries; monthly report or consultations on the development and implementation of projects in the region; harmonization and proper dissemination of local ordinances concerning the Lagonoy Gulf; daily monitoring of catch, both target and non-target species; government subsidy with respect to social security benefits of fishermen and their families; and construction of additional landing areas and storage of fish. The handline fishing industry also

proposes that meetings be conducted regularly to update fishermen on any new research on the fishery, the available market for tuna, and application of local ordinances (i.e. boat registration). The industry further highlighted the need for the formulation and strict implementation of laws, policies, plans, and guidelines on fishing, including handline fishery in the Bicol Region.

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Annex (Project Photos)

Bicol Handline Fishing Port and Landing Sites

Project Enumeration and Field Visit

Regional Workshop Participants, Tabaco City, May 2011

PRELIMINARY ASSESSMENT OF THE HANDLINE FISHERY IN EASTERN SAMAR, PHILIPPINES

Report Prepared for the "Preliminary Assessment of the Handline (Banca) Fisheries in the Philippines" (FIS/2009/033), Project funded by the Australian Centre for International Agricultural Research (ACIAR)

Prepared by the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Bureau of Fisheries and Aquatic Resources (BFAR) National Fisheries Resources and Development Institute, and BFAR Region VIII

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Executive Summary

This Report provides a preliminary assessment of the handline fishery in the Province of Eastern Samar, particularly in the municipalities of Borongan and Guiuan. The handline fishery in the region is mostly municipal in character and comprises about 75% of the fishery in the province in terms of the number of fishing vessels and fishermen. Two types of handlines are observed in the region, including simple handline or hook and line and troll lines. The most common catch by handline fishermen from September 2009 to August 2010 are skipjack and yellowfin tuna.

The management of municipal handline fishery is embodied mostly in local fisheries ordinances which adhere to the Philippine Fisheries Code. Although these ordinances are not specific to handline fishing, some of the measures adopted in these ordinances are relevant for the sector such as the registration of fisherfolks, fishing vessels and gears, licensing of vessels and gears, and various measures such as closed seasons and areas, marine protected areas, fish length and size regulations, and mesh size requirements. The municipal fishery ordinance of Guiuan also contains additional policies and objectives which are not commonly found in other local ordinances, including that of Borongan. One of these policies is the precautionary principle, as well as the promotion of responsibility and accountability in the use of coastal and aquatic resources. Both policies recognize stewardship in the management of coastal and aquatic resources, the adoption of which demonstrates a commendable effort on the part of the municipality to contribute to the sustainability of its fisheries resources.

A number of concerns have been raised by municipal handline fisheries stakeholders in Borongan and Guiuan. These issues mainly focus on competition with other gear users, lack of self-managed fish aggregating devices, lack of effective law enforcement, absence of search and rescue programs, non-compliance by some larger handline tuna vessels with the Handline Fishing Law, inadequate post harvest facilities and techniques, inadequate sources of capital, lack of cooperation amongst fishermen, need for alternative livelihoods, and environmental factors such as climate change. The most common concern amongst handline fishermen in the two project sites is competition from vessels using active gears such as ringnets, which is believed to pose a major threat to the sustainability of fisheries resources.

Despite numerous challenges, there are opportunities for the municipal handline fishing sector of Eastern Samar which were examined during the stakeholder Workshop held in May 2011. These opportunities include the development of the industry through additional business investment, certification of the handline fishery as a sustainable fishery, and establishment of icing and post-harvest facilities. In the Workshop, a list of priority research and training needs were also identified by the fishing industry to be most beneficial for the development of the handline sector. These research and training areas include:

- Spawning season and migration patterns of tuna species in Eastern Samar waters;
- Effect of climate change on tuna handline fishing; improvement on the design of FADs;
- Efficient post harvest techniques and technology;
- Tuna classification and sashimi grade;
- Safety of fisherfolks on the high seas (e.g. compass reading, use of GPS, typhoon path reading); and
- Alternative livelihood for the family of fishermen.

Acknowledgments

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The generous funding of the Australian Centre for International Agricultural Research (ACIAR) for this Project, and its continuous financial support to Philippine-related projects, is highly appreciated.

PRELIMINARY ASSESSMENT OF THE HANDLINE FISHERY IN EASTERN SAMAR, PHILIPPINES

Report Prepared for ACIAR-funded Project entitled "Preliminary Assessment of the Handline (Banca) Fisheries in the Philippines" (FIS/2009/033)

1. Introduction

Handline fishing is a traditional method of fishing using different types of hook and line and bancas, the latter more commonly known as pump boats in the Philippines. Similar handline fishing methods have been practiced for thousands of years in the Philippines and the Pacific, and remain the most common type of fishing in both municipal and commercial fishing sectors in the country. A national census on fisheries conducted in 2003 indicates that there are about 9.45 million sets of handline gears in municipal waters (within 15 km from the coast), which is more than double the total number of other gears set in these waters. This number represents a 300% increase from 1980. Hook and line is also the most common fishing gear used amongst commercial fishers, totalling 54,000 sets deployed in 2003. Similar to municipal hook and line, this number has increased significantly, from 2,655 commercial handline gears in 1980 (National Statistics Office, 2005).

Hook and line fishing exists in all fishing grounds in the Philippines, within the archipelagic waters, territorial sea, and the exclusive economic zone (EEZ). Handline fisheries target a number of species, including commercially significant species such as tuna. It is estimated that there are more than 3,000 Philippine handline vessels or pump boats fishing for tuna alone. This number of vessels equates to tens of thousands of fishers directly involved in the fishing activity, and to millions of people who depend on the handline fisheries for both subsistence and in the downstream fishing economy.

The economic importance of the handline fishery in the Philippines is increasingly threatened by declining fish stocks, illegal fishing, competition with other gear users, environmental factors (such as climate change), and increasing regulatory measures. Declining fish stocks are leading to problems in the handline fisheries, such as smaller-sized fish and longer fishing trip lengths. Unfortunately, information about the handline fisheries of the Philippines is poor and there are inadequate management arrangements in place. For a number of years, handline fishing vessels could neither be classified as municipal or commercial fishing vessels, because of the nature of their operations. This created a gap in the regulatory framework to manage such fisheries. The enactment of Republic Act 9379, or the Handline Fishing Law, in 2007 allowed for regulations for handline fishing vessels that took into account their unique characteristics. However, implementing rules and regulations on the registration and licensing of handline fishing vessels have yet to be agreed upon and the sector has remained unable to enjoy the benefits of these regulations that would assist in development and competitiveness of handline fishing, as well as ensure the safety and seaworthiness of the fishing vessels. There is therefore an urgent need to improve the management regime for the handline fishery to prevent further negative economic and social impacts.

This Report provides a preliminary assessment of tuna handline fishing in the Province of Eastern Samar, specifically in two areas: (1) Municipality of Borongan; and the (2) Municipality of Guiuan. It examines the nature of tuna handline fisheries in the area, the socio-economic aspect of handline fishing sector, and the legal and policy framework to manage handline fishing in the region. It presents a synthesis of the various studies: the outcome of sampling landings of the handline fisheries, conducted from September 2009 to August 2010; the interviews with relevant stakeholders conducted in March 2010; the legal and policy study on the fishery; and, the outcome of the stakeholder workshop conducted in May 2011. This Report further summarises issues for the

tuna handline fishing industry and highlights prospects for the development and effective management of the handline sector. It also provides the context upon which the project on the preliminary assessment on handline fisheries in the Philippines was developed with the assistance of the Australian Government.

2. The ACIAR Project on Handline Fishing: Background, Aims and Methodology

The legal and policy framework for the management of Philippine (and Indonesian) fisheries, focusing on illegal, unreported and unregulated (IUU) fishing was first investigated by the University of Wollongong from 2000-2006 with funding assistance from the Australian Centre for International Agricultural Research (ACIAR). During the project, the handline fishery was identified as a specific area of concern in relation to fisheries assessment, management and compliance, particularly with respect to the lack of adequate information on the sector and the inadequacy of existing regulations to address the unique characteristics of handline fishing vessels.

Upon consultations with the Bureau of Fisheries and Aquatic Resources (BFAR) in 2008, the current project was proposed to ACIAR which aims directly monitor catch composition of the handline vessels, examine some of the socio-economic aspects of the sector, and identify major issues and constraints in effectively managing the fishery. This Project was then developed to provide new information concerning the Philippine handline fishery which will assist in applying long-term improvements in its policy and management frameworks. It also aims to fill some of the gaps in data collection to support the BFAR National Stock Assessment Program.

There are three specific objectives of the ACIAR Project on Handline Fishing. The first objective is to investigate the nature of handline fishery in select regions in the Philippines using existing data and port sampling. The second objective is to benchmark the legal framework for the hand-line fisheries against national and international obligations and best practice. The third objective is to identify opportunities, challenges and information gaps in developing a management plan for this fishery.

To achieve the aims of this research project, field studies have been conducted in three regions: Region V, VIII, and XII. Specific sites in these regions have been selected on the basis that they either do not have, or have significant data gaps on handline fishery. Two new enumerators have been appointed in each region for a period of 12 months to collect catch and other fisheries data. The Project Team, comprising staff from the UOW Australian National Centre for Ocean Resources and Security (ANCORS) and the National Fisheries Research Development Institute (NFRDI), and Regional Offices of BFAR also consulted with and interviewed members of the fishing industry, including handline fishers, vessel owners and operators, company owners, fish distributors, and port and fisheries officials to ascertain the legal and economic challenges confronting the handline fishery. Post harvest activities of the handline sector were also observed during field visits. The field research is supplemented by an examination of the provincial and national laws and regulations, as well as regional and international instruments governing handline fishery in the Philippines. Workshops involving the industry and government officials in key fishing ports were also held to present preliminary findings and investigate management opportunities and challenges, as well as develop mechanisms and pathways for the adoption of an effective management regime for the handline fishery in the Philippines.

Among the selected project sites is Eastern Samar, focusing on four sampling areas: (1) Brgy Rodsan, Ngolos, Guiuan, Eastern Samar; 2) Sapao Beach, Guiuan; 3) Sabang 1, Borongan; and 4) Sabang 2, Borongan. These areas are known to have considerable municipal tuna handline fishing operations, but with very limited data record. Enumeration was therefore necessary to collect information on the fishery and support the activities of the National Stock Assessment program in Region VIII.

3. Eastern Samar

Eastern Samar is a province belonging to Region VIII of the administrative regions of the Philippines. It has a total land area of 4,470 square kilometers and is subdivided by 22 municipalities and one city. The province is bounded by Northern Samar on the north, the Philippine Sea on the east, Samar on the west, and Leyte Gulf on the south.

Figure 1. Map of Eastern Samar and Region VIII

In general, municipal waters, the extent of which is 15 kilometers (km), is reserved for the preferential use of municipal fisherfolks and their organisations. However, small and medium scale commercial fishing vessels may be allowed to operate within the 10.1km to 15km limit of the municipal water, subject to the discretion of and licensing by the local government. No commercial fishing is allowed within municipal waters with depth of less than seven fathoms.

3.1 The Municipality of Borongan

Borongan is the capital of the province of Eastern Samar. Its main means of livelihood is agriculture, although many residents rely on coastal and deep-sea fishing.

The municipal waters of Borongan are classified into eight zones in accordance with the local fishery ordinance. Zone 1 includes one kilometer drawn eastward from the shores of Brgy Bugas, to Ando and Divinudo Island eastward to Brgy Suribao, reserved for the exclusive fishing area of marginal fishermen for their sustenance. Various fishing methods are allowed in this zone, including hook and line, gillnet, and throw nets. Zone 2 covers the area outside Zone 1 to the limit of 15 kilometers designated for commercial fishing. Zone 3 is a bangus (milkfish) fry zone encompassing 50 metres

from the shoreline at low tide of Brgy Bugas to Sabang North. Zone 4 is reserved for oyster culture, seaweeds farming, fishpens and cages, covering the cove of Brgy Bugas, Sta Fe and Tamoso. Similar to Zone 4, Zone 5 is also for seaweed farming but covers the cove of Brgy San Saturnino, Tabunan, Maypangdan and Canlaray. Zone 6 includes the shoreline between Cabong and Lalawigan and Loc-soon for bangus fry rearing and seaweed farming. Zone 7 is a municipal fish sanctuary in Monbon Island near Napla and facing Cabiton-an point. Zone 8 comprises marine reserve areas in the southern parts of Ando and Divinubo Island.

3.2 The Municipality of Guiuan

The Municipality of Guiuan is a second class municipality in the province of Eastern Samar located at the southernmost tip of Samar Island. It is bounded on the north by the municipality of Mercedes, the Pacific Ocean on the east, the Surigao Strait on the south, and the Leyte Gulf on the west. Guiuan is the only town in the province with the biggest number of island barangays. It is a fishing community with rich in fishery and aquatic resources.

Similar to Borongan, the municipal waters of Guiuan are divided into 23 zones. However each zone is a distinct area, which is either a barangay or an island, designated with a particular purpose. Zones 1 and 2 encompass Campoyong to Baras and declared as a wetland area for the sanctuary of migratory birds. Areas which are reserved for the erection of fish corals are Brgy Alingarog to Brgy Sto Niño; Brgy Victory Island; Tubabao Island; Manicani Island; Lupok to Campoyong; Brgy Ngolos to Sulangan; Brgy Inapulangan; and Brgy Bitaugan to Casuguran. The zones that serve as oyster culture beds are Victory Island and Inatunglan, Brgy Camparang; while the areas dedicated as fish sanctuaries are Bagonbanua, Puno Point, Cantican Island, and Monbon Reef. Sulangan Reefs, Brgy San Jose, Brgy Inapulangan, Brgy Canawayon, Usukann Reef and Brgy Sulu-an are considered as marine reserves. Seaweed farming zones are in Baras to Sulangan; Hamor-awon; and Brgy Trinidad to Brgy San Pedro. Fish cages and fish pens are operated along the channels of Sto Niño, Lupok; the whole of Tubabao Island; Inatunglan; Ngolos to Sulangan; Victoriy Island; and Inapulangan. Finally, those other municipal waters not covered in these zones make up the area for fishing for sustenance.

4. Fisheries of Eastern Samar

In order to determine the extent of the handline fishery in Eastern Samar, two enumerators were hired for the project to gather data from September 2009 to August 2010 in four sampling sites of Brgy Rodsan, Ngolos, Guiuan, Eastern Samar; Brgy Sabang 1 and 2; and Sapao Beach, Guiuan. Interviews were also conducted to obtain socio-economic related information on the handline fishery. Table 1 summarises the data collected in the four project sites in Eastern Samar.

The port sampling activities not only provided significant data for the ACIAR Project but also contributed to the National Stock Assessment Program (NSAP) of BFAR. The main objective of NSAP is to strengthen the data collection and verification system in the country in order to obtain a better assessment of fish stocks in the country which will lead to a more effective fisheries management.

Table 1. Summary of Port Sampling Data Collected in Region VIII, Sept 2009-Aug 2010

Note that 0MT includes any weight <1MT.

					TOTAL UNLOADINGS		TOTAL SAMPLED				
Landing Center	Month/ Year	Gear	Days Sampled	%	Trips	MT	Trips	%	MT	%	LFRQ
Rodsan Ngolos Guiuan	Sep-09	Hook and Line	0	0	0	0	0	0	0	0	0
	Oct-09		10	32	57	1	234	79	6	100	0
	Nov-09		10	33	241	11	157	74	2	100	0
	Dec-09		10	33	149	5	125	74	1	100	0
	Jan-10		10	32	156	5	154	99	5	98	0
	Feb-10		9	32	92	3	92	100	3	100	0
	Mar-10		10	32	75	4	75	100	4	99	0
	Apr-10		10	33	119	5	118	99	5	100	0
	May-10		10	32	85	4	85	100	4	81	0
	Jun-10		10	33	86	4	85	99	4	98	0
	Jul-10		10	32	96	5	96	100	5	100	0
	Aug-10		10	32	71	3	71	100	3	100	0
Brgy. Sabang 1, Borongan, E. Samar	Sep-09	Hook & Line	3	10	18	1	17	99	1	100	60
	Oct-09		10	32	96	2	96	100	2	100	182
	Dec-09		8	27	40	2	40	100	2	100	175
	Jan-10		10	32	27	1	27	100	1	100	220
	Mar-10		10	32	26	1	26	100	1	100	312
	Apr-10		9	32	19	0	19	100	0	0	268
	May-10		10	32	47	2	47	100	2	100	306
	Jun-10		9	30	38	1	38	100	1	100	177
	Jul-10		12	39	67	3	63	94	3	100	346
	Aug-10		11	37	34	2	34	100	2	100	403
Brgy. Sabang 1, Borongan, E. Samar	Sep-09	Troll line	3	10	12	1	12	100	1	100	75
	Oct-09		7	23	16	3	16	100	3	100	91
	Nov-09		7	23	10	1	10	100	1	100	213
	Dec-09		4	13	6	1	6	100	1	100	189
	Jan-10		4	13	7	1	7	100	1	100	56
	Feb-10		3	11	4	0	4	100	0	100	101
	Mar-10		8	26	15	3	15	100	3	100	137
	Apr-10		4	13	6	1	6	100	1	100	123
	May-10		9	29	12	2	11	92	2	88	72
	Jun-10		4	13	4	0	4	100	0	100	39
	Jul-10		5	16	18	3	18	100	3	100	171
	Aug-10		6	19	8	1	8	100	1	100	52
Brgy. Sabang 2, Borongan, E. Samar	Sep-09	Hook & Line	2	7	10	0	10	100	0	0	34
	Oct-09		10	32	82	5	82	100	5	99	158
	Nov-09		10	33	72	5	71	99	5	97	353
	Dec-09		10	32	88	4	88	100	4	100	192
	Mar-10		9	29	60	4	60	100	4	100	171
	Apr-10		8	29	53	3	53	100	3	100	289
	May-10		10	32	58	3	58	100	3	100	387
	Jun-10		10	33	95	4	95	100	4	98	343
	Jul-10		10	32	81	4	81	100	4	100	327
	Aug-10		8	27	64	3	64	100	3	100	352

4.1 Overview of Handline Gears

Based on the data gathered in the four selected sites in Eastern Samar, there are two types of handline gears: the simple handline also known as hook and line, and troll lines. Figure 2 shows the percentage catch contribution of the different types of handlines in Eastern Samar. It can be observed that the catch is mainly contributed by hook and line comprising 66% of the total catch, compared to 34% from troll line.

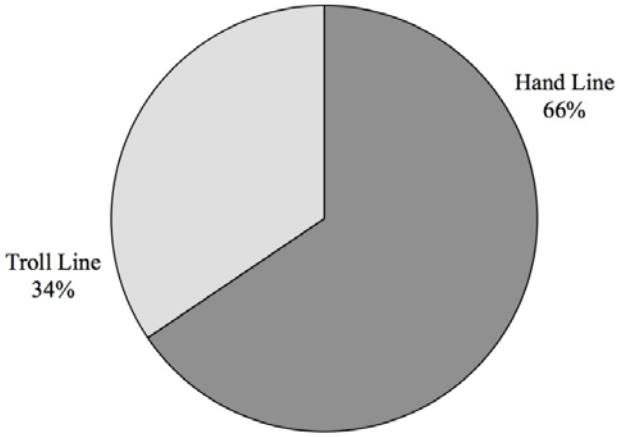

Figure 2. Percentage Catch Contribution of Handline Gears in Eastern Samar

4.2 Catch Composition

This section examines the catch composition, size composition, and catch and effort data for the handline fishery in Eastern Samar. The data collected were encoded and integrated into the NSAP Database system version 5.1, from which reports of processed data are generated. Port sampling data specific to handline fishery in the four project sites are very limited prior to this Project.

Photos: Sample tuna catch in Eastern Samar

Simple Handline or Hook and Line (HL)

For hook and line, skipjack (*Katsuwonus pelamis*) is the major species caught which comprises 49% of the total catch as observed for one year. The rest of the catch is composed of yellowfin tuna (*Thunnus albacares*), 27%; dolphinfish (*Corypheana hippurus*), 7%; marlin (*Makaira mazara*) 5%; and other species, 9%. Others species include small pelagic fishes, billfishes and some oceanic tunas.

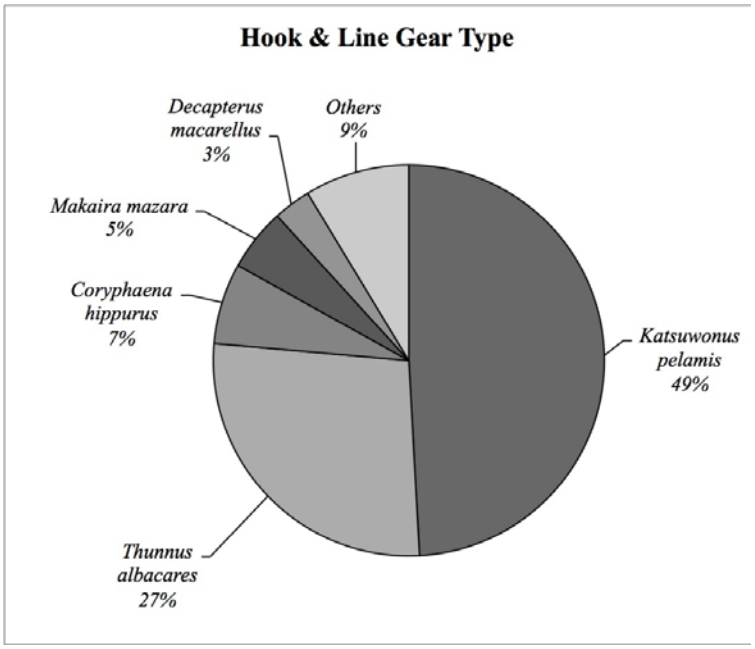

Figure 3. Percentage catch composition for hook and line gears in Eastern Samar, Sept 2009-Aug 2010

Troll line

For troll line, skipjack tuna (*Katsuwonus pelamis*) is also the major species caught which comprises 42% of the total catch for the sampling year. The rest of the catch is composed of yellowfin tuna (*Thunnus albacares*), 39%; eastern little tuna (*Euthynnus affinis*), 7%; mackerel scad (*Decapterus macarellus*), 5%; dolphinfish (*Coryphaena hippurus*), 2%; and other species, 5%.

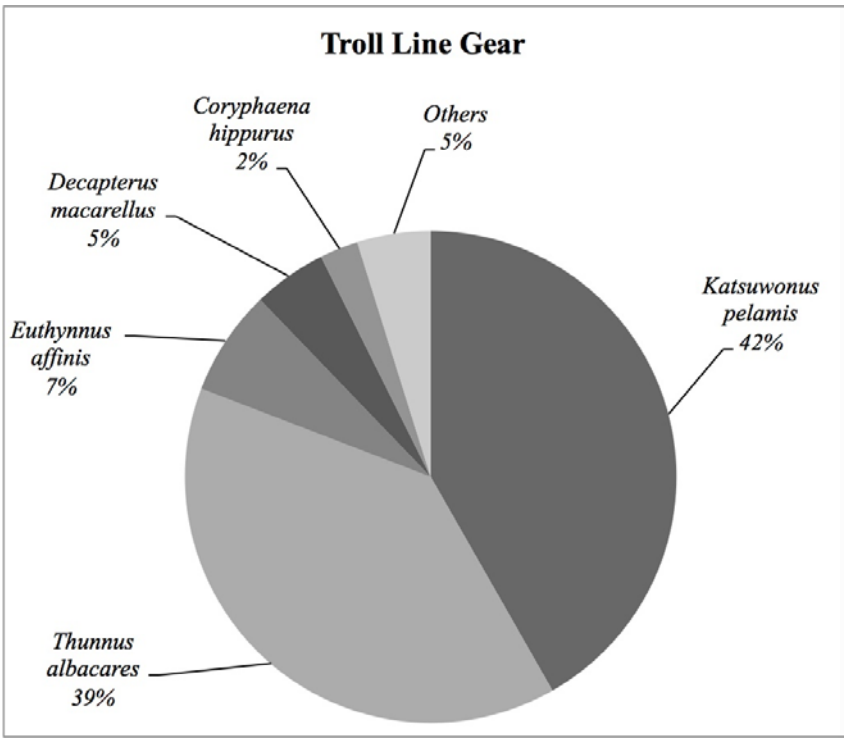

Figure 4. Catch Composition of Troll Line Gears in Eastern Samar

4.3 Size Composition

Hook and Line (HL)

Available length frequency data for hook and line fishery from September 2009 to August 2010 were also compiled. Length frequency distribution consisted of the actual number of yellowfin and skipjack tuna measured. It was observed that hook and line vessels based in Eastern Samar catch yellowfin tuna ranging from 15 to 120 cm. The length frequency of skipjack tuna ranges from 15 to 65 cm. For yellowfin tuna, the dominant length caught by hook and line ranges from 25 to 45 cm and the same may be concluded for skipjack tuna.

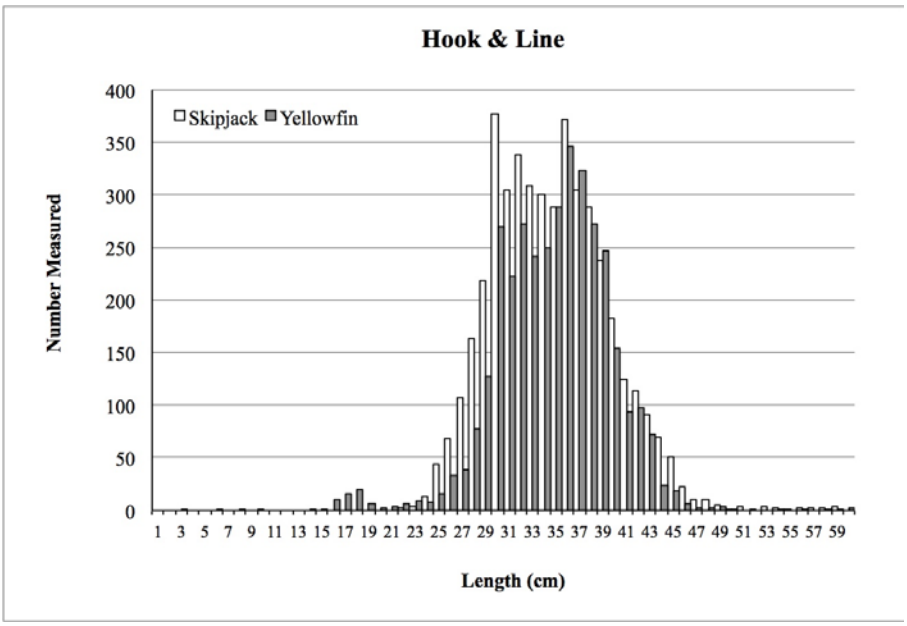

Figure 5. Observed Length Sizes of Tuna Caught by Hook and Line Gears in Eastern Samar

Troll Line (TL)

For tuna caught using troll line gears, the length sizes of skipjack range from 25 to 120 cm. The dominant length of skipjack tuna caught by troll line ranges from 25 to 45 cm which was observed to be smaller compared to sizes of fish caught by troll lines in Eastern Samar.

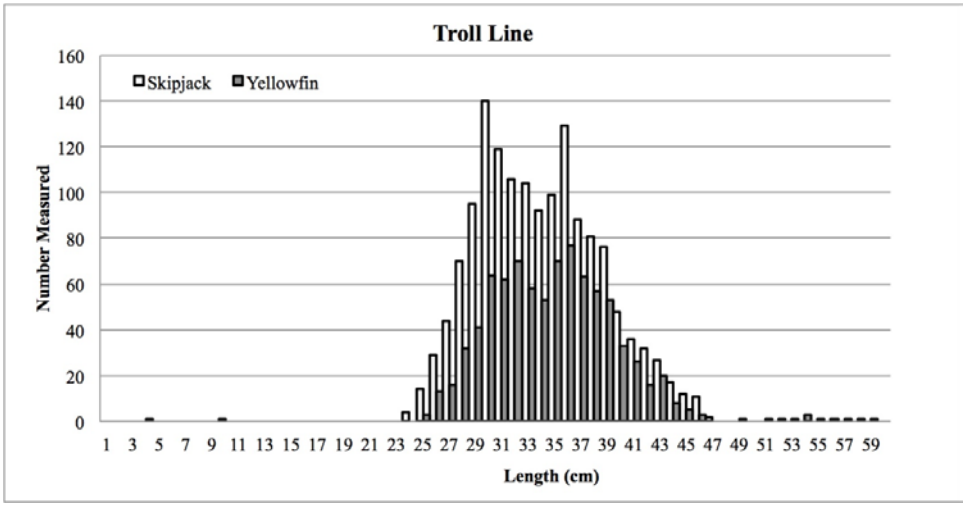

Figure 6. Observed Length Sizes of Tuna Caught by Troll Lines in Eastern Samar

4.4 Catch and Effort Data

Hook and Line(HL)

The hook and line gear in Eastern Samar is one of the major fishing gears in the Philippines, targeting tunas and other pelagic fishes. Figure 7 describes the available effort data for hook and line fishing in Eastern Samar from September 2009 to August 2010, and shows the trends in CPUE.

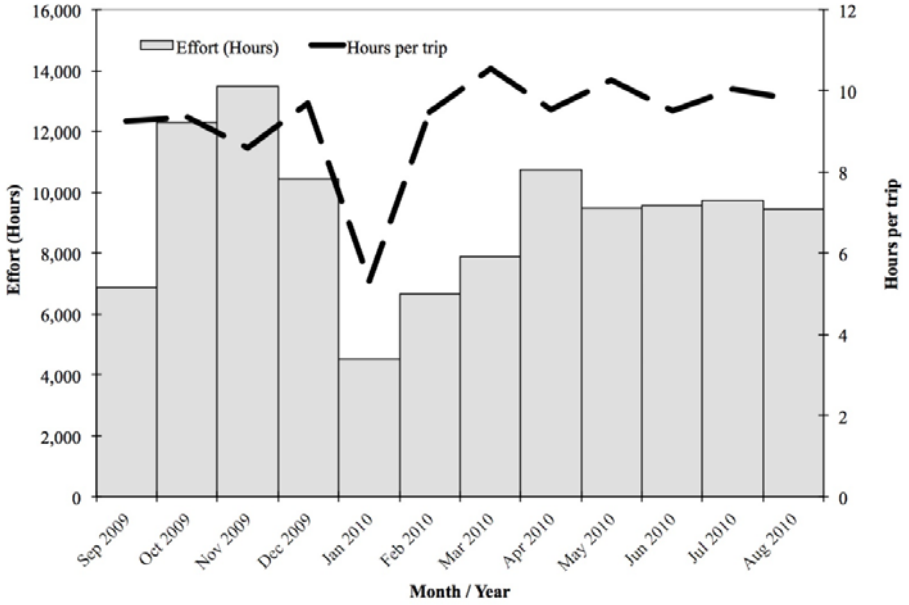

Figure 7. Month Effort (Hours) and Hours/Trip for Hook and Line in Eastern Samar

This figure illustrates that the total effort for hook and line vessels ranges from 4,500 to 13,500 boat hours per month, with the highest effort observed in November 2009 at around 13,500 boat hours. This coincided with highest CPUE catch for skipjack tuna during that period. The average effort is around 9,000 boat hours per month. Fishing activities by hook and line vessels normally range from five to ten hours per trip, which is the average observed throughout the sampling period.

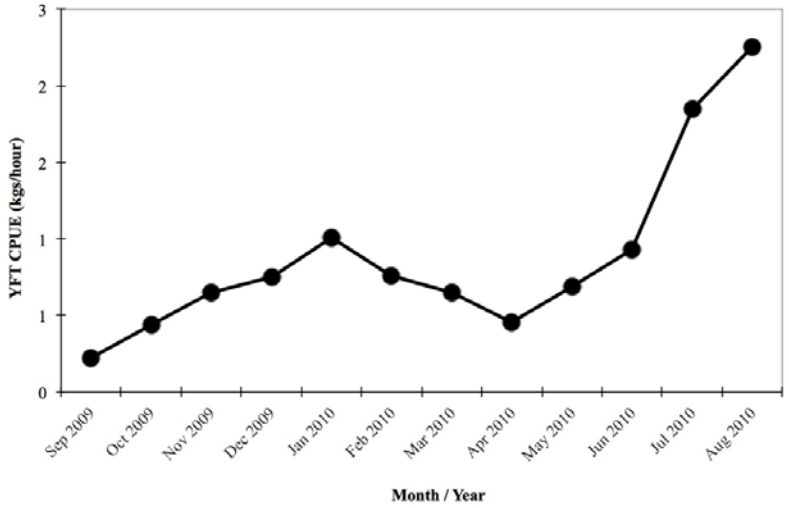

Figure 8. Monthly Yellowfin CPUE for Hook and Line in Eastern Samar, Sept 2009-Aug 2010

The CPUE for yellowfin tuna by the hook and line fleet in Eastern Samar has fluctuated over the sampling year, ranging from 0.5kg to 2.5kgs/trip-hour. An increase in CPUE was observed during the months of September 2009 to January 2010, while there was a drop in CPUE from February to April 2010. Another increase in CPUE was experienced from May to August 2010.

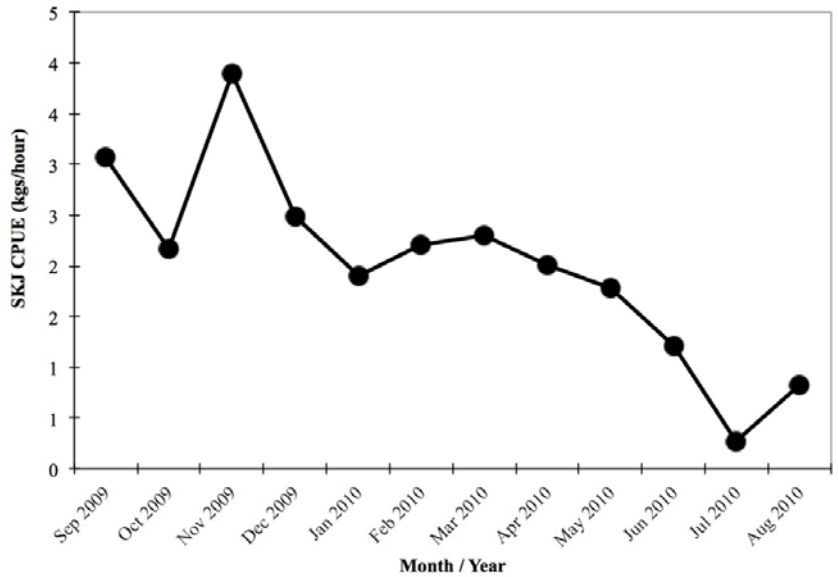

Figure 9. Monthly Skipjack CPUE for Hook and Line in Eastern Samar, Sept 2009-Aug 2010

For skipjack caught by hook and line vessels, the CPUE ranges from 0.3kg to 3.9 kgs/trip-hour. November 2009 proved to be a good period for skipjack tuna catches with the highest CPUE recorded throughout the sampling period. After this peak in catches, the skipjack tuna CPUE began to drop until July 2010. During the period of April to July 2010 when the skipjack CPUE was low, the CPUE for yellowfin tuna was considered relatively higher than in other months.

Troll Line

The troll line gear is another type of handline gear observed in Eastern Samar that targets tunas and other pelagic fishes. The following sections provide a description of the available effort data and looks at trends in CPUE for Eastern Samar troll line fishers from September 2009 to August 2010.

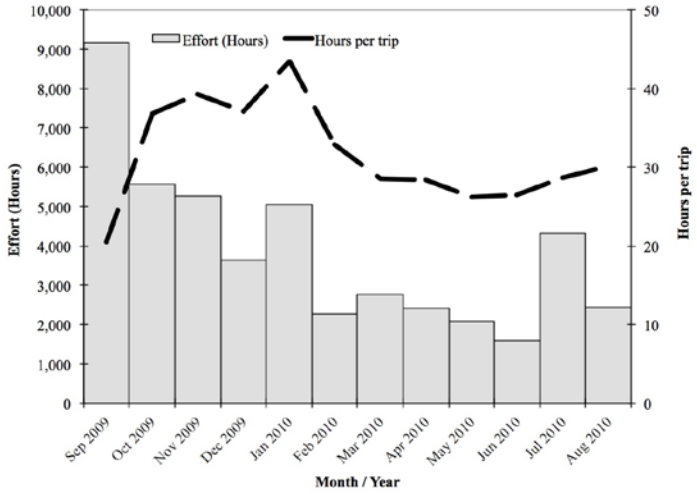

Figure 10. Month Effort (Hours) and Hours/Trip for Troll Line in Eastern Samar

With respect to troll line tuna fishery, the total effort of municipal vessels using this gear ranges from 1,500 to 9,100 boat hours per month with the highest effort observed in September 2009 at around 9,100 boat hours. This observation coincided with the lowest CPUE catch for yellowfin tuna during the same period. The average effort for these vessels is around 3,800 boat hours per month. The hours per trip ranges from 20 to 40 hours, with an average of 30 hours per trip throughout the sampling period.

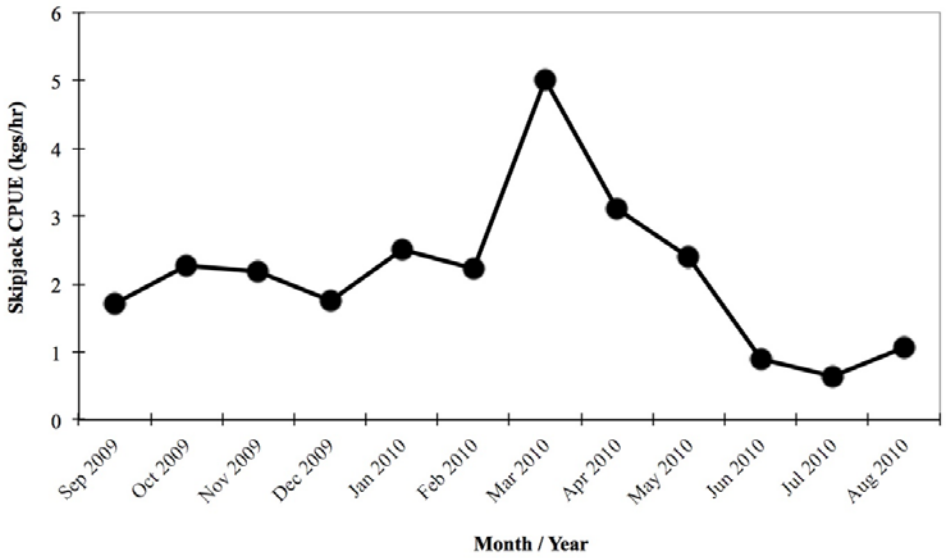

Figure 11. Monthly Skipjack CPUE for Troll Liners in Eastern Samar, Sept 2009-Aug 2010

It was observed that the skipjack CPUE for the Eastern Samar troll line fleet has fluctuated over the sampling period, ranging from 0.6kg to 5 kgs/trip-hour. The highest CPUE for skipjack was observed in March 2010 at 5kgs/trip-hour, while the CPUE was very low between June to August 2010. The average CPUE for skipjack fishing by troll liners is 2kgs/trip-hour.

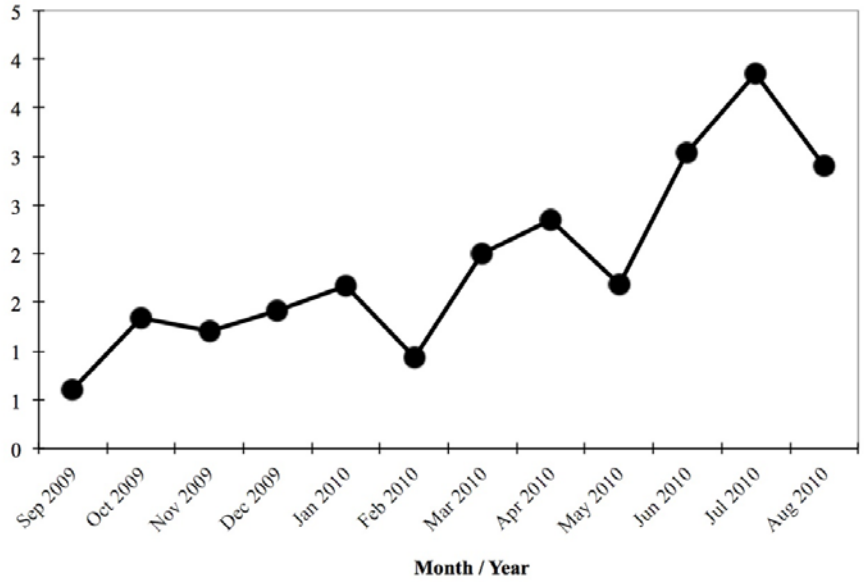

Figure 12. Monthly Yellowfin CPUE for Troll Liners in Eastern Samar, Sept 2009-Aug 2010

In the case of yellowfin tuna, the CPUE by the troll line fleet in Eastern Samar was observed to increase throughout the sampling period, ranging from 0.6 – 3.8 kg/trip-hour. The highest yellowfin CPUE was observed last July 2010 with 3.8 kg/trip-hour. The average CPUE for yellowfin catch by troll line vessels is around 2kg/trip-hour.

4.5 Other Fisheries Information

The table below shows the number of boats and fishers in each sampling area. As explained in the previous sections, most fishermen based in Borongan, Eastern Samar use only hook and line and troll line gears. However, in Guiuan, Eastern Samar, aside from hook and line, there are fishers who have reported to have used drift gillnet (DGN), spear guns, and fish coral. Majority of the fishers, comprising around 75%, are mainly using hook and line gears. The rest of the fishers use drift gillnets (17%), spear guns (5%), and fish corals (3%).

Table 2. Number of Handline Vessels and Fishermen in Eastern Samar

Types of Boats and Gears	Borongan		Guiuan	
	Sabang 1	Sabang 2	Sapao	Ngolos
HL/TL boats	22	50	48	87
HL/TL fishers	22-66	50-150	82	128
DGN boats			24	8
DGN Fishers			64	17
Spear boats				24
Spear fishers				24
Boats Using Fish Coral				14
Fishers Using Fish Coral				14

Fishermen usually fish for four days at sea. A boat would usually have four fishermen per trip. They travel for 80 to 120 miles out to sea or for about eight hours. A trip usually consumes 140 to 180 liters of petrol and the boat carries about five blocks of ice per trip. A single fishing trip would cost about PhP15,000 (~AUD375). During good seasons, the average catch is 400 kilos, and 200 kilos during lean season. The tuna is normally sold for Php80 to PhP120 (~AUD2 to AUD3) per kilo in Calbayog, Tacloban, Ormoc, Catbalogan. Another type of fishing boat used is what they call a *striker* which can accommodate one to two fishermen and only stays out at sea for one day, travels for 60 kms, and catches about five to ten tuna *bariles* on a good season, which they can sell for PhP120 to PhP180 per kilo (~AUD3 to AUD5). The cost of fishing operations include PhP2,500 (~AUD65) per trip for the gasoline and Php400 (~AUD10) per block of ice.

Photos: Small handline fishing vessels in Eastern Samar

Fish catch depends on the season. The peak season is April to May. During this period, about 100 kilos of *pelamis*, or about ten pieces of tuna are caught. Low season is from November to February. A very small quantity of export quality fresh tuna is sold to buyers from General Santos.

There are currently more than 100 fish aggregating devices or *payaos* in operation in Eastern Samar and nearby fishing grounds. There were *payaos* provided previously by BFAR but were mismanaged. A *payao* costs about Php40,000 (~AUD1,000) each.

Photos: Large handline fishing vessel and its hook and line gear in Brgy Rodsan, Eastern Samar

5. Legal and Policy Framework for the Management of Handline Fishery in Eastern Samar

The legal and policy framework for the management of handline fishery in Eastern Samar comprises (1) the overall legal framework that applies to all types of fisheries in the Philippines; and (2) the framework specifically applicable to the handline fishery. Since the handline fishery in the Eastern Samar is mostly municipal, artisanal, and subsistence in scope (with a small number of commercial vessels), a discussion of the access to waters beyond the Philippine EEZ is excluded in these discussions.

5.1 General Framework for the Management of Fisheries in the Philippines

The utilisation, conservation, and management of fisheries resources in the Philippines is primarily governed by three laws namely, the Philippine Fisheries Code 1998, the Agriculture and Fisheries Modernisation Act 1997, and the Local Government Code 1991. The Philippine Fisheries Code 1998 provides the basic fisheries management framework; the Agriculture and Fisheries Modernisation Act 1997 addresses fisheries development as a component of the agricultural sector; and the Local Government Code 1991 provides guidelines for local autonomy and decentralisation which includes fishery functions. There are also regulations implementing the Philippine Fisheries Code in the form of Implementing Rules and Regulations and Fisheries Administrative Orders issued by the Department of Agriculture.

Under the Local Government Code 1991, local government ordinances provide regulations on fisheries matters at the local level. There are four classifications of local ordinances. A 'municipal fishing ordinance' may be formulated to provide the scope of jurisdiction of local governments as well as regulations on licensing and delineation of municipal boundaries. A 'special fisheries ordinance' may be issued on special demarcated fisheries areas, closed season and environmentally critical areas and sanctuaries. A 'unified fisheries ordinance' is formulated by local government units which border bays, lakes and gulfs for the purposes of integrated resource management. The Philippine Fisheries Code, the Local Government Code, including fisheries administrative orders,

provide the basis for the adoption of local fisheries ordinances. Local government councils adopting fisheries ordinances have the obligation to ensure that such ordinances, whether municipal, city or provincial, are consistent with the provisions of the Philippine Fisheries Code.

Aside from these basic fisheries-related laws, national policies are also part of the general framework for sustainable fisheries management. These national policies include the Philippine Tuna Management Plan, National Marine Policy, Philippine Agenda 21, and the Medium-Term Philippine Development Plan (MTPDP). Although not discussed in this Report, there are also other laws and policies relating to the environment, trade, labour, and safety of fishing vessels which form part of the general framework for the effective management of fisheries and control of fishing activities in the Philippines. These laws, policies, and regulations provide the basis for the specific framework applicable for the management of handline fishery discussed in the succeeding section.

5.2 Framework for the Management of Municipal Handline Fishery in Eastern Samar

The framework for the management of the municipal handline fishery for Eastern Samar may be divided into national legislation specifically addressing handline fishing, and municipal fisheries ordinances adopted by local governments. This framework also includes the local institutional framework necessary for the effective management of handline fishery in the Philippines.

5.2.1 The Handline Fishing Law

As highlighted in Section 5.1 of this Report, the general framework on fisheries conservation and management applies to all types of fisheries, including handline fishing. To resolve issues relating to the registration and licensing of commercial handline vessels, Republic Act No 9379 or the Handline Fishing Law was enacted in 2007. This law aims to strengthen the rules and regulations governing handline fishing and ensure the safety and seaworthiness of handline fishing vessels. In this legislation, handline fishing is defined as a “traditional fishing method that use the hook and line, a passive fishing gear with a single vertical line carrying one hook and used by simply dropping the line into the water and waiting for the fish to bite. A handline fishing boat is “a fishing boat with or without outrigger and with or without auxiliary small boats on board that exclusively utilizes the handline fishing method”. In this definition of the handline fishing boat, there is no specification as to the gross tonnage of the vessel, the number of small auxiliary boats, or the extent of their fishing areas.

Section 4 of the Handline Fishing Law provides that the registration, inspection, manning and other documentation of handline fishing boats are the responsibilities of the Maritime Industry Authority (MARINA), while the licensing and related documentation are the functions of BFAR.

Section 5 provides that Philippine registered handline fishing boats may operate in international waters or waters of other countries that allow such operations, provided that they comply with appropriate and applicable safety, manning, radio communications and other standards and requirements geared at promoting seaworthiness. Such vessels are also required to secure an appropriate international fishing permit and certificate of clearance from BFAR. Similar with other types of vessels, fish caught by handline fishing boats shall be considered as caught in Philippine waters and therefore not subject to import duties and taxes when the same is landed in designated fish landings and fish ports in the Philippines. Lastly, Section 5 of the Handline Fishing Law provides that fishermen on board Philippine registered handline fishing boats conducting fishing activities beyond the Philippine EEZ are not considered as overseas Filipino workers.

The Handline Fishing Law provides for the manning requirements of handline fishing vessels. It requires all persons holding the position of Boat Master to be issued a Boat Captain licence after submitting a Certificate of Engagement from the present boat owner whom he works with, affidavit of boat owner taking the risk and responsibility for engaging the Boat Master, and a Certificate of Completion for theoretical and practical training for all applicants to the position. Similarly, the Boat Engineer of a handline boat would need to be issued a Boat Engine Officer Licence after submitting a Certificate of Engagement from the boat owner and after obtaining completing theoretical and practical training. Such training needs to be complied with within one year. For handline boats fishing outside the Philippine EEZ, the boat master, engineer and other personnel shall submit relevant manning documents, as well as the Seaman's Identification and Record Book (SIRB). The Identification Cards of the Boat Master and Boat Engine Officer bear the words "Only for Handline Fishing Boat".

The Handline Fishing Law also contains provisions on the construction of vessels. Section 7 provides that existing and newly constructed handline fishing boats shall be admeasured or re-admeasured and shall follow prepared boat plans. For boats of five gross tons and below including auxiliary boats, the requirement is a picture and actual dimensions of the boat submitted by the owner or boat builder. For boats above five gross tons, the boat plan should be signed and sealed by a naval architect.

Lastly, the Handline Fishing Law provides that 90 days from the approval of the Act, rules and regulations will be promulgated by the Secretary of the Department of Agriculture, through a technical working committee composed of the BFAR, the MARINA, the Philippine Coast Guard, the National Telecommunications Commission and other concerned government agencies, in consultation with fisherfolk and handline fishing industry organisations and other stakeholders. The rules and regulations will consist of provisions on the establishment of a one-stop shop for the industry; first aid, life saving and firefighting devices; operation of radio communication facilities; reportorial requirements, and other standards that promote seaworthiness.

Because of the vague definition of handline vessels under the Handline Fishing Law and the lack of implementing rules and regulations, the scope of application of the registration, manning, and licensing requirements under the legislation is difficult to ascertain. A small number of commercial fishing vessels operating in Rodsan will most be required to abide by the Handline Fishing Law. If these commercial fishing vessels are not given adequate notice to comply with such regulations, the handline sector of Region VIII may be faced with additional and stricter requirements that may prove burdensome to the fishermen. Hence it would be necessary for the industry to be actively involved in future consultations towards a development of an administrative order that will ensure that the interests of the handline operators and fishermen are protected.

5.2.2 Other Applicable Regulations

A number of regulations may be identified as relevant for the fishing operations of the handline sector. One of these regulations is Fisheries Administrative Order No 233 (2010) on the conservation of aquatic wildlife. This fisheries administrative order provides for the requirement to obtain prior permits for the local transport, as well as the exportation and importation of a number of fish species, including yellowfin, skipjack, bullet, and frigate tunas. This regulation implies that any local movement or international trade of these tuna species without proper certification may be punishable by law. Any trade of tuna products are also subject to food handling and safety requirements, such as the Hazard Analysis Critical Control Point, and other trade-related regulations such as rules of origin, catch certification, and import and export control.

The Philippines is also in the process of finalising a FAD Management Policy which will be adopted as a Fisheries Administrative Order to reduce fishing mortality of juvenile yellowfin and bigeye tuna arising from fishing activities using *payaos*. This Fisheries Administrative Order will provide regulations on the design and operation of FADs used by purse seine, ring net, and handline vessels in the Philippine EEZ. Similar management schemes for fishing using FADs in archipelagic waters will be developed. It would therefore be necessary for the handline sector to participate actively in the discussions to develop such fisheries administrative order, to ensure that its interests in fishing using *payaos* are taken into account. Other regulations such as FAD area and time closures applied within Philippine waters would also need to be complied with by handline vessels.

5.3 Local Framework for Managing Handline Fisheries

The framework for the management of handline fisheries in Eastern Samar comprises local fisheries ordinances which are adopted consistent with national laws, policies, and programs, such as the Philippine Fisheries Code and its implementing regulations, the Local Government Code, and other domestic policies and laws on coastal resource management and environmental protection. Currently, only the Handline Fishing Law is yet to be implemented at the local level.

The applicable local ordinances governing fisheries in Eastern Samar are the following: 1) Province of Eastern Samar, Municipality of Guiuan, An Ordinance Enacting the Basic Fishery Ordinance of 209 and Amending for the Purpose Ordinance No. 02, s-1998, Otherwise Known as the Basic Fishery Ordinance of the Municipality of Guiuan, Eastern Samar; and 2) Province of Eastern Samar, Municipality of Borongan, Municipality Order No 23, Series of 2005, An Ordinance Amending Ordinance No 10, s 1993, which Amended Ordinance No 14, s 1992 Regulating Fishing and/or Fisheries in the Municipality of Borongan Province of Eastern Samar and for Other Purposes.

These local ordinances are adopted for the management, conservation, and development of fisheries in municipal waters. The objectives of local these fishery ordinances include the following:

- Conservation, protection and sustained management of the municipal waters and coastal areas;
- Prevention of poverty and the provision of supplementary livelihood among city fisherfolk;
- Ensuring social equity and food security in the coastal areas;
- Support for city fisherfolks through appropriate technology, post-harvest technology and research, credit, marketing assistance and other necessary services;
- Participation of people's organizations in the conservation and management of coastal fisheries; and
- Promotion of awareness of sustainable fisheries through appropriate training, information and education.

These objectives may be clearly summarised into two: the *first* being the conservation and proper management of fisheries resources for the benefit of local fisherfolks; and *second* is to increase the capacity of these fisherfolks to utilize fisheries resources for their economic development. Such objectives promote the rights and privileges of local fisherfolks in municipal waters as espoused in the Philippine Constitution. The municipal fishery ordinance of Guiuan also has additional policies and objectives which are not commonly found in other local ordinances, including those of Borongan. One of these policies is the precautionary principle, where the absence of adequate scientific and technical information shall not be used as a reason for postponing or failing to take conservation and management measures. Another policy which is quite distinct for the Guiuan fishery ordinance is the promotion of responsibility and accountability in the use of coastal and aquatic resources. Both policies recognize stewardship in the management of coastal and aquatic resources, the adoption of which demonstrates a commendable effort on the part of the municipality to contribute to the sustainability of its fisheries resources.

Local fisheries ordinances provide for the preferential right of city fisherfolks, cooperatives and organisations listed in the city fisherfolk registry to conduct fishery-related activities in municipal waters. In certain circumstances, the local government may also conduct public bidding to determine the participation by fisherfolks in such right. The general order of preference in awarding fishing rights start from local municipal or city residents, transient fishermen from neighbouring towns and provinces, local cooperatives, and those who have acquired permits from the local government.

The rights of fisherfolks in municipal waters are not only supported by a number of regulations promoting the preferential rights of fisherfolks but also protection from competition with commercial vessels. The local ordinance also provides for accreditation of fisherfolks and their associations, as well as support to registered fisherfolk organisations and cooperatives in terms of fisheries research, marketing, training, and supplemental livelihood.

The following section summarizes the legal and policy measures for the management of handline fisheries in Eastern Samar. These measures include the registration of fisherfolks, licensing of vessels and gears, and various measures such as closed seasons and areas, marine protected areas, fish length and size regulations, and mesh size requirements. It should be noted that local fishery ordinances apply to all types of fishing, including handline fishing.

5.3.1 Local Fisheries Management Measures in Guiuan, Eastern Samar

The key measures under the local fishery ordinance applicable for the management of handline fishery in Guiuan, Eastern Samar are discussed below.

Registry of Coastal and Aquatic Resource Users

The municipal government of Guiuan is required to maintain a registry of all coastal and aquatic users for the purpose of determining priorities for providing rights of access and for monitoring fishing activities.

Designation of Fishing Areas

As highlighted in Section 3 of this Report, the Guiuan fishery ordinance provides for the designation of zones in municipal waters where certain activities may be conducted such as fishing for sustenance, commercial fishing, operation of fish corrals, fish pens and cages, gathering areas for fish fry and aquatic juveniles, aquaculture and mariculture areas, and protected areas.

Fishing Vessel and Gear Licensing

All individuals, cooperatives, partnerships, firms or corporations who are listed in the Registry of Resource Users must obtain a permit from the local government prior to any use of gear or conduct of fishing activity. This permit is non-transferrable and is valid for a year. Before any permit is issued, the applicant is required to attend an Ecological Awareness Seminar and Orientation on the national and local laws and regulations. Fishing licenses are issued to registered fisherfolks upon completion of requirements and payment of small amount of fees. Obtaining a fishing permit is tantamount to an agreement to comply with all applicable laws and regulations.

Various Prohibitions

There are a number of prohibitions under the Guiuan fishery ordinance, including the gathering of tropical or aquarium fish; gathering of *kuyog* or juveniles of siganids; fishing using other gears other than hook and line, troll and jig within one kilometer radius of the *payaos*; gathering and possession of gravid lobsters and crabs; and gathering and selling of abalone less than two inches

shell length. Other illegal activities include fishing without license or permit, commercial fishing in municipal waters, illegal construction of fish corrals and fish cages, and fishing in sanctuaries or marine reserves.

Other Fisheries Management Measures

The local ordinance of Guiuan provides for the regulation of access to municipal waters on the basis of maximum sustainable yield or other indicators of coastal and fisheries resource health. It also contains provisions on the construction of artificial reefs and FADs; environmental impact assessment; protection of rare, threatened and endangered species; protection of spawners and breeders; establishment of marine protected areas; and management of mangrove areas and seagrasses.

Other Regulatory Measures

The local fishery ordinance of Guiuan provides for the regulation of the exportation and importation of fish and fishery products. Trade of fish from Guiuan waters requires prior permit.

Administrative Sanctions

Every violation of any prohibition under the Guiuan local fishery ordinance is penalized by a fine of PhP2,500 (~AUD65) and/or imprisonment of up to six months. The ordinance also provides for out of court settlement under certain conditions. The law enforcement team who apprehended the violator usually gets 50% of the fine collected by the LGU. Collected fines from illegal fishing activities are distributed as follows: 40% to the City; 50% to the apprehending team; and 10% to the barangay where the violation is committed.

Public Awareness

The local government, through the City Council supports public awareness on the protection and conservation of coastal environment and resources. Through public awareness, it also ensures the participation of communities in policymaking and management process.

Fisherfolk Organisations and Cooperatives

The critical role that fisherfolk organisations and cooperatives play is recognized not only in accessing coastal resources but also in their proper management. Fisherfolks are considered by the Government as partners in achieving the objective of sustainable fisheries management and economic development. To strengthen this partnership, the local ordinance of Guiuan requires local governments to municipal fishers, particularly through appropriate technology, training, credit, and post-harvest facilities.

Institutional Framework

In Guiuan, the management, conservation, development, and utilization of all coastal and fishery resources are the main responsibilities of the local government unit (LGU). The LGU, through the Office of Mayor, is responsible for the issuance of fisheries regulations. These regulations are developed in consultation with relevant stakeholders, including the municipal Fisheries and Aquatic Resource Management Council (MFARMC). When it is determined by the LGU and the FARMC that a specific area of the municipal waters is being overfished, the former can implement measures to regulate or prohibit fishing activities in the area.

The local fishery ordinance of Guiuan also provides for the creation of the Municipal Coastal Resource Management (CRM) office. The CRM office is responsible for developing plans and strategies that relate to coastal and fishery resource management, providing advice to the local government on applicable measures, and in ensuring that municipal fisherfolks have equitable access to the resources.

A number of national and local government entities are authorized to enforce the ordinance, including the Philippine National Police, the Philippine Coast Guard, law enforcement of the Department of Environment and Natural Resources, BFAR, the *Bantay Dagat Kalikasan* (Guardian of the Seas and Nature) Task Force of the community, and deputized wardens and barangay officials.

5.3.2 Local Fisheries Management Measures in Borongan, Eastern Samar

The measures adopted under the local fishery ordinance for the management of handline fishery in Borongan, Eastern Samar are as follows.

Registry of Municipal Fisherfolks

All persons fishing in Borongan municipal waters are required to be listed in the Registry of Municipal Fisherfolks. The registry is maintained for purposes of determining priorities among the fisherfolks, limiting access into municipal waters, and monitoring fishing activities. Registration is free and is renewed annually.

Licencing of Fishing Vessels and Activities

All fishing vessels and fisherfolks wanting to take fish by means of any nets, traps and fishing gears, as well as those establishing or operating fish corrals, fish pens and fish cages are required to obtain a fishing license. Such licenses are issued upon payment of a minimal fee. Registration is a prerequisite to obtaining such licenses. Licenses are also required for the transport of fishery products. By obtaining a license for municipal fishing, all licensees agree unconditionally to comply with all laws and regulations governing fisheries. Licenses and permits also contain specific terms and conditions relating to their fishing activities.

Fisheries Management Measures

There are a number of measures adopted under the Borongan fishery ordinance for the management of fishery resources. For example, access to fisheries by means of a license or permit should be based on maximum sustainable yield. Borongan has also established measures such as closed seasons and fish size limitations, among other measures. The ordinance further requires the preparation of a detailed Environmental Impact Assessment prior to undertaking any projects which have a significant impact on the quality of the environment.

Reporting of Fish

Any individual or entity given the license to fish in municipal waters is required to submit to the relevant MFARMC, within the first ten days of each month, a report showing the kind, quantity, volume of fish caught in the preceding month.

Fisheries Violations

Under the Borongan fishery ordinance, it is illegal to fish without a permit; use baby trawls using fishing boats of three gross tons or less; violate reporting requirements; cut mangrove trees; fish in overfished areas and during closed seasons; fish in marine reserves and refuges; take rare, threatened or endangered species; capture *sabalo* and other breeders; export crablets, spawners, fry or eggs; and violate catch ceilings. Illegal fishing methods include dynamite fishing, fish poisoning, electrofishing, use of fine mesh nets below three centimeters, trawl, muro ami, *hulbot-hulbot*, beach and coral seine, lobster nets, and *tulbong*. These illegal activities closely follow the list of prohibitions under the Philippine Fisheries Code.

Fisheries Penalties

The penalties for fisheries violations range from PhP1,000 to PhP 20,000 (~AUD25 to AUD50) and may include imprisonment.

Institutional Framework

Local fishery ordinances provide institutional mechanisms which would facilitate the development of policies and regulations on municipal fisheries, as well as their implementation. Similar to the institutional framework for fisheries in any municipality, Borongan relies on local government units, municipal and barangay FARMCs and enforcement authorities for the effective management of fisheries and enforcement of fisheries legislation.

The municipal government is responsible for the granting of fishery privileges, licenses, and permits for the operation of fishing vessels, transport of fish and other fishing activities. The FARMCs, which are established in every municipality and barangay, assist in the development of fishery management plans and the enforcement of fisheries laws and regulations, as well as the provision of advice to local councils on fisheries matters. The Philippine National Police, other enforcement agencies and deputized fish wardens are authorized to enforce the local fishery ordinance.

6. Key Issues on the Management of Handline Fishery in Eastern Samar

A number of concerns have been raised by municipal handline fisheries stakeholders in the ACIAR Project sites. These issues mainly focus on overfishing, competition with other gear users, lack of effective law enforcement, non-compliance with the Handline Fishing Law for large handline vessels, absence of search and rescue programs, inadequate post harvest facilities and techniques, insufficient sources of capital, lack of cooperation amongst fishermen, need for alternative livelihoods, and impact of environmental factors such as climate change. Amongst these problems, the unabated fishing access by ringnet vessels from other municipalities is considered the greatest threat to the sustainability of fisheries resources and the livelihood of handline fishermen. The fishermen believe they are no match to commercial fishers who continue to fish in municipal waters.

Photos: Catch of ringnet vessels

7. Opportunities for the Handline Fishery in Eastern Samar

Despite numerous challenges, there are opportunities for the municipal handline fishing sector of Eastern Samar which may be further examined. One of these opportunities relates to development of the industry by means of **additional investment**. In the field visits conducted by the ACIAR project

team to General Santos City, there were indications that some of the processing companies may be interested in expanding their business in other regions, either by getting their fish supply or establishing canneries in other fish ports. This opportunity may open up potential business arrangements with the fishing industry in Eastern Samar. The handline fishing industry of Region VIII may also promote **certification of the handline fishery** as a sustainable fishery by working with the government and non-governmental organizations such as the World Wildlife Fund for Nature (WWF). The WWF is currently undertaking pilot projects for tuna handline fisheries to meet the sustainability criteria of the developed by the Marine Stewardship Council (MSC). Other opportunities may be explored for the growth of the handline fishing industry, such as the **establishment of icing and post-harvest facilities**. As in the practices of other countries and other regions of the Philippines, development of post-harvest facilities may be initiated and funded by the government, and leased and operated partly or wholly by the industry. The local governments may also investigate on other non-fisheries activities which the fishing industry may consider as part of their **alternative livelihood** or source of income during off-seasons in fishing. The province of Eastern Samar may further examine the possibility of having a **regional focus on fish trade**, where the local governments can explore various markets for tuna caught by handline vessels and establish a consortium of tuna supply from the various ports of the region. This may assist in strengthening Region VIII in both national and international fish trade and encourage handline fishermen to get involved in external trade.

In terms of enforcement of fisheries law, two areas where local governments of the Eastern Samar may further develop are in terms of enhancing community-based enforcement and provision of stricter fisheries penalties. **Better organisation of *Bantay Dagat*** as a community based enforcement system will lead to improved implementation of law, especially with respect to illegal fishing in coastal waters. A more effective enforcement regime will help gain the confidence of handline fishermen in the management of tuna fisheries, which may eventually lead to self-compliance, one of the factors contributing to a strong institutional framework in municipal fisheries. Part of a reliable enforcement regime is a **robust penalty system**. The municipal legislation in Guiuan has sophisticated provisions on imposing sanctions where other municipalities in Eastern Samar may be able to **draw model legal provisions**.

The last aspect of development that the local areas may have the greatest opportunity is the advancement of the **principle of 'cooperativism'**. One of the key aspects to municipal fisheries is enhancing cooperation through the establishment of cooperatives. Philippine domestic and municipal law supports the organisation of fisherfolks to promote economic activities and services, and facilitate mutual help and cooperation. The collective voice of cooperatives is important in developing fisheries policies, putting forward economic interests, and in finding solutions to common problems.

8. Future Research and Training Opportunities

The stakeholder Workshop held in May 2011, which gathered government officials and members of the handline fishing sector of Eastern Samar identified a list of research priorities and training needs which are believed to be most beneficial for the development of the handline sector. The following research topics were identified during the Workshop:

- Spawning season and migration patterns of tuna species in Eastern Samar waters;
- Research on the physical and chemical characteristics of the tuna highway;
- Effect of climate change on tuna handline fishing;

- Improvement on the design of FADs;
- Efficient post harvest techniques and technology.

In terms of training, the following areas where identified as crucial for the improvement of the handline fishing industry:

- Modern methods of handline fishing and post harvest techniques (e.g. icing, handling and transport);
- Tuna classification and sashimi grade;
- Safety of fisherfolks on the high seas (e.g. compass reading, use of GPS, typhoon path reading, precaution on weather conditions);
- Training on first aid for the rescue team (e.g. CPR);
- Alternative livelihood for the family of fishermen.

The fishing industry also provided a number of recommendations to help improve the status of the handline fishing sector in Eastern Samar, such as the need for regular consultations and meetings with fishermen in fish landing sites, proper dissemination of information on relevant laws and ordinances (e.g. *payaos*); establishment of search and rescue teams in strategic locations to promote safety at sea; and price monitoring in the market of marine products, especially for tuna. The handline sector further proposes that the Philippine Government supports the industry by providing communication facilities, fuel subsidy, and a "mother boat" which will provide basic needs in fishing such as fuel, food and ice, and a boat which may store the surplus catch of fishermen.

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Annex (Selected Field Visit and Workshop Photos)